ATTACHMENT 3

Contour
Town Planners

Town Planning and Urban Context Report
Westfield Doncaster
619 Doncaster Road, Doncaster

Manningham Planning Scheme Amendment C104

Date of Report **April, 2016**

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1 Introduction

This report has been prepared to accompany a request to amend the Manningham Planning Scheme as it applies to the Westfield Doncaster complex, located at 619 Doncaster Road, Doncaster. The Amendment will facilitate an expansion of the existing centre to provide 43,000sqm of additional retail floorspace and 18,000sqm of commercial floorspace.

Amendment C104 to the Manningham Planning Scheme proposes to:

- Amend the content of Clause 21.09 (Activity Centres and Commercial Areas);
- Amend the content of the Activity Centre Zone (Schedule 1);
- Delete the Incorporated Plan Overlay (Schedule 1) from the land at 619 Doncaster Road and 1 Grosvenor Street, Doncaster;
- Apply a Development Plan Overlay (Schedule 4) to the land at 619 Doncaster Road, Doncaster;
- Apply a Road Closure Overlay to the western end of Westfield Drive;
- Amend the content of the Parking Overlay (Schedule 1); and
- Amend the content of the Development Contributions Plan Overlay (Schedule 1) to include reference to the Development Plan Overlay.

A draft Development Plan, prepared pursuant to the terms of the proposed DPO4, has been submitted for consideration concurrently with Amendment C104.

The project team comprises:

- **Scentre Ltd.** – owner and manager of Westfield retail complexes in Australia;
- **Contour Consultants** – Town Planners;
- **GTA Consultants** – Traffic Engineers;
- **Tract Consultants** – Urban Design;
- **Land Design Partnership** - Landscape;
- **Cundall** – ESD;
- **Urbis** – Economics and Social Impact Assessment;
- **Scentre Group Design** – Services and Infrastructure; and
- **Acoustic Logic** – Acoustic Engineering.

2 Site Analysis

2.1 Subject Site and Surrounds

The land which is the subject of this Amendment includes:

- The Westfield Doncaster complex, at 619 Doncaster Road, Doncaster (Lot 1 PS 626413); and
- 1 Grosvenor Street, Doncaster (Lot 1 PS 623416)

The Westfield Doncaster complex is located at the north-eastern corner of Doncaster Road and Williamsons Road in Doncaster. The site comprises 13.4 ha of land.

The centre currently comprises:

- Retail floor-space of approximately 105,000sqm;
- A non-retail floor-space of approximately 18,000sqm;
- Myer and David Jones department stores;
- Big W and Target discount department stores;
- Coles and Woolworths supermarkets;
- Various mini-major tenancies;
- A Village Cinemas complex; and
- An entertainment and dining precinct located at the southern end of the complex.

The centre is accessed from Williamsons Road, Doncaster Road, Tower Street and Goodson Street. Williamsons Road includes two signalised intersections providing access to the centre. Doncaster Road has a left-turn slip lane into a loading bay. Tower Street is a signalised intersection with access to the speed ramps on the eastern side of the centre, plus roof-top parking. Goodson Street predominantly provides access to the at-grade car parking in the eastern part of the site.

A total of approximately 4,782 car parking spaces are provided on the site.

A bus interchange is located on the Williamsons Road frontage and it accommodates eight bus bays in a one-way (north-bound) configuration. The bus interchange services routes 207, 279, 280, 281, 282, 293, 295, 304, 305, 902, 903 and 907.

The shopping complex ranges in height largely due to the sloping land and functional requirements of different uses (such as cinemas) which vary from standardised building heights. There is an office tower of seven storeys above the podium which primarily accommodates office and medical-related tenancies, and centre management.

Planning Permit PL13/23936 allows for the construction of a multi-deck (5 level) car park in the eastern part of the site, allowing for the installation of 556 additional (net) car parking spaces (although this may increase by 18 spaces, pending approval of a request to amend the endorsed plans. Construction commenced in January, 2016.

2

2 Site Analysis

To the north, the land has an interface with Westfield Drive. The properties on the northern side of Westfield Drive are designated for future consolidation and multi-unit development of up to 3 storeys, but are currently predominantly occupied by two-storey dwellings. To the north-east, Westfield Drive includes a church with associated car park, and an apartment building.

To the east, the land has an interface with residential properties which face Roseville Avenue. These properties are predominantly single-storey and are also designated for future consolidation and multi-unit development of up to 3 storeys.

To the south-east, the land has a frontage to Tower Street which includes speed ramps providing access to / from the car parking contained on the roof and the eastern part of the centre. The north-east corner of Tower Street and Doncaster Roads is approved for a mixed use redevelopment comprising a Bunnings outlet, retail tenancies and dwellings.

A three-storey office building is located at 651 Doncaster Road, which forms an indentation in what is otherwise the frontage of the Westfield Doncaster complex to Doncaster Road.

On the opposite side of Doncaster Road is a temporary car park and an apartment building with a two-storey podium accommodating a gymnasium. The corner of Tram Road and Doncaster Road is currently occupied by restricted retail premises, but has approval for a mixed use development including retail tenancies and apartments.

The land at 1 Grosvenor Street is included in this Amendment to enable the removal of the Incorporated Plan Overlay (IPO). The land has the benefit of Planning Permit PL08/020023 which allows the development of 185 apartments in a part 3, 4 and 10 storey building. Construction works are well-advanced.

2.2 Site Context

The Westfield Doncaster complex is the retail anchor within the Doncaster Hill Activity Centre area and is a regional shopping centre.

Doncaster Hill is a higher-order activity centre within the eastern region of Melbourne. Included within the Activity Centre Zone and covering an area of 58ha, it is intended to *create a 'state of the art', contemporary, sustainable, high-density, mixed-use village that enhances the social, environmental, economic and cultural elements of the region*, including:

- → 4,080 new dwellings;
- → 8,300 residents by 2030;
- → 10,000 new employment opportunities;
- → 20,000sqm of additional office floor-space; and
- → 10,000sqm of additional retail floor-space (excluding Westfield).
  (as set out in the Doncaster Hill Strategy 2004)

The character of the activity centre is being influenced by development of multi-level apartment buildings, planning approvals secured for similar redevelopment proposals, and the existing uses within the area.

Some of the future redevelopments approved by Council, both within and outside the Doncaster Hill Activity Centre, are set out below.

- → Eastern Golf Course (463 – 535 Doncaster Road – Development Plan Overlay in Amendment C101), comprising a 47ha site included within the Residential Growth Zone and approximately 900 new dwellings.
- → 602 Doncaster Road (Autobarn site – Planning Permit PL11/22360), comprising a 13 storey building with 270 apartments, shops and café tenancies.
- → 642 – 654 Doncaster Road, comprising a 12 storey building with 251 apartments and a restaurant.
- → 659 Doncaster Road (Bunnings site – Planning Permit PL12/22747), comprising apartments, trade supplies and retail tenancies.
- → 682 – 686 Doncaster Road, comprising a 9 storey building with 296 apartments, café, restaurant, shops and offices.
- → 88 Tram Road, comprising an 8 storey building with 60 apartments.
- → 101 Tram Road, comprising a 13 storey building with 201 apartments.
- → 5 Elgar Court, comprising an 11 level building with 132 apartments.
- → 1 Grosvenor Street, comprising 3, 4 and 10 storey buildings and 185 apartments.
- → 5 Sovereign Point Court, comprising a 9 storey building with 93 apartments.
- → 20 Hepburn Road, comprising a 14 storey building with 181 apartments.

2 Site Analysis

Figure 2.1
SITE CONTEXT MAP

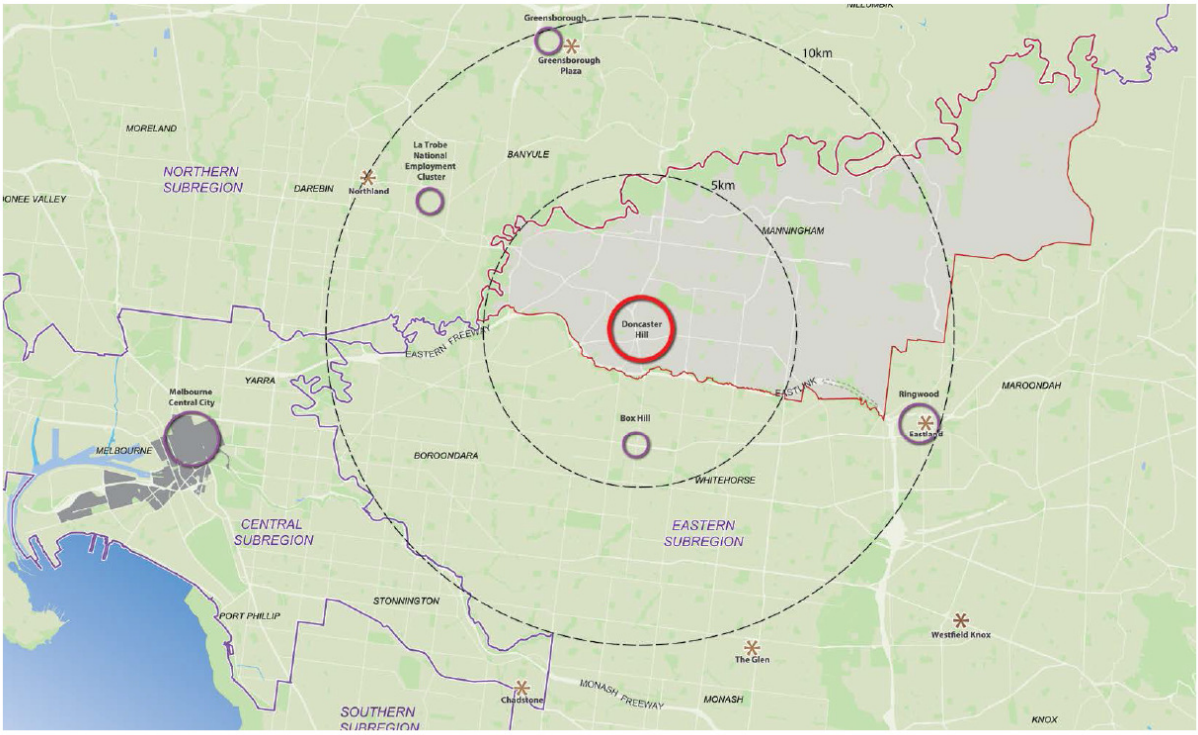


Figure 4: Metropolitan context map. Scale 1:100,000

2 Site Analysis

Figure 2.2
SUBJECT SITE – LOCALITY PLAN

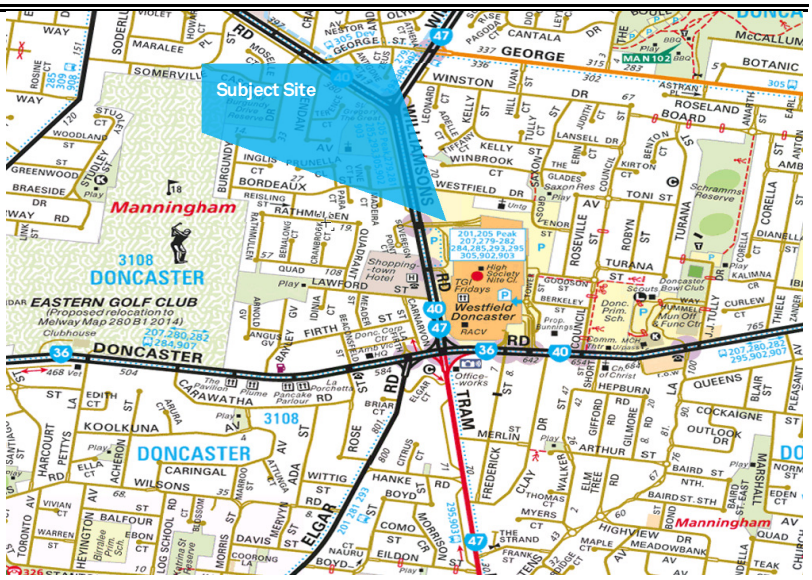
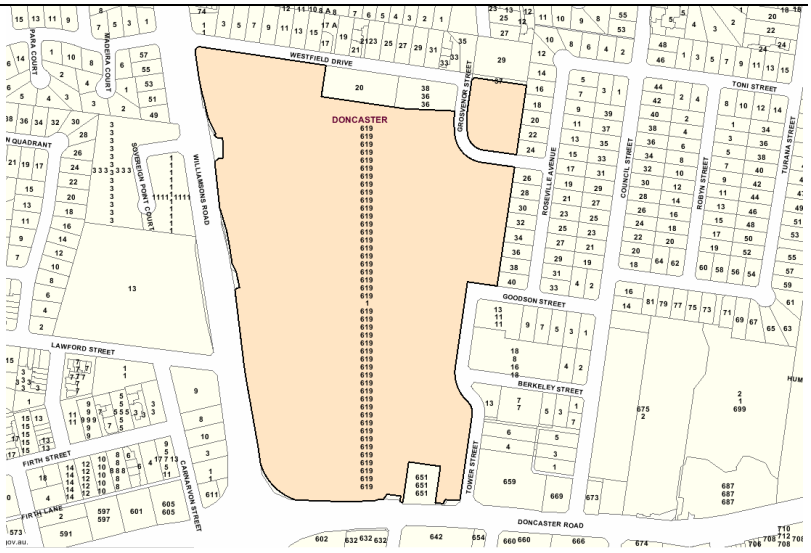


Figure 2.3
CADASTRAL PLAN



2 Site Analysis

Figure 2.4
AERIAL PHOTOGRAPH – NEAR MAP, FEBRUARY 2015
(indicative site boundary shown in blue)

3 Manningham Planning Scheme

3.1 State Planning Policy Framework (SPPF)

The Goal for planning in Victoria as set out in Clause 10.02 of the Manningham Planning Scheme is:

The State Planning Policy Framework seeks to ensure that the objectives of planning in Victoria (as set out in Section 4 of the Planning and Environment Act 1987) are fostered through appropriate land use and development planning policies and practices which integrate relevant environmental, social and economic factors in the interests of net community benefit and sustainable development.

The following Clauses of the SPPF are relevant to the proposal:

Clause 11.01 – Activity Centres

As part of 'Plan Melbourne', Doncaster Hill is recognised as an activity centre.

The objectives for activity centres are as follows:

- *To build up activity centres as a focus for high-quality development, activity and living for the whole community by developing a network of activity centres.*
- *To encourage the concentration of major retail, residential, commercial, administrative, entertainment and cultural developments into activity centres which provide a variety of land uses and are highly accessible to the community.*

Related planning strategies include:

- *Broaden the mix of uses in activity centres to include a range of services over longer hours appropriate to the type of centre and needs of the population served.*
- *Provide a focus for business, shopping, working, leisure and community facilities.*
- *Encourage economic activity and business synergies.*
- *Improve the social, economic and environmental performance and amenity of the centre.*

Clause 11.04-1 – Delivering Jobs and Investment

Clause 11.04-1 includes a strategy to *plan for jobs closer to where people live*.

Clause 13.04-1 – Noise Abatement

Noise impacts in the proposal are relevant in terms of the surrounding residential interface to the north / north-east. The relevant planning strategy is to:

Ensure that development is not prejudiced and community amenity is not reduced by noise emissions, using a range of building design, urban design and land use separation techniques as appropriate to the land use functions and character of the area.

Clause 15 – Built Environment and Heritage

Clause 15 notes that *planning should achieve high quality urban design and architecture that:*

- → *Contributes positively to local urban character and sense of place.*
- → *Reflects the particular characteristics, aspirations and cultural identity of the community.*
- → *Enhances liveability, diversity, amenity and safety of the public realm.*
- → *Promotes attractiveness of towns and cities within broader strategic contexts.*
- → *Minimises detrimental impact on neighbouring properties.*

Relevant planning strategies include:

- → *Promote good urban design to make the environment more liveable and attractive.*
- → *Ensure new development or redevelopment contributes to community and cultural life by improving safety, diversity and choice, the quality of living and working environments, accessibility and inclusiveness and environmental sustainability.*
- → *Require development to respond to its context in terms of urban character, cultural heritage, natural features, surrounding landscape and climate.*
- → *Ensure transport corridors integrate land use planning, urban design and transport planning and are developed and managed with particular attention to urban design aspects.*
- → *Ensure the design of buildings, public spaces and the mix of activities contribute to safety and perceptions of safety.*
- → *Support initiatives that provide safer walking and cycling routes and improved safety for people using public transport.*

Clause 15.02-1 – Resource and Energy Efficiency

Environmental sustainability is a key focus within the Doncaster Hill activity centre. At a State level, the following strategies are relevant:

- → *Ensure that buildings and subdivision design improves efficiency in energy use.*
- → *Promote consolidation of urban development and integration of land use and transport.*
- → *Improve efficiency in energy use through greater use of renewable energy.*
- → *Support low energy forms of transport such as walking and cycling.*

Clause 17.01-1 - Business

The objective for business in Victoria is:

To encourage development which meet the communities' needs for retail, entertainment, office and other commercial services and

provides net community benefit in relation to accessibility, efficient infrastructure use and the aggregation and sustainability of commercial facilities.

Relevant planning strategies include:

- → *Locate commercial facilities in existing or planned activity centres.*
- → *Provide new convenience shopping facilities to provide for the needs of the local population in new residential areas and within, or immediately adjacent to, existing commercial centres.*
- → *Provide small scale shopping opportunities that meet the needs of local residents and workers in convenient locations.*
- → *Provide outlets of trade-related goods or services directly serving or ancillary to industry and which have adequate on-site car parking.*
- → *Locate cinema based entertainment facilities within or on the periphery of existing or planned activity centres. Such facilities should not require a permit for use within activity centres and are not encouraged on freestanding sites.*
- → *A five year time limit for commencement should be attached to the planning approval for all shopping centres or expansions of over 1,000 square metres in floorspace.*

Clause 18.01 – Integrated Transport and Clause 18.02 – Movement Networks

Relevant transport strategies include:

- → *Plan urban development to make jobs and community services more accessible by:*
  - → *Ensuring access is provided to developments in accordance with forecast demand, taking advantage of all available modes of transport and to minimise adverse impacts on existing transport networks and the amenity of surrounding areas.*
  - → *Coordinating improvements to public transport, walking and cycling networks with the ongoing development and redevelopment of the urban area.*
  - → *Concentrating key trip generators such as higher density residential development in and around Central Activities Districts, Principal, Major and Specialised Activity Centres on the Principal Public Transport Network.*
  - → *Requiring integrated transport plans to be prepared for all new major residential, commercial and industrial developments.*
  - → *Requiring that substantial increases in activity in employment corridors are connected to the Principal Public Transport Network.*
  - → *Providing routing, bus stop and interchange arrangements for public transport services in new development areas.*
  - → *Providing safe, convenient and direct pedestrian and cycling access to activity centres, public transport interchanges and other strategic redevelopment sites.*

- → *Integrate public transport services and infrastructure into new development.*
- → *Plan or regulate new uses or development of land near an existing or proposed transport route to avoid detriment to, and where possible enhance the service, safety and amenity desirable for that transport route in the short and long terms.*
- → *Encourage higher land use densities and mixed use developments near railway stations, major bus terminals, transport interchanges, tramways and principal bus routes. Pedestrian and cyclists access to public transport should be facilitated and safeguarded.*
- → *Ensure transport practices, including design, construction and management, reduce environmental impacts.*
- → *Consider all modes of travel, including walking, cycling, public transport, taxis and private vehicles (passenger and freight) in providing for access to new developments.*
- → *Encourage the use of walking and cycling by creating environments that are safe and attractive.*
- → *Develop high quality pedestrian environments that are accessible to footpath-bound vehicles such as wheelchairs, prams and scooters.*
- → *Ensure development provides opportunities to create more sustainable transport options such as walking, cycling and public transport.*
- → *Ensure cycling routes and infrastructure are constructed early in new developments.*
- → *Direct and connected bicycle infrastructure should be provided to and between key destinations including activity centres, public transport nodes and major attractions.*
- → *Achieve greater use of public transport by increasing densities, maximising the use of existing infrastructure and improving the viability of the public transport operation.*
- → *Plan and regulate the design of transport routes and nearby areas to achieve visual standards appropriate to the importance of the route with particular reference to landscaping, the control of outdoor advertising and, where appropriate, the provision of buffer zones and resting places.*
- → *Allocate or require land to be set aside for car parking subject to the existing and potential modes of access including public transport, the demand for off-street car parking, road capacity and the potential for demand management of car parking.*

3.2 Local Planning Policy Framework (LPPF)

Clause 21.02 – Municipal Profile

Retail is recognised by Council as a substantial contributor to the local and regional economy, and it creates substantial employment opportunities with over 12,000 people employed in the wholesale and retail trade industry, representing more than 22% of all employed residents. In addition, based on the Eastern Region Housing Statement, 11,000 new households will be required by 2031.

Clause 21.03 – Key Issues

One of the nominated key issues for the municipality is retailing trends. Clause 21.03 notes:

Initiatives which promote the economic well-being of the principal, major, neighbourhood and local activity centres as the commercial and social focus for the local community, will be of a high priority.

Changing shopping patterns and competition from larger centres, including the regional centres of Doncaster Shoppingtown, Greensborough, Ringwood and Box Hill will influence the viability of neighbourhood and local shopping centres.

Activity centres will be developed as centres for business, shopping, working and leisure. They will also be important locations for the development of different types of housing, including forms of higher density development. It is vital to consolidate development of commercial activities within existing activity centres to reinforce the existing retail hierarchy and ensure that each centre remains viable, vibrant and sustainable into the future.

Clause 21.04 – Vision – Strategic Framework

The Doncaster Hill precinct is nominated as a Principal Activity Centre on the Strategic Framework Overview Plan.

Clause 21.09 – Activity Centres and Commercial Areas

Clause 21.09 recognises Doncaster Hill as a *prime location for redevelopment*. With an area of 58ha, it has been designated in Council policy for higher-density residential development and housing growth with a focus on sustainability. The Westfield Doncaster site is acknowledged as the *principal retail and entertainment focus* of the activity centre. Council's vision for the Westfield site is:

As the Principal retail and entertainment focus of the Doncaster Hill Activity Centre it is envisaged that Westfield Shoppingtown will be better integrated into Doncaster Hill Activity Centre and the surrounding community. Future developments of Westfield Shoppingtown should be consistent with the vision of Doncaster Hill Activity Centre by incorporating activated street frontages and external spaces, a greater mix of uses, pedestrian accessibility, an accessible

and prominent public transport interchange and improved engagement with the main intersection.

Clause 21.10 – Ecologically Sustainable Development

Council's ESD policy includes strategies for:

- → Building energy management
- → Water-sensitive urban design
- → External environmental amenity
- → Waste management
- → Quality of public and private realm
- → Transport

Clause 21.12 – Infrastructure

Clause 21.12 includes objectives and strategies for roads and public transport.

Of relevance are the following:

- → *Facilitate the location and development of transport hubs at or adjoining activity centres.*
- → *Facilitate the provision of bus shelters at high use public transport sites.*
- → *Require that design and construction standards cater for safe, efficient and effective vehicle movement and servicing needs.*
- → *Promote cycling and walking opportunities by providing safe bicycle routes and expanding the bicycle network, and providing pedestrian trails to improve accessibility to local and regional commercial, community and recreational facilities.*
- → *Provide opportunities to enhance the amenity of Doncaster Road and other main roads.*

3.3 Zoning

The land is included in the Activity Centre Zone (Schedule 1) following approval of Amendment VC59 in December, 2009. The Explanatory Report which accompanied Amendment VC59 noted:

The ACZ schedule for the Doncaster Hill Principal Activity Centre defines the boundary for the centre and identifies seven precincts with differentiated land use and development objectives, building heights and setbacks, and public realm improvements as articulated in the Doncaster Hill Strategy (Manningham City Council, October 2002, Revised 2004) and Doncaster Hill Sustainability Guidelines (Manningham City Council, June 2004). The Table of uses included in the schedule gives direction on the preferred location of land uses across the centre. Accommodation and a mix of uses are encouraged in all precincts, but the land use emphasis is determined by specific precinct objectives. Additional details are included for centre-wide provisions, precinct provisions, application requirements, decision guidelines, and reference documents.

Objectives for the Westfield Doncaster Precinct 4 are as follows:

- → *To further improve existing active street frontages.*
- → *Encourage an enhanced pedestrian environment within the precinct.*
- → *To maintain and improve the positive engagement of the precinct with the main intersection of Doncaster Road and Williamsons Road.*
- → *To provide opportunities for a range of residential and commercial uses to develop within the precinct along with the existing retail development.*
- → *To create a number of significant externalised public urban spaces/plazas, which are well connected to the public transport interchange and boulevard along Doncaster Road.*
- → *To support and connect with the pedestrian link proposed for the Doncaster, Williamsons and Tram Roads intersection at the western end of the precinct.*
- → *Precinct guidelines include:*
- → *Maintain a landmark building at the Doncaster Road and Williamsons Road intersection.*
- → *Develop a unique gateway building abutting Williamsons Road in the north-west corner of the precinct.*
- → *Maintain and enhance an integrated public transport interchange to support both Westfield Doncaster and the greater Doncaster Hill area in a prominent and easily accessible location.*
- → *Create a pedestrian friendly interface between Westfield Doncaster, Doncaster Road, Williamsons Road and Tower Street.*
- → *Establish strong pedestrian entries and linkages from Westfield Doncaster to all other precincts within Doncaster Hill.*
- → *Future building form is to maximise the north-east aspect and views, and vistas to the CBD.*
- → *External spaces should directly link to Williamsons Road and Doncaster Road where appropriate.*

Within the Zone, a planning permit can be sought (or is not required) for a range of land uses, including:

- → Shop / retail premises
- → Supermarket
- → Food and drink premises
- → Cinemas
- → Office
- → Dwelling

A planning permit is also required to construct a building or construct or carry out works.

Building heights are specified for parts of the surrounding land, including (refer map over page):

Precinct requirements

Sub-Precinct	Maximum height (Excluding Basement)	Design Element Height	Setbacks
4A	None specified	None specified	None specified
4B	21.5m	4.3m above maximum height	5m to front podium edge from front boundary 13m to front tower edge from the front boundary 4.5m from the side boundaries 4.5m from the rear boundary
4C	None specified	None specified	None specified
4D	11m	None specified	5m from front site boundary 4.5m from side boundaries
4E	None specified	None specified	None specified

Figure 3.1
ZONING MAP

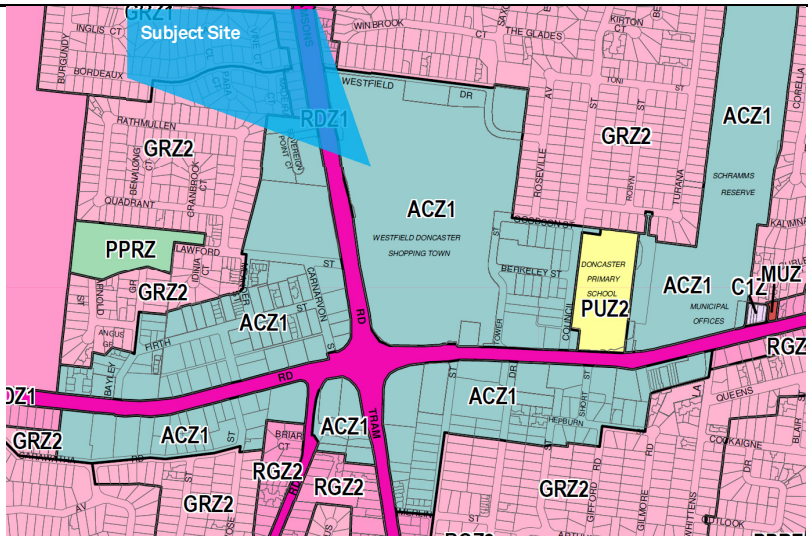
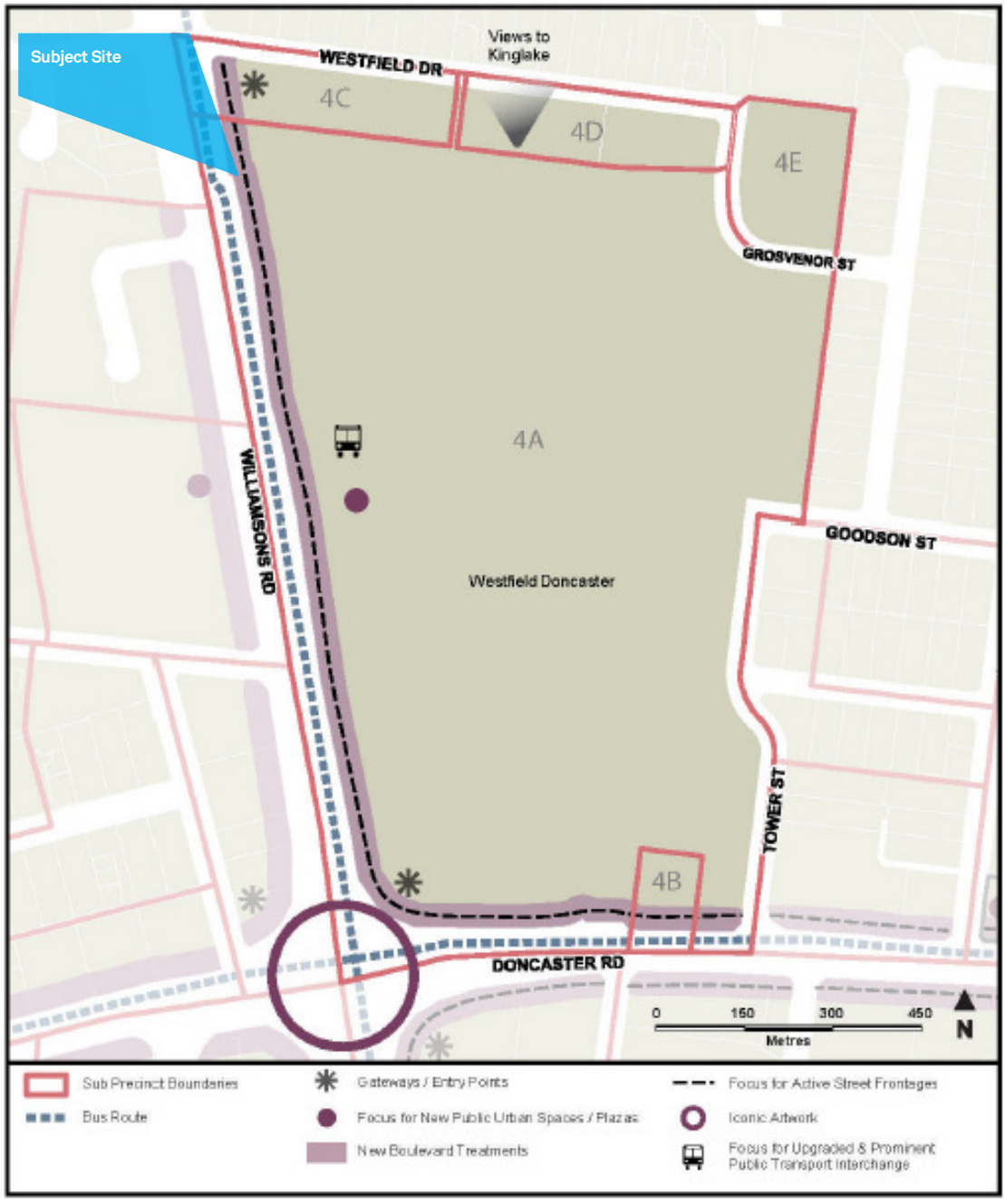


Figure 3.2
ACTIVITY CENTRE ZONE (SCHEDULE 1)
PRECINCT 4 MAP

5.4-1 Precinct map
03/08/2010
C87



3.4 Overlays

Parking Overlay (Schedule 1)

The Parking Overlay which applies to the Doncaster Hill Activity Centre varies the following Clause 52.06 car parking rates:

- → Office: 2.5 spaces / 100sqm
- → Restaurant: 0.36 spaces / 100sqm
- → Restricted retail premises: 1.5 spaces / 100sqm
- → Shop: 3.5 spaces / 100sqm

Development Contributions Plan Overlay (Schedule 1)

For non-residential development, the approved DCP requires a current contribution of $1,168 per 121sqm of commercial floor-space or 19sqm of retail floor-space for Development Infrastructure (encompassing transport, streetscape and public art).

There is no contribution payable for community infrastructure.

There is an exemption in the DCPO for Westfield Doncaster as follows:

Construction of a building or construction or carrying out of works on the land known as Westfield Shoppingtown Doncaster being the land identified on Planning Scheme Map 7IPO up to a leasable floor area of 135,000 square metres (comprising a maximum of 90,000 square metres leasable floor area for shop) provided that the infrastructure works specified in the conditions of Planning Permit No. PL03/015005 or other works in lieu of the specified works (as agreed by Council) are carried out or there is an agreement to secure the carrying out of those works to the satisfaction of the responsible authority.

The existing centre exceeds 90,000sqm of shop floor space.

Incorporated Plan Overlay (Schedule 1)

The Incorporated Plan is shown at Figure 3.5.

The provisions of the IPO1 allow for a planning permit to be granted for development which is not generally in accordance with the Incorporated Plan.

The IPO1 also requires that a "Development Plan" be prepared which encompasses the following items:

- → Architectural plans and elevations
- → Staging information
- → Traffic Plan
- → Landscape Plan
- → Shopping Centre Management Plan
- → Perimeter Road Plan

Figure 3.3
PARKING OVERLAY MAP

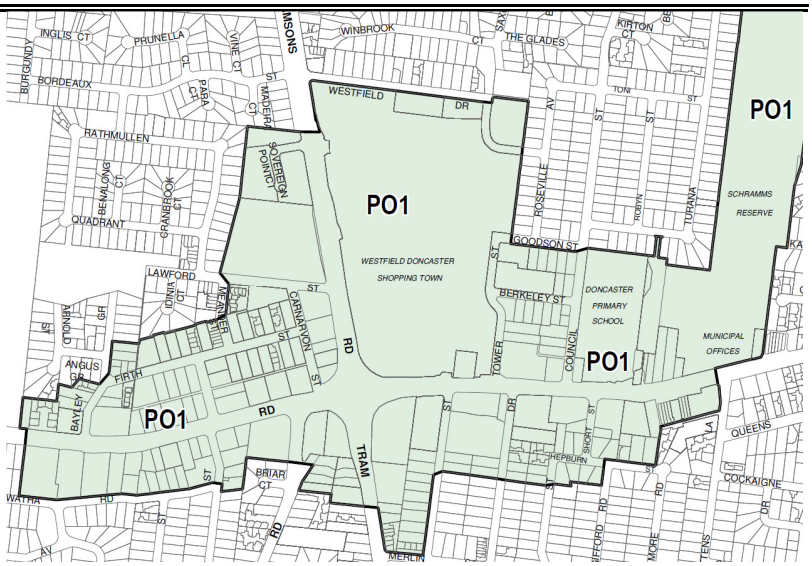
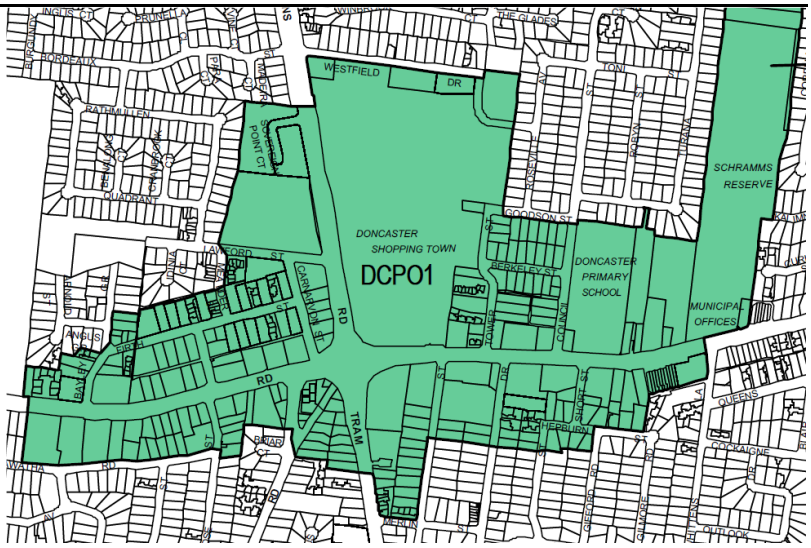


Figure 3.4
DEVELOPMENT CONTRIBUTIONS PLAN OVERLAY MAP



3 Manningham Planning Scheme

Figure 3.5
WESTFIELD DONCASTER INCORPORATED PLAN (1996)

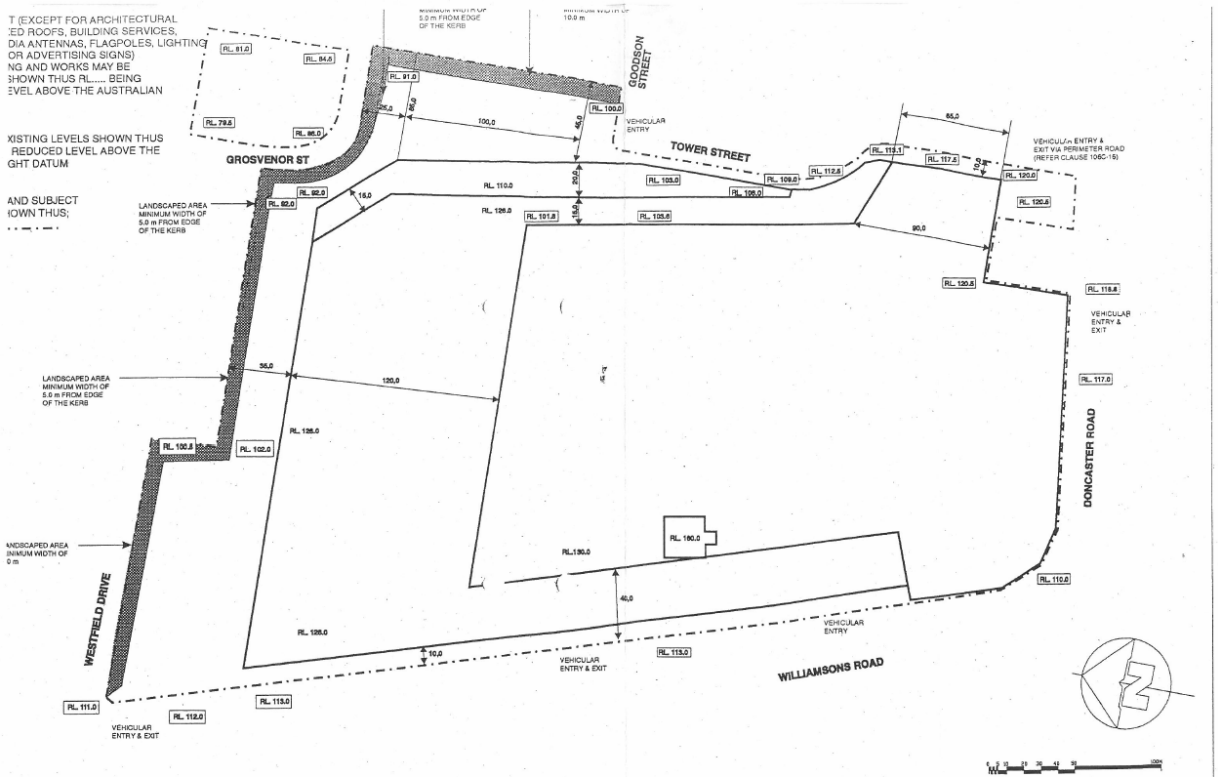
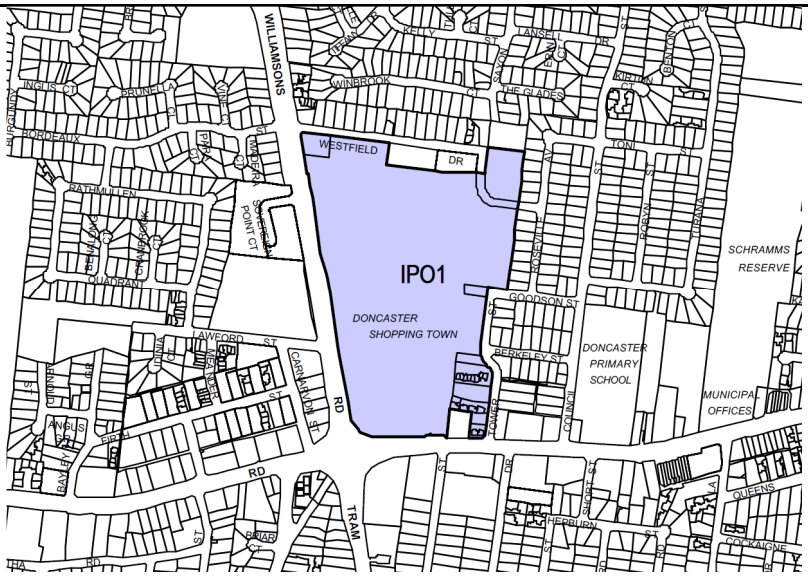


Figure 3.6
INCORPORATED PLAN OVERLAY (SCHEDULE 1)



3.5 Particular Provisions

The following Particular Provisions are relevant:

Clause 52.06 – Car Parking

Clause 52.06 is read in conjunction with the Parking Overlay which is in place for the Doncaster Hill activity centre.

Clause 52.07 – Loading and Unloading of Vehicles

Clause 52.07 specifies the required loading bay dimensions for new or extended land uses.

Clause 52.29 – Land Adjacent to a Road Zone (Category 1)

A planning permit is required to create or alter access to a road in a Road Zone (Category 1). An application made pursuant to Clause 52.29 must be referred to the Roads Corporation.

Clause 52.34 – Bicycle Facilities

Clause 52.34 sets out bicycle parking rates for new or extended land uses.

Clause 52.36 – Integrated Public Transport Planning

An application for the following requires referral to Public Transport Victoria:

- → *A new retail premises of 4000 or more square metres of leasable floor area.*
- → *An increase of more than 1000 square metres to the leasable floor area of an existing retail premises which is 4000 or more square metres leasable floor area.*
- → *An office development of 10,000 or more square metres of leasable floor area.*
- → *Any alteration or development of public transport infrastructure or stops.*

4 Proposed Manningham Planning Scheme Amendment C104

Manningham Planning Scheme Amendment C104 proposes to:

- → Amend the content of Clause 21.09 (Activity Centres and Commercial Areas);
- → Amend the content of the Activity Centre Zone (Schedule 1);
- → Delete the Incorporated Plan Overlay (Schedule 1) from the land at 619 Doncaster Road and 1 Grosvenor Street, Doncaster;
- → Apply a Development Plan Overlay (Schedule 4) to the land at 619 Doncaster Road, Doncaster;
- → Apply a Road Closure Overlay to the western end of Westfield Drive;
- → Amend the content of the Parking Overlay (Schedule 1); and
- → Amend the content of the Development Contributions Plan Overlay (Schedule 1) to include reference to the Development Plan Overlay.

Clause 21.09

Clause 21.09 of the Manningham Planning Scheme contains Council's strategic planning policy for Activity Centres and Commercial Areas.

It is proposed to make a number of text changes to confirm the strategic importance of Westfield Doncaster to achieving the wider Doncaster Hill objectives.

Activity Centre Zone

The following amendments are proposed to the Zone:

- → Within 'Land Use', add:

  To recognise that, central to the activity centre, the site is a major regional shopping centre.

- → The requirements for 'Boulevard Character' and 'Advertising Signs' are proposed to be varied to provide an exemption for Westfield Doncaster and, instead, address these requirements as part of a Development Plan prepared for the land.

- → Within Section 5.4-2 'Precinct Objectives', add two new objectives for the Westfield Doncaster complex.

- → Within Section 5.4-3 'Precinct Requirements', delete Sub-Precinct 4C.

- → In 'Application Requirements', confirm that the Development Plan Overlay (Schedule 4) includes application requirements for the Westfield Doncaster site.

The Doncaster Hill Framework Plan and the Precinct 4 Map are also proposed to be amended. The Framework Plan will be amended to confirm a new public space on the northern side of the bus interchange (currently shown to the south of the bus interchange). The Precinct 4 Map will be amended to delete sub-precinct 4C and consolidate this

land with Precinct 4A (the wider Westfield Doncaster land), and confirm a new public space on the northern side of the bus interchange (currently shown to the south of the bus interchange).

Delete IPO1

The existing IPO1 will be deleted from the Westfield Doncaster land and the redevelopment site at 1 Grosvenor Street.

The land at 1 Grosvenor Street is now under construction for a 10 level apartment building and the IPO is no longer required to apply to this site.

Add DPO4

The IPO1 will be replaced at Westfield Doncaster by a new Development Plan Overlay (Schedule 4) and provide a framework for the future land use and development at the Westfield Doncaster site over a 10 – 15 year timeframe.

The DPO4 will require the preparation of a Development Plan which includes the following items:

- → Site Analysis Plans
- → Envelope Plans
- → Design Criteria
- → Landscape Concept Plan
- → Integrated Transport Plan
- → Environmental Sustainability Plan
- → Acoustic Engineering Report
- → Economic Report
- → Services / Infrastructure Report
- → Infrastructure and Contributions
- → Staging Plan
- → Social Impact Report

For future applications that are 'generally in accordance with an approved Development Plan' there will be an exemption from third party notice, decision and review.

Apply a Road Closure Overlay

The Road Closure Overlay (RXO) is proposed to be applied to the western end of Westfield Drive to prevent direct access from Westfield Drive to / from Williamsons Road.

Amend PO1

The Parking Overlay is amended to reflect the car parking rates adopted as part of the Integrated Transport Plan, being 3.4 spaces / 100sqm for shop uses, and 3.5 spaces / 100sqm for office uses, applying to the expansion of the centre only. The PO1 also includes new decision guidelines to acknowledge the staged nature of the development, the benefits of multi-purpose trips in the Activity Centre, and the upgrade of the new bus interchange and walking / cycling connections to the site. The Development Plan itself reflects a proposed end retail car parking rate at the site for 4.09 spaces / 100sqm.

Amend DCPO1

The DCPO1 will be amended as follows:

→ Under Section 4.0 'Land or development excluded from development contributions plan', delete:

Construction of a building or construction or carrying out of works on the land known as Westfield Shoppingtown Doncaster being the land identified on Planning Scheme Map ~~7IPO~~ 7DPO up to a leasable floor area of 135,000 square metres (comprising a maximum of 90,000 square metres leasable floor area for shop) provided that the infrastructure works specified in the conditions of Planning Permit No. PL03/015005 or other works in lieu of the specified works (as agreed by Council) are carried out or there is an agreement to secure the carrying out of those works to the satisfaction of the responsible authority.

4 Proposed Manningham Planning Scheme Amendment C104

Figure 4.1
AMENDMENT C104 IPO MAP

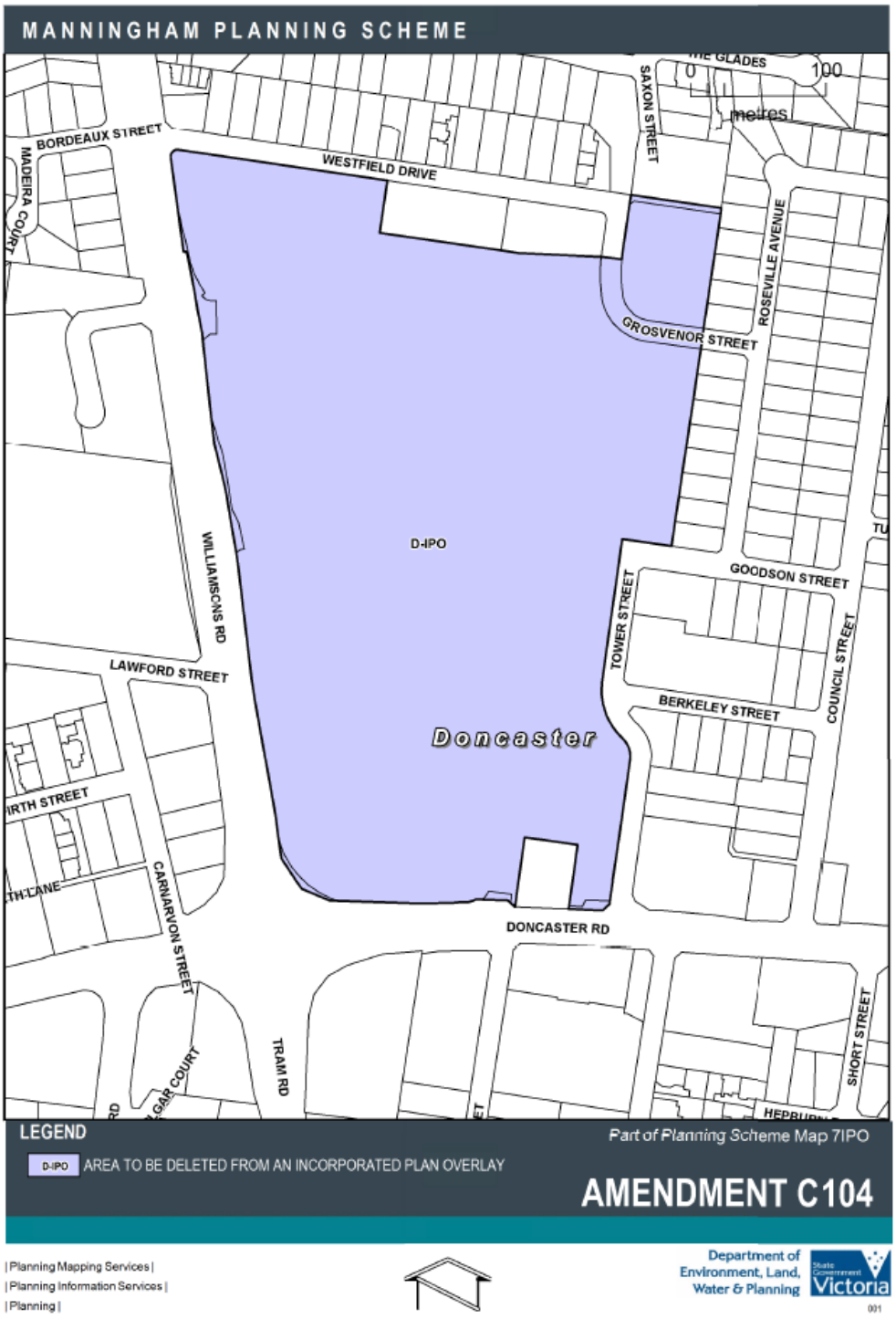


Figure 4.2
AMENDMENT C104 – DPO4 MAP

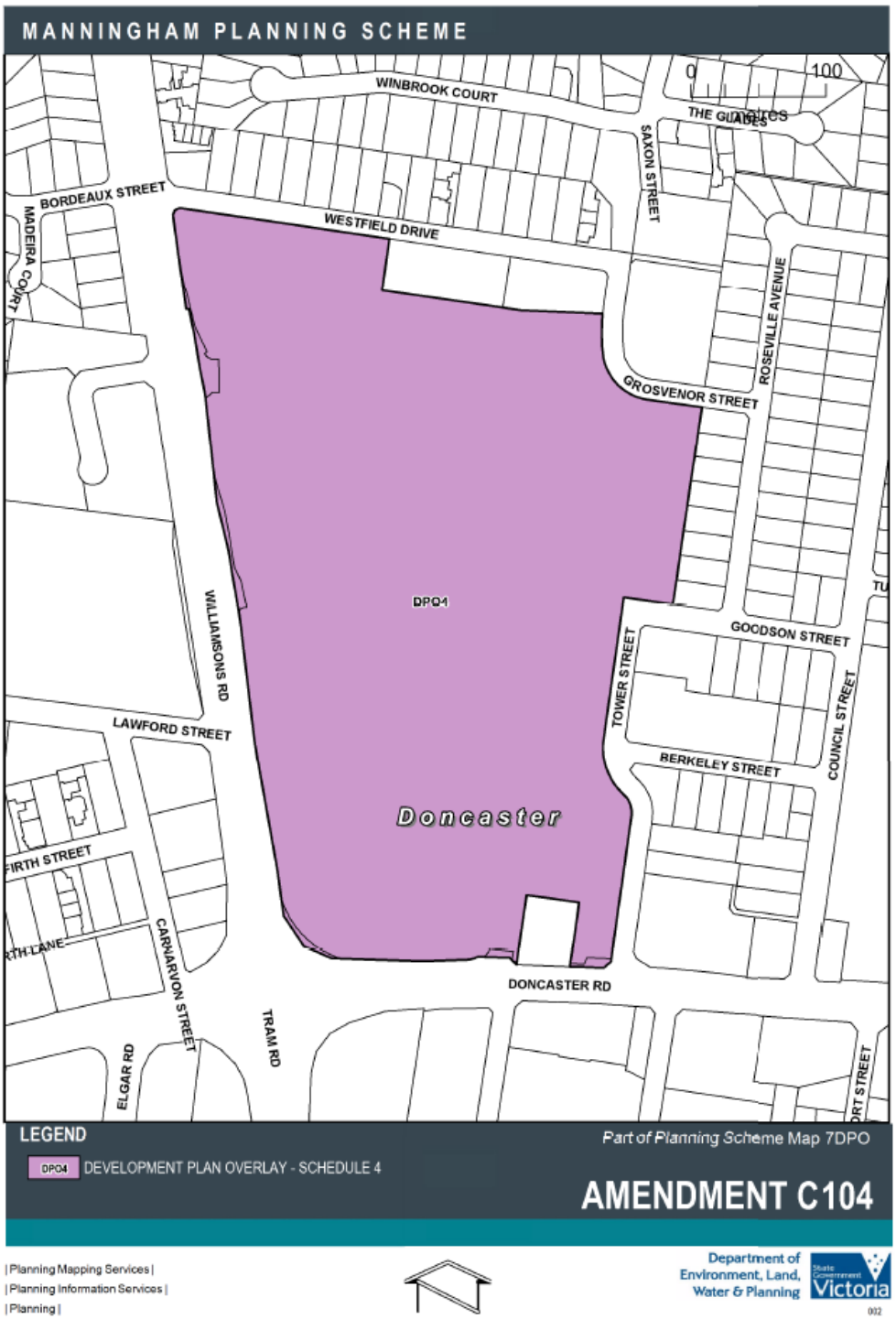


Figure 4.3
ROAD CLOSURE OVERLAY MAP

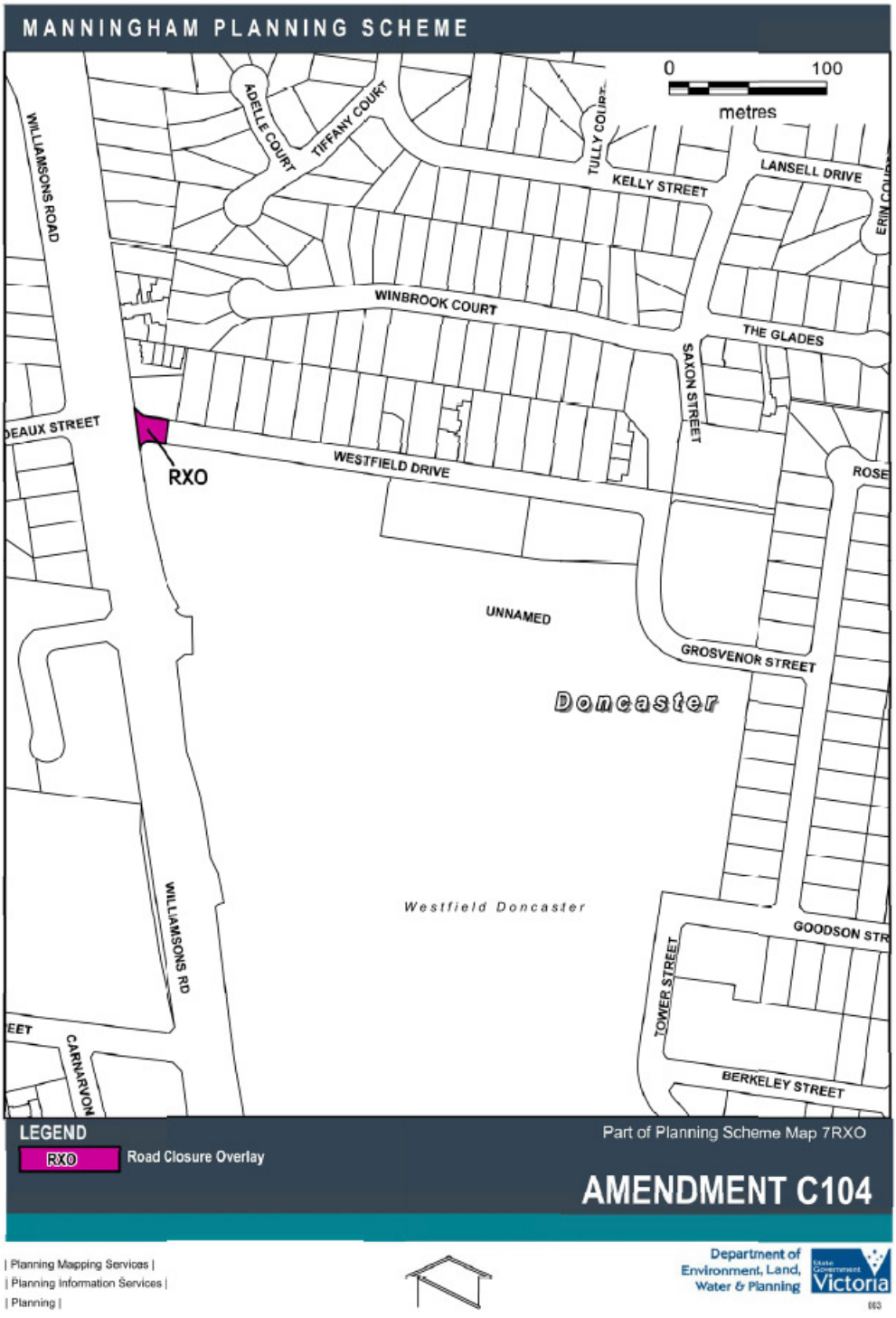
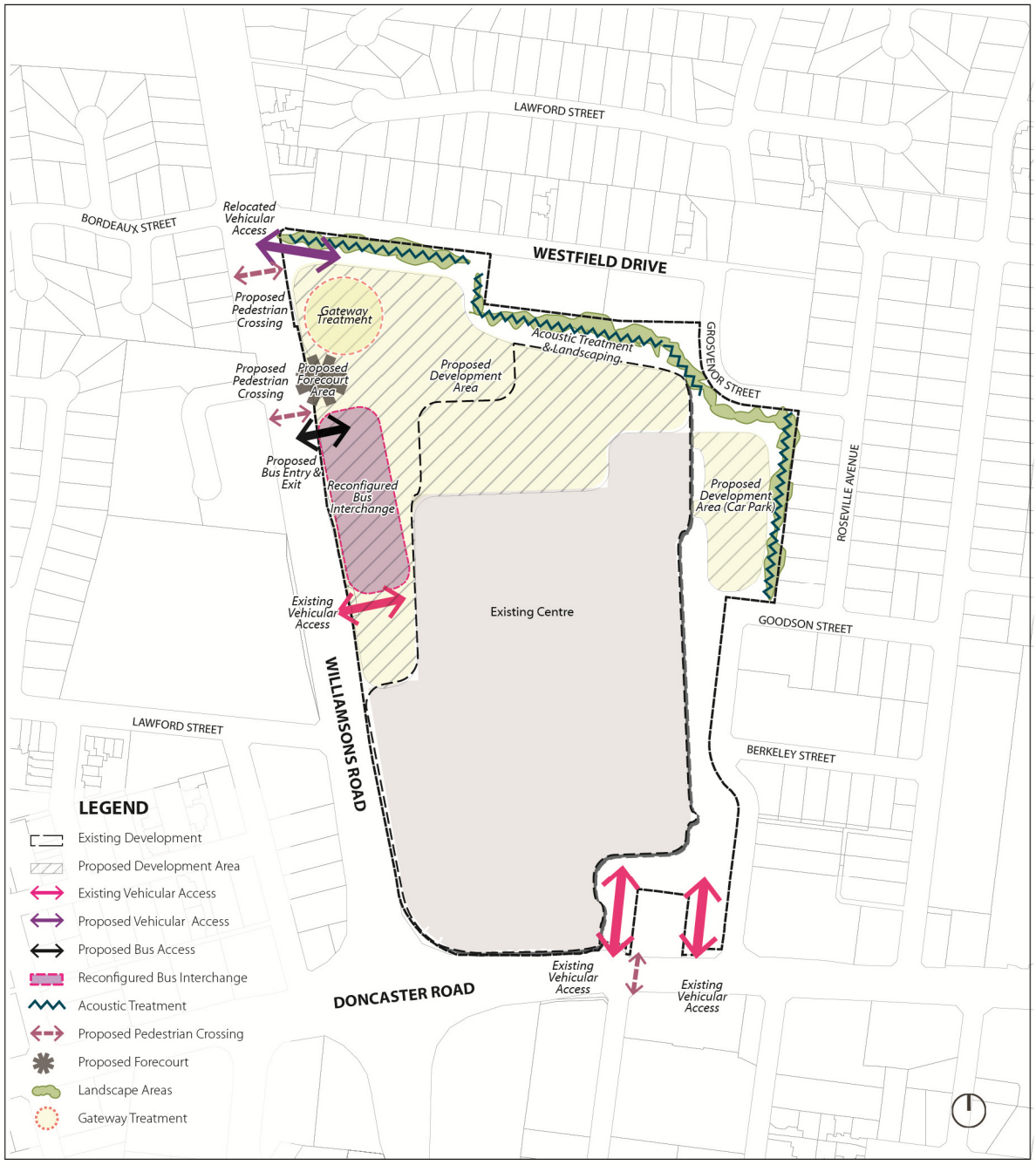


Figure 4.4
DPO CONCEPT PLAN



5 Draft Development Plan

The draft Development Plan has been prepared and submitted concurrently with the Planning Scheme Amendment and responds to the provisions set out in the draft DPO (Schedule 4) within Amendment C104.

In total, the Development Plan allows for 18,000sqm of office / commercial floor-space and 43,000sqm of retail floor-space. The expansion of the centre is generally in a northerly direction towards Westfield Drive and includes extensive works to the bus interchange on Williamsons Road and changes to the existing site access arrangements.

The 'vision' for the master-planning site is as follows:

- → To provide for future use and development in accordance with the Doncaster Hill Strategy (October, 2002, revised 2004), the Activity Centre Zone, and the State and Local Planning Policy Frameworks.
- → To recognise the key role that the site plays as an anchor in the Doncaster Hill activity centre.
- → To provide an economically viable and sustainable precinct with retail, commercial and entertainment offerings that meet local and regional expectations and demand.
- → To provide flexibility to respond to key international retail trends, formats and requirements.
- → To provide a high-quality urban design outcome and improved streetscapes and interfaces with residential areas.
- → To reduce off-site amenity impacts associated with future development.
- → To recognise the opportunity to provide a gateway building at the corner of Westfield Drive and Williamsons Road.
- → To improve the pedestrian, cyclist and public transport accessibility into the centre and end-of-trip facilities, as a means of promoting environmental sustainability and walkable neighbourhoods.
- → To provide sufficient car parking for staff and customers.
- → To provide for efficient traffic and access movements within and around the centre.

<u>Land Use</u>

It is proposed to maintain the existing retail base of the centre by providing for a northerly extension to the existing malls and facilitating 43,000sqm of additional retail-based floor-space. This floor-space may include [approximately] 5,000sqm additional discount department store floor area, 24,000sqm of new mini-major tenancies, 12,000sqm in speciality retail tenancies, and 1,000sqm associated with a cinema expansion. The specific retail uses will be determined at a later stage as part of future planning permit applications.

The existing 'Westfield Tower' centrally located within the site includes primarily office and medical-related tenancies. This land use will be expanded with up to 18,000sqm of new commercial and office floor

area proposed for the site, primarily contained within a new gateway tower building located in the north-western part of the site.

Built Form

The draft Development Plan includes 'Envelope Plans' which specify the future built form envelope for the expansion of the centre. The envelope plans have had regard to the site context, existing site conditions, planning policy for the development of the DHAC and internal retail planning requirements.

The Envelope Plans illustrate:

→ The addition of further levels of car parking above the multi-deck car park (to RL121) approved pursuant to Planning Permit PL13/23936. The additional levels include RL115.6 which is set back by 5.5 metres from the eastern edge of the approved car park, and RL121 which is set back by up to 11 metres from the eastern edge and up to 17 metres from the northern edge of the approved car park.

→ A north and north-western expansion of the existing shopping malls, with a height of RL127 - RL136. The majority of the retail expansion is at RL127, with a section being higher at RL136 to allow for a department store to be accommodated. The malls are set back from the northern Title boundary by at least 15 metres, increasing to 45 metres at the corner of Williamsons Road and Westfield Drive to allow for future site access. (refer below)

→ An area of new building at the north-eastern corner of the site at RL121.

→ An area of building on Williamsons Road with a height of RL135 and RL137 to allow for the cinema expansion in a northerly direction.

→ The addition of a new gateway building at the north-west corner of the site, set back from the western edge of the mall expansion by 6 - 14 metres and from the northern Title boundary by up to 53 metres. The proposed gateway building will have a height of RL 166 and contain 18,000sqm of commercial and office floor-space.

→ New basement car parking will be constructed beneath the mall extension in the north-western corner of the site.

Access

Access to and from the centre will be altered as follows:

→ The existing signalised southern access location on Williamsons Road will be reconfigured to allow for vehicle entry to new basement car parking.

- → The existing signalised northern access location on Williamsons Road will become a central access and provide for left and right-turn movements into the upgraded bus interchange.

- → A new signalised northern access location at the corner of Williamsons Road and Westfield Drive will provide for access to basement car parking. This new arrangement will also allow for access to residential properties in Westfield Drive and has been designed to accommodate waste collection and emergency vehicle requirements. The western end of Westfield Drive will be terminated through the application of the RXO.

- → Minor works will be undertaken at Frederick Street, including pedestrian operated signals.

- → The existing access locations on Goodson Street, Tower Street and Doncaster Road will be retained as per existing conditions.

Bus Interchange

The new bus interchange will be accessed by a new signalised intersection on Williamsons Road, providing for left and right in / out movements. A total of 9 bus bays (including one articulated bus bay) will be provided, including safety fencing, timetable information and staff / passenger amenities.

The bus interchange has been located and designed in consultation with Public Transport Victoria and Transdev.

Public Forecourt

A new public forecourt will be located to the north of the new bus interchange and will have an area of approximately 400sqm.

The forecourt will provide for a defined entry to the shopping centre and provide a transitional space between the bus interchange, the commercial precinct in the north-western part of the site, and a public amenity and meeting space.

Car Parking

A total of 7,430 car parking spaces will be provided on the land, representing an increase of approximately 2,500 spaces (including those provided in the new multi-deck car park) from the existing conditions. The future car parking arrangements, design and supply will be subject to detailed designs as part of future planning permit applications.

6 Planning Considerations

6.1 Preamble

The key planning considerations for this proposal are as follows:

1. The suitability of the proposed amendments to the Manningham Planning Scheme, including Clause 21.09, the Activity Centre Zone, the Development Contributions Plan Overlay, the Parking Overlay and the Road Closure Overlay;
2. The suitability of removing the Incorporated Plan Overlay and applying a Development Plan Overlay;
3. The suitability of the proposed draft Development Plan; and
4. The specialist responses associated with traffic, economics, social planning, acoustic engineering, ESD and services / infrastructure.

The above considerations are addressed in this report, following a review of the existing planning policy settings that provide the planning impetus for the Amendment.

6.2 Existing Policy Context

Manningham Planning Scheme Amendment C104 is required to provide a new strategic and policy framework for the Westfield Doncaster complex, and to recognise the advancement in State and local planning policy since the previous expansion was approved in 2004.

Since the previous expansion, the following major changes to planning policy have occurred:

- → Amendment C33 (February, 2004) which introduced the Doncaster Hill Strategy (October, 2002, revised 2004) into the Manningham Planning Scheme;
- → Amendment C35 (September, 2004) which introduced the Doncaster Hill Parking Precinct Plan into the Manningham Planning Scheme;
- → Amendment C45 (March, 2005) which applied a Comprehensive Development Zone to land in the Business 2 Zone forming part of the Doncaster Hill activity centre (excluded the Westfield site which was in the Business 1 Zone);
- → Amendments C30 and C37 (September, 2005) which introduced the Development Contributions Plan Overlay into the Manningham Planning Scheme and applied the Public Acquisition Overlay (road and open space purposes) to a number of sites within Doncaster Hill;
- → Amendment VC59 (September, 2009) which introduced the Activity Centre Zone into the VPPs and Manningham Planning Scheme (in place of existing zones, including the Comprehensive Development Zone);
- → Amendment VC55 (July, 2010) which introduced Melbourne @ 5 Million to replace Melbourne 2030;
- → Amendment VC71 (September, 2010) which revised the State Planning Policy Framework;
- → Amendment VC95 (April, 2013) which removed the Doncaster Hill Parking Precinct Plan and introduced a Parking Overlay;

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→ Amendment VC100 (July, 2013) which introduced the commercial / business zone reforms; and
→ Amendment VC106 (May, 2014) which introduced Plan Melbourne.

The Westfield Doncaster complex is the centrepiece of the Doncaster Hill activity centre, and it provides the commercial and retail core of the precinct. With over 123,000sqm of floor-space and a regional bus interchange, it provides a basis for people to visit the activity centre and amenity to those who live within or nearby to the activity centre.

The State and local planning policy support for the expansion of the centre is as follows:

→ Plan Melbourne, as the current metropolitan strategy, recognises the need to facilitate investment and respond to international competition, demographic changes and advancements in technology. The nominated Strategic Direction for activity centres is to *enable 20-minute neighbourhoods by providing access to a wide range of goods and services in centres that are planned and coordinated by local governments. The centres will provide employment and vibrant local economies. Some will serve larger subregional catchments. Through the removal of retail floorspace and office caps, activity centres may grow unrestricted*.

→ Plan Melbourne also encourages the diversification of land uses within shopping centres: *Opportunities for future diversification, investment and employment growth in these centres should be explored and facilitated through planning provisions where appropriate*. (p. 35)

→ Clause 11 of the Manningham Planning Scheme seeks to broaden the mix of land uses within activity centres and to encourage economic investment.

→ Clause 17.01 of the Manningham Planning Scheme includes the objective for business in Victoria, which is *to encourage development which meet the communities' needs for retail, entertainment, office and other commercial services and provides net community benefit in relation to accessibility, efficient infrastructure use and the aggregation and sustainability of commercial facilities*.

→ The LPPF within the Manningham Planning Scheme recognises Doncaster Hill as the focus for future economic investment, residential development and retail / commercial expansion. Doncaster Hill is the highest-order activity centre within the municipality and is strategically well-positioned to accommodate this change.

→ The Doncaster Hill Strategy (October, 2002, revised 2004), which is a reference document in the Manningham Planning Scheme seeks to *create a state of the art', contemporary,*

sustainable, high-density, mixed-use village that enhances the social, environmental, economic and cultural elements of the region with 10,000 new employment opportunities, retail uses and 20,000sqm of office / commercial floor-space (excluding Westfield Doncaster).

→ More specifically in relation to the Westfield Doncaster complex, the Strategy proposes that *Westfield ... will become better integrated into Doncaster Hill and the surrounding community with activated street frontages, more permeable pedestrian and vehicular accessibility, a greater mix of land uses, accessible and prominent public transport interchange, pedestrian linkages to other precincts, and improved engagement with the main intersection*. (p. 77)

→ The application of the Activity Centre Zone (ACZ) by way of Amendment VC59, recognised the status of the Doncaster Hill activity centre in the metropolitan hierarchy and includes the following purposes:

- → *To implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.*
- → *To encourage a mixture of uses and the intensive development of the activity centre:*
  - → *As a focus for business, shopping, working, housing, leisure, transport and community facilities.*
  - → *To support sustainable urban outcomes that maximise the use of infrastructure and public transport.*
- → *To deliver a diversity of housing at higher densities to make optimum use of the facilities and services.*
- → *To create through good urban design an attractive, pleasant, walkable, safe and stimulating environment.*
- → *To facilitate use and development of land in accordance with the Development Framework for the activity centre.*

Having regard to the above policy statements, the Doncaster Hill Activity Centre and the Westfield Doncaster complex are well supported by planning policy, and the proposed master-planning will deliver investment in the economic and land use base of the centre, environmental sustainability and the functionality of the precinct. The expansion of retail and commercial / office floor areas in an area which is undergoing substantial change with new residential development fulfils state and local planning policies for activity centres.

6.3 Amendment to Clause 21.09, ACZ, PO1, RXO and DCPO1

The proposed Amendments to Clause 21.09, the Activity Centre Zone and Development Contributions Plan Overlay are required to provide an updated statutory planning framework for the further consideration of the expansion of Westfield Doncaster.

The changes to Clause 21.09 seek to reinforce the strategic policy support for the expansion of the Westfield Doncaster complex as noted in Section 6.2 of this report, and to replace reference to an Incorporated Plan with a Development Plan.

The changes to the Activity Centre Zone ensure that the land use objectives for the Zone properly recognise the anchor role played by Westfield Doncaster. The Zone amendments otherwise exclude the Westfield Doncaster site from the specific boulevard and advertising signs requirements within the Zone and defer consideration of the built form to the proposed Development Plan (which in itself is informed by the Zone and other provisions of the Manningham Planning Scheme).

The amendments to the Parking Overlay reflects the outcome of the detailed traffic engineering study undertaken as part of the master plan. In particular, it references a car parking rate of 3.5 spaces / 100sqm for office and 4.09 spaces / 100sqm for shop, and provides new decision guidelines which are required to reflect the unique nature of this site and development, relative to the balance of the activity centre.

The application of a Road Closure Overlay to the western end of Westfield Drive will formalise the new car parking, traffic and access arrangements and ensure that vehicle access is provided to Westfield Drive in accordance with the approved VicRoads functional layouts for the shopping centre access.

The DCPO is also being updated to make reference to the approved Development Plan in place of the existing Incorporated Plan.

6.4 Application of the DPO

Amendment C104 proposes to delete the existing Incorporated Plan Overlay from the land and to apply a Development Plan Overlay in its place.

The basis for the application of the DPO is as follows:

- → The existing Incorporated Plan is from 1996 and reflects the redevelopment of the centre as set out in Planning Permit PL03/15005.
- → The intervening 20 years has brought about many changes to the Victorian planning system, Victoria Planning Provisions, and the planning policy and strategies for the Doncaster Hill Activity Centre.
- → Retail planning and trends have advanced since the 1996 Plan was approved, which impacts on expansion plans and approaches to design.
- → The land is in one ownership and its future redevelopment can therefore be managed in a more straightforward manner than if there were multiple land owners and land parcels to consider.
- → The IPO tool does not enable flexibility for amendments to the approved Plan and would necessitate a Planning Scheme Amendment to bring about changes. Whilst a planning permit can be sought to obtain approval for works outside the nominated building envelope under the IPO, this approach does not deliver certainty to the Responsible Authority, the permit applicant/s or interested third parties.
- → The exhibition of a Draft Development Plan with Amendment C104 enables community consultation on the proposal to ensure that the planning controls and the Development Plan are considered in parallel.
- → The Development Plan Overlay allows for the approval of a comprehensive package of specialist reports and plans which form part of the approved Development Plan.
- → Once a Development Plan is approved, any future planning permits must be generally in accordance with the approved Development Plan, providing certainty to all stakeholders.

The proposed Development Plan Overlay has also included a “vision” for the Westfield Doncaster site to support the Activity Centre Zone provisions (which are also proposed to change) and to provide the strategic basis for the future redevelopment of the centre.

6.5 Draft Development Plan

The draft Development Plan comprises the matters which are set out in the proposed DP04 forming part of Amendment C104.

Having regard to the existing and proposed planning controls and policies for the site and the surrounding Doncaster Hill precinct, the following planning assessment is provided in relation to the master plan components.

Envelope Plans

The envelope plans have evolved from an assessment of the site context, the strategic planning framework for Doncaster Hill, and the retail planning requirements of the shopping centre. The site is well-placed to accommodate change and will allow for the implementation of planning policy as discussed in Section 6.2 of this report.

The envelope plans depict a northerly building height extension of the centre "podium" to RL127-136 and a north-westerly gateway building of RL166. The multi-storey car park to the east will have a height of up to RL121 (currently approved at approx. RL108).

The proposed building heights are within the range of heights generally being constructed and encouraged by policy within the Doncaster Hill Activity Centre, whilst establishing a transitional interface with the future medium-density housing area to the north and east of the site. In this way, the new building will maintain a minimum 15 metre setback zone to the north, increasing to 45 metres at the Williamsons Road frontage of the site. The commercial building has been set back from the podium edges to the north to create a visual separation of the building form and enable a gateway profile to delineate the entry to the activity centre.

It is within the proposed three dimensional footprint that any building/s will be constructed and incorporate the proposed 43,000sqm of retail and 18,000sqm of commercial floor space.

To the east, additional car parking levels are accommodated above the existing approved "Stage 1" car park (Planning Permit PL13/23936) to enable flexibility as to future car parking provision within the site. The proposed envelope follows a further reduced footprint above the uppermost level of the approved car park, including further setbacks from the residential properties to the east / north-east.

Built form outcomes: Williamsons Road

The existing building profile which extends around the Doncaster / Williamsons Road corner will be extended in a northerly direction along Williamsons Road at RL127, being approximately 13 metres above street level (which is RL114). This built form profile will positively correlate with the western side of Williamsons Road which is designated for development of between 29 metres and 36 metres, and the existing Sovereign Point apartment buildings which are seven levels. The cinema box expansion will have a height of RL135 – 137 (approximately 21 to 23 metres above street level) which will provide a transition between the existing Williamsons Road frontage of the centre and the new expansion area.

The Manningham Planning Scheme, through the ACZ, nominates the north-western corner of the site as a "gateway entry" to the activity centre. The gateway treatment has recently been recognised in the construction of a ten storey building (93 apartments) at 5 Sovereign Court, directly opposite the Westfield site, at RL 142.6.

The proposed commercial building will positively relate to the new apartment building opposite and frame the boulevard entry to the activity centre, travelling south along Williamsons Road.

Built form outcomes: Westfield Drive

The building envelope is set back from the northern Title boundary by at least 15 metres. The ACZ currently does not specify any preferred or mandatory height limit or setbacks for the Westfield land; and by providing a building height and setback zones within the Development Plan, future permit applications will need to be generally in accordance with these heights / setbacks and it provides certainty to the Council, community and land owner about the future redevelopment of the land.

The northern interface of the land includes residential and non-residential uses (ie. church) and is accordingly subject to future detailed design as part of planning permit applications. The Development Plan proposes to establish a framework by which future applications can be assessed and considered, including the boundary setbacks, landscape zones, acoustic treatment options and vehicle access to Westfield Drive. The northern interface will also change over time with a Design and Development Overlay in place to encourage site consolidation and medium density housing of three levels.

In this context, the northern site interface framework has sought to:

- → Provide appropriate setbacks to mitigate increased building height and scale;
- → Provide dedicated landscape zones for tiered planting and bunding, where appropriate;
- → Aesthetically incorporate acoustic treatments to provide the existing dwellings with noise attenuation;

→ Encourage separation of commercial / retail and residential traffic; and
→ Enable new pedestrian connectivity to the centre from the north.

Built form outcomes: East

To the east, the Development Plan includes additional car parking levels above the approved Stage 1 Car Park. The height increase has been combined with a staggered and reduced car park envelope (and therefore greater setbacks) in recognition of the residential interface to the east. Importantly, as shown in the Section diagrams, the additional car parking levels will not be visible from the eastern or western footpaths of Roseville Avenue given anticipated built form of 11 metres in the street and the setbacks proposed for the additional car park levels.

Bus interchange

The bus interchange has been retained in a prominent location at the primary frontage of the centre to Williamsons Road. The interchange has been designed with advice from PTV in relation to capacity, functionality, aesthetics, comfort and safety.

The Development Plan allows for the bus interchange to become a focus for pedestrian and commuter activity, with a public forecourt located on the northern side of the interchange at a new major shopping centre entry location (and existing secondary entry location). In addition, pedestrian accessibility and sightlines have been examined in the Development Plan to maximise connectivity to the interchange from the surrounding residential areas as development and densities increase over time. The bus interchange will include built form above which will allow for weather protection.

The improvements to the bus interchange also recognise the Council's adopted Mode Shift Plan to promote the use of public and sustainable transport within the Doncaster Hill activity centre.

Public Forecourt

The public forecourt is proposed to be located on the northern side of the new bus interchange. The forecourt will provide for a meeting place and transitional area around the interchange and shopping centre entry. The Development Plan includes design guidelines for the space, together with hard and soft landscaping opportunities to encourage passive recreation (such as lighting and seating).

6.6 Specialist Responses

Amendment C104 to the Manningham Planning Scheme incorporates a range of specialist technical reports and inputs as required by the proposed DP04. A summary of each is provided below:

Integrated Transport Plan

Based on the research and investigations completed under this study, the following conclusions have been made:

- → *The Master Plan seeks to increase the floor area of Westfield Doncaster by 43,000sqm from a total of 120,000sqm (existing) to 163,000sqm (post-development). In addition, it is proposed to provide approximately 18,000sqm of commercial floor area (total equal to 181,000sqm).*
- → *A recent planning approval will increase car parking on the subject site by a further 556 car parking spaces and result in an expanded supply equal to 5,338 car parking spaces. This expanded supply is expected to be available and active by the end of 2015.*
- → *Preliminary planning for the Master Plan anticipates an ultimate provision of car parking equal to approximately 7,430 car parking spaces.*
- → *An upgraded and expanded bus interchange facility is proposed under the Master Plan on Williamsons Road with access provided on an exclusive basis through the provision of a new signalised intersection.*
- → *Vehicular access to the Centre is proposed to be provided to both Doncaster Road and Williamsons Road via a total of three signalised access points for general traffic. Revisions to access on Williamsons Road are proposed with a revised spacing and the addition of one new signalised intersection for exclusive use of public transport (buses). Traffic access at Fredrick Street is also proposed to be altered through the removal of traffic signals and their replacement with a signalised pedestrian crossing facility. Access to and from Fredrick Street is proposed to be left-in / left-out with the same proposed for the Westfield Shopping Centre Service Area on the north side of Doncaster Road.*
- → *Updated land use forecasts developed during the preparation of this review for Doncaster Hill (by Manningham City Council) indicate a material uplift in residential and commercial land use is expected since the preparation of the last land use assessment strategy for the precinct.*
- → *Various state and local policies underpin and guide the re-development of the Doncaster Hill area including the Westfield Doncaster Shopping Centre. These policy guidelines set the context for traffic and transport planning outcomes associated with land use growth in the precinct.*

- → *The intersection of Doncaster Road, Williamsons Road and Tram Road is most influential in determining the through-put of traffic in and out of the Doncaster Hill area. This intersection effectively meters traffic and transport demand through the precinct.*

- → *Road works are proposed at the intersection of Doncaster Road, Williamsons Road and Tram Road in the form of a triple right turn facility (north to west) to assist with alleviating transport impacts associated with the Master Plan and further development within Doncaster Hill.*

- → *The implementation of the transport infrastructure improvements outlined to occur as part of the Master Plan development deliver for the most part improved transport operating conditions through the Doncaster Hill road network. In fact, the resultant (proposed) transport infrastructure package proposed under the Master Plan delivers an outcome which indicates a basis for a collective, precinct wide monetary contribution given the improvements that are made between the 2031 scenario with and without the Westfield Master Plan development. Further discussions are warranted between the Applicant and key stakeholders to explore options and mechanisms which might support the future funding of select transport works.*

Environmental Sustainability Plan

The Westfield Doncaster Expansion Masterplan will continue to recognise the importance of achieving a strong sustainable outcome for the proposed development to support the Manningham City Council's sustainability aspirations for Doncaster Hill.

It also builds on the Centre's previous environmental successes and best practice' sustainable design approach, to take a further step forward and achieve a 'National Excellence' outcome by demonstrating the potential to achieve a 5-Star Green Star rating or equivalent performance for the expanded retail centre as well as the proposed new commercial office development (noting that obtaining a formal rating may not be possible as the development reflects an expansion of the existing facility).

Acoustic Engineering Report

The proposed expansion will incorporate additional retail, associated car parking and may include commercial office and associated facilities. The primary expansion is located at the northern end of the site and additional parking, redesigned new northern access and new bus interchange fronting Williamsons Road is also proposed.

This report provides the following recommended criteria and associated acoustic treatment measures.

- → *Plant and equipment serving the development should be designed to ensure compliance with SEPP N-1. Conventional acoustic treatment measures can be implemented to ensure compliance with this criteria.*
- → *Traffic noise on the site associated with the modification to the planning scheme has been designed to meet noise objectives based on SEPP N-1.*
- → *As part of the assessment a 4.5 metre high screen has been proposed along the northern boundary of the site as set out in Appendix 3 which also incorporates an opening to provide public access to Westfield Drive.*
- → *Predicted noise levels for development across Westfield Drive which is constructed to a height of up to 11 metres will be above SEPP N-1 design levels but will be low in level (less than 58 dB(A) Leq) and will not adversely impact future residents.*
- → *It is recommended that where future development along Westfield Drive occurs the development sites should consider external traffic noise intrusion with design criteria based on Australian Standard 2107:2000.*

Economic Report

In relation to new employment generated jobs, we forecast that the proposed expansion will generate:

- → *Approximately 2,040 direct construction jobs, based on a projected development cost of $500 million.*
- → *Almost 2,900 new full time and part time workers at the centre on completion of the expansion*
- → *A further 5,500 indirect jobs from flow-on employment effects.*

Social Impact Report

It is recommended that the proposed development to expand Westfield Doncaster will deliver, or contribute to achieving, a number of the strategies and objectives Council has identified will have a Net Community Benefit including:

- → *development of sustainable transport options, reduce travel demand and change travel behaviour*
- → *provide future traffic and transport infrastructure requirements in a comprehensive, timely and equitable way*
- → *further enhance the status of the Doncaster Hill Activity Centre, which provides for an appropriate mix of uses and functions.*

The additional workforce generated by the proposed development expansion will require access to a range of services and facilities during the working day, especially recreation and child care facilities. Given the design and layout of the shopping centre, with limited access to local open space areas, consideration may need to be given to expansion of the existing recreation facilities in the shopping centre due to increased usage rates during the day. In addition, amelioration measures will be required to cater to the increased pressure on child care facilities created by the additional number of new employees in the precinct.

The community feedback provides very valuable information regarding opportunities to improve the design and layout of the shopping centre to better meet the needs of the shopping centre users. A number of services have been identified that are not provided in the centre or easily accessible for the shopping centres users.

We recommend that Westfield further investigates the feasibility of providing additional services in the shopping centre, particularly allied, medical and dental services to complement the proposed office development. With regards to the youth incubator space, we recommend that Westfield and YMCA discuss this opportunity with Apple who may be interested in this from a business development perspective.

In regards to the youth hub at the bus interchange, Council will need to work with local youth agencies including the YMCA to scope out the proposal in terms of size, staffing and financial feasibility. If the facility was feasible and could be funded, a suitable space would need to be designed into the Bus Interchange so that it is well located in terms of safety, accessibility and visibility.

7 Conclusion

In summary, Amendment C104 will:

- → Recognise the importance of the Westfield Doncaster complex in the Doncaster Hill Activity Centre and facilitate investment in the future economic viability and environmental sustainability of the precinct;
- → Provide a new strategic planning context for the Westfield Doncaster complex and the mechanism to prepare a longer-term master-plan for the precinct through the application of a Development Plan Overlay;
- → Provide a revised statutory framework for the future use and development of the site in response to key State and local planning policy objectives;
- → Provide for the upgrade of the existing bus interchange facility; and
- → Improve the appearance of and accessibility to/from/within the Westfield Doncaster site.

7

PO Box 1040
Level 1/283 Drummond Street
Carlton Victoria 3053

Telephone 03 9347 6100
info@contour.net.au
contour.net.au

Contour Consultants Australia Pty Ltd
ABN 98 417 162 976
ACN 068 152 714

WESTFIELD DONCASTER

URBAN DESIGN REPORT

PREPARED BY TRACT CONSULTANTS & LAND DESIGN PARTNERSHIP

APRIL 2016

Tract
Urban Designers
Town Planners
Landscape Architects

LandDesign Partnership

Report Name	Westfield Doncaster Urban Design Report
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Westfield

Figure 1: Existing landscaping treatment along Williamsons Road

1. INTRODUCTION

1.1 Background

Tract Consultants have been engaged by Scentre Group to prepare an Urban Design Report for the proposed Manningham Planning Scheme Amendment C104. The amendment affects the Westfield Doncaster complex and proposes a Development Plan Overlay (DPO) to facilitate the following development at the Westfield Doncaster site:

- Approximately 43,000 square metres of additional gross retail lettable area, including additional mini-major tenancies (generally between 500-2,000 sqm) and an additional discount department store.
- Approximately 18,000 square metres of additional commercial office space to support increased employment opportunities at the centre.
- Expanded and upgraded bus interchange with dedicated accessway to minimise conflict with vehicles.
- Additional 2,500 car parks, accommodated in a mix of basement and multi-storey configurations.

The proposed development will enhance the role and function of the Doncaster Hill activity centre by facilitating the transformation of the Westfield Doncaster complex into world class retail and commercial complex.

1.2 Objectives

The key objectives of this report are to:

- Provide detailed analysis of the existing conditions at the study site and it's wider context from an urban design perspective, including consideration of existing state and local policy.
- Identify the key urban design influences that will affect the future development at the Westfield Doncaster complex.
- Formulate design responses and design objectives that will inform and underpin any future built form and make recommendations for the framework and envelope plans being developed for the site.
- Ensure positive pedestrian outcomes, a high quality streetscape and safe, lively public realm areas.

1.3 Document Structure

The remainder of this document is organised into five key chapters. The purpose of each chapter is outlined below:

POLICY CONTEXT

Outlines State and local planning policies and controls relevant to the site.

SITE ANALYSIS

Explores the existing site conditions and context including built form, movement networks, landscaping and public realm, topography and interfaces.

SITE OPPORTUNITIES

Identifies the key opportunities of the site, building on from the site analysis.

DESIGN RESPONSE

Establishes a set of design principles and outlines the framework plan for the future development of the Westfield Doncaster site.

Outlines a Concept Plan for the development.

Summarises the purpose and key findings of this report.


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Figure 2: Existing built form near Grosvenor Street

2. POLICY CONTEXT

2.1 State Planning Policy Framework (SPPF)

The goal for planning in Victoria as set out in Clause 10.02 of the Planning Scheme is:

The State Planning Policy Framework seeks to ensure that the objectives of planning in Victoria (as set out in Section 4 of the Planning and Environment Act 1987) are fostered through appropriate land use and development planning policies and practices which integrate relevant environmental, social and economic factors in the interests of net community benefit and sustainable development.

The following Clauses of the SPPF are also relevant to the proposal:

Clause 11.01 – Activity Centres

As part of 'Plan Melbourne', Doncaster Hill is recognised as an Activity Centre.

The objectives for activity centres are as follows:

- *To build up activity centres as a focus for high-quality development, activity and living for the whole community by developing a network of activity centres.*
- *To encourage the concentration of major retail, residential, commercial, administrative, entertainment and cultural developments into activity centres which provide a variety of land uses and are highly accessible to the community.*

Related planning strategies include:

- *Broaden the mix of uses in activity centres to include a range of services over longer hours appropriate to the type of centre and needs of the population served.*
- *Provide a focus for business, shopping, working, leisure and community facilities.*
- *Encourage economic activity and business synergies.*
- *Improve the social, economic and environmental performance and amenity of the centre.*

Clause 11.04-1 – Delivering Jobs and Investment

Clause 11.04-1 includes a strategy to plan for jobs closer to where people live.

Clause 13.04-1 – Noise Abatement

Noise impacts in the proposal are relevant in terms of the surrounding residential interface to the north / north-east, the relevant planning strategy is:

Ensure that development is not prejudiced and community amenity is not reduced by noise emissions, using a range of building design, urban design and land use separation techniques as appropriate to the land use functions and character of the area.

Clause 15 – Built Environment and Heritage

Clause 15 notes that planning should achieve high quality urban design and architecture that:

- *Contributes positively to local urban character and sense of place.*
- *Reflects the particular characteristics, aspirations and cultural identity of the community.*
- *Enhances liveability, diversity, amenity and safety of the public realm.*
- *Promotes attractiveness of towns and cities within broader strategic contexts.*
- *Minimises detrimental impact on neighbouring properties.*

Relevant planning strategies include:

- *Promote good urban design to make the environment more liveable and attractive.*
- *Ensure new development or redevelopment contributes to community and cultural life by improving safety, diversity and choice, the quality of living and working environments, accessibility and inclusiveness and environmental sustainability.*
- *Require development to respond to its context in terms of urban character, cultural heritage, natural features, surrounding landscape and climate.*
- *Ensure transport corridors integrate land use planning, urban design and transport planning and are developed and managed with particular attention to urban design aspects.*
- *Ensure the design of buildings, public spaces and the mix of activities contribute to safety and perceptions of safety.*
- *Support initiatives that provide safer walking and cycling routes and improved safety for people using public transport.*

Clause 15.02-1 – Resource and Energy Efficiency

Environmental sustainability is a key focus within the Doncaster Hill activity centre, and at a State level, the following strategies are relevant:

- *Ensure that buildings and subdivision design improves efficiency in energy use.*
- *Promote consolidation of urban development and integration of land use and transport.*
- *Improve efficiency in energy use through greater use of renewable energy.*
- *Support low energy forms of transport such as walking and cycling.*

Clause 17.01-1 - Business

The objective for business in Victoria is:

To encourage development which meet the communities' needs for retail, entertainment, office and other commercial services and provides net community benefit in relation to accessibility, efficient infrastructure use and the aggregation and sustainability of commercial facilities.

Relevant planning strategies include:

- *Locate commercial facilities in existing or planned activity centres.*
- *Provide new convenience shopping facilities to provide for the needs of the local population in new residential areas and within, or immediately adjacent to, existing commercial centres.*
- *Provide small scale shopping opportunities that meet the needs of local residents and workers in convenient locations.*
- *Provide outlets of trade-related goods or services directly serving or ancillary to industry and which have adequate on-site car parking.*
- *Locate cinema based entertainment facilities within or on the periphery of existing or planned activity centres. Such facilities should not require a permit for use within activity centres and are not encouraged on freestanding sites.*
- *A five year time limit for commencement should be attached to the planning approval for all shopping centres or expansions of over 1,000 square metres in floorspace.*

Clause 18.01 – Integrated Transport and Clause 18.02 – Movement Networks

Relevant transport strategies include:

- *Plan urban development to make jobs and community services more accessible by:*
- *Ensuring access is provided to developments in accordance with forecast demand, taking advantage of all available modes of transport and to minimise adverse impacts on existing transport networks and the amenity of surrounding areas.*
- *Coordinating improvements to public transport, walking and cycling networks with the ongoing development and redevelopment of the urban area.*
- *Concentrating key trip generators such as higher density residential development in and around Central Activities Districts, Principal, Major and Specialised Activity Centres on the Principal Public Transport Network.*
- *Requiring integrated transport plans to be prepared for all new major residential, commercial and industrial developments.*
- *Requiring that substantial increases in activity in employment corridors are connected to the Principal Public Transport Network.*
- *Providing routing, bus stop and interchange arrangements for public transport services in new development areas.*
- *Providing safe, convenient and direct pedestrian and cycling access to activity centres, public transport interchanges and other strategic redevelopment sites.*
- *Integrate public transport services and infrastructure into new development.*
- *Plan or regulate new uses or development of land near an existing or proposed transport route to avoid detriment to, and where possible enhance the service, safety and amenity desirable for that transport route in the short and long terms.*
- *Encourage higher land use densities and mixed use developments near railway stations, major bus terminals, transport interchanges, tramways and principal bus routes. Pedestrian and cyclists access to public transport should be facilitated and safeguarded.*
- *Ensure transport practices, including design, construction and management, reduce environmental impacts.*
- *Consider all modes of travel, including walking, cycling, public transport, taxis and private vehicles (passenger and freight) in providing for access to new developments.*
- *Encourage the use of walking and cycling by creating environments that are safe and attractive.*
- *Develop high quality pedestrian environments that are accessible to footpath-bound vehicles such as wheelchairs, prams and scooters.*
- *Ensure development provides opportunities to create more sustainable transport options such as walking, cycling and public transport.*
- *Ensure cycling routes and infrastructure are constructed early in new developments.*
- *Direct and connected bicycle infrastructure should be provided to and between key destinations including activity centres, public transport nodes and major attractions.*
- *Achieve greater use of public transport by increasing densities, maximising the use of existing infrastructure and improving the viability of the public transport operation.*
- *Plan and regulate the design of transport routes and nearby areas to achieve visual standards appropriate to the importance of the route with particular reference to landscaping, the control of outdoor advertising and, where appropriate, the provision of buffer zones and resting places.*
- *Allocate or require land to be set aside for car parking subject to the existing and potential modes of access including public transport, the demand for off-street car parking, road capacity and the potential for demand management of car parking*

2.2 Local Planning Policy Framework (LPPF)

Clause 21.02 – Municipal Profile

Retail activity is recognised by Council as a substantial contributor to the local and regional economy and creates substantial employment opportunities with over 12,000 people employed in the wholesale and retail trade industry, representing more than 22% of all employed residents.

Clause 21.03 – Key Issues

One of the nominated key issues for the municipality is retailing trend, and Clause 21.03 notes:

Initiatives which promote the economic well-being of the principal, major, neighbourhood and local activity centres as the commercial and social focus for the local community, will be of a high priority.

Changing shopping patterns and competition from larger centres, including the regional centres of Doncaster Shoppingtown, Greensborough, Ringwood and Box Hill will influence the viability of neighbourhood and local shopping centres.

Activity centres will be developed as centres for business, shopping, working and leisure. They will also be important locations for the development of different types of housing, including forms of higher density development. It is vital to consolidate development of commercial activities within existing activity centres to reinforce the existing retail hierarchy and ensure that each centre remains viable, vibrant and sustainable into the future.

Clause 21.04 – Vision – Strategic Framework

The Doncaster Hill precinct is nominated as a Principal Activity Centre on the Strategic Framework Overview Plan.

Clause 21.09 – Activity Centres and Commercial Areas

Clause 21.09 recognises Doncaster Hill as a prime location for redevelopment. With an area of 58ha, it has been designated in Council policy for higher-density residential development and housing growth with a focus on sustainability. The Westfield Doncaster site is acknowledged as the principal retail and entertainment focus of the activity centre, and Council's vision for the Westfield site is:

As the Principal retail and entertainment focus of the Doncaster Hill Activity Centre it is envisaged that Westfield Shoppingtown will be better integrated into Doncaster Hill Activity Centre and the surrounding community. Future developments of Westfield Shoppingtown should be consistent with the vision of Doncaster Hill Activity Centre by incorporating activated street frontages and external spaces, a greater mix of uses, pedestrian accessibility, an accessible and prominent public transport interchange and improved engagement with the main intersection.

Clause 21.10 – Ecologically Sustainable Development

Council's ESD policy includes strategies for:

- Building energy management
- Water-sensitive urban design
- External environmental amenity

- Waste management
- Quality of public and private realm
- Transport

The Amendment documentation includes an ESD report prepared by Cundall which addresses the above policy.

Clause 21.12 – Infrastructure

Clause 21.12 includes objectives and strategies for roads and public transport.

Of relevance are the following:

- Facilitate the location and development of transport hubs at or adjoining activity centres .
- Facilitate the provision of bus shelters at high use public transport sites.
- Require that design and construction standards cater for safe, efficient and effective vehicle movement and servicing needs.
- Promote cycling and walking opportunities by providing safe bicycle routes and expanding the bicycle network, and providing pedestrian trails to improve accessibility to local and regional commercial, community and recreational facilities.
- Provide opportunities to enhance the amenity of Doncaster Road and other main roads.

2.3 Land Use Zones

Activity Centre Zone Schedule 1 (ACZ1)

The subject land is included in the Activity Centre Zone (Schedule 1) following approval of Amendment VC59 in December, 2009. The Explanatory Report which accompanied Amendment VC59 noted:

The ACZ schedule for the Doncaster Hill Principal Activity Centre defines the boundary for the centre and identifies seven precincts with differentiated land use and development objectives, building heights and setbacks, and public realm improvements as articulated in the Doncaster Hill Strategy (Manningham City Council, October 2002, Revised 2004) and Doncaster Hill Sustainability Guidelines (Manningham City Council, June 2004). The Table of uses included in the schedule gives direction on the preferred location of land uses across the centre. Accommodation and a mix of uses are encouraged in all precincts, but the land use emphasis is determined by specific precinct objectives. Additional details are included for centre-wide provisions, precinct provisions, application requirements, decision guidelines, and reference documents.

Objectives for the Precinct 4 Westfield Doncaster are as follows:

- *To further improve existing active street frontages.*
- *Encourage an enhanced pedestrian environment within the precinct.*
- *To maintain and improve the positive engagement of the precinct with the main intersection of Doncaster Road and Williamsons Road.*
- *To provide opportunities for a range of residential and commercial uses to develop within the precinct along with the existing retail development.*
- *To create a number of significant externalised public urban spaces/plazas, which are well connected to the public transport interchange and boulevard along Doncaster Road.*
- *To support and connect with the pedestrian link proposed for the Doncaster, Williamsons and Tram Roads intersection at the western end of the precinct.*

Precinct guidelines include:

- *Maintain a landmark building at the Doncaster Road and Williamsons Road intersection.*
- *Develop a unique gateway building abutting Williamsons Road in the north-west corner of the precinct.*
- *Maintain and enhance an integrated public transport*
- *interchange to support both Westfield Doncaster and the greater Doncaster Hill area in a prominent and easily accessible location.*
- *Create a pedestrian friendly interface between Westfield Doncaster, Doncaster Road, Williamsons Road and Tower Street.*
- *Establish strong pedestrian entries and linkages from Westfield Doncaster to all other precincts within Doncaster Hill.*
- *Future building form is to maximise the north-east aspect and views, and vistas to the CBD.*
- *External spaces should directly link to Williamsons Road and Doncaster Road where appropriate.*

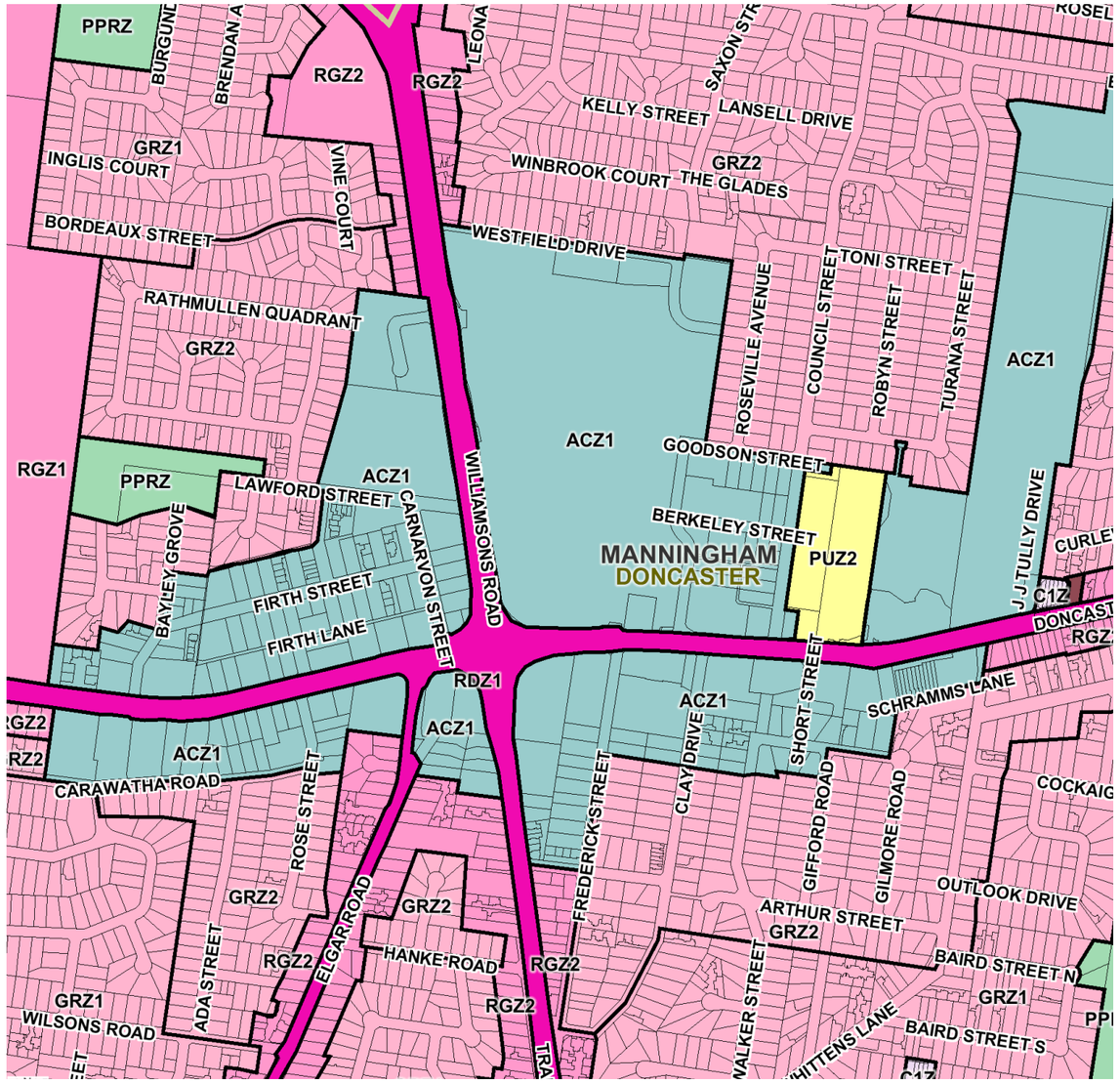


Figure 3: Existing planning scheme zones that affect the site

2.4 Overlays

The land is affected by three Planning Scheme Overlays, as outlined below:

Parking Overlay Schedule 1 (PO1)

The Parking Overlay which applies to the Doncaster Hill Activity Centre varies the following Clause 52.06 car parking rates:

- Office: 2.5 spaces / 100sqm
- Restaurant: 0.36 spaces / 100sqm
- Restricted retail premises: 1.5 spaces / 100sqm
- Shop: 3.5 spaces / 100sqm

Development Contributions Plan Overlay Schedule 1 (DCPO1)

For non-residential development, the approved DCP requires a contribution of $855 per 121sqm of commercial floor-space or 19sqm of retail floor-space for Development Infrastructure (encompassing transport, streetscape and public art).

There is no contribution payable for community infrastructure.

There is an exemption in the DCP for Westfield Doncaster as follows:

Construction of a building or construction or carrying out of works on the land known as Westfield Shoppingtown Doncaster being the land identified on Planning Scheme Map 7IPO up to a leasable floor area of 135,000 square metres (comprising a maximum of 90,000 square metres leasable floor area for shop) provided that the infrastructure works specified in the conditions of Planning Permit No. PL03/015005 or other works in lieu of the specified works (as agreed by Council) are carried out or there is an agreement to secure the carrying out of those works to the satisfaction of the responsible authority.

The existing centre exceeds 90,000sqm of shop floor space.

Incorporated Plan Overlay Schedule 1 (IPO1)

The proposed Planning Scheme amendment seeks to replace the existing Incorporated plan overlay with a Development Plan Overlay.

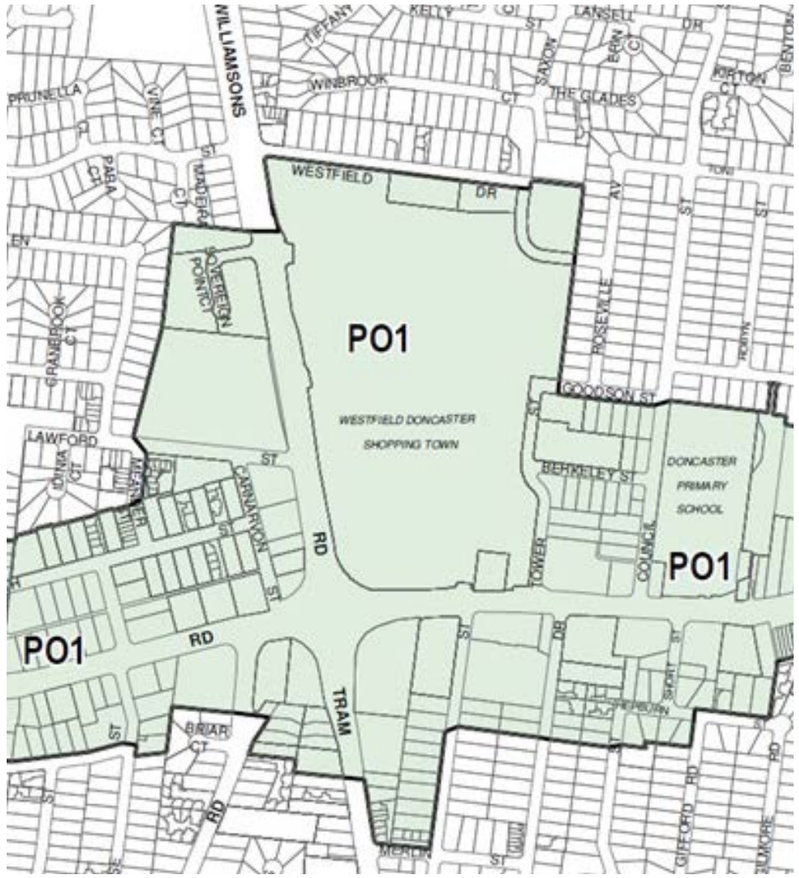


Figure 4: Parking Overlay plan

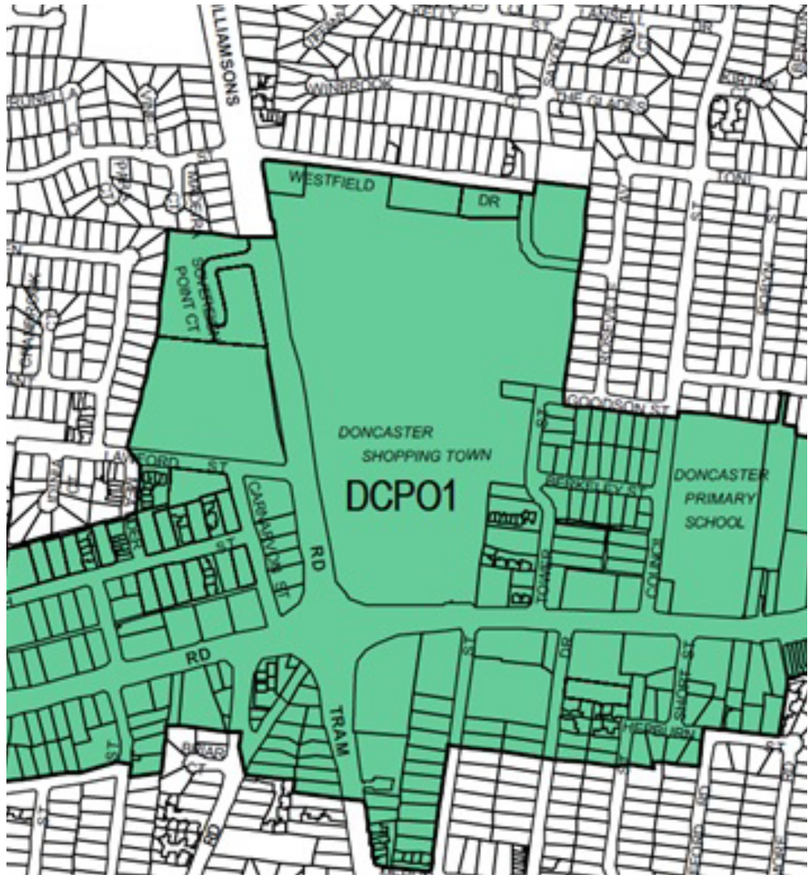


Figure 5: Development Contributions Plan Overlay plan

2.5 Key Studies & Strategies

Doncaster Hill Strategy

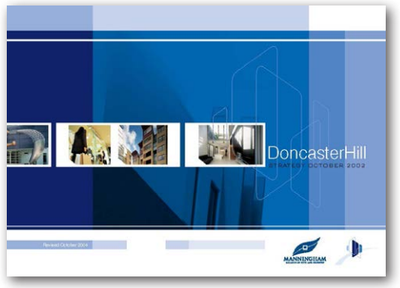
The Westfield Doncaster complex forms a central part of the Doncaster Hill activity centre. The boundary of the activity centre is identified in Council's Doncaster Hill Strategy (2002), which provides a strategic framework for the future land use and development of the area.

The 20-year strategy aims to protect the non-urban areas and green spaces of Manningham by concentrating development into areas with good access to transport, community services, shopping and open space. The strategy identifies the Doncaster Hill activity centre as a prime location for redevelopment, given its topographic features and existing physical and community infrastructure assets.

By 2020, Doncaster Hill will accommodate over 8,300 residents and provide 10,000 employment opportunities. The aim of the strategy is to create a state of the art, contemporary, sustainable, high density, mixed use village that enhances the social, environmental, economic and cultural elements of the region. It also seeks to promote positive economic, environmental and social performance over the long term.

Westfield Doncaster forms Precinct 4 of the Activity Centre. The vision statement for the precinct is:

"...that Westfield Shoppingtown will become better integrated into Doncaster Hill and the surrounding community with activated street frontages, more permeable pedestrian and vehicular accessibility, a greater mix of uses, accessible and prominent public transport interchange, pedestrian linkages to other precincts, and improved engagement with the main intersection."



Doncaster Hill Strategy, 2002

The strategy also outlines urban design requirements to underpin the development of a diverse and lively mix of urban environments across Doncaster Hill. This includes objectives and design guidelines relating to built form, open space, landscape, and safety. These are listed below.

Built form:

- To better integrate Westfield Shoppingtown into Doncaster Hill.
- To encourage innovative, contemporary architecture in which the retail component is externalised.
- To provide positive engagement of the Precinct with the main intersection of the Doncaster Boulevard and Williamsons Road.

Open Space:

- To create a number of significant externalised urban spaces, which are well connected within a permeable urban environment
- To ensure access to useable and well landscaped private and communal open space.

Landscape:

- To support and maintain a consistent planting strip in support of the proposed boulevard and along Williamsons Road.
- Landscape layout and design for developments should provide and environment that is safe, attractive and functional for all users.

Safety:

- To ensure the layout of development provides for the safety and security of residents, visitors, workers, and property

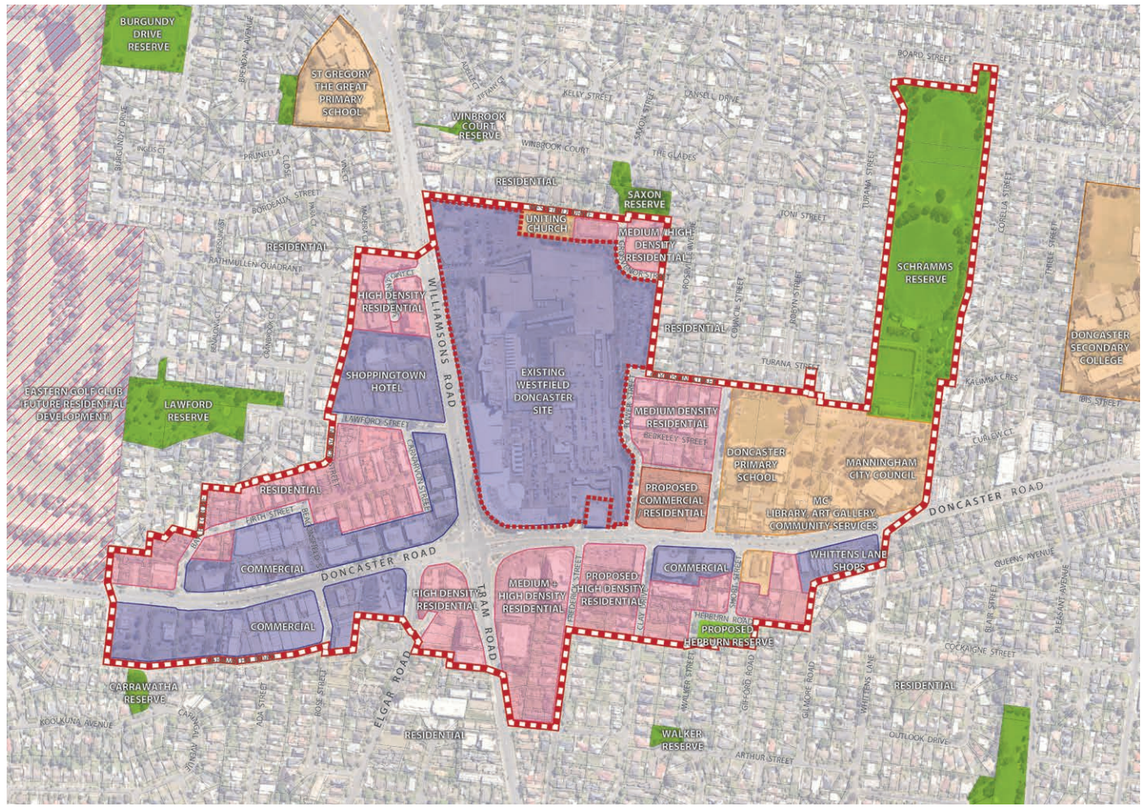


Figure 6: Plan showing Doncaster Hill Activity Centre boundary and existing land uses

Figure 7: Existing public art located along Williamsons Road frontage

3. SITE ANALYSIS

3.1 Regional Context

Westfield Doncaster is located approximately 14 kilometres north-east of the Melbourne CBD and is situated amongst a network of metropolitan activity centres including Box Hill and Ringwood. The La Trobe National Employment Cluster is located to the north-west of the site.

A wide range of shopping centres are located within a 15km radius of the complex. This includes Northland Shopping Centre and Greensborough Plaza to the north and north-west, Eastland to the east, and The Glen, Chadstone and Westfield Knox to the south and south-east. Sub-regional shopping centres located within close proximity include Forest Hill Chase, Victoria Gardens, Stockland The Pines and Burwood One.

Westfield Doncaster is a major employment and retail node and attracts 16 million customer visits annually, equating to total annual retail sales of over $887 million. With over 440 shops across a gross lettable area of 123,026 sqm, Westfield Doncaster is Victoria's third largest shopping complex is another major draw card for residents and visitors to Manningham and Doncaster Hill.

The size and status of the Westfield Doncaster complex as a regionally significant retail and employment node makes it important to the future growth and development of the Doncaster Hill activity centre and Manningham City Council.

Figure 8: Regional context plan

3.2 Built Form

Existing built form

The Westfield Doncaster retail complex presents as a large, contiguous building mass to the surrounding streets and public realm. While the "frontages" are largely focused on the Williamsons Road and Doncaster Road interfaces, the nature of the site, topography and the nature of the surrounding streets means the built form is highly visible. The centre is comprised of a number of building volumes of different heights and scales that establishes a varied built form character at the site.

Key elements of the existing built form at the site include:

- The majority of the centre incorporated into a building of 3-4 retail 'storeys' across the site, and located largely to the western and southern boundaries,
- The main retail centre presenting its "front door" to the south-western corner of the site, addressing the main intersection of Williamsons Road and Doncaster Road,
- A nine storey commercial tower (RL151.5) located near the centre of the Westfield Doncaster site. Located at the high point of Doncaster Hill, it acts as regional landmark and signifies the role of the complex as an important retail and commercial centre,
- Built form that is generally higher, consistent in scale and more articulated along the Doncaster Road and southern portion of the Williamsons Road frontages, contributing to a boulevard character along both arterial roads,
- The height of the remainder of the complex varies across the site due to the topography and layout of the retail spaces,
- Built form to the north and east of the site are generally bulky in form and dominated with blank walls and car parking structures resulting in little engagement with adjacent built form or surrounding areas,
- Surface car parking to the north of the site results in an undefined northern gateway to the Doncaster Hill Activity. This area of land represents a valuable opportunity to develop built form that contributes to the sense of arrival to the activity centre.

Figure 9: Existing higher built form currently located on the site acts as a regional landmark and defines the top of Doncaster Hill.

Figure 10: Corner treatment and minimal street setbacks strengthen the boulevard character along Williamsons Road and Doncaster Road.

Figure 11: A significant built form setback from Williamsons Road provides limited engagement with the street and results in an undefined northern gateway to Doncaster Hill.

Figure 12: Analysis plan of existing built form

3.3 Built Form Interfaces

The height and scale of the built form surrounding the Westfield Doncaster complex is varied, resulting in a mix of interfaces to the site. Typically the western and southern boundaries of the site interact with the more commercial, "activity centre" areas of Doncaster Hill, and the eastern and northern boundaries interact with the more residential areas.

The features and character of key interfaces include:

- Single and double storey dwellings along Westfield Drive and Tower Street establishing a generally low-lying and residential character to the north and the east. Some infill is visible and
- Recent lot consolidation and infill development has facilitated the development of three-four storey apartment blocks on key corner sites,
- Higher built form of between 8-12 storeys in height is established along Williamsons Road and Doncaster Road. The built form edge of these developments contributes to a boulevard streetscape character along both arterials,
- Big box retail and low-lying commercial uses located along Williamsons Road and Doncaster Road are generally single or double storey with car parking to the front. Such sites may be developed in the future into higher density residential accommodation or for commercial purposes at similar or taller heights than currently visible at Doncaster Hill,
- Sensitive residential interfaces, where the retail centre shares a number of boundaries with adjacent residential precincts - in particular to the northern and eastern boundaries of the centre,
- The northern interface of the centre, abutting Westfield Drive, is comprised largely of single and double storey detached dwellings, fronting Westfield Drive as a local street. For the north-eastern boundary of the centre, a number of residential properties and a church share a rear boundary fence with the centre. Given the local topography in this area, the levels, viewlines to the centre from abutting residential streets, and interface treatments vary accordingly,
- The eastern interfaces between the centre and local streets comprise commercial sites that front Doncaster Road, and largely residential properties north of Berkely Street. In this area the local topography means the hill falls away from the centre towards the residential street and dwellings. Properties along Roseville Avenue back onto the centre boundary with a shared read boundary and fence, and properties to Tower and Grosvenor front the centre and share a local street interface with the centre.

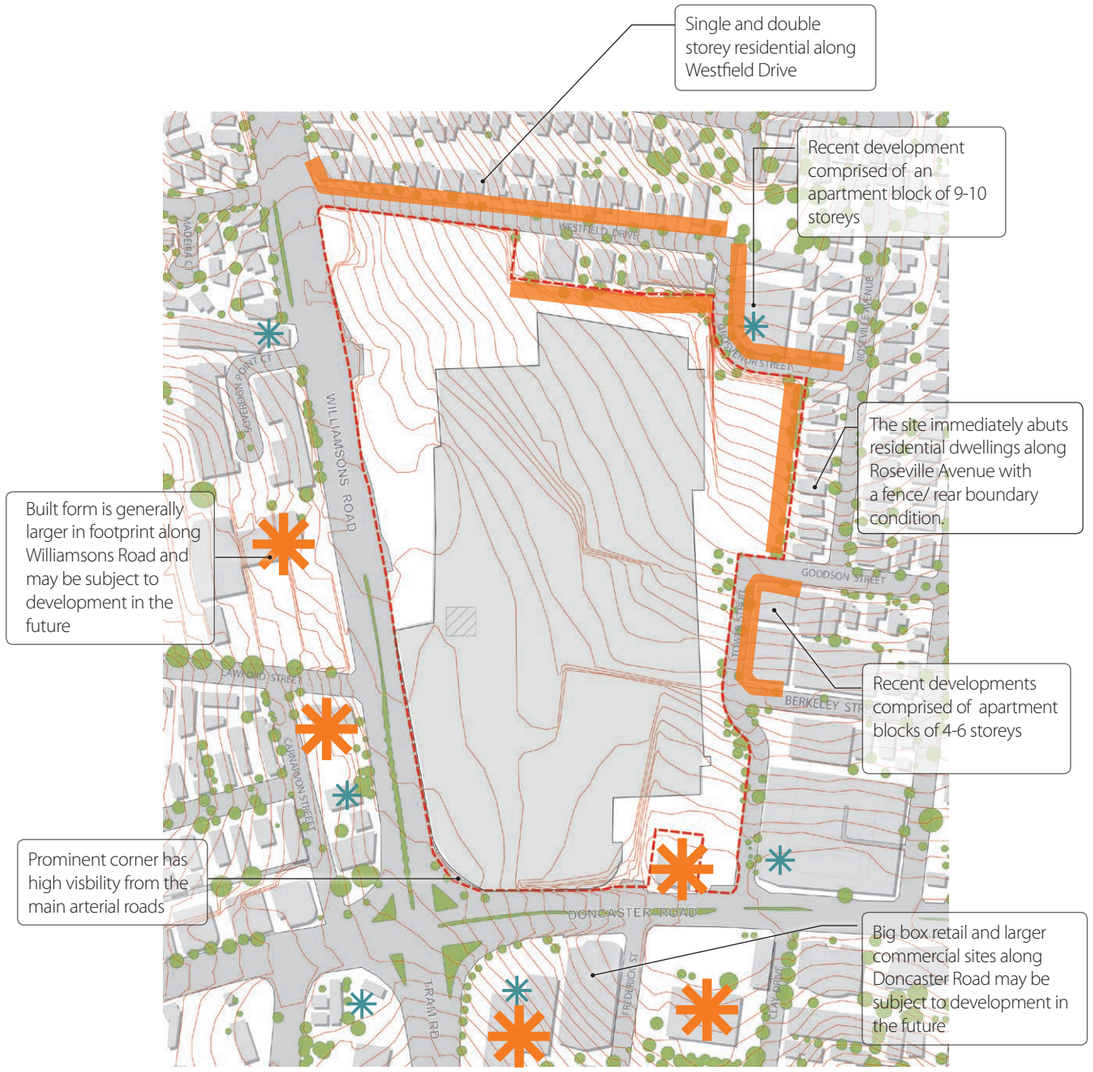


Figure 13: Analysis of built form interfaces

Given the topography, there are viewlines from local streets and dwellings west to the built form mass of the centre. Some of these views are dispersed or screened to some degree by the local mature street trees and trees in private properties.

- In a number of locations along the eastern boundary, such as the Grosvenor Street corner and the area where Tower Street fronts the centre, the residential built form is of a higher density and massing. This incorporates typically 4-5 storey built form along Tower Street, and the 'Pearl Doncaster' apartment building to Grosvenor Street of 9-10 storeys.

Figure 14: Recently completed apartment building with 12 storeys built form height along Doncaster Road

Figure 15: Recent apartment developments are generally between 8-12 storeys in height, with built form highest to frontages to main arterial roads such as Williamsons Road

Figure 16: Residential dwellings along Westfield Drive are single or double storey in height establishing a low-lying residential interface to the north

3.4 Movement Networks & Parking

Public Transport Networks

Public transport plays an important role in getting people to the Westfield Doncaster complex and to the wider Doncaster Hill activity centre. It also provides local residents access to major employment and activity centres, including the Melbourne CBD.

The bus interchange, located on Williamsons Road, currently provides a total of 8 on-site bays over two designated lanes and is served by both SmartBus and metropolitan bus routes.

Entry into the bus interchange is via the southernmost signalised intersection along Williamsons Road, with exit via the northernmost signalised intersection of Williamsons Road. Access via these signalised intersections by buses is currently shared with general vehicular traffic.

In addition to the bus interchange, bus services are also available along Doncaster Road. SmartBus services operate from the Westfield Doncaster transport interchange. These services run later than metropolitan bus services, with services on Monday - Friday running between 5am and 11pm.

For further details on the local Public Transport network, and analysis, refer Appendix B - Traffic and Transport Assessment Report.

Pedestrian Networks

There are no external pedestrian routes which cross the entire site, with primary pedestrian networks being located internally within the Westfield Doncaster complex. Pedestrian access points into the complex from the surrounding street network are provided in the following locations:

- Designated access across the bus interchange into the western entrance of the building, linked by the street footpath to two pedestrian crossings of Williamsons Road.
- Designated access into the complex from Doncaster Road, linked by the street footpath to a pedestrian crossing of Doncaster Road at Frederick Street, and to the pedestrian crossings at the intersection of Williamsons Road and Doncaster Road.
- A pedestrian walkway from Grosvenor Street, to the north-east of the site, into the complex via the eastern car park.
- A pedestrian walkway from Goodson Street to the east, into the centre via the eastern car park.
- A pedestrian walkway from Tower Street to the east, into the centre via the eastern car park.
- There is currently no pedestrian access from Westfield Drive or areas north of the complex.

There are a number of additional entrances that provide access to the complex's multi-deck car parking areas.

For further details on the local pedestrian network, and analysis, refer Development Plan, Appendix B - Traffic and Transport Assessment Report.

Figure 18: Analysis of pedestrian and public transport networks

Figure 19: Many of the complex's entrances are internalised and accessed from car parking areas

Figure 17: Buses entering and exiting the bus interchange may conflict with vehicular transport, limiting efficiency and reliability of services.

Bicycle Networks

No dedicated on-road or shared bike paths currently exist in the immediate proximity of the complex. Williamsons Road and Doncaster Road have been identified as important north-south and east-west linkages as part of the VicRoads PBN.

Bicycle use within the Doncaster Hill Activity Centre is currently very low. This is considered to be due to the terrain, lack of network and facilities that generally users would consider safe, as well as a general lack of end-of trip facilities.

Connecting bicycle routes, indicated as 'Preferred Bicycle Routes' (Refer Traffic and Transport Assessment Report), have been identified for Council's consideration in starting to provide a suitable network. The development of the PBN is not considered feasible along Doncaster road and Williamsons Road, as suitable facilities would require the removal of traffic lanes, which would not likely be supported by VicRoads.

There are opportunities to improve the cycling conditions through the provision of end-of-trip facilities being provided around the site.

For further details on the local bicycle network, and analysis, refer Appendix B - Traffic and Transport Assessment Report.

Road Network

Williamsons Road is a major north-south arterial road. Doncaster Road is a major east-west arterial. Both roads have direct connections to the Eastern Freeway, which provides direct access to the CBD and to Melbourne's south-eastern suburbs. The scale of both roads forms a barrier to the pedestrian accessibility of the site.

Five vehicular access points are currently provided into the site. Two are located on the Williamsons Road frontage, two are located on the Doncaster Road frontage (opposite Frederick Street and adjacent Tower Street), and a fifth entry is provided from Goodson. Dedicated traffic lights are provided to each of the Doncaster Road and Williamsons Road access points. Truck access to loading bays is via each of the Williamsons Road and Doncaster Road access points.

Recent traffic counts undertaken of the Centre's access points indicate a Friday PM peak hour volume of approximately 4,600 vehicle movements, with approximately 5,200 movements occurring during the Saturday midday peak.

For further details on the local road network, and analysis, refer Traffic and Transport Assessment Report.

Parking

At present the site provides approximately 4,800 on-site car parking spaces, provided through a mix of both surface car parks and multi-storey car parking buildings. Detail are provided below:

- Three separate surface car parks are located to the north, east and west of the centre. Two are accessible from the Williamsons Road. The third car park is accessed from the Goodson Street/Tower Street entrance. Surface car parking is generally located at a distance from key pedestrian entries. Furthermore, the pedestrian environment is relatively poor with a limited number of footpaths and minimal shelter.
- Three multi-storey parking buildings are located within the site. A permit has been approved by Manningham City Council for a five storey extension to the car park. The proposed car park is located to the east of the site, with access provided from Goodson Street and Doncaster Road.

Figure 21: Surface car parking adjacent to Williamsons Road dominates the streetscape

Figure 22: Surface car parking is generally located at a distance from the complex's key entrance points

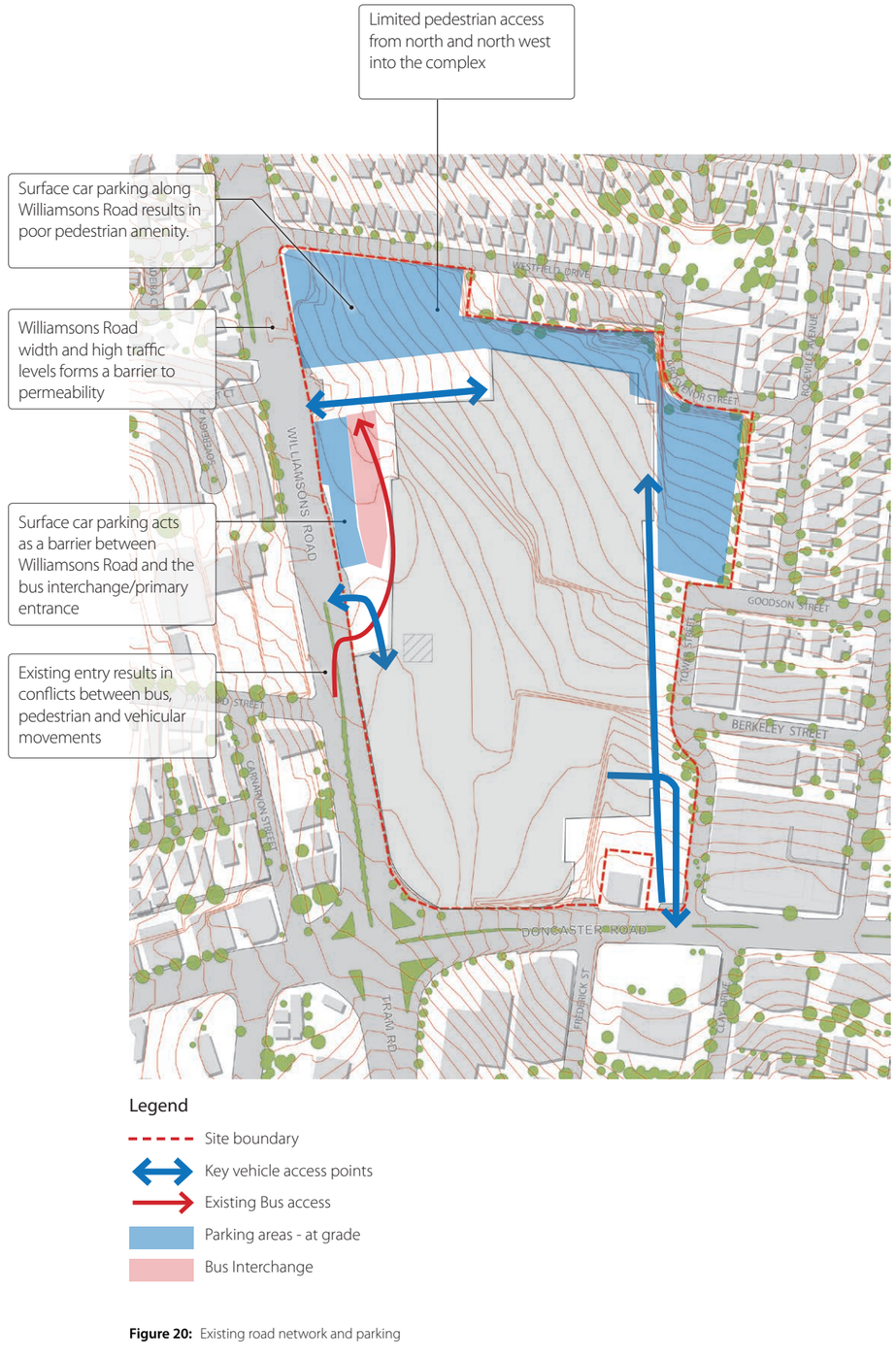


Figure 20: Existing road network and parking

3.5 Landscaping & Public Realm

Public realm

The public realm spaces at Westfield Doncaster are focussed primarily along Williamsons Road and Doncaster Road. In particular, the bus interchange area on Williamsons Road is a public space with a distinct function and significant daily and weekly public use.

The public realm on Doncaster Road has been developed in accordance with the City of Manningham's standard palette of pavements and urban furniture for Doncaster Road within Doncaster Hill.

Public realm on Williamsons Road is primarily focussed between the front entrance and the street edge. Planting, seating and dedicated pedestrian zones are provided.

Bus Interchange

The bus interchange at the complex is one of Doncaster Hill's major transport hubs, it is isolated from the complex; defined with blank walls to the east and surface car parking to the west. This condition contributes to reduced perception of safety and activity at the interchange.

Landscaping

As a result of its extensively built up nature, significant vegetation is limited to the edges of the site. Key existing plantings, or planting themes, include:

Materials

The character of the public realm is influenced by the urban landscape elements including:

- Use of exposed aggregate coloured concrete pavements which characterise the general public realm on the Williamsons Road frontage
- Textured planting forms at the pedestrian level, referencing the thematic use of Canary Island palms and providing a visual character distinct from other areas of the site.
- Use of standard City of Manningham thematic site furniture

Phoenix canariensis (Canary Island Palm) along Williamsons Road.

The row of palms along Williamsons Road, between the Doncaster Road intersection and the bus interchange entry has long been a distinctive, almost iconic, element of Doncaster Hill. On this basis this row of trees was reinstated as part of the most recent centre expansion in 2008.

Figure 23: There is little engagement between the primary pedestrian entrance and the bus interchange

Figure 25: Public seating and landscaping treatment along Williamsons Road

Phoenix canariensis (Canary Island Palm) at the Williamsons Road bus interchange.

The row of palms referred to above intensifies to become a cluster around the bus interchange, signifying this point as a significant centre entry. Some of these palms pre-date the previous centre expansion, while others were relocated to this location as part of the expansion.

Figure 24: Existing row of Canary Island Palms contributes to the streetscape character of the complex

Figure 26: Landscaping zone along Williamsons Road, adjacent to the bus interchange breaks up the public realm and enhances the visual amenity of the primary pedestrian entrance

Pyrus "Capital" (Flowering Pear) and Platanus acerifolia (London Plane) along Doncaster Road.

These species were established by the City of Manningham as the thematic planting to be installed along Doncaster Road, and were installed in this location as part of the 2008 centre expansion. The species continue around the Doncaster Road / Williamsons Road intersection before meeting the Phoenix canariensis row referred to above.

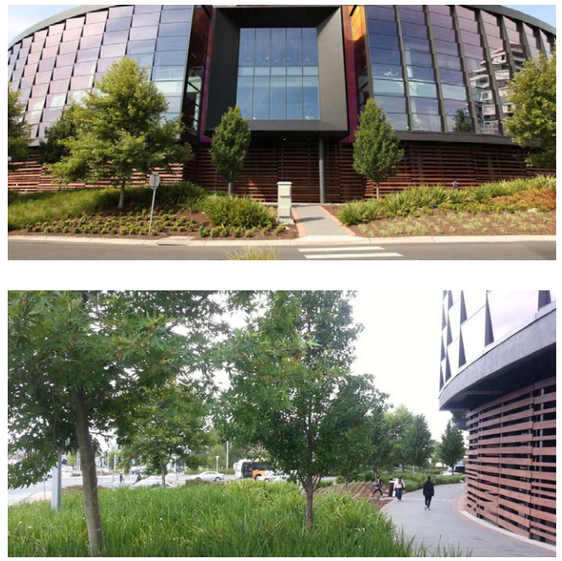


Figure 27: Landscaping treatments installed as part of the complex's expansion in 2008 enhance the boulevard treatment of Williamsons Road and Doncaster Road

Corymbia citriodora (Lemon Scented Gum) at Williamsons Road access road.

This intersection is marked by three large and visually prominent Corymbia citriodora. These trees have been previously identified by the City of Manningham as having local significance.

Figure 28: Existing Lemon Scented Gums located within existing surface car park area along Williamsons Road

Scattered trees within north-west car park.

A number of mixed eucalyptus species, and a single Phoenix canariensis, are scattered through the car park at the corner of Williamsons Road and Westfield Drive. None of these trees has great significance either visually or environmentally, although the single Phoenix canariensis would have potential to augment other palms located across the site.

Corymbia citriodora and mixed understorey along Tower Street.

Corymbia citriodora were planted as canopy trees, with a mixed non-indigenous native understorey, along the eastern access road as part of the 2008 centre expansion. This planting has been successful in establishing a landscape which provides both a strong visual character and a sense of "buffer" along the eastern edge of the site. While of a different character this landscape is in some ways as strong an edge as the Canary Island palms which define the western site boundary.

Figure 29: Landscaping zone located along Tower Street

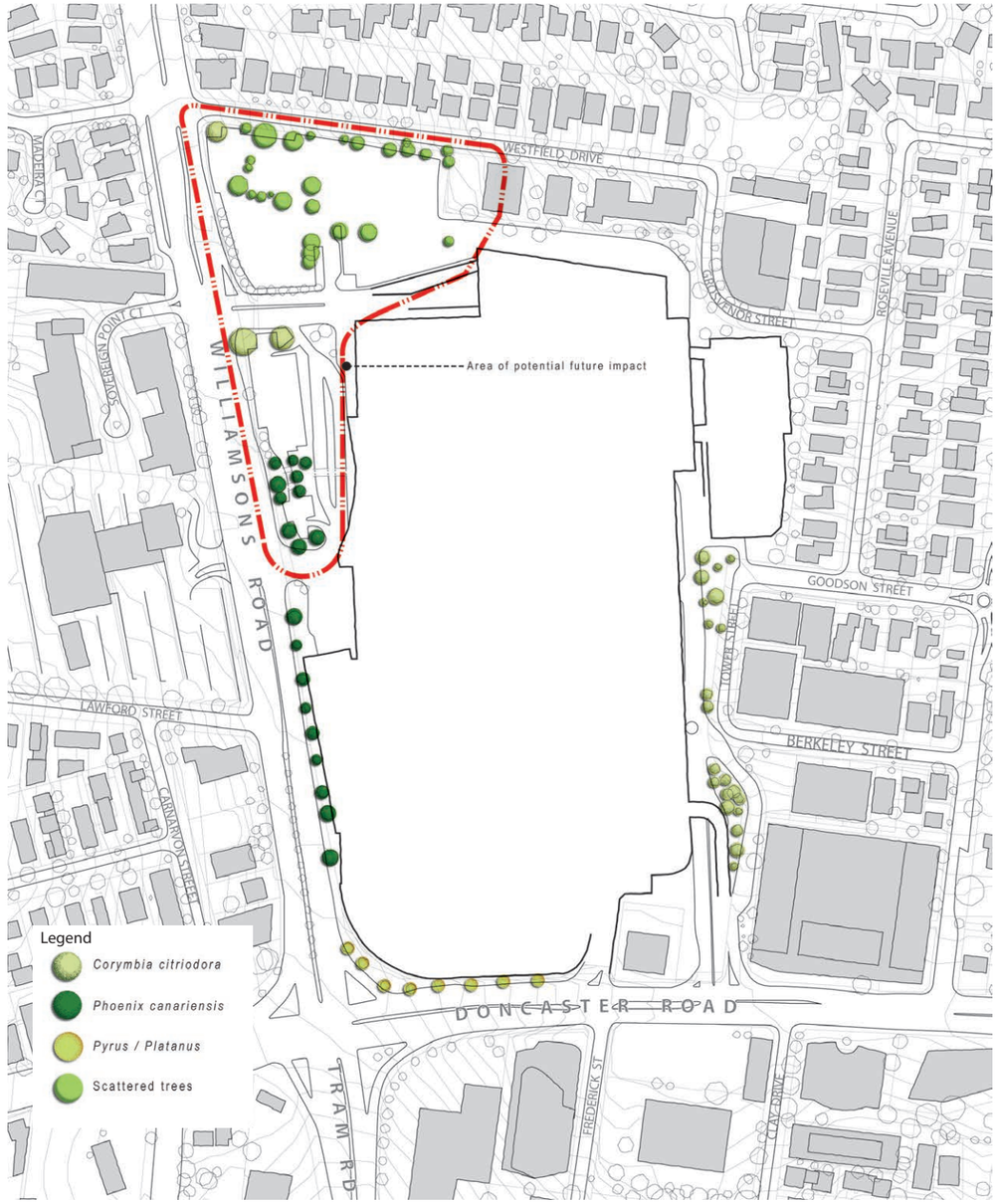


Figure 30: Existing tree location plan

3.6 Topography

Topographic Response

Doncaster Hill is regarded as a regional high point and has a natural elevation of 127 metres above sea level. The complex is located at the top of Doncaster Hill, giving it a significant visual prominence, particularly from the north and the east of the site.

The dramatic topography of the site has a particularly significant impact on interface conditions to the north and the east. The change in the level between the site and the residential to the north has required the construction of significant retaining walls here, as well as the interface to Grosvenor Street to the north-east. The topography and resulting retaining walls also discourage pedestrian access to the site, particularly from the west and the north.

Views and vistas

As a result of its prominent elevated site and the surrounding road network, the centre is highly visible from the many parts of the surrounding residential and commercial areas.

Major aspects towards the site occur:

- looking south along Williamsons Road
- looking east from Doncaster Road
- looking north from Tram Road
- looking west along Doncaster Road

Distant views to Doncaster Westfield also occur across the surrounding suburbs and views from the site extend to the Melbourne CBD (west), the Dandenong Ranges (east), and Kinglake Ranges (north-east).

Figure 31: Aerial view of Westfield Doncaster showing sloping nature of Doncaster Hill and views towards Melbourne CBD west of the site.

Figure 32: Analysis of topography and views/vistas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GARDENHILL
DISPLAY NOW O
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Figure 33: Existing landscaping treatment along Williamsons Road

4. SITE OPPORTUNITIES

4.1 Activities & Land Use

Role of Doncaster Hill

Increasing the prominence of Doncaster Hill as a regional destination will be reliant on the diversification of land uses at Doncaster Hill that enhance employment options and services and attract additional investment opportunities to the area.

The expansion of the Westfield Doncaster complex provides an opportunity to diversify the complex's retail and commercial offering, furthering Manningham City Council's vision for a mixed use urban village at Doncaster Hill, and ensuring the centre's commercial viability and longer-term economic sustainability.

Retail Land Uses

To maintain its role as one of the leading shopping centres in Melbourne, Westfield Doncaster needs to respond to trends occurring the retailing market. This includes the entry of international brands to the Australian market, including as H&M, Topshop, Uniqlo, Muji and Samsung. Many of these international retailers require large tenancies in the range of 500-2,000 square metres in size.

Redevelopment of the Westfield Doncaster complex offers the opportunity to enhance the role of Westfield Doncaster as one of Australia's top shopping centres by accommodating additional luxury brands, international mini-majors, and food and entertainment offerings that will better meet the needs of the complex's relatively affluent retail catchment.

Office Uses

The Doncaster Hill Strategy seeks to encourage diversification of employment within the activity centre, including additional office/commercial uses. This is supported by the Victorian Government which has long promoted the decentralisation of employment to suburban locations outside of the traditional CBD.

Given the strong retail offerings at Westfield Doncaster, the co-location of the bus interchange, the mix of housing within close proximity to the activity centre, and the proximity of Eastlink, there is a significant opportunity to attract larger office uses to the area. This opportunity should be pursued as large office development to encourage major corporations and government agencies.

Recent examples of government agencies locating within activity centres include the Government Services Building in Footscray, South East Water's commitment to a new head office in Frankston, and the Australian Taxation Office choosing to remain in Box Hill.

Food & Beverage

Future growth in the number of residents within the Doncaster Hill activity centre will generate demand for additional cafés and restaurants in the vicinity. Currently, there are a limited range of food and beverage offerings and there is an opportunity to emphasize a village with a larger, more diverse range of cafés and restaurants in a modern setting to better meets the needs and preferences of Doncaster's relatively affluent market.

New food and beverage options at Westfield Doncaster should also provide experiences outside the existing food court model. There is an opportunity at the complex to offer a high amenity alfresco café environment that takes advantage of the expansive views afforded from the site. Dinner trading hours could also be considered to encourage activation of the site at night.

Key opportunities include:

- **Elevate the role of Doncaster Hill activity centre as a higher-order centre for the north-east through the diversification of the uses, particularly those that generate new employment opportunities,**
- **Establish office uses within the complex that are integrated with existing retail activities,**
- **Rationalise vehicle access into the centre to ensure the retail and commercial uses are well served.**

4.2 Built Form

Building Character & Design

The further development of the Westfield Doncaster centre is an opportunity to reinforce and enhance the built form character of Doncaster Hill. As one of the key landmarks of the Doncaster Hill, the new development should exhibit high quality, contemporary architecture and treatments to set the direction and character for future built form in the activity centre.

The design language and materiality of the built form should reflect the use and function of Westfield Doncaster as a world-class shopping and commercial centre. Form, use of materials, colours, landscape features, and articulation, should be consistent in its quality and contribute positively towards the overall character of Doncaster Hill.

At ground level, an increased level of detail and articulation should be incorporated to be visually interesting and reinforce a sense of the "human scale" at street level around the centre. The design should incorporate textured materials and landscape elements to support a pleasant and engaging pedestrian experience. The interior design of tenancies with public realm frontages should contribute to street-level experience and consider how they present at all times of day and night.

Built Form Height & Setbacks

Future development on the Westfield Doncaster site should seek to better integrate the complex with the surrounding urban fabric. There is an opportunity to better respond to residential interfaces along Westfield Drive and Roseville Avenue through more detailed articulation, careful management of visual bulk and appropriate setbacks.

The redevelopment of the north western at-grade car park offers an opportunity to further enhance the boulevard character of Williamsons Road. The establishment of a continuous built form edge provides consistency along the streetscape and can provide better outcomes for pedestrians through activated frontages and passive surveillance.

Gateway Building

The definition of prominent locations within an activity centre plays an important role in way-finding and reinforcing the urban structure.

Williamsons Road represents the major northern entry to the Doncaster Hill activity centre. Currently, this arrival experience is undefined and dominated by at-grade car parking on the Westfield site.

This area of land represents a valuable opportunity to develop built form that contributes to the sense of arrival to the activity centre. To reflect the prominence of the site, a high quality built form outcome should be pursued, including 'landmark' contemporary architecture. This should be complemented by distinctive and consistent public realm, landscape elements and planting, and high-quality integrated signage and wayfinding.

Key opportunities for built form include:

- **Incorporate high quality, contemporary architecture to provide benchmarks for future built form at Doncaster Hill and signify regional importance of the complex,**
- **Contribute positively to an improved pedestrian environment at street level through material choice, built form articulation, and landscape treatments to public realm spaces,**
- **Incorporate better integration of complex with surrounding built form through careful management of visual bulk and appropriately articulated building volumes,**
- **Redevelop northern at-grade car parking to include built form fronting and addressing Williamsons Road to enhance the boulevard character and provide a more sympathetic built form interface to Westfield Drive,**
- **Establish a gateway building to the north-west corner of the site to mark the entrance to the Doncaster Hill activity centre from the north, and a local landmark consistent with the Doncaster Hill Strategy.**

Figure 34: Built form opportunities plan

4.3 Public Realm

Streetscapes

To support a positive pedestrian experience, the architectural and landscape design of street interfaces should respond to human scale and walking speed through formal tree planting, a well defined built edge, and various pedestrian-generating and retail activities at street level. Vehicle crossings of pedestrian footpaths should be minimised or consolidated, where appropriate.

The high level of vehicular traffic on Williamsons Road, as well as the increasing amount of bus movements associated with the improved bus interchange, present a challenge to delivering active and engaging façades along this high profile frontage. In order to respond to these constraints, areas of ground level activation should be set back from Williamsons Road, concentrated around major pedestrian entries and, where possible, aligned with key areas of public realm.

In areas where activation at street level is limited, building façades should be designed to provide a sense of a visual journey for pedestrians. The use of detailed and textured materials can contribute to an engaging pedestrian experience. Ground and upper podium levels addressing the corner of Williamsons Road and Westfield Drive should be designed to be engaging, with a high level of transparency.

Public spaces

The primary pedestrian entrance is currently separated from Williamsons Road by the bus interchange, limiting engagement with the street. The relocation and expansion of the entry forecourt offers the opportunity to provide a more vibrant and lively entrance. Direct and close access to the bus interchange can further enhance this.

There is an opportunity to establish an activated space at an upper level above the bus interchange. Locating active uses at upper podium levels along Williamsons Road can provide passive surveillance of the road and contribute to an increased sense of safety and vibrancy, as well as a broader lifestyle offering for visitors and the local community.

Landscaping

There are opportunities to maximise vegetative landscape to provide soft barriers and protection to surrounding areas with respect to the visual, noise and operational requirements of the complex. Careful consideration should be given to tree and low level planting species to reduce the heat island effect of hard spaces in the public realm and to provide shade to footpaths.

Key opportunities for the public realm include:

- **Street interfaces should incorporate architectural and landscape design and pedestrian-generating and retail activities at street level to support a better pedestrian experience**
- **Relocated and expanded forecourt/entry with active frontages in appropriate locations to establish a vibrant public space along Williamsons Road**
- **Potential upper level public space above Williamsons Road to provide passive surveillance and take advantage of views over surrounding area and Melbourne CBD.**
- **Establish appropriate landscaping to provide shade in the public realm, soften built form and acoustic walls, and further enhance Williamsons Road boulevard.**

Figure 35: Analysis - vehicle access and parking

4.4 Movement & Transport

The Development Plan proposal involves important modifications to vehicle access arrangements, an increase in parking at the centre for cars, bicycles, and the provision of associated new loading areas.

It also incorporates a significant investment in public transport and active travel infrastructure including an expanded bus interchange, new pedestrian and cyclist connections between the Shopping Centre and the surrounding Doncaster Hill precinct.

There are a number of opportunities to improve the movement network across all modes, to and within the centre. These include upgrades to the bus interchange to provide improved bus services, level of service and general amenity, bicycle end-of-trip provisions, and revised and improved pedestrian crossings and access points into the centre.

These opportunities seek to support and reinforce the objectives of State and local policies and studies including the VicRoads - SmartRoads Network Operating Plan, The Doncaster Hill Strategy, and the Doncaster Hill Mode Shift Plan (2014).

Public Transport

The Development Plan will help to support the objectives of the Mode Shift Plan which aim for more sustainable and accessible transport systems to support the future level of development in the area, and increasing the current alternative transport mode share from 20% to 30%.

Entry and egress to the bus interchange is currently shared with vehicular access to car parking. This limits movement efficiencies with impacts on service delivery and efficiencies. Improvement to circulation for bus services may be enhanced through dedicated bus access points and turning bays from Williamsons Road.

Given the proposed increase in retail floor space and the growing residential population projected around the complex, additional bus bays should also be considered. This enables the future proofing of the interchange should additional services and increases in frequency be required.

Any reconfiguration of the interchange should also enhance the pedestrian environment. Additional landscaping and improved safety for pedestrians at crossing points could be provided to enhance the bus interchange. In order to support passive surveillance of the bus interchange, active ground level tenancies should be located within a clear line of site from the bus interchange concourse.

There is an opportunity to co-locate uses with longer operating hours such as food and beverage that provide amenity for early morning and evening bus commuters. This provides a greater sense of safety and activity at the interchange.

Key opportunities

- **Support and reinforce the aims to increase the local use of public transport services and links, as outlined in the Doncaster Hill Mode Shift Plan (2014),**
- **Provide a more sustainable and accessible transport system within Doncaster Hill to support changed travel behaviour to decrease car dependency and increase use of public transport, walking and cycling,**
- **Contribute to the desired mode shift through an increased use of active transport for trips of 2.5km or less within, and around the centre,**
- **Redevelop the existing bus interchange to improve its operation and capacity,**
- **Improve public transport efficiencies with dedicated access from Williamsons Road such as a dedicated and prioritised access into the bus interchange,**
- **Improve bus interchange facilities and address existing safety concerns and provide a higher level of amenity for pedestrians,**
- **Enhance sense of safety and activity at the bus interchange by co-locating food and beverage uses,**

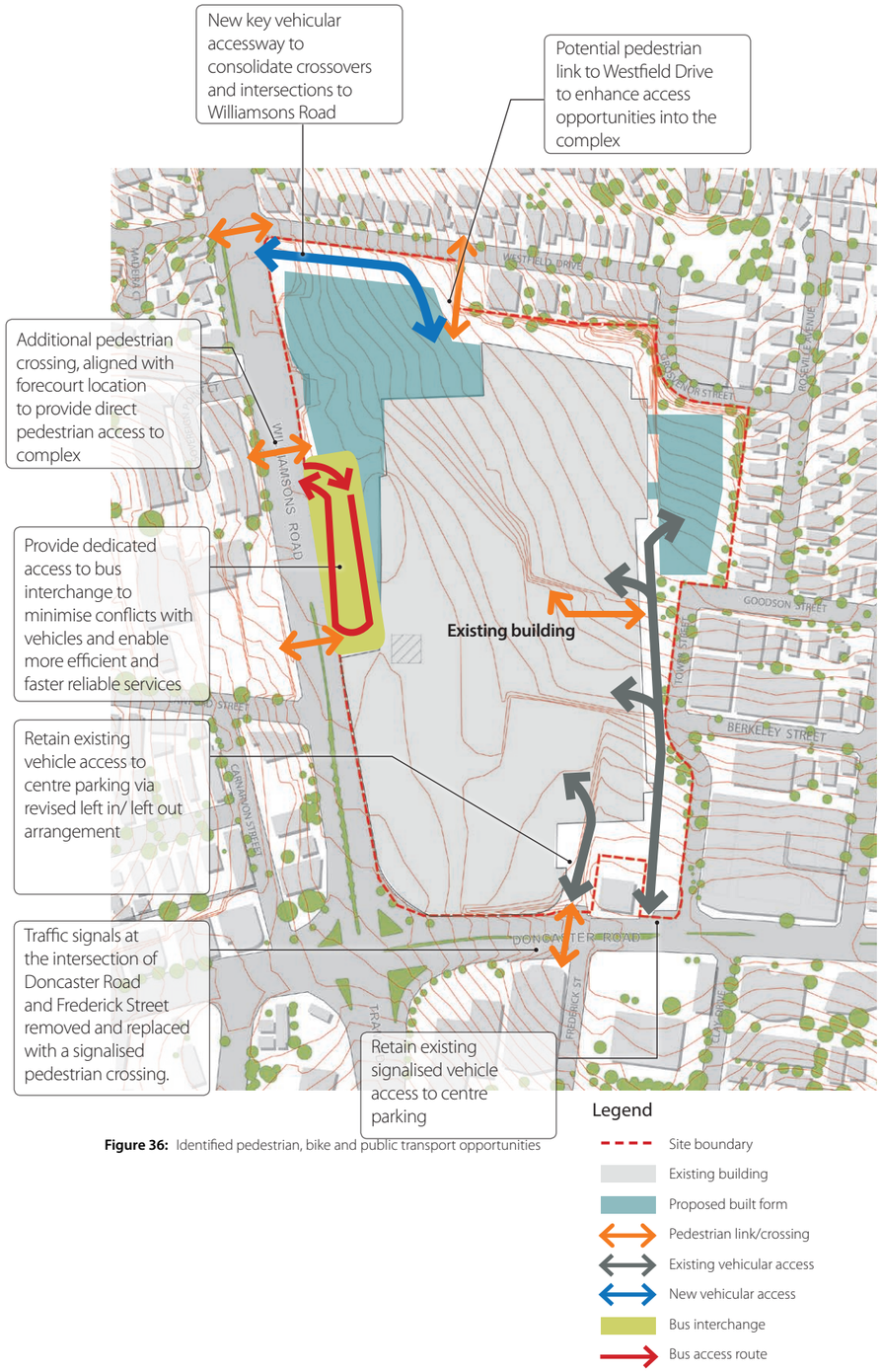

Figure 36: Identified pedestrian, bike and public transport opportunities

Pedestrian Access

Future expansion of the Westfield Doncaster complex to the north-west end of the site will need to support legible and safe pedestrian connections to the surrounding areas.

Additional linkages that facilitate pedestrian and bicycle access into the surrounding residential neighbourhood should be considered, particularly to areas that are undergoing development. This includes the residential precinct to the north of the complex and the proposed redevelopment of the Eastern Golf Club to the west.

The existing bus interchange also presents, in some ways, a potential barrier to wider pedestrian permeability. Future expansion and/or reconfiguration of the bus interchange will need to carefully consider pedestrian movements and, where possible, provide a safe and legible pedestrian route from Williamsons Road.

This should be supported with the alignment of road crossing points with main entry points to the centre to make getting around the centre on foot, easier, safer, and more enticing.

It is noted that given the terrain and existing constraints, not all facilities or to a standard that is considered desirable may be possible, such as the pedestrian boulevard along the Williamsons Road frontage of the site, which is constrained by the proposed bus interchange improvements and the existing building that will remain.

Key opportunities

- **Enhance local pedestrian links and the wider network through the redevelopment works of the centre,**
- **Ensure that development facilitates a permeable, activated, connected, safe (includes passive surveillance) and comfortable pedestrian environment adjacent to the proposed boulevards and with strong linkages within Doncaster Hill to key trip generators and passive open space.**
- **Minimise pedestrian conflicts through the rationalisation of crossovers and street intersections,**
- **Provide new pedestrian crossing signals to the north-west corner of the site at the Williamsons Road/ Westfield Drive intersection,**
- **Provide revised and improved pedestrian crossing conditions on Williamsons Road adjacent to Sovereign Ct,**
- **Provide revised and improved pedestrian crossing conditions on Williamsons Road outside the Shoppingtown Hotel and linked into the new bus interchange,**
- **Provide a new pedestrian access into the retail centre from the north, linking Westfield Drive across the new vehicle access and into the centre,**
- **Improve and refine the existing pedestrian access point to the east, from Goodson Street which uses the undercroft carparking areas to link pedestrians into the retail centre,**
- **Improve and refine the existing pedestrian access point from the north-east, from Grosvenor Street through the new multi-level carpark,**
- **Provide improved pedestrian crossing conditions at the Doncaster Road, Frederick Street intersection as a result of the revised traffic and signal conditions.**
- **Work together with Council to help to support and reinforce the objectives for Williamsons Road as an important visual boulevard within the Doncaster Hill Activity Centre. This will include boulevard landscape treatments along both sides Williamsons Road in order to help provide a pedestrian focused environment, through associated footpath, verge and streetscape works.**

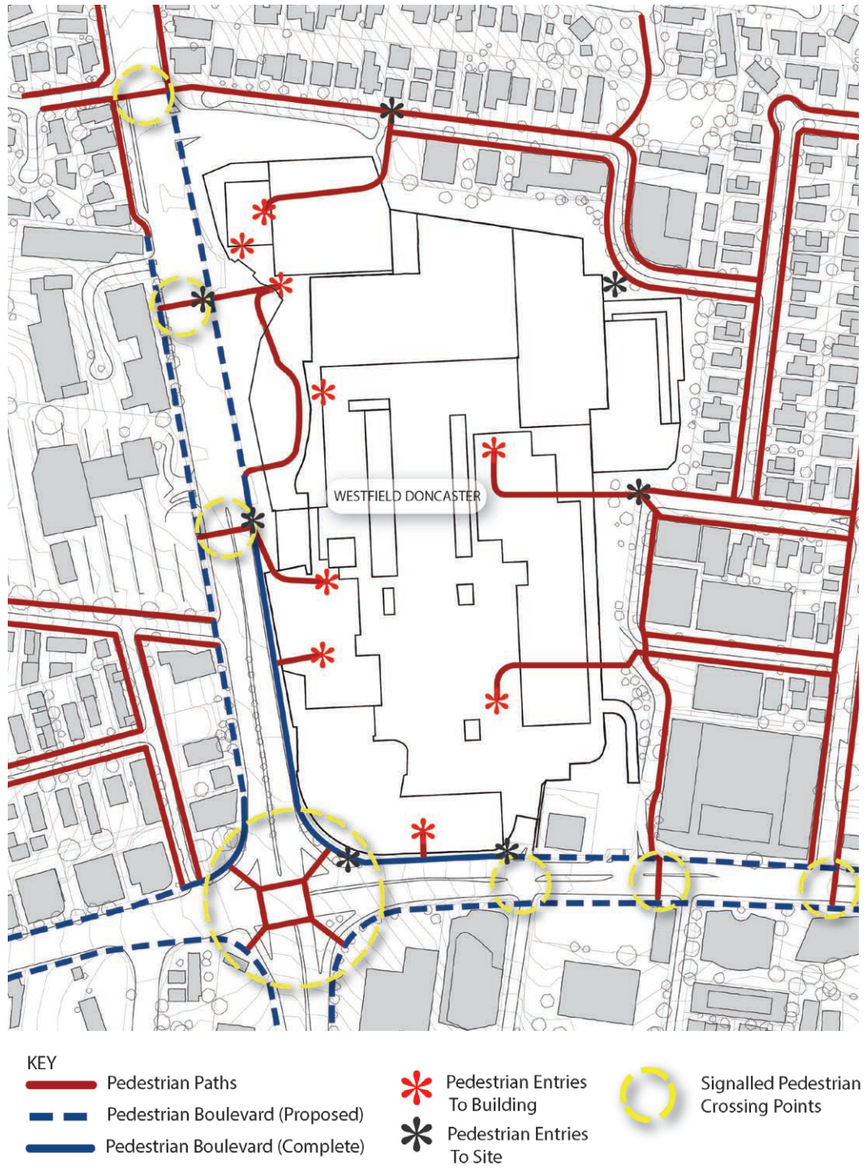

Figure 37: Pedestrian Network and Facilities - Site Interface and Internal Access Arrangement

Bicycle Access

As a major activity generator at Doncaster Hill, Westfield Doncaster has the capacity to positively influence bicycle mode share in the area. It is acknowledged that bicycle paths lie outside the site boundaries, However, the relocation of vehicular entry points should consider impacts of the cycling environment through the consideration of crossover frequency and length and connections to entry points.

There is also an opportunity to provide end of trip facilities, including bike parking and showers, in convenient areas. This will encourage the use of bikes as a means of transport for visitors and workers within the local area and as a means of connecting to the bus interchange.

Key opportunities

- **Enhance and support existing bicycle links and network across the wider Doncaster Hill Activity Centre.**
- **Improve on-road and off-road cycling infrastructure, to connect to key destinations and generators**
- **Improve end of trip facilities at key destinations and improve bicycle facilities on key routes**
- **Improve the local signage and wayfinding for the bicycle network, paths, facilities and parking areas.**

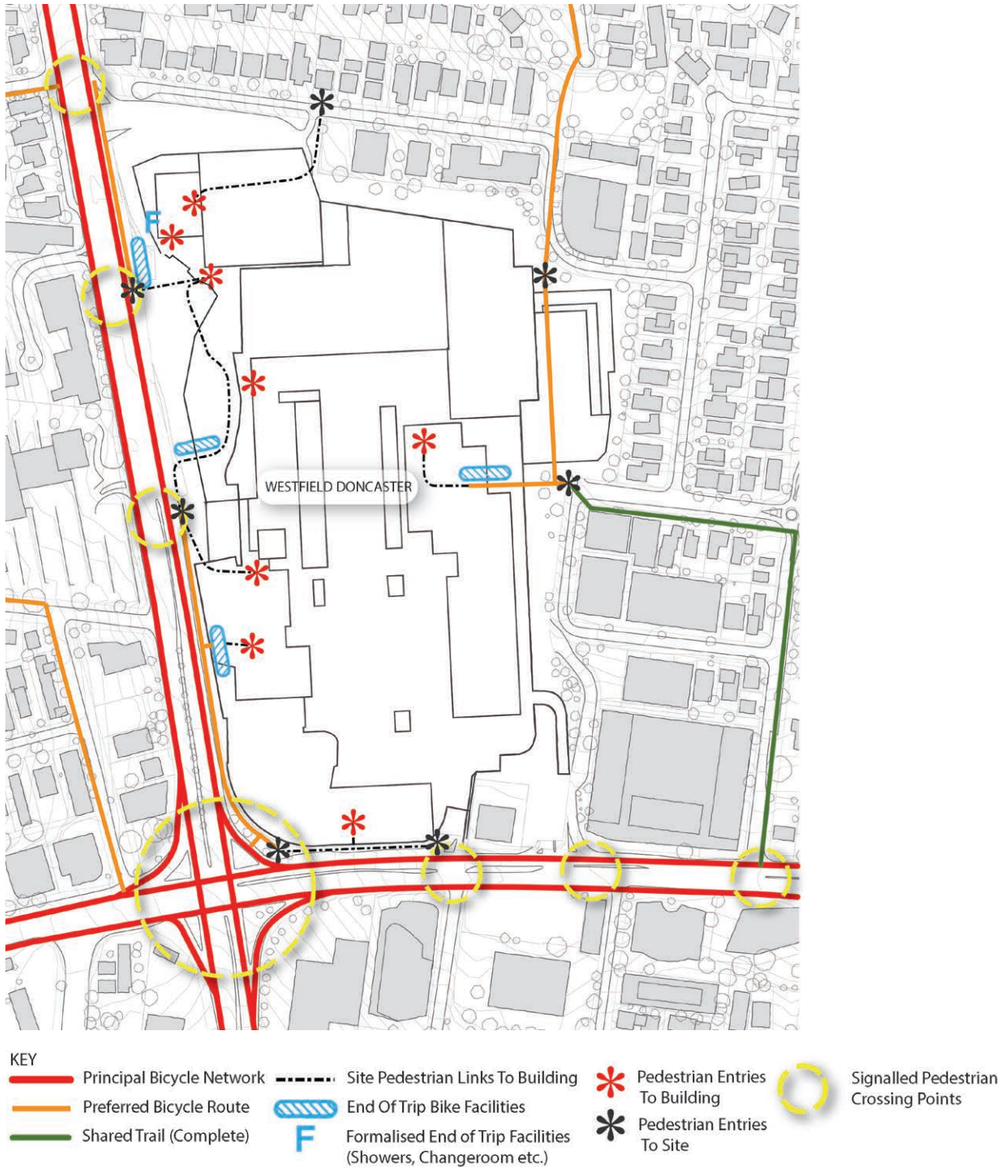

Figure 38: Bicycle Network and Facilities - Site Interface and Internal Access Arrangements

Vehicular Access

The existing Westfield retail centre is at the core of the wider Doncaster Hill Activity Centre.

As such, high traffic volumes along Williamsons Road and Doncaster Road create congestion and traffic conflicts around the complex, and make vehicle access into the centre challenging. The management of vehicle movement has been reconsidered to improve traffic network efficiencies, vehicle access to carparking areas and local pedestrian activity. This may include minimising the frequency and length of crossovers that interrupt footpaths and aligning intersections and pedestrian crossings with key desire lines. Vehicular access should be minimised in locations where other modes of transport are prioritised, particularly public transport.

An opportunity to minimise pedestrian conflict exists in the closure of Westfield Drive to Williamsons Road. During peak times significant traffic volumes constrain movement for vehicles accessing Westfield Drive. There is an opportunity to co-locate a new signalised intersection with Westfield Drive to provide a safer entry and egress to residents and visitors accessing the local street.

Key opportunities

- **Modify and enhance vehicular access arrangements to the redeveloped centre,**
- **Relocate the existing northernmost signalised intersection along Williamsons Road towards Westfield Drive for access into carparking areas,**
- **Provide a new dedicated signalised access to the new bus interchange,**
- **Enhance pedestrian access opportunities from the west and north of the site as a result of the modified vehicle access,**
- **Improve internal and external site linkages and reduce internal transport conflicts,**
- **Consider the impact on the cycling environment when redesigning vehicular access points and pedestrian pathways,**
- **Minimise car and pedestrian conflicts through the rationalisation of crossovers and street intersections,**
- **Improve Revisions to access on Williamsons Road are proposed with a revised spacing and the addition of one new signalised intersection for exclusive use of public transport (buses). Traffic access at Frederick Street is also proposed to be altered through the removal of traffic signals and their replacement with a signalised pedestrian crossing facility. Access to and from Frederick Street is proposed to be left-in / left-out with the same proposed for the Westfield Shopping Centre Service Area on the north side of Doncaster Road.**
- **Provide in the order of 7,430 car spaces in conjunction with the increase and expansion of retail and other floorspace within the centre. This total will result in a net gain of some 1,962 additional car spaces over those existing (4,782) and those pending (556) delivery by the end of 2015.**

Figure 39: Identified vehicular opportunities

5. DESIGN RESPONSE

5.1 Urban Design Vision

To guide the future development of the site, a vision has been established for Westfield Doncaster. Formed through careful consideration of the existing physical, environmental and economic context and with due regard to existing planning policies, the vision of the Development Plan is as follows:

> *To create a vibrant, world-class retail and commercial complex at the heart of the Doncaster Hill activity centre that offers a diverse mix of activity, transport, and employment opportunities to improve and meet the needs of the growing residential and worker population.*
>
> *Westfield Doncaster will be distinctive in scale and form to signify the regional significance of the complex, and built form will reinforce the Doncaster Road and Williamsons Road boulevards and establish a defined gateway to Doncaster Hill. Pedestrians, cyclists and public transport users will be prioritised through improved public realm along key roads, a new entry forecourt, and an upgraded bus interchange.*

The Development Plan should address the following objectives for the future use and development of the site:

- *To provide for future use and development of the land in accordance with the Doncaster Hill Strategy, the Activity Centre Zone, and the State and Local Planning Policy Frameworks.*
- *To recognise the key role that the site plays in the Doncaster Hill activity centre.*
- *To provide an economically viable and sustainable precinct with retail, commercial, community and entertainment uses that meet local and regional expectations and demand.*
- *To provide flexibility to respond to retail and employment trends.*
- *To provide a high-quality urban design outcome and improved streetscapes and interfaces with residential areas.*
- *To minimise off-site amenity impacts associated with future development.*
- *To encourage the development of a gateway / marker building at the south-east corner of Westfield Drive and Williamsons Road.*
- *To improve the pedestrian, cyclist and public transport accessibility into the centre and end-of-trip facilities, as a means of promoting environmental sustainability and walkable neighbourhoods.*
- *To upgrade the existing bus interchange abutting Williamsons Road to improve access, capacity, the visual presentation, integration and functionality of the facility.*
- *To provide sufficient car parking for staff and customers.*
- *To provide for safe and efficient traffic movements within and around the centre*

These objectives and recommendations are illustrated in the Concept Plan.

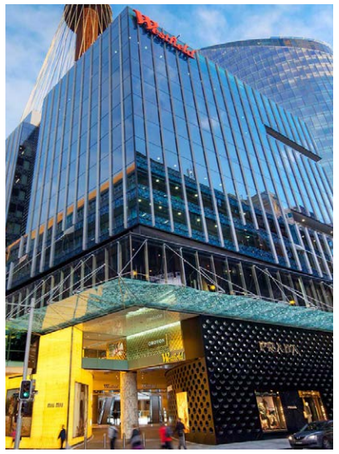

Figure 40: Ensure design and materials provide architectural interest at varying scales.

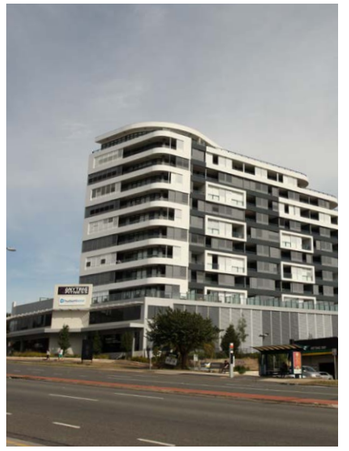

Figure 41: Respond to changing built form character occurring in Doncaster Hill with appropriate massing, scaling of built form elements and articulation.

Figure 42: Generate activity near entrances to create vibrant public realm spaces particularly on Williamsons Road and along entry forecourt edges

Figure 43: Potential to establish an upper level dining terrace to activate upper levels and establish activity on Williamsons Road.

Figure 44: Establish entry forecourt on Williamsons Road and incorporate active uses to create a vibrant space with direct access to the bus interchange and complex entry

Figure 45: Landscaping buffer along sensitive interfaces to soften presentation of built form to adjacent dwellings

5.2 Concept Plan

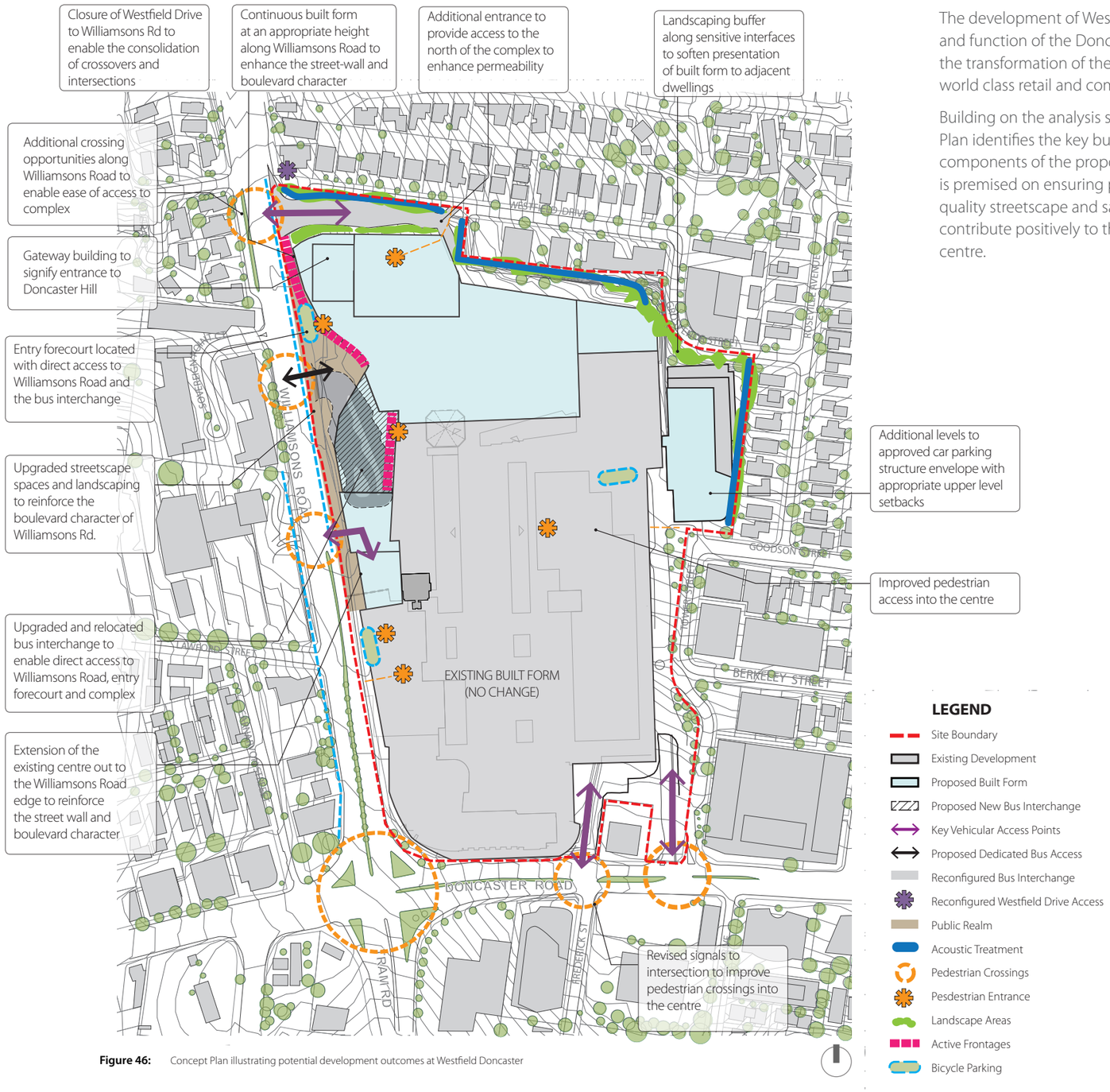

Figure 46: Concept Plan illustrating potential development outcomes at Westfield Doncaster

5.3 Urban Design Recommendations

The development of Westfield Doncaster will enhance the role and function of the Doncaster Hill activity centre by facilitating the transformation of the Westfield Doncaster complex into a world class retail and commercial complex.

Building on the analysis set out in this report, the Concept Plan identifies the key built form, urban design and landscape components of the proposed development. The Concept Plan is premised on ensuring positive pedestrian outcomes, a high quality streetscape and safe, and lively public realm areas that contribute positively to the surrounding Doncaster Hill activity centre.

This report outlines the key issues and opportunities of the Westfield Doncaster site. Building on these finding, this report incorporates the following urban design outcomes for Westfield Doncaster:

- Establish a gateway building form along the northern end of Williamsons Road and reinforce the boulevard through continuous built form at appropriate heights. This should be designed and located to signify the regional importance of Westfield Doncaster, and reinforce the northern 'gateway'entry as referenced in the Doncaster Hill Strategy,
- Shops, where appropriate, should be located to provide surveillance over the bus interchange and complex entrances.
- Existing crossings should be improved to prioritise pedestrians and additional crossings should enable pedestrians to directly access new entrances to the north and east of the site.
- Boulevard treatments along Williamsons Road , the removal of surface car parking and improved facilities for bus interchange users will achieve improvements for pedestrians.
- Bicycle parking should be provided within close proximity of key entrances and activity nodes. A bike pod with end of trip facilities may be included as part of the bus interchange.
- Buses should be provided with dedicated access points into and out of the centre and bus layouts should enable efficiencies in the loading and unloading of passengers.
- Basement and multi-storey parking options should be explored to replace surface parking to the north and east of the site.
- Diversify land uses through the provision of commercial, recreational and community spaces such as a public forecourt and outdoor dining opportunities.
- A continuous built form edge along Williamsons Road that responds to existing height and landscaping treatments will enhance the boulevard.

The Concept Plan informs the proposed Development Plan for the centre, and should be read in conjunction with other relevant background and consultant reports relating to traffic, sustainability, acoustic engineering, economic assessment, and social impact.

Westfield Doncaster

Acoustic Assessment

MELBOURNE
A: 170 - 172 Montague Street
South Melbourne VIC 3205
T: (03) 9272 6800
F: (03) 9645 7839

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

www.acousticlogic.com.au
ABN: 11 068 954 343

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1 INTRODUCTION

Acoustic Logic Consultancy (ALC) has been engaged by Scentre Group to conduct an acoustic study of potential noise impacts from proposed Manningham Planning Scheme Amendment C104 for the redevelopment and future expansion of the Westfield Doncaster shopping centre precinct. The amendment proposes to incorporate;

1. Expansion of Gross Floor Area (GFA) incorporating additional retail and commercial office space and associated facilities along the northern end of the site within the existing carpark area adjoining Westfield Drive
2. Additional parking on the site
3. Redesigned vehicle access fronting Williamsons Road and along Westfield Drive.
4. A new bus interchange facility fronting Williamsons Road
5. Additional carparking adjacent to the eastern side of the existing retail facility located between Westfield Drive and Goodson Street.

The report will includes the following:

- Indication of existing significant noise sources associated with the site.
- Identification of sensitive noise receivers / land use.
- Identification of future proposed noise sources, including vehicle movement.
- Identification of parameters for future acoustic mitigation works and assessment criteria.

2 SITE DESCRIPTION

The site is bounded by Westfield Drive to the north, Williamsons Road to the west, and residential development to the north fronting Westfield Drive, with the remainder of the existing facilities bounded by residential development to the east and Doncaster Road to the South. The site currently incorporates on grade carparking facilities at the northern end of the existing Shopping Centre and at the primary entry along Williamsons Road.

The acoustic environment at the site is dominated by transportation noise associated with the surrounding road network, particularly near Williamsons Road. An existing bus interchange is currently located off Williamsons Road along the western side of the existing development, however traffic noise associated with Williamsons Road dominates noise generated by the existing facility.

The proposed Manningham Planning Scheme Amendment C104 will facilitate the expansion of the Westfield Doncaster shopping centre to the northern end of the site which currently is used as on grade carparking. The proposed expansion will incorporate additional retail space, associated car parking and may incorporate a commercial office tower.

Nearest noise sensitive receivers are the existing residential dwellings located to the north of the site along Westfield Drive as indicated in Figure 1 as well as residential receivers to the east and west of the site on Williamsons Road. Noise associated with Williamsons Road dominates the acoustic environment at that location. The potentially most affected sensitive noise receivers are the residential properties along Westfield Drive to the north of the site, as highlighted in Figure 1.

The primary source of potential impact associated with the subject development will be traffic noise associated with the proposed future expansion. This element will continue to be the predominant source of environmental noise emissions from the development site from car movements accessing the proposed new northern entrance location. The aerial photo below shows the site, surroundings and noise measurements locations.

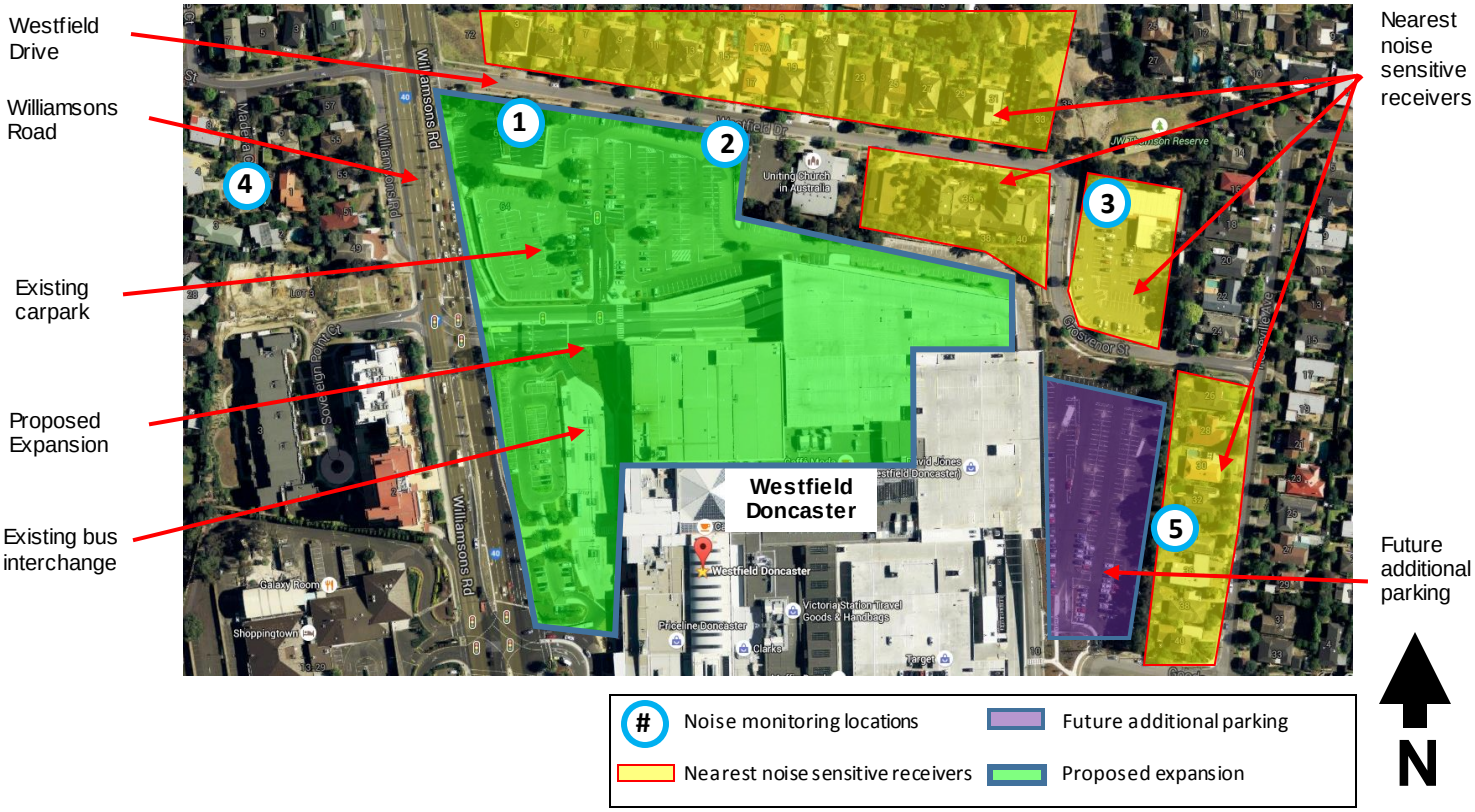


Figure 1 – Subject site, and measurement locations (Source: Google Map)

3 ENVIRONMENTAL NOISE DESCRIPTORS

Environmental noise constantly varies. Accordingly, it is not possible to accurately determine prevailing environmental noise conditions by measuring a single, instantaneous noise level.

In order to accurately determine the environmental noise, a 15-20 minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In analysing environmental noise, three principle measurement parameters are used, namely $_{L10}$, L_{90} and L_{eq}.

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the 15 minute period. L_{eq} is important in the assessment of environmental noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

The L_1 parameter (or the noise level exceeded for 1% of the time) is used during the night period to assess potential sleep arousal effects due to transient noise sources.

4 ASSESSMENT CRITERIA

Noise emissions from the development are restricted by EPA Victoria and the State Environmental Protection Policy. The EPA State Environmental Protection Policy N-1 (SEPP N-1) provides guidelines to assess noise in Metropolitan Melbourne and provides a specific methodology to establishing noise emission criteria within particular usage zones.

SEPP N-1 details the methodology to be used in assessing environmental noise emissions such that protection of residential amenity may be preserved. SEPP's are statutory instruments that are required to be complied with by private individuals, public and private sector organisations. SEPP N-1 includes both Schedule A and B that provide procedures to measure noise from premises and to determine noise emission limits, respectively. In order to determine the assessment criteria both the 'zoning' level and ambient background noise levels are required to determine if the background noise level is neutral, high or low.

4.1 ZONING LEVEL

The 'Zoning' level is determined by the Influencing Factor (IF) and is calculated by the formula nominated in section B.2.4 of SEPP N-1, the 'Zoning Level versus Influencing Factor' graph in section B3 of SEPPN-1 and Victoria's Planning Scheme Maps. The IF is calculated from the proportion of industrial and commercial land around noise sensitive areas (in this case residential premises). Review of the surrounding area indicates an IF of approximately 0.28 which results in the zoning limits detailed in Table 1 below.

Table 1 - Zoning Levels

Period	Zoning Level
Day time	55
Evening	49
Night time	44

4.2 NOISE MONITORING

Unattended noise monitoring was conducted at several locations around the site to determine the existing ambient noise levels experienced by the existing residents. Noise monitors were installed for a typical period of 7 days to categorise the background noise environment.

4.2.1 Measurement Locations

Four unattended noise monitors were installed at various locations around the subject site as shown in Figure 1 which are as the following:

- Location 1 – North of subject site within the existing Westfield Doncaster car park facing Westfield Drive. 1.5m above grade.
- Location 2 – North of subject site facing Westfield Drive. 1.5m above grade at the site boundary.
- Location 3 – North east of subject site and within the existing residential development. 1.5m above grade.
- Location 4 – West of subject site and within the existing residential development. 1.5m above grade.
- Location 5 – East of the Westfield Doncaster shopping centre within the backyard of residential development on Roseville Avenue.

4.2.1.1 Time of Measurement

The unattended noise monitors at Locations 1 and 2 were installed from 13 to 26 November 2014, whereas the monitors at Locations 3 and 4 were installed from 26 November to 3 December 2014 with the monitors recorded noise levels continuously from the time of installation to the time of collection throughout the measurement periods (refer section 4.2.1.2).

4.2.1.2 Measurement Equipment

Unattended noise monitoring was conducted using an Acoustic Research Laboratories EL-215 and Ngara monitors. The noise monitors were programmed to store 15-minute statistical noise levels throughout the unmanned monitoring period.

Equipment was calibrated at the beginning and the end of the measurement using Rion NC-74 sound calibrator; no significant drift was detected. All measurements indicated in the report are A-weighted set to fast time weighting.

4.2.1.3 Measured Background Levels

Background noise levels as measured around the subject site are summarised in Table 2 below. Those noise levels have been used in determination of planning levels for the existing residential receivers, to govern noise emissions from the subject development.

Table 2 – Measured Background Noise Levels

Period	Measured Background Noise Levels dB(A) L_{90}				
	Location 1	Location 2	Location 3	Location 4	Location 5
Day Monday – Friday (7am – 6pm) Saturday (7am – 1pm)	50	45	45	40	41
Evening Monday – Friday (6pm – 10pm) Saturday (1am – 10pm) Sunday (7am – 10pm)	47	38	41	34	37
Night Monday – Sunday (10pm – 7am)	33	30	28	28	29

Note: The above measurements are free field and do not include adjustments for façade correction.

4.3 SEPP N-1 NOISE EMIISION CRITERIA

Tables below details the assessment criteria based on both the zoning levels and the measured background noise levels at various measurement locations. Assessment has been made in accordance with SEPP N-1.

Table 3 – Noise Emission Criteria – Location 1

Period	Measured Background $L_{90,15min}$ dB(A)	Zoning limit	Classification	Noise Emission Criteria L_{eq} dB(A)
Day Monday – Friday (7am – 6pm) Saturday (7am – 1pm)	50	55	High	**56**
Evening Monday – Friday (6pm – 10pm) Saturday (1am – 10pm) Sunday (7am – 10pm)	47	49	High	**50**
Night Monday – Sunday (10pm – 7am)	33	44	Low	**41**

Note: The above criteria are free field and do not include adjustments for façade correction.

Table 4 – Noise Emission Criteria – Location 2

Period	Measured Background $L_{90,15min}$ dB(A)	Zoning limit	Classification	Noise Emission Criteria L_{eq} dB(A)
Day Monday – Friday (7am – 6pm) Saturday (7am – 1pm)	45	55	Neutral	**55**
Evening Monday – Friday (6pm – 10pm) Saturday (1am – 10pm) Sunday (7am – 10pm)	38	49	Low	**46**
Night Monday – Sunday (10pm – 7am)	30	44	Low	**40**

Note: The above criteria are free field and do not include adjustments for façade correction.

Table 5 – Noise Emission Criteria – Location 3

Period	Measured Background $L_{90,15min}$ dB(A)	Zoning limit	Classification	Noise Emission Criteria L_{eq} dB(A)
Day Monday – Friday (7am – 6pm) Saturday (7am – 1pm)	45	55	Neutral	**55**
Evening Monday – Friday (6pm – 10pm) Saturday (1am – 10pm) Sunday (7am – 10pm)	41	49	Neutral	**49**
Night Monday – Sunday (10pm – 7am)	28	44	low	**39**

Note: The above criteria are free field and do not include adjustments for façade correction.

Table 6 – Noise Emission Criteria – Location 4

Period	Measured Background $L_{90,15min}$ dB(A)	Zoning limit	Classification	Noise Emission Criteria L_{eq} dB(A)
Day Monday – Friday (7am – 6pm) Saturday (7am – 1pm)	40	55	Low	**52**
Evening Monday – Friday (6pm – 10pm) Saturday (1am – 10pm) Sunday (7am – 10pm)	34	49	Low	**44**
Night Monday – Sunday (10pm – 7am)	28	44	Low	**39**

Note: The above criteria are free field and do not include adjustments for façade correction

Table 7 – Noise Emission Criteria – Location 5

Period	Measured Background $L_{90,15min}$ dB(A)	Zoning limit	Classification	Noise Emission Criteria L_{eq} dB(A)
Day Monday – Friday (7am – 6pm) Saturday (7am – 1pm)	41	55	Low	**53**
Evening Monday – Friday (6pm – 10pm) Saturday (1am – 10pm) Sunday (7am – 10pm)	37	49	Low	**46**
Night Monday – Sunday (10pm – 7am)	29	44	Low	**39**

Note: The above criteria are free field and does not include adjustments for façade correction

5 OPERATIONAL NOISE EMISSION ASSESSMENT

It is noted that the primary source of noise from the proposed additional development allocated with Amendment C104 to the Manningham Planning Scheme will be that associated with noise from traffic movement on the site. Other potential sources of potential noise impact are primarily associated with plant and equipment.

5.1 VEHICLE MOVEMENTS / CARPARK

Noise emissions to nearby residential receivers have been assessed. Noise sources assessed includes operational noise from the following:

- Cars entering and exiting the development through northern access points; and
- Cars moving through the car park.

The nearest potentially affected residential receivers have been identified in Section 2 of this report. Operational noise impacts have been predicted at the façades of these identified affected receivers.

Predicted noise levels at residential façades have been determined using the SoundPlan™ noise modelling software and the assumptions detailed below. It is noted that there are no statutory criteria for assessing vehicle movements on development sites. Although traffic movement is not assessed against SEPP N-1, where possible, noise emissions resulting from the operation of the development (including vehicle movements) should be designed where practical to comply with criteria nominated in SEPP N-1.

5.1.1 Noise Modelling Parameters

Noise emissions associated with predicted future vehicle movements associated with the proposed development have been predicted based on the worst case one hour traffic movements provided by GTA Consultants, refer to Table provided by GTA in Appendix 1.

5.1.2 Vehicle Movements Associated with the Development

GTA Traffic Consultants have provided the following predicted vehicle movements associated with the new northern access and these numbers are used in our model to predict noise generated from the operation of the expansion.

- ***Daytime – Monday to Friday (7am-6pm) & Saturday (7am-1pm)***
    - New Northern Access - 2140 vehicle movements in an hour.
- ***Evening – Monday to Sunday (6pm-10pm), Saturday (1pm-6pm) & Sunday (7am-6pm)***
    - New Northern Access - 2248 vehicle movements in an hour.
- ***Night – Monday to Sunday (10pm-7am)***
    - New Northern Access - 257 vehicle movements in an hour.

5.1.3 Distribution of the Traffic Flow

Based on provided traffic movements from GTA Consultants, the distribution of the traffic flows is based on the assumptions below.

- 100% of the predicted vehicle movements will enter via the new main northern access the location which services the proposed new car park area on the north-western corner of the site, as well as the existing carpark.

- Up to 50% of the predicted vehicle movements will access the eastern multi-level carpark via the new northern access along the northern boundary of the site.

5.1.4 Noise Source Sound Power Levels

Sound power levels associated with vehicle movements, are detailed in the table below.

Table 8 – Operational Sound Power Levels

Noise Source	Sound Power Level
Car Engine at 20km/h – downhill	84dB(A)L_{eq}
Car Engine at 20km/h – accelerating	88dB(A)L_{eq}

5.2 MODELLING

Noise levels from vehicle movement associated with the new northern access are predicted at noise sensitive receiver locations using SoundPlan™ modelling software implementing the ISO 9613-2:1996 *"Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation"* noise propagation Standard. Noise levels presented are the façade incidence levels and do not include façade reflection. Grid noise maps appended to this report include façade reflection.

5.3 PREDICTED NOISE IMPACTS

Noise impacts to the surrounding sensitive receivers have been predicted below. For each receiver, the levels have been predicted at the worst affected façade. Noise associated with movement of vehicles ***has been designed where possible*** to meet design criteria based on SEPP N-1.

Noise levels have been predicted for each time period and are presented in the tables below. Refer to Appendix 2 for Soundplan® generated Grid Noise Maps. Note that the predicted noise levels assume the recommended acoustic treatment detailed in Section 6.

Table 9 – Predicted Noise Levels – Daytime

Noise Receiver	Predicted Noise Level dB(A) $L_{eq(30min)}$	Noise Emission Criteria dB(A) $L_{eq(30min)}$	Complies
Location 1	48	56	Yes
Location 2	46	55	Yes
Location 3	48	55	Yes
Location 4	42	52	Yes

Table 10 – Predicted Noise Levels – Evening

Noise Receiver	Predicted Noise Level dB(A) $L_{eq(30min)}$	Noise Emission Criteria dB(A) $L_{eq(30min)}$	Complies
Location 1	48	50	Yes
Location 2	46	46	Yes
Location 3	48	49	Yes
Location 4	42	44	Yes

Table 11 – Predicted Noise Levels – Night time

Noise Receiver	Predicted Noise Level dB(A) $L_{eq(30min)}$	Noise Emission Criteria dB(A) $L_{eq(30min)}$	Complies
Location 1	38	41	Yes
Location 2	38	40	Yes
Location 3	36	39	Yes
Location 4	34	39	Yes

5.3.1 Discussion

Predicted noise impacts from traffic movement meet noise limits associated with daytime, evening and night time with noise limits based on SEPP N-1 and the assumptions outlined in Section 5.1, coupled with recommendations in Section 6 of this report.

It is noted that future additional carpark envelope has been proposed to the eastern side of the development. In order to address amenity issues the additional parking is proposed to be set back significantly from the eastern boundary thereby increasing additional distance and separation from existing residential dwellings to the east.

In addition to the above, it is noted that no additional loading docks or associated services are proposed or envisaged with the development proposed as part of Amendment C104 to the Manningham Planning Scheme.

5.4 PLANT AND EQUIPMENT

No plant and equipment selections/design or locations associated with the development proposed in response to C104 has been developed or confirmed. Therefore to ensure amenity for nearby noise sensitive receivers is preserved, plant equipment must be designed to ensure noise emissions comply with the criteria nominated in Table 3.

Identification of acoustic treatment options which could be incorporated where required include barriers, silencers, enclosures, internally lined ductwork as well as location of the plant and equipment. It is noted that plant and equipment can be treated to ensure compliance with SEPP N-1.

6 RECOMMENDED MITIGATION WORKS AND CRITERIA

6.1 MITIGATION WORKS

Analysis of the development plan and traffic generation, which includes the new northern access indicates a solid screen of approximately 4.5 metres in height would be one way to meet noise criteria based on SEPP N-1 at existing residents. Notwithstanding the above, an opening in the screen is proposed to facilitate access to Westfield Drive and retain public access from Williamsons Road.

The extent of the potential screen is indicated in principle in *Appendix 3 – Extent of Solid Screen.* Material options for the screen that could be considered include precast concrete, Hebel, glazed walls, masonry walls, cement sheet, timber, landscape earth berms or similar or a combination of those elements. Final details of the screen and materiality would be confirmed during future planning permit stages.

6.2 FUTURE DEVELOPMENT

The current planning overlay (DDO8-2) applicable to the existing residential premises to the north of the site permits dwellings to be constructed to a height of three storeys (11 metres) whereas existing residential dwellings in this area are predominantly a mix of single and two storey dwellings.

The acoustic barrier indicated in Section 6.1 will ensure design noise levels based on SEPP N-1 are achieved for all dwellings up to two storeys in height on Westfield Drive including existing residential premises. Based on the above overlay where future development across Westfield Drive results in increased height above that currently construction noise levels during peak traffic movement across will be less than 58 dB(A) L_{eq}. Although this level is above SEPP N-1 design levels it is commensurate with that generated on typical local suburban streets and is low in level. Further we note in comparison that this level of noise is lower than the 63dB(A)$L_{10,18hr}$ traffic noise design criteria adopted by VicRoads. We note that the predicted noise level would not result in adverse impact on future residential amenity.

Notwithstanding the above it is recommended that future development to the North of the site should consider external traffic noise intrusion with design criteria based on Australian Standard 2107:2000. Given the level of noise conventional building construction is expected to adequately address external noise intrusion.

6.3 DESIGN CRITERIA

It is recommended that the noise emission assessment of plant and equipment associated with the proposed development on the site be based on SEPP N-1 as set out in Table 3 of the report. Traffic noise associated with the proposed Planning Scheme Amendment C104 should where practical be designed to meet noise limits under SEPP N-1 to further improve amenity for the surrounding residents. Where compliance cannot be achieved (such as potential future multi-level residential development on Westfield Drive overlooking acoustic barriers) it is noted that predicted noise levels are low in level, similar to suburban streets and will not adversely impact residential amenity.

7 CONCLUSION

Acoustic Logic Consultancy (ALC) has conducted an acoustic study of potential noise impacts from the proposed Manningham Planning Scheme Amendment C104 which facilitates a development plan (master plan) for the Westfield Doncaster site.

The proposed expansion will incorporate additional retail, associated car parking and may include commercial office and associated facilities. The primary expansion is located at the northern end of the site and additional parking, redesigned new northern access and new bus interchange fronting Williamsons Road is also proposed.

This report provides the following recommended criteria and associated acoustic treatment measures.

1. Plant and equipment serving the development will be designed to ensure compliance with SEPP N-1. Conventional acoustic treatment measures will be implemented to ensure compliance with this criteria.
2. Traffic noise on the site associated with the modification to the planning scheme has been designed to meet noise objectives based on SEPP N-1.
3. As part of the assessment a 4.5 metre high screen has been proposed along the northern boundary of the site as set out in Appendix 3 which also incorporates an opening to provide public access to Westfield Drive.
4. Predicted noise levels for development across Westfield Drive which is constructed to a height of up to 11 metres will be above SEPP N-1 design levels but will be low in level (less than 58 dB(A) Leq) and will not adversely impact future residents.
5. It is recommended that where future development along Westfield Drive occurs the development sites should consider external traffic noise intrusion with design criteria based on Australian Standard 2107:2000.

APPENDIX 1: TRAFFIC DATA (GTA CONSULTANTS)

Table 4: Projected Friday Traffic Volume Profile (New Northern Access)

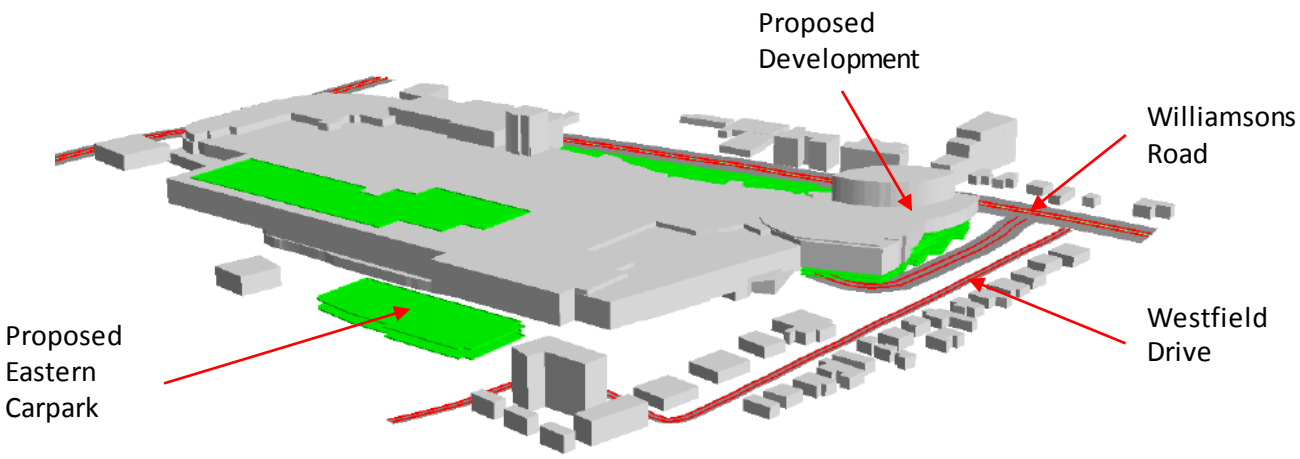
Time	Total Peak Hour Volumes (85%ile Design Day)	Total Peak Hour Volumes Rounded (85%ile Design Day)
Absolute Peak	16390	16390
0:00 - 1:00	6	10
1:00 - 2:00	3	0
2:00 - 3:00	0	0
3:00 - 4:00	5	0
4:00 - 5:00	2	0
5:00 - 6:00	22	20
6:00 - 7:00	89	90
7:00 - 8:00	153	150
8:00 - 9:00	363	360
9:00 - 10:00	781	780
10:00 - 11:00	952	950
11:00 - 12:00	1183	1180
12:00 - 13:00	1250	1250
13:00 - 14:00	1263	1260
14:00 - 15:00	1356	1360
15:00 - 16:00	1336	1340
16:00 - 17:00	1262	1260
17:00 - 18:00	1337	1340
18:00 - 19:00	1311	1310
19:00 - 20:00	1236	1240
20:00 - 21:00	1031	1030
21:00 - 22:00	957	960
22:00 - 23:00	295	300
23:00 - 0:00	197	200

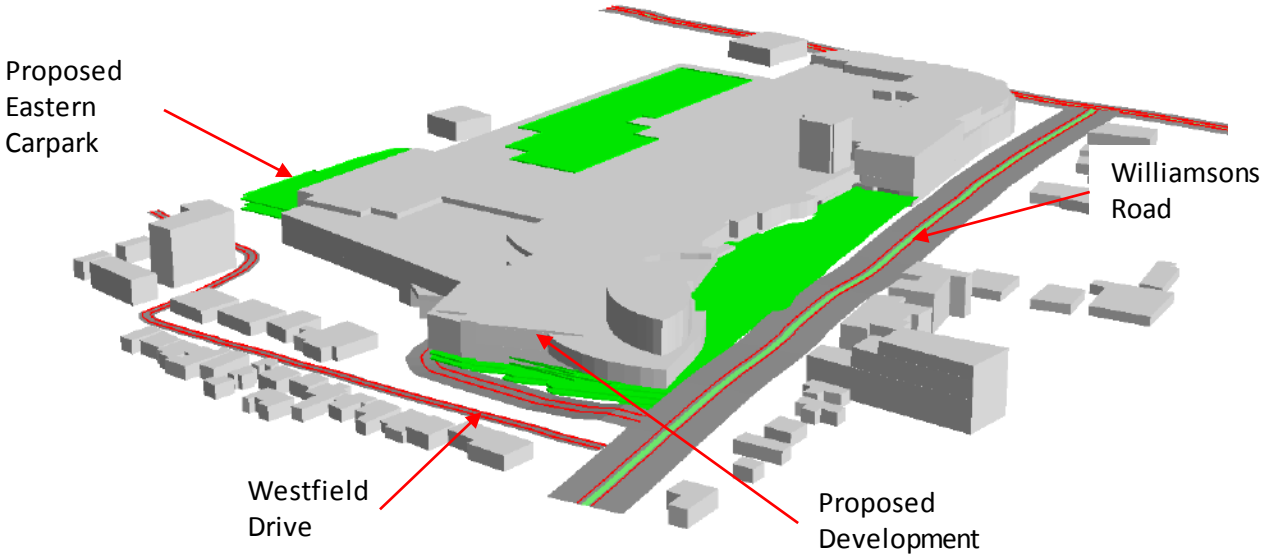
Table 5: Projected Saturday Traffic Volume Profile (New Northern Access)

Time	Total Peak Hour Volumes (85%ile Design Day)	Total Peak Hour Volumes Rounded (85%ile Design Day)
Absolute Peak	19445	19450
0:00 - 1:00	9	10
1:00 - 2:00	7	10
2:00 - 3:00	0	0
3:00 - 4:00	7	10
4:00 - 5:00	0	0
5:00 - 6:00	4	0
6:00 - 7:00	34	30
7:00 - 8:00	100	100
8:00 - 9:00	453	450
9:00 - 10:00	1124	1120
10:00 - 11:00	1544	1540
11:00 - 12:00	1891	1890
12:00 - 13:00	2134	2130
13:00 - 14:00	2164	2160
14:00 - 15:00	2241	2240
15:00 - 16:00	2114	2110
16:00 - 17:00	1778	1780
17:00 - 18:00	1499	1500
18:00 - 19:00	784	780
19:00 - 20:00	400	400
20:00 - 21:00	447	450
21:00 - 22:00	295	300
22:00 - 23:00	256	260
23:00 - 0:00	160	160

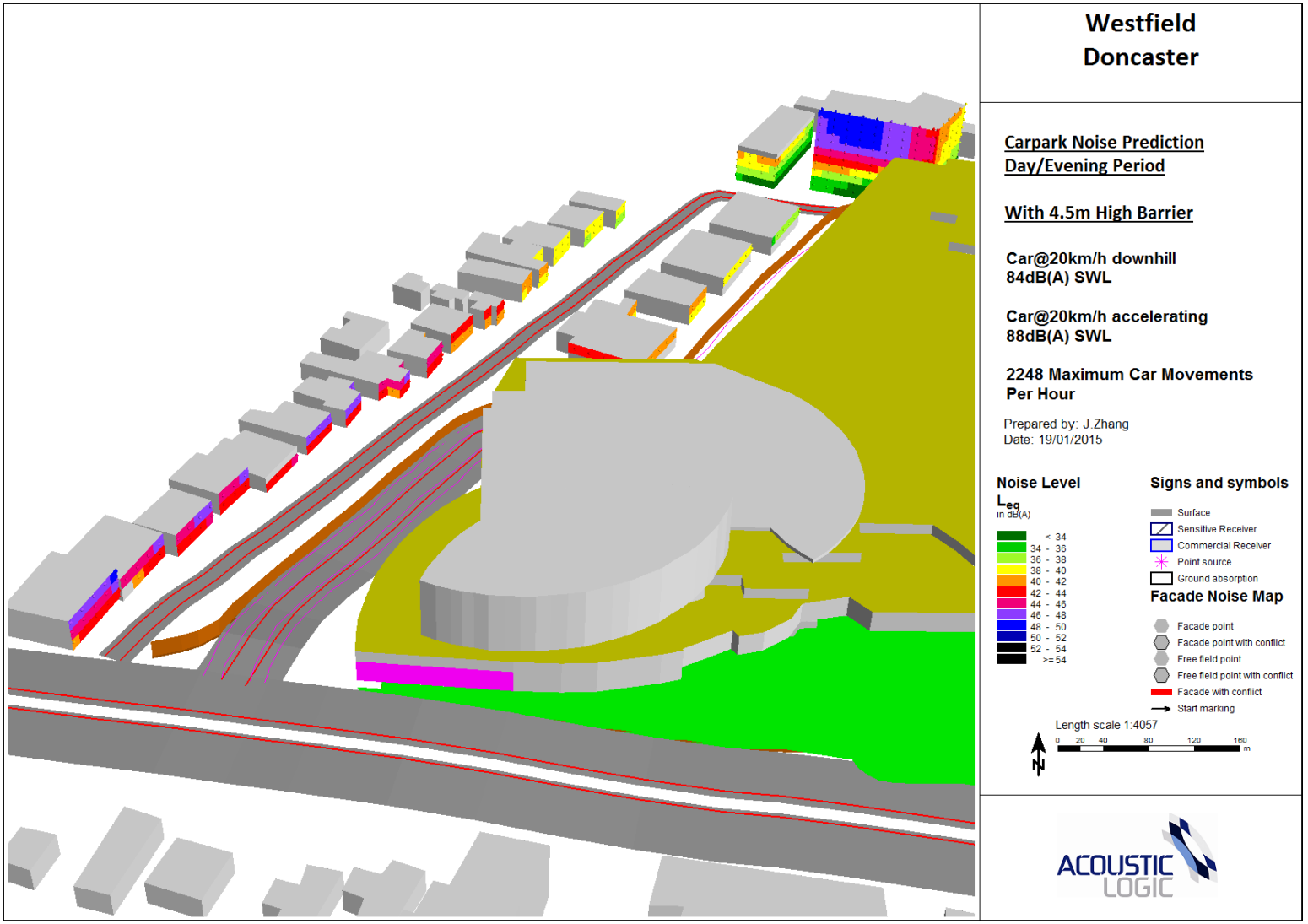
APPENDIX 2: SOUNDPLAN MODELS

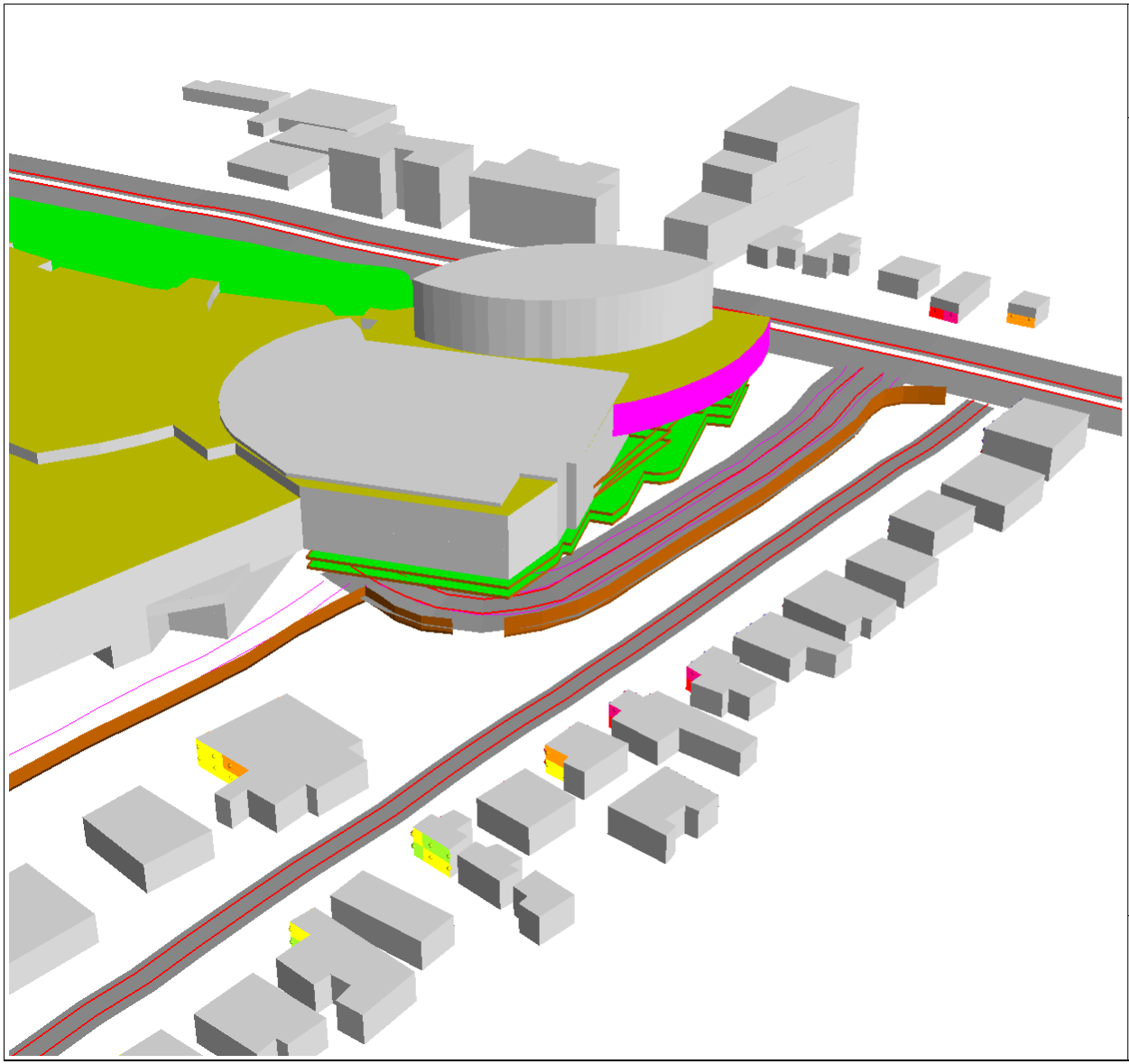
3D MODEL





FAÇADE NOISE MAPS





Westfield Doncaster

Carpark Noise Prediction
Day/Evening Period

With 4.5m High Barrier

Car@20km/h downhill
84dB(A) SWL

Car@20km/h accelerating
88dB(A) SWL

2248 Maximum Car Movements Per Hour

Prepared by: J.Zhang
Date: 19/01/2015

Noise Level
L_{eq}
in dB(A)

< 34
34 - 36
36 - 38
38 - 40
40 - 42
42 - 44
44 - 46
46 - 48
48 - 50
50 - 52
52 - 54
>= 54

Signs and symbols

- Surface
- Sensitive Receiver
- Commercial Receiver
- Point source
- Ground absorption

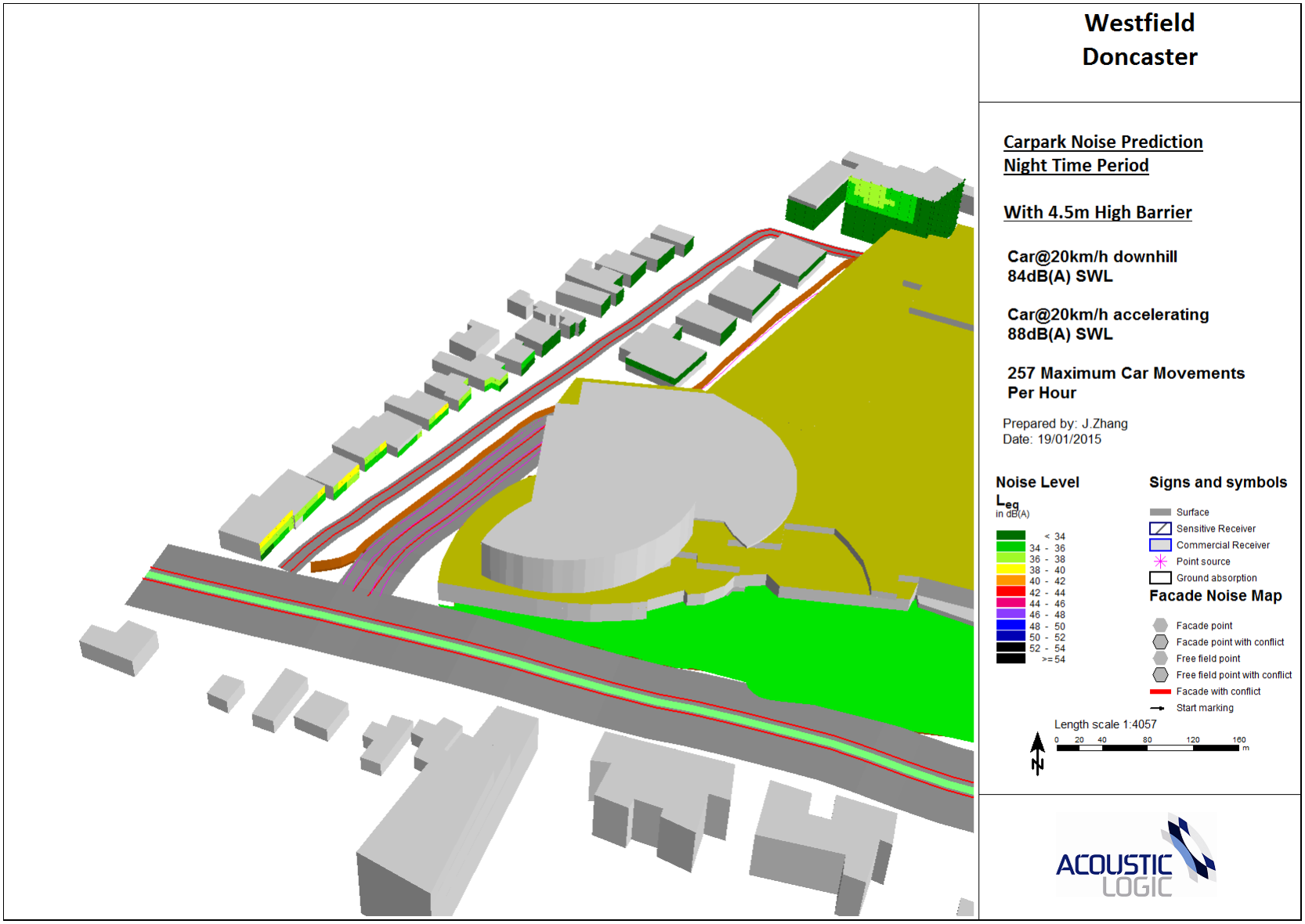
Facade Noise Map

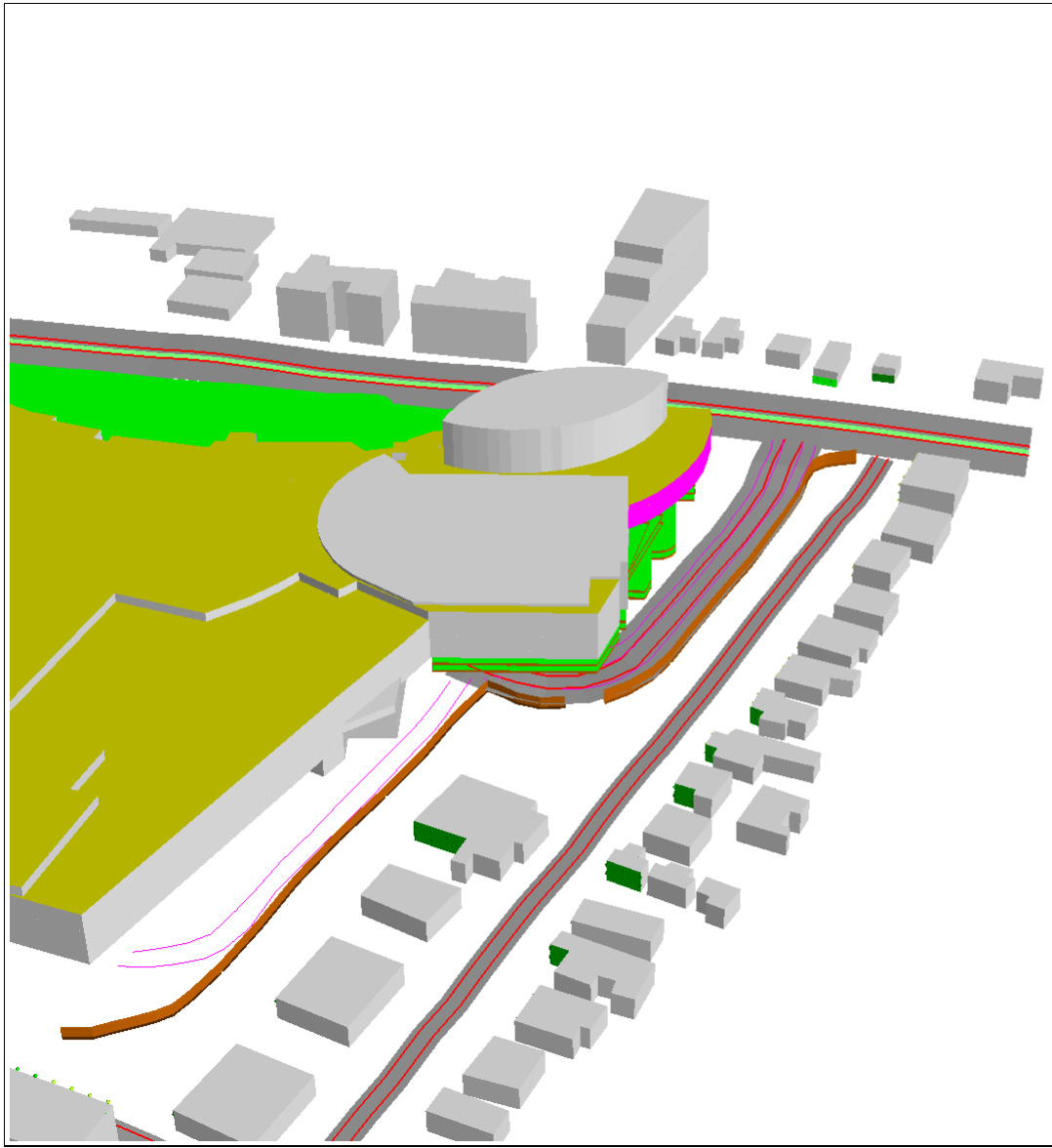
- Facade point
- Facade point with conflict
- Free field point
- Free field point with conflict
- Facade with conflict
- Start marking

Length scale 1:4057
0 20 40 80 120 160 m

N

ACOUSTIC LOGIC


Westfield
Doncaster
Carpark Noise Prediction
Night Time Period
With 4.5m High Barrier
Car@20km/h downhill
84dB(A) SWL
Car@20km/h accelerating
88dB(A) SWL
257 Maximum Car Movements
Per Hour
Prepared by: J.Zhang
Date: 19/01/2015
Noise Level
Leq
in dB(A)
< 34
34 - 36
36 - 38
38 - 40
40 - 42
42 - 44
44 - 46
46 - 48
48 - 50
50 - 52
52 - 54
>= 54
Signs and symbols
Surface
Sensitive Receiver
Commercial Receiver
Point source
Ground absorption
Facade Noise Map
Facade point
Facade point with conflict
Free field point
Free field point with conflict
Facade with conflict
Start marking
Length scale 1:4057
0 20 40 80 120 160
m
N
ACOUSTIC
LOGIC



Westfield Doncaster

Carpark Noise Prediction
Night Time Period

With 4.5m High Barrier

Car@20km/h downhill
84dB(A) SWL

Car@20km/h accelerating
88dB(A) SWL

257 Maximum Car Movements Per Hour

Prepared by: J.Zhang
Date: 19/01/2015

Noise Level
L_{eq}
in dB(A)

- < 34
- 34 - 36
- 36 - 38
- 38 - 40
- 40 - 42
- 42 - 44
- 44 - 46
- 46 - 48
- 48 - 50
- 50 - 52
- 52 - 54
- >= 54

Signs and symbols

- Surface
- Sensitive Receiver
- Commercial Receiver
- Point source
- Ground absorption

Facade Noise Map

- Facade point
- Facade point with conflict
- Free field point
- Free field point with conflict
- Facade with conflict
- Start marking

Length scale 1:4057
0 20 40 80 120 160 m

N

ACOUSTIC LOGIC

APPENDIX 3: EXTENT OF SOLID SCREEN

4.5m high screen along northern boundary of the site

A break in the screen has been proposed to allow for public access

Westfield Doncaster

Assessment of Potential Social Impacts

April 2016

urbis

URBIS STAFF RESPONSIBLE FOR THIS TENDER WERE:

Director	Jane Homewood
Consultant	Joanna Farmer
Job Code	MPP02215

Urbis's Public Policy team has received ISO 20252 Certification for the provision of public policy research and evaluation, social planning, community consultation, market research and communications research

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1 Introduction

Manningham City Council has requested that a Social Impact Assessment (SIA) be undertaken for the proposed retail and commercial expansion of Doncaster Shopping Centre by the Scentre Group, on behalf of Westfield (by Amendment C104). Council wishes to fully understand the social impacts of the proposal and the potential demand generated by the proposal for additional community facilities and services to mitigate any social impacts generated by the development.

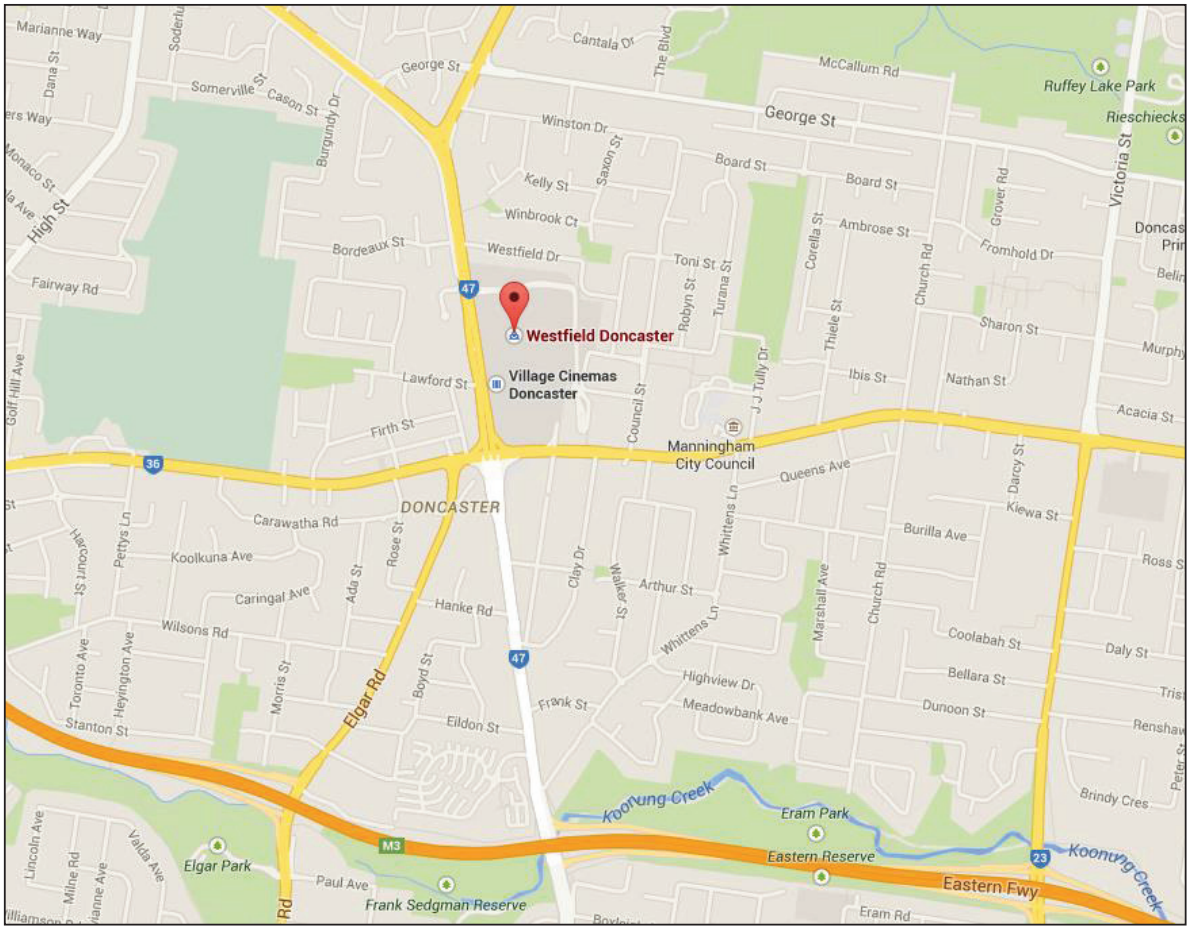
Council has requested that the Assessment should include:

- an assessment of demographic data to understand the current and future population characteristics of the Doncaster Shopping Centre catchment
- an evaluation of potential social impacts or community benefit, if any, of the proposed expansion of Westfield Doncaster, including any proposed actions to mitigate social impacts. This may involve the provision of new or upgraded community services and facilities.
- an understanding of the capacity of those community services and facilities that may be required to cater to the additional demands generated by the proposed development.

1.1 BACKGROUND

Westfield Doncaster shopping centre is located on the north-east corner of Doncaster Road and Williamsons Road, Doncaster. It is a major regional shopping centre with more than 120,000 square metres of retail floor space, including a range of shops, department stores, supermarkets, food and drink premises and cinemas with associated car parking (currently 4,782 spaces) and a bus interchange located on the Williamsons Road frontage. The shopping centre underwent a major expansion in 2008 and continues to evolve via minor internal alteration.

FIGURE 1 – LOCATION MAP



Westfield proposes Amendment C104 to the Manningham Planning Scheme to facilitate an additional 43,000 square metres of additional floor space, (including restaurants and cinema) and 18,000 square metres of additional commercial floor space for office and associated uses in a commercial tower.

1.2 THE SOCIAL IMPACT ASSESSMENT PURPOSE

The Social Impact Assessment (SIA) has been prepared by Urbis, on behalf of the Scentre Group representing Westfield. An SIA is an applied interdisciplinary field that has emerged from within the social sciences. It is an approach to understanding and assessing the impacts of change on individuals, families, communities and society. It draws on existing knowledge and methods used in a number of different social science disciplines including sociology, psychology, human geography, environmental studies, economics and political science. The goal of a SIA is to assess the consequences of an action before the event has actually taken place.

The SIA process generally includes a number of procedural steps. The following steps are considered acceptable practice:

- Profiling
- Impact prediction and evaluation
- Mitigation

1.2.1 THE SCOPE OF WORKS

This report responds to the requirements of an SIA as described above. The report is based on the outcomes of desktop research, social planning analysis, a site visit and consultation with local community service providers nominated by Council. There is no projected direct increase in residential population expected from the proposed development. There is a projected increase in employment population resulting from the proposed development (see Section 5.0 Assessment of Social and Community Impact), which generates a requirement to consider the additional social and community services and facilities associated with this particular population.

The following outlines the steps that were carried out to provide a prediction and evaluation of the likely social impacts of the proposed development.

Step 1: Profiling – Description of Existing Social Conditions

A series of research tasks were completed in order to provide a baseline of existing social conditions:

- A review of relevant state and local government policy.
- Development of a demographic profile for a 2km radius area surrounding the proposed site (the Study Area), as well as for the suburb of Doncaster (within which the development site is situated) and Manningham Local Government Area (LGA).
- Mapping of existing community/recreational facilities and assessment of the relationship these facilities have with the projected employment generating needs of the proposed development.

Step 2: Social Impact Prediction and Evaluation

- The proposal was examined in the context of all the relevant data ascertained from the above tasks; and social impact categories were identified to provide a framework for the assessment.
- The predicted or potential social effects or changes created by the proposed development were described for each impact category.
- The desirability and acceptability of such changes were evaluated in terms of their beneficial or detrimental nature. In this instance potential social changes were assessed using desktop research only.

Step 3: Community consultation with key local service providers nominated by Council

- Local Service providers identified a number of activities and design attributes to better meet their needs .

Step 4: Mitigation

- Recommendations are made regarding the need for appropriate mitigation activities.

1.3 CONSULTATION WITH LOCAL COMMUNITY SERVICE PROVIDERS

As part of this work, the City of Manningham (Council) asked Urbis to meet with a number of community groups to discuss the key issues impacting their community groups and clients. At the request of Council, Urbis attended Manningham's Community Forum on 22 April, 2015, and then held a second meeting with attendees interested in further discussion regarding their community's needs in more detail on the 29 April, 2015.The issues discussed focussed on the needs of young people, the aged and people with disabilities, accommodating the needs of multicultural communities and more general issues related to the provision of more diverse services such as allied health and medical services, legibility within the centre and connectivity of the centre from the surrounding local areas for pedestrians. These are summarised below:

1.3.1 YOUNG PEOPLE

- The transport hub is used by most young people and presents a great opportunity for a 'Youth Hub" to connect young people to local support services. Information has been provided by Contour Town Planning to inform the recommendations for a potential youth hub at Westfield Doncaster. This is elaborated in section 6.2.1.

- YMCA identified the need for a small youth incubator space for creative activities and to support young people develop businesses such as on line applications. The space would need access to advanced technology.

1.3.2 AGED & DISABILITY

- Improved planning and layout of the shopping centre from an older person's perspective to address location of facilities, DDA accessibility, materials and finishes and signage:

  - Cluster older people's uses together including food, pharmacy, banking, social areas (for example, coffee shop), toilets and rest areas and charging points for electric scooters

  - Older people would prefer to go to the shopping centre at quieter times

- Need for private sitting areas adjacent to/outside toilets for carers looking after people with limited mobility– need to be able to transfer some older people on to the toilet, dimensions of toilets need to enable easier access for people with walkers and provision of full adult change facilities and appropriate feeding room for people with disabilities that is respectful and includes access to microwaves and water

- The size and number of accessible parking bays needs to be increased to allow for greater access and space for safe manoeuvring for people with walkers, wheelchairs and scooters

- Consider centrally located 'front door' area for community buses to drop off older people

1.3.3 MULTICULTURAL COMMUNITY

- Information/signage in multiple languages

- Multi-faith prayer room required (male & female)

1.3.4 PROVISION OF ADDITIONAL SERVICES

- Allied and comprehensive health services including podiatry, physiotherapy, medical & dental practices, ideally major hospital services outreach services and associated services such as x-ray, blood tests
- Maternal and child health care centre
- Serviced offices and community meeting spaces connectivity & legibility
- Opportunity to better integrate with Doncaster Hill precinct, MC2 (Council) and Council facilities, including sports ovals and facilities to the north east including alternative to pedestrian access through the car parks
- Shop front activation on the external façade to enhance night time access for the local resident population
- Improved legibility to and within the car parks such providing landmarks, enhanced colour coding and appropriate signs (for example, arrows to yellow/blue level, rather than simply 'parking')

1.3.5 CONCLUSION

The community feedback provides very valuable information regarding opportunities to improve the design and layout of the shopping centre to better meet the needs of shopping centre users. A number of services have been identified that are not provided in the centre or easily accessible for the some of the shopping centres users.

We recommend Westfield further investigate the feasibility of providing additional services in the shopping centre, particularly allied, medical and dental services to complement the proposed office development. With regards to the youth incubator space, we recommend Westfield and YMCA discuss this opportunity with Apple who may be interested in this from a business development perspective.

In regards to the youth hub at the bus interchange, Council will need to work with local youth agencies including the YMCA to scope out the proposal in terms of size, staffing and financial feasibility. If the facility was feasible and could be funded, a suitable space would need to be designed into the bus interchange so that it is well located in terms of safety, accessibility and visibility.

2 Profiling: Strategic Context

2.1 PLAN MELBOURNE

Plan Melbourne states that the Eastern Sub Region will house an additional 146,000 people, which will take the future population to approximately 1.25 million people. It is also projected that employment numbers will increase to just over 466,000. Doncaster Hill is identified as an Activity Centre, with the proposed Doncaster Rail Link providing new public transport accessibility opportunities for the region.

2.1.1 20 MINUTE NEIGHBOURHOODS

Plan Melbourne reinforces the importance of a planning approach that reinforces the 20-minute neighbourhood, where current and future residential development have quick access to local shops, schools, parks, jobs and a range of community services. The policy objective is reliant on creating the market size and concentration that can support a broad range of local services and facilities.

2.1.2 DELIVERING JOBS AND INVESTMENT

Plan Melbourne reinforces the need to provide commercial zoned land to accommodate future job growth across Melbourne. Initiative 1.2.3 identifies the need for existing activity centres to have the flexibility to accommodate growth, particularly where there is significant population and household growth forecast in their catchment area.

2.2 VICTORIA IN FUTURE 2012

In 2014, the former DTPLI released its updated population and household projections, Victoria in Future (VIF). From 2013 to 2031, the population of Victoria is projected to grow by 2 million to 7.7 million, at a rate of 1.6 per cent per annum. Victoria is projected to add another 2.3 million people to reach a population of 10 million by 2051. The total projected growth in Victoria's population of 4.5 million over the 40 years to 2051 is more than double the growth from the period 1971 to 2011 (1.9 million people).

The City of Manningham is projected to grow from a population of 116,800 (42,200 households) in 2011 to 125,700 (47,100 households) in 2031 and 136,700 (52,100 households) in 2051. The percentage of population under 20 is predicted to reduce from 22.5% to 21% by 2031 and over 65 years of age from 19.2 % to 25% by 2031. Further assessment of Manningham's demographic profile is provided in Section 3.0 - Demographic Context.

2.3 CITY OF MANNINGHAM MUNICIPAL STRATEGIC STATEMENT

Clause 21.05 of the City of Manningham Municipal Strategic Statement (MSS) encourages the consolidation of established urban areas, whilst protecting landscape character, neighbourhood character and environmental values. Furthermore, the MSS promotes the need for housing choice to meet the needs of the local community and reflect demographic change. The MSS highlights Council's desire to balance conflicting objectives in favour of net community benefit and sustainable development. Importantly, through the MSS, Manningham Council aims to help create a healthy, vital community, environment and economy and create a better place to live, visit and work for all present and future citizens.

Clause 21.09 Activity Centres and Commercial Areas identifies Doncaster Hill as a Principal Activity Centre and a prime location for redevelopment based on topographic features and the existing physical and community infrastructure assets.

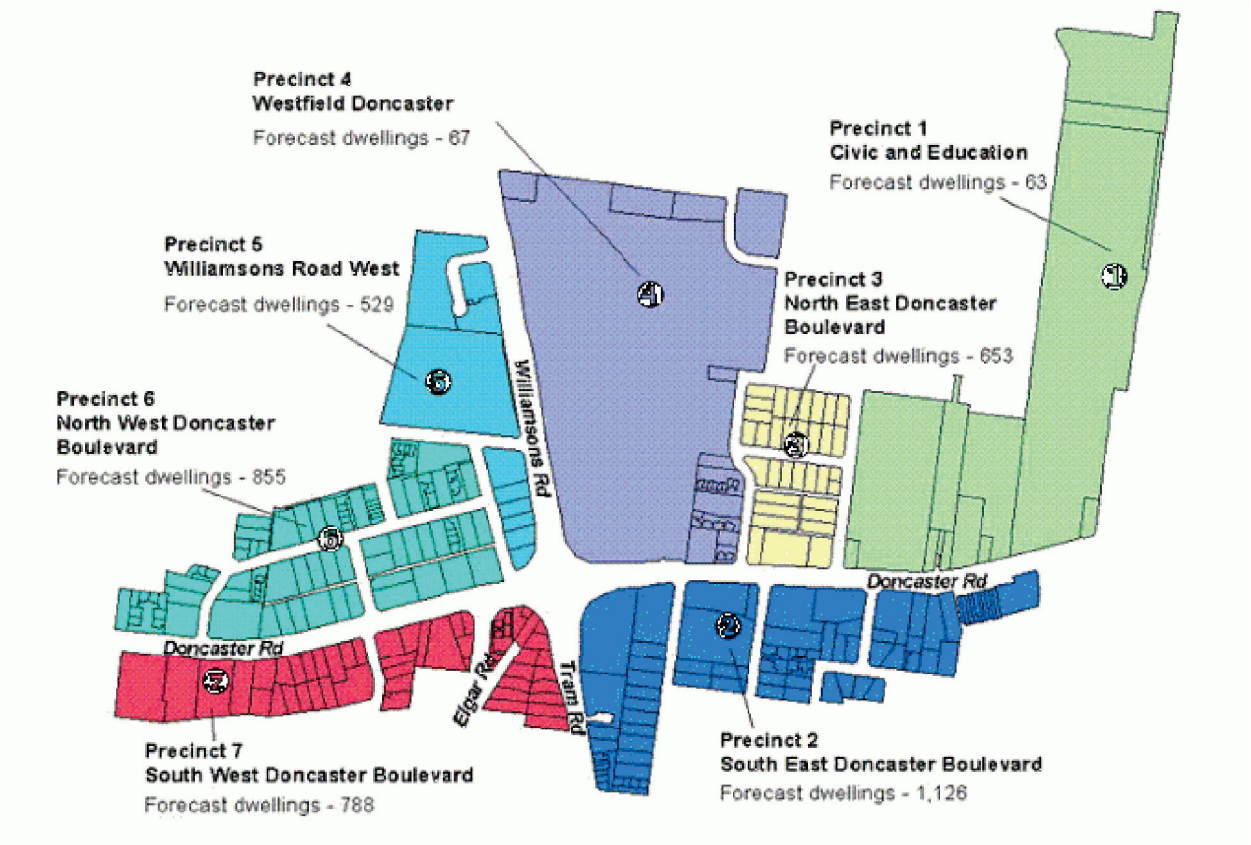
2.4 DONCASTER HILL STRATEGY

The Doncaster Hill Strategy (October 2002 and revised in 2004), (The Strategy), provides a strategic framework for future land use development in the Doncaster Hill Activity Centre. Doncaster Hill comprises 58 hectares and extends along Doncaster Road from the south east corner of the Eastern Golf Course Development site.

The Strategy aims to increase development of more than 4000 new residential apartments, 10,000 square metres of retail and 20,000 square metres of commercial/office space. This is estimated to equate to 7000 additional residents which will achieve Council's objective of responding to increased demand for more appropriate housing options for the municipality's changing demographic including:

- Providing greater opportunities for local residents to change housing types locally as people move through the lifecycle.
- Much of the take up of apartments is likely to come from a local market that means younger people will have an alternative to the inner city and older people will free up family homes in the municipality, allowing 'regeneration' in the municipality.
- Increasing population levels and the current rate base in order to support and enhance physical and social infrastructure and services.

FIGURE 2 – DONCASTER HILL ACTIVITY CENTRE



The Doncaster Hill Activity Centre is regarded as a prime location for redevelopment based on its topographic features and existing physical and community infrastructure assets. The objectives for the precinct include:

- a sustainable, vibrant mixed-use activity centre with a strong sense of place and civic identity
- a focus for contemporary high density residential development incorporating a mix of complementary retail, social, commercial and entertainment uses
- provide for a high level of activity that attracts people, provides a focal point for the community, creates an attractive and safe urban environment, increasing opportunities for social interaction
- to encourage commercial and small-scale retail uses at the lower level of buildings, with high-density apartment style residential development on upper levels

- built form at gateway locations identified in the Framework Plan to be designed to act as markers with distinguishing architectural or urban design treatments.
- active street frontages and pedestrian generating activities to be located along main roads
- public spaces are minimally impacted by overshadowing, including preserving solar access in mid-winter to the key boulevards of Doncaster Road and Williamsons Road
- the enjoyment of public urban spaces/plazas, streetscapes, pedestrian and bicycle paths by ensuring that these areas are not excessively overshadowed or affected by wind tunnelling
- development that provides accessible, safe, attractive and functional private and public open space opportunities, which are well connected and integrated within a permeable urban environment
- ensure each precinct has ready access to well-designed public open space.
- provide strong linkages within the Doncaster Hill Activity Centre, and enhance public transport, pedestrian and bicycle users' amenity
- provide for well-defined vehicular, bicycle and pedestrian access both within and external to all precincts, with strong pedestrian crossing points to be established between the north and south sides of Doncaster Road
- encourage the integration of car parking areas into buildings and the unique sloping landform, including providing under-croft and basement as opposed to open-lot parking.

The City of Manningham has a commitment to provide quality art and cultural facilities, together with relevant lifestyle opportunities, to cater to increased growth at Doncaster Hill. The type of facilities required to match the demographic profile of this future growth is outlined in Section 4.0 Community Infrastructure.

2.5 DONCASTER HILL MODE SHIFT PLAN

Manningham's Doncaster Hill Mode Shift Plan seeks to achieve a sustainable transport future for all by encouraging increased public transport use and reduced levels of car dependency. The Plan outlines that transport mode choice is influenced by:

- higher density neighbourhoods with easy access to shopping and work
- the degree of integration of land uses with transportation systems
- comfort, safety and convenience of transport services

A key element of the Plan is the Doncaster Westfield Bus Interchange, which currently addresses the Plan's objectives in the following way:

- directly accessible to the surrounding community with bike and pedestrian links
- prominently positioned within a central and pedestrian friendly location
- now has increased bus service frequency to cater to increasing number of residents in the region

2.6 MANNINGHAM ECONOMIC DEVELOPMENT STRATEGY 2011-2030

The proposed expansion development also supports the Manningham Economic Development Strategy's five strategic directions. The five strategic directions identified by The Manningham Economic Development Strategy are:

- attracting and retaining businesses

- developing leading local businesses
- enhancing Manningham tourism
- activating and improving activity centres
- integrating economic development.

This includes advocacy by the Council for the Doncaster Hill area to be recognised as a Metropolitan Activity Centre, demonstrating the Council's recognition of the value of, and commitment to, economic development of this area.

2.7 STRATEGIC IMPLICATIONS FOR PROPOSED DEVELOPMENT

The proposed development accords with the strategic objectives set by the State Government and Manningham Council for Doncaster Hill in the following way:

- It promotes the role of public transport, walking and cycling to access the site
- It supports the focus on creating 20 minute neighbourhoods where there is direct access to local shops, schools, parks, jobs and a range of community services. This policy objective is reliant on creating the market size and concentration of development that can support a broad range of mixed use activities, services and facilities, which the proposed development provides.
- It assists in meeting some of the future community infrastructure requirements of Doncaster Hill, even though the proposed development itself does not directly generate additional residents to the area.
- It provides an integrated mixed-use precinct for Doncaster Hill Activity Centre through the provision of:
  - mixed uses within buildings, particularly along boulevard locations
  - small scale retail opportunities at ground floor level in conjunction with other mixed use developments
  - additional commercial/office floor space
  - flexible floor spaces within buildings to ensure life cycle adaptability.

3 Profiling: Demographic context

3.1 STUDY AREA

The study area for this section of the report is Doncaster Hill, which is shown in Figure 3 and the suburb of Doncaster as identified in the report.

FIGURE 3 – MAP OF DONCASTER HILL STUDY AREA

3.2 POPULATION GROWTH

Forecast.id data shows that the population of Doncaster is projected to increase by around 2.3% per annum or by 3,868 people between 2012 and 2020. This is a significantly higher growth rate than projected for the City of Manningham as a whole. The faster rate of growth in Doncaster compared to

Manningham as a whole can be explained by the intensification of housing development in and around the Doncaster Hill Activity Centre.

It is important to note, however, that there is a discrepancy between the 2011 Census actual population and the 2011 ERP for Doncaster, with the population actually growing at a lower rate between 2006 and 2011 than was forecast in 2006. This was also the case in the Doncaster Hill study area, where population levels declined between 2006 and 2011. The actual annual growth rate for Doncaster between 2006 and 2011 was 0.5% compared to the forecast growth rate of 3%. The Doncaster Hill Strategy (October 2002 and revised 2004) estimates an additional 7000 residents will be housed in the area.

TABLE 1 – EXISTING AND PROJECTED POPULATIONS FOR STUDY AREA

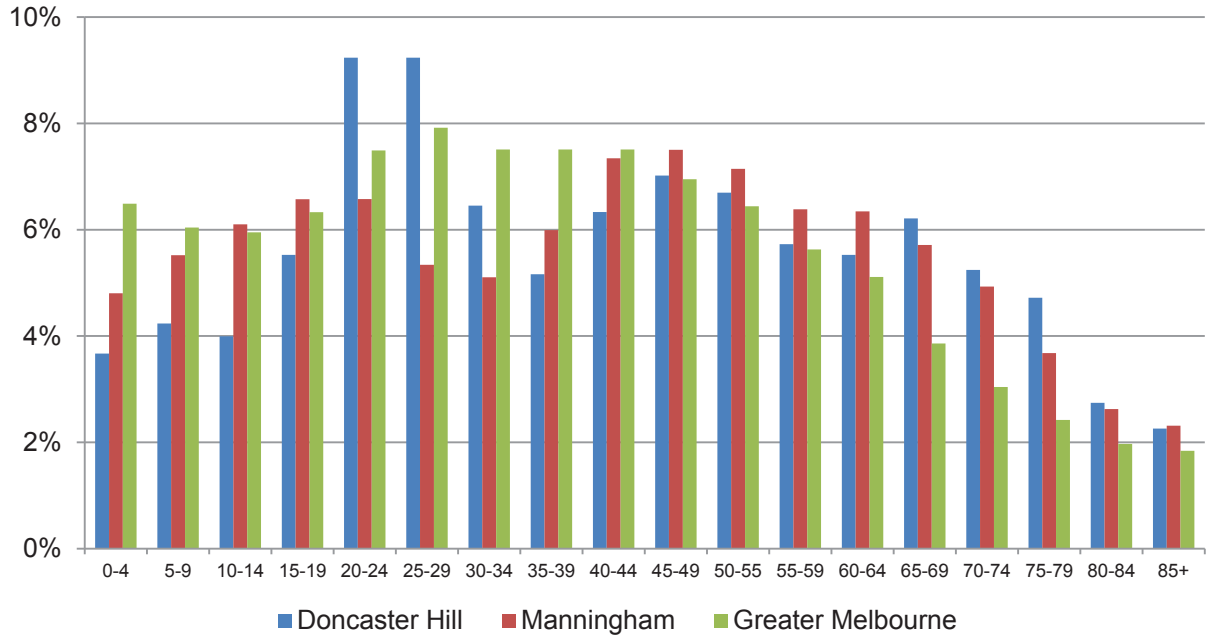
	2011 (ACTUAL)	2011 (ERP)	2012	2017	2020	ANNUAL GROWTH RATE 2012-2020
Doncaster Hill	2,479	2,610	*	*	*	*
Doncaster	18,359	20,661	21,211	23,655	25,079	2.3%
Manningham	111,300	118,636	119,326	122,746	125,297	0.6%

*Data not available at time of writing report

3.3 AGE PROFILE

The existing age profile of the Study Area (based on the 2011 Census) is shown in Figure 4 below. By way of comparison, the age profile for Manningham and Greater Melbourne is also shown. Proportionally, there are more young adults (aged 20-29) in Doncaster Hill than in Greater Melbourne, and fewer children and adults aged 35-44. This may reflect the household structure of the area (see section 3.4), with fewer families with children in Doncaster Hill than Greater Melbourne.

FIGURE 4 – AGE STRUCTURE OF STUDY AREA, 2011



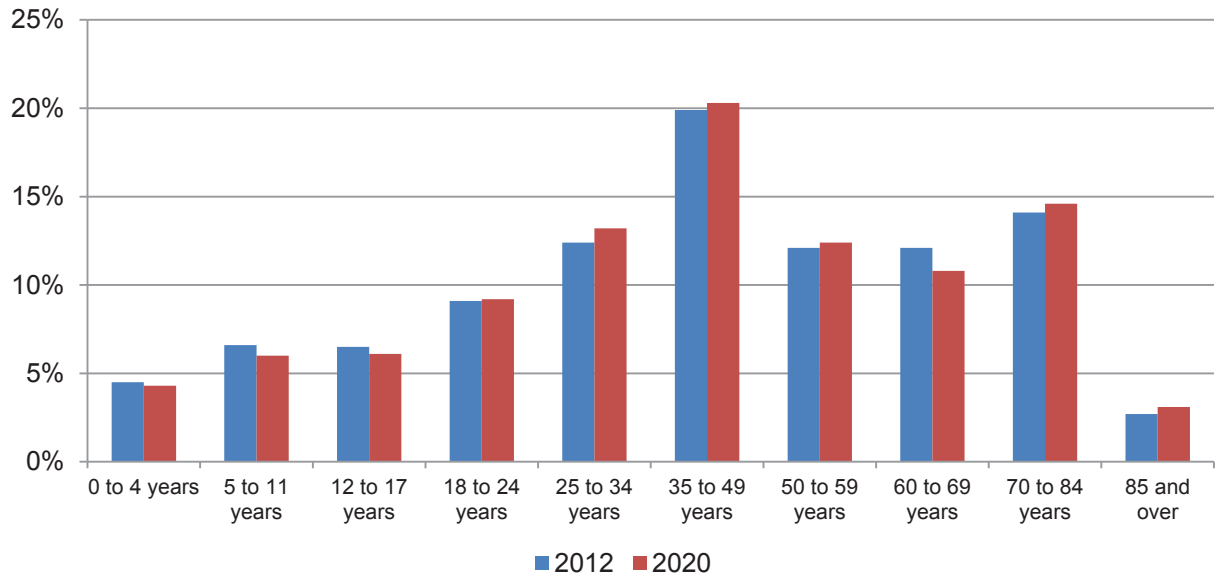
The forecast age structure of Doncaster (based on Forecast.id population projections) is shown in Table 2 and Figure 4. The data shows that the age profile of the Doncaster population is not projected to change significantly between 2012 and 2020. The most significant increases are expected in the 25-34 and 35-49 age cohorts, accounting for approximately 17% and 22% of the growth respectively. This growth corresponds with projected ageing of the population. Doncaster will also generate a slightly higher percentage of people aged over 50. The most significant proportion of the 50+ population will be in the

70-84 age group which comprises 17.3% of the growth to 2020. Against the general trend, it is projected that there will be a slight decline in the 60-69 age group.

TABLE 2 – FORECAST CHANGE IN AGE STRUCTURE, DONCASTER

AGE GROUP	2012		2017		2020		CHANGE 2012-2020	
	Number	%	Number	%	Number	%	Number	%
0 to 4 years	953	4.5	1,001	4.2	1,078	4.3	125	3.2
5 to 11 years	1,400	6.6	1,486	6.3	1,517	6	117	3.0
12 to 17 years	1,369	6.5	1,468	6.2	1,533	6.1	164	4.2
18 to 24 years	1,937	9.1	2,204	9.3	2,304	9.2	367	9.5
25 to 34 years	2,637	12.4	3,083	13	3,304	13.2	667	17.2
35 to 49 years	4,220	19.9	4,761	20.1	5,089	20.3	869	22.5
50 to 59 years	2,560	12.1	2,866	12.1	3,099	12.4	539	13.9
60 to 69 years	2,569	12.1	2,621	11.1	2,705	10.8	136	3.5
70 to 84 years	2,990	14.1	3,453	14.6	3,661	14.6	671	17.3
85 and over	576	2.7	714	3	789	3.1	213	5.5
Total	**21,211**		**23,657**		**25,079**		**3,868**	

FIGURE 5 – FORECAST CHANGE IN AGE STRUCTURE, DONCASTER 2012-2020



3.4 HOUSEHOLD STRUCTURE

Table 3 outlines the household structure of Doncaster Hill in comparison to Manningham and Greater Melbourne. Doncaster Hill has a slightly lower proportion of family households (69 per cent) than the

Melbourne average (72 per cent), with more lone person households. This is also lower than the Manningham average of 80 per cent.

Couples without children represent over 40 per cent of families in Doncaster Hill, significantly higher than for the rest of Manningham.

TABLE 3 – HOUSEHOLD STRUCTURE, 2011

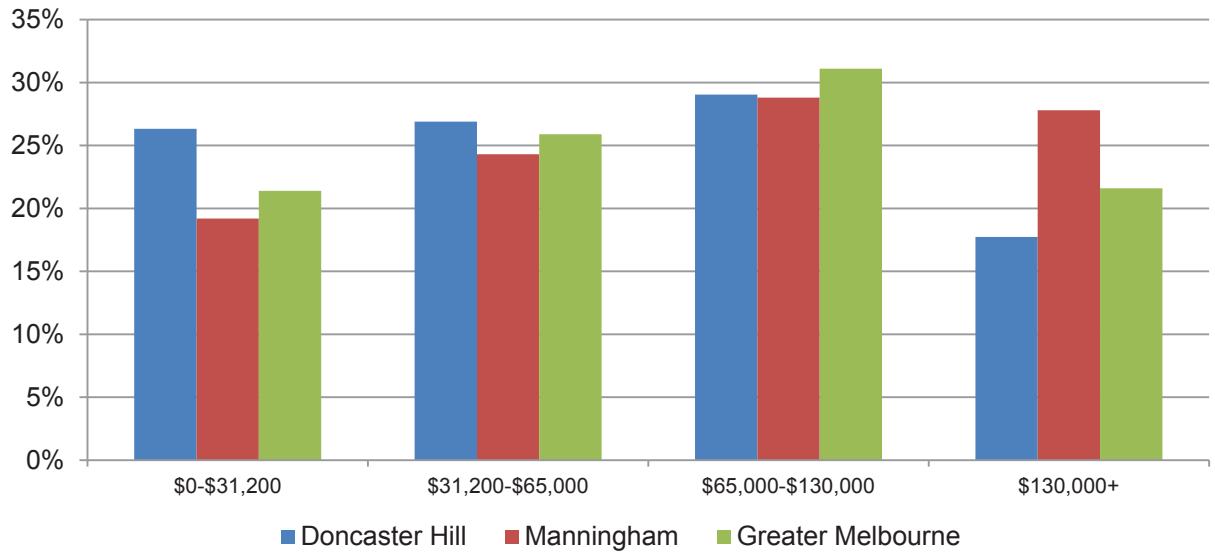
	DONCASTER HILL	MANNINGHAM	GREATER MELBOURNE
Average Household Size	2.4	2.7	2.6
Family Households	*69.3%*	*80.4%*	*72.0%*
Couple family with no children	41.8%	35.5%	34.8%
Couple family with children under 15	20.1%	28.8%	31.7%
Couple family with no children under 15	17.4%	22.4%	16.2%
One parent family with children under 15	5.6%	4.2%	7.0%
One parent family with no children under 15	12.4%	7.7%	8.3%
Other	2.7%	1.4%	2.0%
Non-family Households	*30.75%*	*19.6%*	*30.0%*
Group	3.6%	2%	4.7%
Lone Person	27.2%	17.6%	23.3%

3.5 SOCIO-ECONOMIC STATUS

Figure 6 outlines the household incomes for the Doncaster Hill area. While Manningham is an affluent area, the study area is significantly less affluent – the average household income for Doncaster Hill ($76,800) is approximately $20,000 less than the average household income for Manningham ($96,400).

A higher proportion of the residents in Doncaster Hill own their own home (41.5 per cent) compared to the Melbourne average (33.5 per cent), but fewer than the Manningham average (49.5 per cent). Perhaps reflecting comparatively low incomes in an affluent area, the proportion of households in mortgage and rental stress is higher in Doncaster Hill than Greater Melbourne.

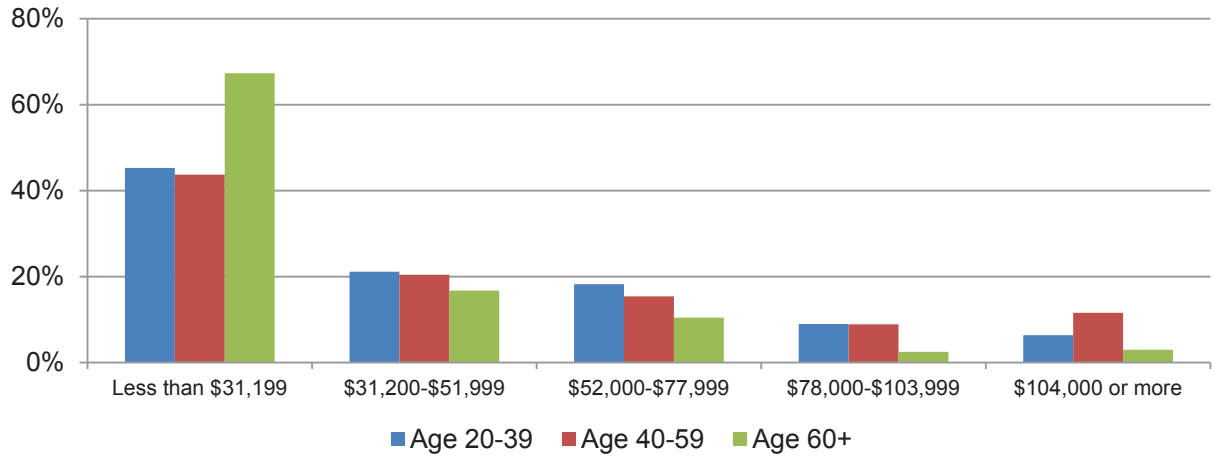
FIGURE 6 – HOUSEHOLD INCOME, 2011



Analysis of income data by age suggests that there are a significant number of retirees on low income in the Doncaster Hill area. While Figure 7 shows that low incomes are common across age brackets in Doncaster Hill, low incomes are especially common among older people, with 67 per cent of people aged over 60 on annual household incomes of less than $32,000.

However, there are indicators that older people with low incomes are not necessarily asset poor. While the public data cannot be split by age, 71 per cent of one-person and two-person families that are not in the labour force own their own home outright.[1] This suggests that a large number of retirees own their own home outright.[2]

FIGURE 7 – HOUSEHOLD INCOMES BY AGE, DONCASTER HILL, 2011



[1] Australian Bureau of Statistics (2011)

[2] The most common explanatory reason for a person being classified as 'not in the labour force' is retirement (see ABS Catalogue number 6220.0). Other common reasons include long-term study, disability and home duties. It is a reasonable supposition that the costs associated with owning a home outright are less manageable for families that are not in the labour force for these reasons.

3.6 CULTURAL AND LINGUISTIC DIVERSITY

The proportion of residents born overseas is higher in Doncaster Hill than both the Manningham and Greater Melbourne averages. Significant overseas populations include people born in China (16.7 per cent), Malaysia (3.9 per cent), Italy (2.8 per cent), and India (2.3 per cent). The Indigenous Australian population in Doncaster Hill is significantly lower than Greater Melbourne, with fewer than 0.05 per cent of the population identifying as Australian Aboriginal.

Linguistic diversity is high in the Doncaster Hill area, with 58.3 per cent of the population speaking a language other than English at home. English proficiency is also relatively low, with 11.0 per cent of the population speaking English poorly, or not at all. This is more than double the Greater Melbourne average (4.3 per cent).

3.7 HEALTH NEEDS

Data relating to health needs is only publicly available at the LGA level. Table 4 shows that the LGA of Manningham performs the same or better than Melbourne and Victoria on all indicators, except for rates of heart disease and the proportion of residents meeting fruit and vegetable consumption guidelines.

However, given the indicators of a pocket of disadvantage around Doncaster Hill – including lower household incomes and higher cultural and linguistic diversity – it is likely that poorer health performance in the Doncaster Hill area is masked by the high overall performance of Manningham.

TABLE 4 – HEALTH STATISTICS, MANNINGHAM (2011/2012)[3]

	MANNINGHAM	MELBOURNE AVERAGE	VICTORIA
Excellent/very good self-reported health status	53.2%	47.5%	46.6%
Fair/poor self-reported health status	9.1%	16.0%	16.0%
Overweight and obesity	43.9%	48.2%	50.2%
Type II diabetes	3.2%	4.9%	5.0%
Cancer	6.6%	6.9%	7.0%
Heart Disease	7.5%	6.8%	7.0%
Stroke	2.4%	2.4%	2.2%
Meeting fruit and veg guidelines	3.3%	5.2%	5.1%
Meeting physical activity guidelines	65.1%	63.9%	63.9%
Current smokers	12.4%	15.5%	15.8%
High long term risk from alcohol	3.1%	3.2%	3.4%
High/very high psychological distress	7.5%	10.9%	11.0%
Lifetime prevalence of depression/anxiety	14.7%	19.5%	20.0%

[3] Department of Health (Victoria) (2014)

3.8 DEMOGRAPHIC IMPLICATIONS

The demographic assessment above shows that Manningham Council will need to consider the following community and social needs for the Doncaster Hill area:

- Population growth for Doncaster and Manningham is expected to be less than the Greater Melbourne average, but the Doncaster Hill Activity Centre is likely to experience significant population growth in line with the housing development in this area. As such, there will be an increasing pressure on existing community and recreation facilities within and adjacent to the Doncaster Hill area.

- The age structure of the Doncaster Hill Activity Centre area is not likely to change significantly as the population grows – the most growth will be in the older middle-aged bracket (50-59) and the very old (70+) age bracket. As such, a range of community services and facilities will be tailored to the current relatively high proportion of young adults with no children (especially in recreation), as well as aged care and health services associated with an ageing population.

- The relatively culturally diverse population suggests that existing and future facilities could provide an increased focus on cultural programs and activities.

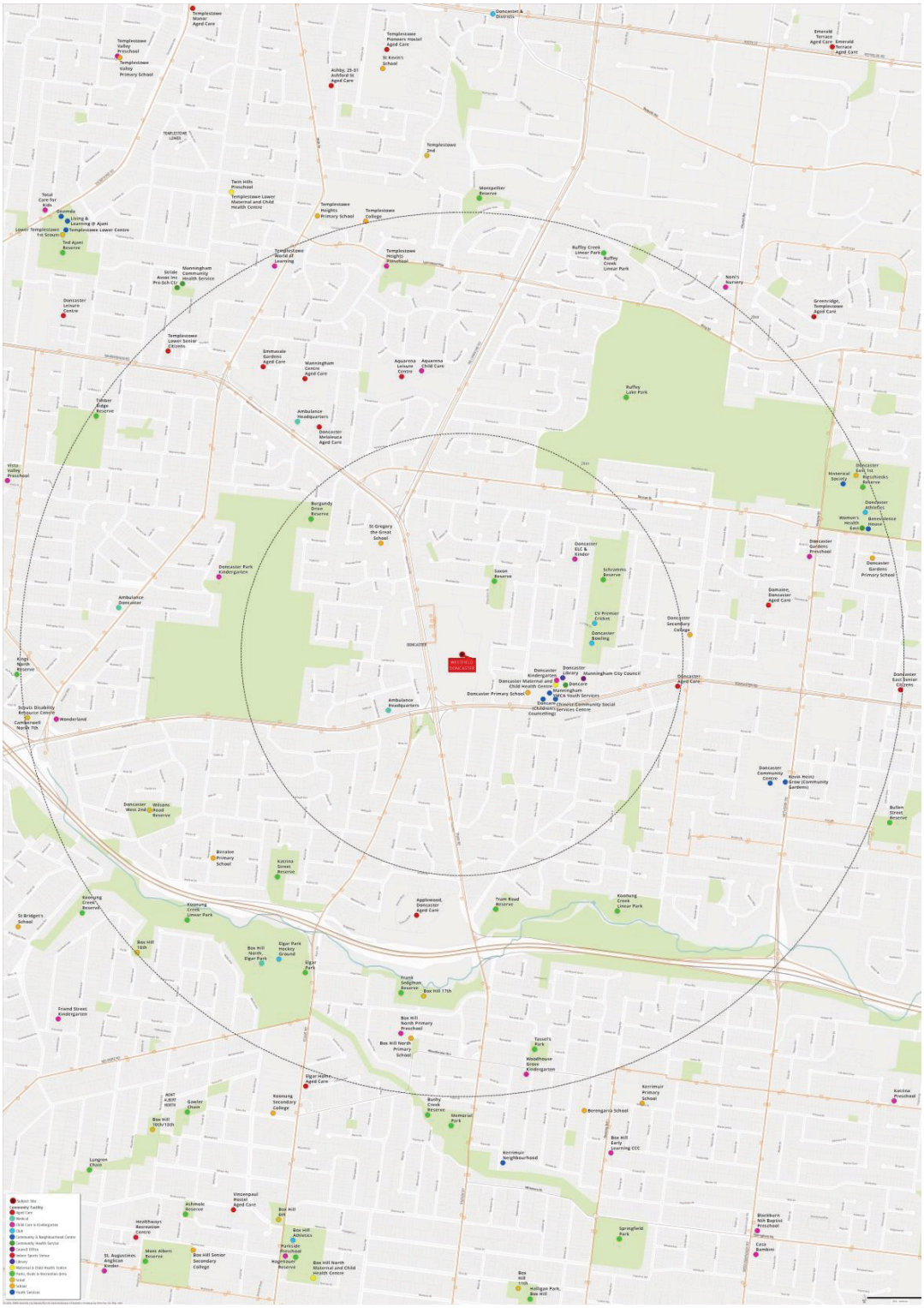
In summary, Manningham is an affluent suburb, with high household incomes and comparatively low health needs; however, the area around Doncaster Hill is expected to be a higher needs population given its lower incomes and high cultural and linguistic diversity.

4 Profiling: Social Service and Infrastructure Assessment

4.1 CURRENT COMMUNITY INFRASTRUCTURE PROVISION

Figure 8 shows the community infrastructure which currently exists within in a 1km radius of the Westfield Doncaster site.

FIGURE 8 – COMMUNITY INFRASTRUCTURE PROVISION WITHIN 2KM RADIUS OF WESTFIELD DONCASTER SITE (REFER TO APPENDIX A FOR A3 MAP FOR IMPROVED READABILITY)



The following key community services are provided within 1km of Westfield Doncaster:

- Schramms Reserve: A large and important 8.5 hectare reserve that provides two sporting ovals, two bowling greens, two pavilions, car parking, public toilets, a path network, treed open space and a small play space catering for 1-10 year olds. Clubs using the Reserve include Doncaster Bowls Club, Fitzroy Doncaster Cricket Club and Doncaster Football Club.

- JW Thomson Reserve Playground: A playground that caters to children aged 4-12 years. Play opportunities include a challenging climbing frame, slide, swings and spinners.

- There is a cluster of services around the Council offices on Doncaster Road to the east of Westfield, including maternal and child health, child care and kindergarten, Doncaster Primary School, Doncaster library and a variety of youth services, including counselling and community welfare provided by YMCA, Salvation Army and Doncare.

Between 1km and 2km of the subject site are aged care facilities on the boundaries of the study area, which help cater to the older demographic of the study area.

4.2 EXISTING COMMUNITY SERVICE GAPS WITHIN STUDY AREA

The Manningham Public Health and Wellbeing Plan 2013-17 identifies five priorities for health and wellbeing in Manningham:

- mental wellbeing, including dementia

- healthy living, including obesity and chronic disease

- safety, including family violence and binge drinking

- healthy city, including urban design that promotes healthy living

- leading change, including leadership and collaboration across Manningham to promote health outcomes.

Within this context, the study area around Westfield Doncaster is well serviced by open space and recreation facilities, which assists in addressing some of these priorities, especially related to the promotion of healthy living and healthy city.

One area that the area may lack is in community health services. A Department of Human Services review into service needs for Manningham from October 2014 found that, of those services that did exist:

> *Their small size, limited infrastructure and financial reserves limit the capacity for services to develop a more complete range of programs. Manningham Community Health Service is not in a suitable location, which limits its profile and accessibility.*

The review found significant needs among certain groups that were not currently being met by the services provided in the LGA. Those groups identified that may be of particular relevance to the demographic profile of this study area is :

- culturally isolated women with children, many of whom have experienced or are experiencing violence

- vulnerable young people, many of whom are experiencing mental health and other problems

- older people, especially older women from communities with a culturally and linguistically diverse background.

5 Evaluation of the Proposed Westfield Doncaster Development: Potential Social Impact

5.1 INTRODUCTION

Westfield Doncaster is seeking an amendment (C104) to the Manningham Planning Scheme to facilitate an increase of 59,100 square metres of additional floor space, which includes 42,000 square metres of leasable shop (retail, restaurants and cinema) and 17,100 square metres of additional commercial floor space for office and associated uses.

This will result in an additional 10,256 jobs overall: 4,826 direct jobs with a multiplier effect of 5,430 generated supplier jobs. The estimated number of ongoing jobs as a result of the proposed expansion at the centre is 2,786 with 2,220 generated supplier jobs. In 2011, there were 24,178 jobs in Manningham. The value of these additional jobs to the local community is very significant and of great economic and social value to Manningham City Council.

The following sections assess the nature of the social impacts likely to be associated with the development proposal in relation to the following impact categories:

- Employment generation impacts
- Physical and social integration

As there is no residential population increase resulting from the proposed development amendment, an assessment of residential impact on the current and future study area population is not required.

5.2 EMPLOYMENT GENERATION IMPACTS

The additional workforce generated by the proposed development expansion will require access to a range of services and facilities during the working day. A workforce generally requires access to the following (Elton Consulting, 2009):

- Shops and general stores for daily convenience needs, including snacks and meals, chemist supplies etc.
- Other everyday services, such as a post office, bank or ATM
- Pleasant spaces away from the workplace to eat lunch or have a break
- Places to socialise and gather after work, or to network with those from other firms, such as cafes and pubs
- Open space & recreation facilities for recreation, exercise and fitness before or after work or during lunch breaks
- Childcare for parents with pre-school aged children and babies
- Access to training and lifelong learning opportunities
- Business support services, including places for meetings and access to resources such as photocopying or IT support.

Given the current retail and cultural services nature of the current Westfield Doncaster centre, the needs of the future workforce will be met largely through the variety of current and additional retail, entertainment and cultural related services that Westfield Doncaster provides. Additional impacts that may be generated outside the development are:

- Increased demand to access open space and recreational opportunities; and

- Increased demand for child-care facilities.

The impact on current open space and recreational facilities, childcare facilities and library services are outlined below.

5.2.1 OPEN SPACE AND RECREATION IMPACTS

Active and passive open space reserves and recreation facilities are required for residents and other visitors (employees) to undertake social and active pursuits in their local area. The community infrastructure assessment in the previous section showed the availability of one large active recreation area and one smaller playground. In addition, the shopping centre has a large commercial fitness centre with health and fitness services including:

- Full Service Gym & Health Club
- Personal Trainer & Personal Training
- Yoga Class
- Pilates Class
- Aerobics - Group Exercise
- Spin - Cycle Class
- Fitness Equipment
- Child Care
- Treadmill, Bike, Stepper

Although these facilities are likely to cater to the increased employee generated open space and recreation demands of the proposed development, consideration may need to be given to expansion of the existing recreation facilities in the shopping centre due to increased usage rates during the day.

5.2.2 CHILD CARE FACILITIES

It is understood by Urbis that there are up to 6 childcare centres in the wider study area providing a mixture of long day care and/or occasional care. Long day care centres usually operate for around nine hours every week day. Occasional care is short term care offered less frequently.

Although it is difficult to estimate the number of childcare places required to cater to an additional 4,826 potential new jobs at the centre, it is likely that this number has the potential to increase pressure on existing facilities. As such, it is recommended that Westfield Doncaster consider facilitating the provision of an additional long-day care centre within the proposed development.

5.3 PHYSICAL AND SOCIAL INTEGRATION

This Section assesses how the proposed development integrates with the local area. Integration has been assessed in relation to:

- The extent to which the development will invite integration with the surrounding community from a design perspective
- How accessibility arrangements effectively connect Westfield Doncaster with the surrounding community.

5.3.1 DESIGN INTEGRATION

The following design impacts have been identified in the master planning for the proposed expansion:

- Noise: The nearest noise sensitive receivers from the proposed development expansion is the existing residential to the north boundary of subject site, as well as noise from future traffic movement associated with the proposed development. Noise from mechanical plant and equipment serving the proposed expansion can also be expected. It is recommended that noise ameliorative treatment options be adopted in the final development plans.

- Visual: The nearest visual impact potential from the proposed development expansion is the existing residential to the north boundary of the subject site. Landscaping treatments to visually buffer the expanded development from surrounding residents should be considered in the final development plans.

5.3.2 ACCESSIBILITY

The development proposal includes significant capital infrastructure works including upgrading the bus interchange, streetscape works, stormwater drainage, street traffic signal works (Westfield Drive), lighting works and traffic signal works (Bus Interchange access). An estimate of these works is in the range of $8 to $10million. These works implement a number of Council's planning and development objectives outlined in the Doncaster Hill Urban Master Plan (June, 2003) and the Doncaster Hill Mode Shift Plan (2014).

5.3.2.1 PUBLIC TRANSPORT, WALKING AND CYCLING

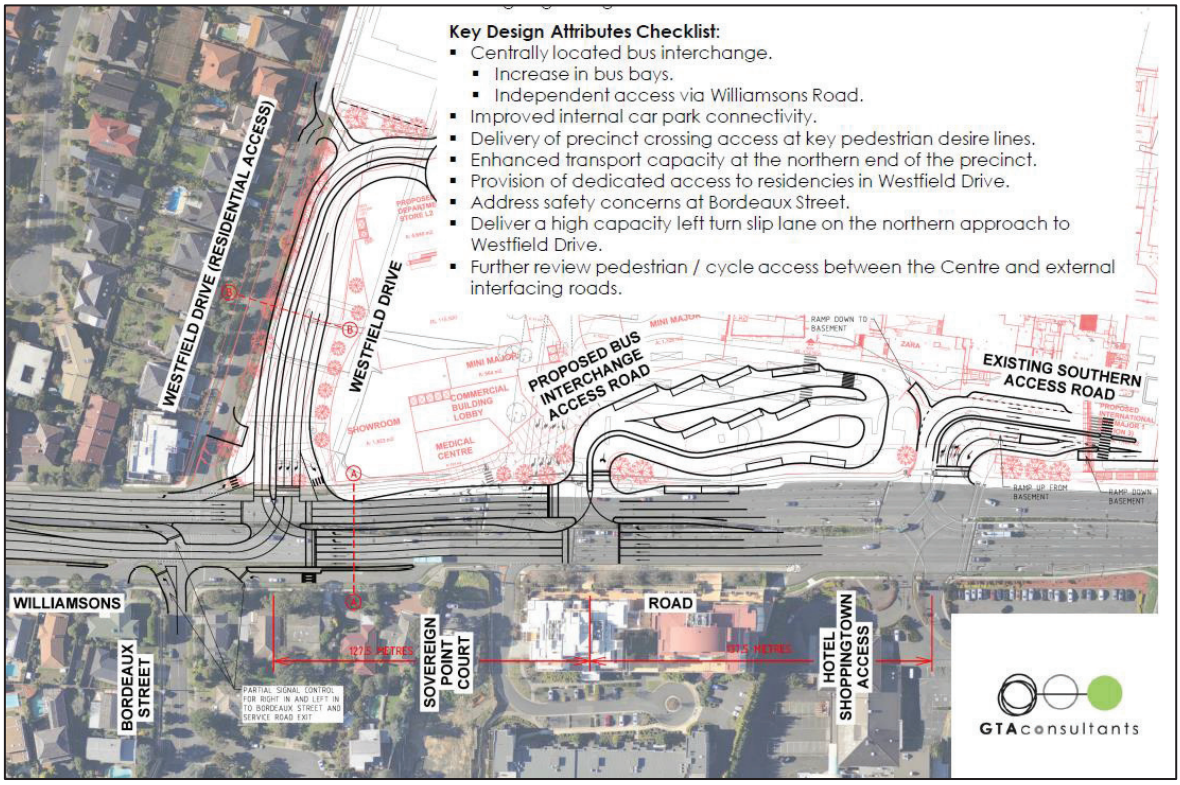
Westfield Doncaster has an existing bus terminus that serves approximately 14 bus routes. It provides direct access to Doncaster Road, which is currently well serviced by bus routes, including Smart Bus/Principal Bus route for Metropolitan Melbourne.

The proposed development will improve public transport accessibility and the level of service through the provision of a new bus interchange and new southern access road (see Figure 9 below). As part of this improved accessibility, enhanced walking and cycling connections to surrounding residences, open space facilities and nearby community facilities should be further considered and implemented.

This investment by Westfield Doncaster will go a long way towards meeting a number of Council's planning and development objectives outlined in the Doncaster Hill Urban Master Plan (June, 2003) and the Doncaster Hill Mode Shift Plan (2014).

It is recommended that in order to ensure these facilities are utilised by Westfield Doncaster employees and visitors, a transport management plan (also referred to as an Active Travel Plan) be developed to ensure the modal share targets set in the Doncaster Hill Model Shift Plan are met.

FIGURE 9 – PROPOSED ACCESSIBILITY PROPOSAL



Source: GTA Consultants

5.3.2.2 TRAFFIC AND PARKING

In any new development that generates a significant number of new employees and visitors, one of the measures that must be addressed is minimising traffic and parking overflow onto surrounding residential streets.

The proposed new bus interchange and southern access road will include the following features to negate any adverse impacts on the surrounding community:

- New separated access for buses via Williamson Road, which improves traffic access as well
- New internal car park connectivity internally and externally to the road system
- New pedestrian crossings where new internal and external pedestrian desire lines are created
- A dedicated access to the Westfield Drive residences
- A new left-turn slip lane into Westfield Drive

The proposed traffic and parking upgrades associated with the proposed development are considered satisfactory for minimising traffic and parking impacts in the surrounding community.

6 Conclusion

6.1 SUMMARY OF SOCIAL IMPACTS AND NET COMMUNITY BENEFIT

Table 5 provides an assessment of potential social and community impacts that are expected to arise from the proposed expansion of Westfield Doncaster. In summary, it is expected that the development will deliver a net community benefit to the Doncaster community.

6.2 RECOMMENDATIONS

It is recommended that the proposed development to expand Westfield Doncaster will deliver, or contribute to achieving, a number of the strategies and objectives Council has identified will have a Net Community Benefit including:

- development of sustainable transport options, reduce travel demand and change travel behaviour
- provide future traffic and transport infrastructure requirements in a comprehensive, timely and equitable way
- further enhance the status of the Doncaster Hill Activity Centre, which provides for an appropriate mix of uses and functions.

The additional workforce generated by the proposed development expansion will require access to a range of services and facilities during the working day, especially recreation and child care facilities. Given the design and layout of the shopping centre, with limited access to local open space areas, consideration may need to be given to expansion of the existing recreation facilities in the shopping centre due to increased usage rates during the day. In addition, amelioration measures will be required to cater to the increased pressure on child care facilities created by the additional number of new employees in the precinct.

The community feedback provides very valuable information regarding opportunities to improve the design and layout of the shopping centre to better meet the needs of the shopping centre users. A number of services have been identified that are not provided in the centre or easily accessible for the shopping centres users.

We recommend that Westfield further investigates the feasibility of providing additional services in the shopping centre, particularly allied, medical and dental services to complement the proposed office development. With regards to the youth incubator space, we recommend that Westfield and YMCA discuss this opportunity with Apple who may be interested in this from a business development perspective.

In regards to the youth hub at the bus interchange, Council will need to work with local youth agencies including the YMCA to scope out the proposal in terms of size, staffing and financial feasibility. If the facility was feasible and could be funded, a suitable space would need to be designed into the bus interchange so that it is well located in terms of safety, accessibility and visibility.

6.2.1 RECOMMENDATIONS FOR A POTENTIAL YOUTH HUB

Following discussions with Council and Contour, the following information was provided by Contour Town Planners on the 4th March 2016 to inform the recommendations for the potential youth hub at Westfield Doncaster.

The preferred service model for the facility is as follows:

- provision of a multipurpose youth services space that is consistently activated
- a café could be central to the location with breakout areas for social enterprise, youth training and sense of place/gathering point
- digital space where young people can come together though interactive digital platforms

- potential for an ideas incubator with existing and potential commercial partnerships or links with other retailers (i.e, Apple, Dangerfield, Village Cinemas)
- a place to go to for personal and professional development in terms of vocational and educational programming, leadership opportunities, wellbeing activities and enhancing of skills in a safe and supportive environment
- the facility will be utilised/accessed for a progam rather than being used as a drop in centre/counselling service
- the facility will act as a point of information and referral if required.

The facility's preferred location will be:

- a shop front at ground level with 24 hr (independent) access that integrates with the broader design of Westfield Doncaster
- near the bus interchange to provide ready access to public transport
- whilst space within the existing or potential commercial tower would not be appropriate for the type of facility being sought, there may be potential for partnerships with businesses or service providers who may see benefit in being located within the existing or potential commercial tower.

In relation to timing and resourcing:

- further work is required with Council to:
    - understand how Westfield could incorporate and resource such a space under an arrangement that would be beneficial to Council and the community; and
    - explore a potential partnership with YMCA, Youth Services or other non-government organisations to deliver the programs and services.

The floor area is yet to be confirmed, but it is expected to be a minimum of 100m2.

The benefits of a youth hub for Westfield Doncaster are as follows:

- commercial benefit to Westfield, with increased expenditure on a range of retail and entertainment services
- opportunities for tenants to extend their reach into new markets and to develop partnerships with other existing or new businesses
- westfield Doncaster could be seen as a leader in the provision of an innovative and progressive model of service for young people, now and into the future
- minimises anti-social behaviour by providing positive engagement opportunities/activities for young people.

The following existing models/services need to be reviewed in the context of the elements identified in the preferred service model.

- Edge Youth Services – Shop NM1 Westfield Plenty Valley, 415 McDonalds Road, Mill Park
- Knox Youth Information Centre – Knox Ozone Shopping Precinct

TABLE 5 – SUMMARY OF SOCIAL EFFECTS AND SOCIAL IMPACTS

IMPACT CATEGORY	SOCIAL EFFECT/CHANGE	LEVEL OF IMPACT	AMELIORATION MEASURE
Strategic Context	State and local policy supports enhancement of Doncaster Hill as an Activity Centre. The proposal reinforces Doncaster Hill as a strategic location for accommodating Melbourne's employment growth. The proposed development has the potential to greatly increase employment opportunities for the region. The proposal builds upon existing good levels of public transport access and increases the amount of local services and facilities required by surrounding communities.	Positive	
Demographic Character	The residential population increase expected as a result of the new development is zero. As such, no new community infrastructure is required to cater to increased demand for services generated by new residents.	Nil	
Physical and Social Integration	The proposal has the potential to generate noise and visual impacts on residences to the north of the Westfield Doncaster precinct. The proposal contains transport, traffic and parking proposals that will improve access arrangements to, from and within the Westfield Doncaster precinct.	Potential community impact Positive community benefit	Introduce noise and visual screening devices on northern boundary to reduce impacts on surrounding residences.
Future Community Infrastructure Needs – Residences	As stated, there will be no increase in the residential population associated with the new development. As such, no new community infrastructure is required to cater to increased demand for services generated by the new residents. The increase in retail and personal services as a result of the proposed development will enhance community service	Positive community benefit	

IMPACT CATEGORY	SOCIAL EFFECT/CHANGE	LEVEL OF IMPACT	AMELIORATION MEASURE
	provision for the existing Doncaster Hill community.		
Future Community Infrastructure Needs - Employees	The additional workforce generated by the proposed development expansion will require access to a range of services and facilities during the working day, especially recreation and child care facilities. Other potential community needs associated with employee generated demand will be catered for within the existing and proposed development.	Potential community facility impact.	Increased pressure on existing child care facilities: developer contribution required at the planning permit stage.

7 References

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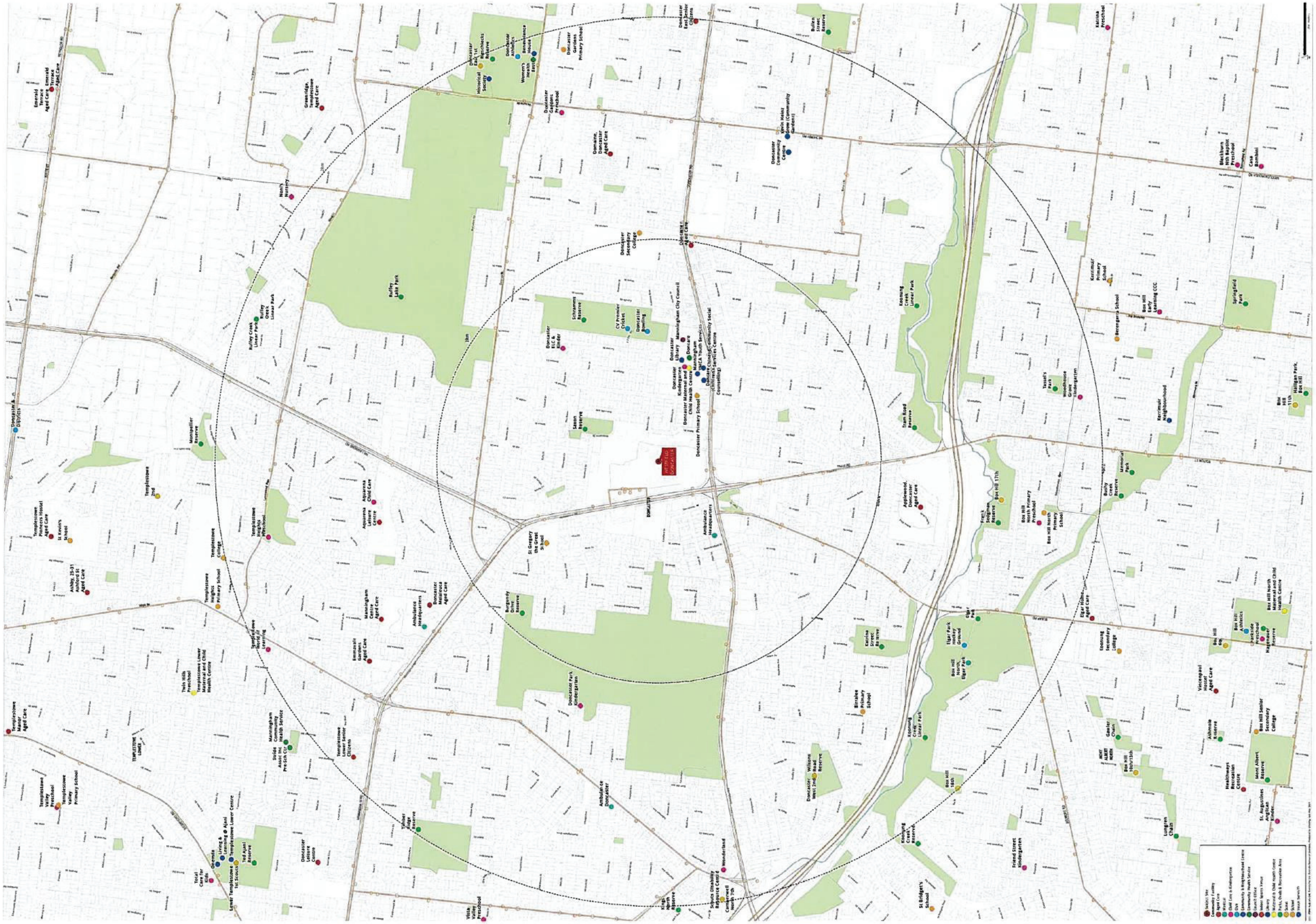
SGS Economics and Planning. (2011). The Polycentric Metropolis: The Role of the CBD and Central Activities Districts in a Sustainable and Prosperous Melbourne.

Appendix A Community Facilities Map


Emerald Terrace Aged Care
Greenridge, Templestowe Aged Care
Nonis Nursery
Ruffey Lake Park
Ruffey Creek Linear Park
Doncaster & Districts
Montpellier Reserve
Templestowe 2nd
Templestowe Pioneers Hostel Aged Care
St Kevin's School
Ashby, 25-31 Ashford St Aged Care
Templestowe College
Templestowe Heights Primary School
Templestowe Heights Preschool
Templestowe World of Learning
Twin Hills Preschool
Templestowe Lower Maternal and Child Health Centre
Templestowe Manor Aged Care
TEMPLESTOWE LOWER
Templestowe Valley Preschool
Templestowe Valley Primary School
Manningham Community Health Service
Stride Assoc Inc Pre-Sch Ctr
Templestowe Lower Senior Citizens
Total Care for Kids
Onemda
Living & Learning @ Ajani
Templestowe Lower Centre
Lower Templestowe 1st Scouts
Ted Ajani Reserve
Doncaster Leisure Centre
Aquarena Child Care
Aquarena Leisure Centre
Manningham Centre Aged Care
Emmavale Gardens Aged Care
Ambulance Headquarters
Doncaster Melaleuca Aged Care
Timber Ridge Reserve
Vista Valley Preschool
Doncaster East 1st
Historical Society
Rieschiecks Reserve
Doncaster Athletics
Women's Health East
Benevolence House
Doncaster Gardens Primary School
Doncaster Gardens Preschool
Domaine, Doncaster Aged Care
Doncaster East Senior Citizens
Bullen Street Reserve
Kevin Heinz Grow (Community Gardens)
Doncaster Community Centre
Doncaster Secondary College
Doncaster Aged Care
Schramms Reserve
CV Premier Cricket
Doncaster Bowling
Doncaster ELC & Kinder
Manningham City Council
Doncaster Library
Doncare
Doncaster Kindergarten
Doncaster Maternal and Child Health Centre
Manningham YMCA Youth Services
Doncare Chinese Community Social (Children's Services Centre Counselling)
Doncaster Primary School
Saxon Reserve
WESTFIELD DONCASTER
DONCASTER
St Gregory the Great School
Ambulance Headquarters
Burgundy Drive Reserve
Doncaster Park Kindergarten
Ambulance Doncaster
Kings North Reserve
Scouts Disability Resource Centre
Camberwell North 7th
Wonderland
Keonung Creek Linear Park
Tram Road Reserve
Applewood, Doncaster Aged Care
Katrina Street Reserve
Birralee Primary School
Doncaster West 2nd
Wilsons Road Reserve
Koonung Creek Reserve
St Bridget's School
Katrina Preschool
Blackburn Nth Baptist Preschool
Casa Bambini
Kerrimuir Primary School
Berengarra School
Box Hill Early Learning CCC
Springfield Park
Tassel's Park
Woodhouse Grove Kindergarten
Kerrimuir Neighbourhood
Halligan Park, Box Hill
Box Hill 11th
Memorial Park
Bushy Creek Reserve
Box Hill 17th
Frank Sedgman Reserve
Box Hill North Primary Preschool
Box Hill North Primary School
Elgar Park
Elgar Park Hockey Ground
Box Hill North, Elgar Park
Elgar Home Aged Care
Koonung Secondary College
Box Hill 4th
Box Hill Athletics
Parkside Preschool
Hagenauer Reserve
Box Hill North Maternal and Child Health Centre
Vincentpaul Hostel Aged Care
Box Hill 16th
Gawler Chain
MONT ALBERT NORTH
Box Hill 10th/13th
Ashmole Reserve
Box Hill Senior Secondary College
Healthways Recreation Centre
Mont Albert Reserve
St. Augustines Anglican Kinder
Lungren Chain
Friend Street Kindergarten

Appendix B Community Infrastructure Audit

INFRASTRUCTURE TYPE	ADDRESS
Childcare	
Aquarena Aquatic and Leisure Centre Child Care (27 places)	139-153 Williamsons Rd, Templestowe Lower
Early Years at MC Square (38 places)	MC Square, Basement Level 1, 687 Doncaster Rd, Doncaster
Doncaster Early Learning Child Care Centre (45 places)	20 Turana Street, Doncaster
Wonderland Childcare and Kindergarten (60 places)	6 High Street, Doncaster
Dinky's Early Learning Centre (Private – 19 places)	97 High Street, Doncaster
Templestowe World of Learning (Private – 60 places)	247 High Street, Templestowe
Kindergarten	
Doncaster Kindergarten (29 places)	MC Square, 687 Doncaster Road
Doncaster Park Kindergarten (30 places)	18 Studley Street, Doncaster
Templestowe Heights Pre-School (30 places)	64 Fyfe Drive, Templestowe Lower
Templestowe Valley Pre-School (50 places)	3 Birchwood Ave, Templestowe Lower
Twin Hills Pre-School (29 places)	39 Mayfair Ave, Templestowe Lower
Vista Valley Kindergarten (29 places)	3 Vista Street Bulleen 3105
Maternal and Child Health	
Doncaster Maternal Child Health Centre	MC Square 687 Doncaster Road, Doncaster
Lower Templestowe Maternal and Child Health Centre	39 Mayfair Ave, Templestowe Lower
Libraries	
Doncaster Library	MC Square, 687 Doncaster Rd, Doncaster
Schools	
Doncaster Secondary College (Government)	123 Church Road Doncaster VIC 3108
Doncaster Primary School (Government)	2-12 Council Street Doncaster VIC 3108
Birralee Primary School (Government)	Heyington Avenue, Doncaster
Templestowe College (Government)	Cypress Ave, Templestowe Lower
Templestowe Heights Primary School (Government)	High Street, Templestowe Lower
Templestowe Valley Primary School (Government)	15 Birchwood Ave, Templestowe Lower

St Gregory The Great Primary School (Independent)	396 Manningham Road, Doncaster
St Kevins Catholic Primary School (Independent)	Herlihys Road, Templestowe Lower
Parks and Reserves	
Burgundy Reserve (active)	Burgundy Drive, Doncaster
Park Avenue Reserve (active)	Park Avenue, Doncaster
Schramms Reserve (active)	JJ Tully Drive, Doncaster
Ted Ajani Reserve (active)	Thompsons Road, Doncaster
Timber Ridge Reserve (active)	Timber Ridge Road, Doncaster
Wilsons Reserve (active)	Wilsons Road, Doncaster
Bimbadeen Park (passive)	Corner Templestowe Road and Airds Road, Lower Templestowe
Dellfield Drive Park (passive)	Dellfield Drive, Templestowe Lower
Eram Park (passive)	Tram Road, Doncaster
Katrina Street Reserve (passive)	Katrina Street, Doncaster
Marshall Reserve (passive)	Marshall Avenue, Doncaster
Ruffey Lake Park (passive)	King Street, George Street and Victoria Street, Doncaster
Studley Street Reserve (passive)	Studley Street, Doncaster
Stutt Reserve (passive)	Stutt Avenue, Doncaster
Leisure	
Aquarena Aquatic and Leisure Centre	139-153 Williamsons Road Doncaster VIC 3108
Youth	
YMCA - Youth Services	Suite 8, Level 2 MC Square, 687 Doncaster Road, Doncaster
Senior Citizens Clubs	
Ajani Centre	284 Thompsons Road, Lower Templestowe
Bulleen & Templestowe Senior Citizens Club	Corner Manningham Road and Balmoral Avenue
National Seniors	680 Doncaster Road, Doncaster
Residential Aged Care	
Manningham Centre (75 low care, 75 high care beds)	371 Manningham Road

Templestowe Pioneers Village (52 low care beds)	16 Herlihys Road, Lower Templestowe
BlueCross Ashby (60 low care beds)	25 Ashford Street, Lower Templestowe
General Community	
MC Square	687 Doncaster Road, Doncaster
Bulleen and Templestowe Community House	284 Thompsons Road, Lower Templestowe
Manningham Municipal Offices	699 Doncaster Road, Doncaster
Scout Halls	
Scout Hall	Paul Street, Doncaster

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Sydney
Tower 2, Level 23, Darling Park
201 Sussex Street Sydney, NSW 2000
t +02 8233 9900
f +02 8233 9966

Brisbane
Level 7, 123 Albert Street
Brisbane, QLD 4000
t +07 3007 3800
f +07 3007 3811

Melbourne
Level 12, 120 Collins Street
Melbourne, VIC 3000
t +03 8663 4888
f +03 8663 4999

Perth
Level 1, 55 St Georges Terrace
Perth, WA 6000
t +08 9346 0500
f +08 9221 1779

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w urbis.com.au **e** info@urbis.com.au

March 2016

Sustainability Commitments

Westfield Doncaster Development Plan

Prepared by Cundall for:

Scentre Group

CUNDALL
Level 2, 330 Little Collins St
Melbourne, VIC 3000

Phone: (03) 9635 3700
Fax (03) 9635 1234

Contact: **Caimin McCabe**

Author:	Caimin McCabe	
Checked by:	Andrew Thompson	
Approved by:	Caimin McCabe	

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Rev A	Updated Draft	22/12/2014
Rev B	Amended	07/05/2015
Rev C	Amended Following Council Comments	14/08/2015
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Rev E	Amended following additional Council comments	15/03/2016

The success and realisation of the proposed initiatives will be dependent upon the commitment of the design team, the development of the initiatives through the life of the design and also the implementation into the operation of the building. Without this undertaking the proposed targets may not be achieved.

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1 Overview

The Westfield Doncaster Expansion Masterplan will continue to recognise the importance of achieving a strong sustainable outcome for the proposed development to support the Manningham City Council's sustainability aspirations for Doncaster Hill.

It also builds on the Centre's previous environmental successes and *best practice*' sustainable design approach, to take a further step forward and achieve a ***'National Excellence'*** outcome by demonstrating the potential to achieve a 5-Star Green Star rating or equivalent performance for the expanded retail centre as well as the proposed new commercial office development (noting that obtaining a formal rating may not be possible as the development reflects an expansion of the existing facility).

1.1 Sustainable Design Response

As per the previous expansion the proposed next expansion will adopt an integrated and holistic sustainable design approach that considers a triple bottom line view of sustainability incorporating the different aspects of achieving real outcomes, as graphically depicted in *Figure 1.2* below.

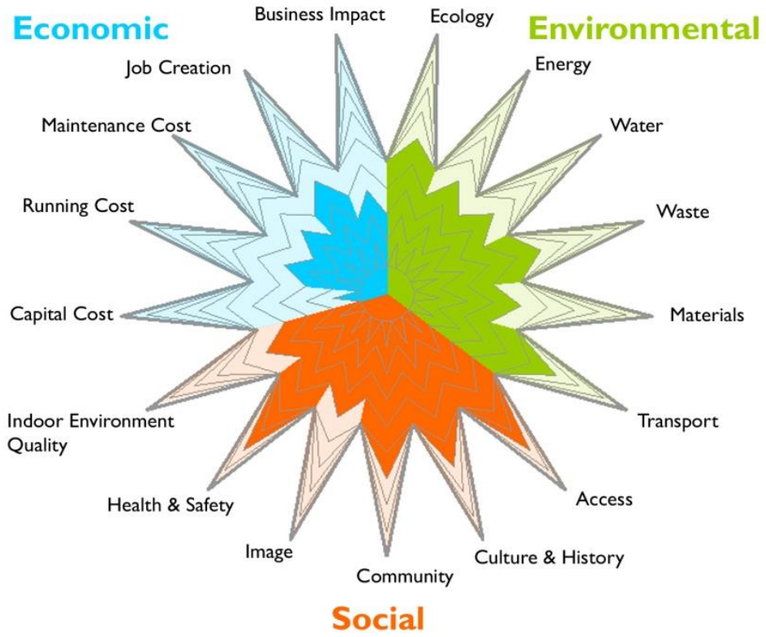

Figure 1.2: Responsible Design Approach to Sustainability

1.2 Approach & Methodology

The integrated and holistic approach that will be adopted will be a responsible one where environmental design and sustainability initiatives will be considered based on offering a practical, effective and real sustainable outcome. Each initiative will be reviewed against the following considerations:

Cost	e.g.	Capital, Maintenance, Energy Life Cycle & related Building Costs
Flexibility	e.g.	Operational, Layout / Load Adaptability, & Future Expansion
Reliability	e.g.	Ease of Maintenance, Resilience & use of Proven Technology
Environmental	e.g.	CO_2 Emissions, Water Conservation, Waste Minimisation & Comfort Control

For ease of review the sustainability commitments of the expansion the following sections provide a preliminary summary of the strategies under the following environmental categories that would generally be applicable to both the Retail and Commercial Office components of the redevelopment.

The environmental categories reflect the Green Star environmental assessment categories. To further assist review and understanding of the environmental design approach to attain the ***'National Excellence'*** outcome, a preliminary Green Star points summary is provided in Appendix A.

- ***Management***

  Covering such issues as:

  - Input from Sustainable Design Consultant
  - Commissioning
  - Building Tuning
  - Independent Commissioning Agent
  - Building Guides
  - Environmental Management
  - Waste Management
  - Waste & Recycling Management Plan
  - Building Management Plan

- ***Indoor Environmental Quality***

  Covering such issues as:

  - Ventilation Rates
  - Air Change Effectiveness
  - Carbon Dioxide Monitoring & Control
  - Daylight
  - Thermal Comfort
  - Hazardous Materials
  - Internal Noise Levels
  - Volatile Organic Compounds
  - Formaldehyde Minimisation
  - Mould Prevention

- ***Energy***

  Covering such issues as:

  - CO_2 Emissions
  - Energy Sub-metering
  - Peak Energy Demand Reduction
  - Car Park Ventilation

- ***Transport***

  Covering such issues as:

  - Provision of Car Parking
  - Fuel Efficient Transport
  - Cyclist Facilities
  - Commuting Mass Transport
  - Trip Reduction Mixed Use

- ***Water***

  Covering such issues as:

  - Occupant Amenity Water
  - Water Meters
  - Landscape Irrigation
  - Heat Rejection Water
  - Fire System Water

- ***Materials***

  Covering such issues as:

  - Recycling Waste Storage
  - Building Re-use
  - Recycled Content & Re-used Products & Materials
  - Concrete
  - Steel
  - PVC Minimisation
  - Sustainable Timber
  - Design for Disassembly
  - Dematerialisation

- ***Land Use & Ecology***

  Covering such issues as:

  - Topsoil
  - Re-use of Land
  - Reclaimed Contaminated Land
  - Change of Ecological Value

- ***Emissions***

  Covering such issues as:

  - Refrigerant ODP
  - Refrigerant GWP
  - Refrigerant Leak Detection
  - Insulant ODP
  - Stormwater
  - Discharge to Sewer
  - Light Pollution
  - Legionella

- ***Public Realm & Community Infrastructure***

  Covering such issues as:

  - Social Interaction
  - Landscaping
  - Information Kiosk
  - Internet Accessibility

1.3 Reporting & Verification

As with the previous expansion of the Centre, on-going consultation and regular reporting to Council will occur at strategic points in the design, documentation and construction of the expansion with respect to progress on sustainability commitments as well as ultimate verification of built outcomes.

In respect to progress reporting it would be proposed to:

- At time of lodgement of formal town planning application provide a Sustainable Management Plan (SMP) outlining the mix of ESD commitments and strategies to be adopted by the development, as well as an updated benchmark summary of the developments environmental performance against its '***National Excellence***' target using Green Star or an equivalent environmental rating tool.
- At the completion of the tender documentation phase of the expansion, an updated summary report would be prepared outlining final documented mix of ESD commitments and strategies embedded in the design to achieve its '*National Excellence*' environmental performance target.

  Again the developments environmental performance would be benchmarked against its '*National Excellence*' target using Green Star or an equivalent environmental rating tool.
- Post completion a report would be prepared summarising the final sustainability outcomes achieved by the expansion against its ESD commitments and targets.

  If a formal Green Star rating is obtained, which may not be possible as development is an expansion of the existing facility, then a copy of rating certificate would be provided to Council to further reinforce quality of built outcomes.

1.4 Reference

In assessing and determining the proposed sustainability commitments for the Westfield Doncaster masterplan the following documents were reviewed and referred to:

- Doncaster Hill Strategy 2002, revised in October 2004
- Westfield Doncaster Sustainability Management Plan dated December 2005 and approved by Manningham City Council in February 2006
- Doncaster Hill Sustainability Guidelines
- Doncaster Hill Mode Shift Plan 2014
- Manningham City Council's Water15 Sustainable Water Management Plan 2005 – 2015
- Green Star Retail Centre (v1) 2008 Technical Manual as well as associated Technical Clarifications (TC's), Credit Interpretation Requests (CIR's) and updated credits (http://www.gbca.org.au/green-star/rating-tools/green-star-retail-centre-v1/1757.htm)

2 Management

2.1 Objectives

The expansion aims to optimise the building efficiency during operation and exercise environmental responsibility during construction, with specific goals including:

- Facilitate on-going metering and monitoring with the ability to identify trends, leaks and opportunities for improvements in operational efficiency;
- Minimise environmental impact during construction works;
- Reduce the total amount of waste sent to landfill both in construction and in operation;
- Commission and carry through the environmental design measures into the post-construction phase; and
- Facilitate effective lowering of the developments on-going operational environmental impact.

2.2 Sustainability Commitments

Address and improve construction and on-going operation environmental management by the following:

Key Goals	Strategies/initiatives
Environmental Design Professional	Westfield has and will continue to include the services of an Environmental Design Consultant during the subsequent design and construction phases of the redevelopment to guide the other design consultants and construction team as well as to challenge Westfield and its consultants in enhancing and meeting the environmental objectives set for the redevelopment.
Environmental Management	The Main Contractor, who will have overall responsibility for undertaking the construction of the expansion works will be required to be ISO14001 EMS accredited and Implement a comprehensive, project-specific Environmental Management Plan (EMP) for the works.
Construction Waste Management	The Main Contractor ultimately engaged to complete the masterplan redevelopment will be required to implement a Waste Management Plan (WMP) as part of its overall Construction Management Plan, retaining waste records and provide quarterly reports to the Westfield and to achieve a minimum 60% (by mass) target of all demolition and construction waste being reused or recycled, and aspire to an 80% target.
Waste and Recycling Management	A Waste and Recycling Management Plan shall be developed for the reduction in the weight of the Centres operational waste. In addition the Centres waste storage facilities will be sized and configured to meet the general, space, access, amenity and management requirements for the Centre.
Building Management Systems	Include and / or enhance the existing electronic BMS within the Centre to monitor and report on energy and water consumption; and monitor and control building services systems.
Commissioning	Westfield commit to include within the building contract the requirement that comprehensive pre-commissioning, commissioning, and monitoring of the Building Management System (BMS) and Services in accordance with CIBSE Commissioning Codes or ASHRAE Commissioning Guideline 1-1996 (Mechanical Services only). The transfer project knowledge to the building owner/manager through preparing documented design intent statements for each discipline; As-built drawings; Operations & Maintenance (O&M) Manuals; Commissioning Report; and Training of building managements staff, will also be contractually required.
Building Tuning	Commitment to adopting a building tuning process so that: • A tuning process of the BMS and Mechanical Services will be implemented • Monthly monitoring will be undertaken and outcomes reported quarterly; • On completion of 12-months building tuning a "Final Re-commissioning" process of "fixing issues" not resolved during the 12-month building tuning process will be carried out to make calibration checks on key building controls, with the intent of "final re-commissioning" not to fully re-commission as there is the potential to disrupt the services that are otherwise working efficiently; and • A *Building Tuning Report* for Mechanical Services on the outcomes of the tuning process will be provided to the building owner and made available to the design team.
Building Guides	A simple and easy-to-use Building Users' Guide (BUG) for the redevelopment will be prepared, that includes information relevant for the building users, occupants and tenants representatives and made available to the Centre's Facility Management Team. In addition a Tenancy Fitout Guide (TFG) will also be prepared to provide tenants with practical recommendations to improve their tenancy's environmental design, fitout and operation.
Tenant Fitout Guide	Prepare tenant fitout guides for both the retail and commercial tenants to direct and assist them in reducing the environmental impact of their respective fitout both in respect to its initial construction / installation as well as their on-going operational performance, to complement the commitments and environmental performance of the base building.
Reporting & Verification	Commit to on-going consultation with Council including regular reporting at strategic points in the design, documentation and construction of the expansion with respect to progress on sustainability commitments as well as ultimate verification of built outcomes.

3 Indoor Environment Quality (IEQ)

3.1 Objectives

The objectives of the expansion with regard to Indoor Environment Quality (IEQ) are to provide occupants with a generally pleasant and comfortable internal space whilst reducing or avoiding potentially detrimental health impacts.

Specific goals are to provide an internal environment that is healthy and comfortable in terms of:

- Sight (e.g. natural light, external views and glare);
- Sound comfort;
- Air quality and odour; and
- Thermal comfort.

3.2 Sustainability Commitments

Address and improve indoor environmental quality within the redevelopment by the following:

Key Goals	Strategies/initiatives
Ventilation Rates	To improve indoor air quality within both the Retail and Commercial Offices components of the redevelopment to provide at least a 50% improvement in the outside air requirements of the Australian Standard AS1668.2-2002.
Carbon Dioxide Monitoring and Control	Inclusion of a carbon dioxide (CO_2) monitoring sensor and associated control system to continuously monitor and adjust outside air ventilation rates to the return air of each mall and Tenant AHU to maintain good indoor air quality within these space.
Daylight	Within the physical and functional layout restrictions of the redevelopment will maximise daylight availability within the extended public areas of the Centre. Within the Commercial Office areas a minimum target of 30% of NLA has access to good levels of daylight for building users.
External Views	Within the physical constraints of the site visual connection to outside from public circulation areas within the retail centre will be maximised, with a target 60% of the Commercial Office NLA to be within 8m of direct line of sight to outside.
Thermal Comfort	Direct its design team to design so that the air conditioning system(s) can achieve a Predicted Mean Vote (PMV) levels calculated in accordance with International Standard ISO7730 of between -1.5 and +1.5 inclusive for the Retail areas and a minimum of -1 and +1 inclusive within the Commercial offices. Comfort conditions being met during Standard Operating Hours of Occupancy for 98% of the year using standard clothing and metabolic rate values.
Lighting Design	Commit to the use of LED lighting throughout the centre's extension and commercial office areas for all applications unless not practical or appropriate, and where fluorescent luminaires are used they will have electronic ballasts. Lighting will also be designed so that the respective maintained luminance is no more than accepted industry best practice to avoid unnecessary over illumination.
Hazardous Material	Have any demolished or redeveloped areas to have a hazardous materials survey conducted and to responsibly address any material found.
Internal Noise Levels	Direct its design team to have building services within the redevelopment meet the recommended sound levels provided in Table 1 of Australian Standard AS/NZS2107:2000 for 95% of retail areas.
Volatile Organic Compounds (VOC's)	Commit to include a requirement within ultimate masterplan redevelopment design documentation, finishes schedules and trade packages to have at least 95% of all interior painted surfaces, all interior adhesives & sealants and flooring meet the TVOC Content Limits outlined in *Table IEQ-8.1 - Paints*, *Table 8.2 – Sealants & Adhesives* and *Table 8.3 – Flooring* respectively of the Green Star – Retail (v1) Technical Manual.
Formaldehyde Minimisation	Commit to requiring all engineered wood products (including exposed & concealed applications, but not including exterior applications, formwork, internal car park applications, reused composite wood products, or raw timber) to have low formaldehyde emissions or contain no formaldehyde.
Tenant Exhaust Riser	Design the Commercial Office to include the provision of a general exhaust riser that can be used by tenants to remove indoor pollutants from printing and photocopying areas.

4 Energy & Greenhouse Gas Emissions

4.1 Objectives

The objectives of the expansion with regard to greenhouse gas emissions and energy use are to:

- Design to reduce greenhouse gas emissions of the development compared to conventional design;
- Reduce the peak energy demand;
- Reduce the operational demand for energy through efficient plant and appliances with good management;
- Reduce operational energy costs; and
- Promote awareness of energy efficiency for occupants and the community.

4.2 Sustainability Commitments

Address energy conservation and minimise greenhouse gas emissions of the redevelopment by the following:

Key Goals	Strategies/initiatives

Greenhouse Gas Emissions	The expanded section of the retail centre will target a target greenhouse gas emission reduction of between 25 – 40% as compared to a reference design though a combination of some or all of the following efficiency measures:
	• Building design response in respect to thermal insulative performance, solar control and building sealing;
	• A right sizing approach to heating, ventilation & air-conditioning (HVAC) plant selection and optimised operational strategies to minimise unnecessary energy consumption;
	• Connection to the proposed district energy system.
	• General use of high efficiency lighting through a combination of:
	  • Minimising over illumination;
	  • Optimised controls, including limiting of lighting zoning, time clock, PE cells and appropriate use of presence detectors; and
	  • Luminaire selection, including preferential use of LED lighting to reduce installed lighting power densities.
	• Centralised solar boosted domestic hot water service (DHWS);
	• Efficient vertical transportation; and
	• Integration of on-site power generation.
	Target a minimum 4.5-Star NABERS Energy (Base Building) rating for the Commercial Office building.

Energy Sub-metering	Provide metering and sub-metering to all substantive energy uses (i.e. all energy uses of 100kVa or greater), as well as provide sub-metering separately to each tenancy and have this metering connected to the Building Management System (BMS) so as to provide continual comparison and tracking of actual performance against energy benchmarks.
Car Park	All car park ventilation systems to be CO controlled as well as have variable speed drive (VSD) fans, and for the lighting power density within car park to be at least 20% less than BCA maximum lighting densities allowances.

5 Transport

5.1 Objectives

The objectives of the expansion with regard to sustainable transport are to:

- Reduce dependency on car use;
- Encourage public transport use;
- Encourage low / no emission alternatives such as walking, cycling or carpooling;
- Promote small cars, hybrid and alternative fuel vehicles; and
- Assist Council meet target mode shift of 30% to sustainable transport modes.

5.2 Sustainability Commitments

Address and improve sustainable transport options by the following:

Key Goals	Strategies/initiatives
Public Transport	• Improve the traffic flow of the bus interchange to promote and encourage the use of sustainable transport and reduce private car use. • Improve traffic flow and operational efficiency of the bus interchange; • Provide adequate infrastructure (signal phasing & civil works); • Adopt an advocacy in partnership approach with stakeholders including Council, DELWP, VicRoads and PTV; • Encouraging behaviour change through a combination of Travel Demand Management and Community Engagement; and • Planning Controls, including Car Parking Management and Accessible Infrastructure.
Cyclist Facilities	Encourage cycling as a mode of transport to the Centre by providing patron and visitor bicycle parking distributed around the redevelopment and within 50m of the entrances that exceed statutory requirements as set out in the Manningham Planning Scheme. Complement this with the provision of Retail and Commercial Office staff bicycle parking as well as end of trip facilities to promote cycling to work.
Provision of Parking	The proposed car parking provisions associated with the redevelopment will reflect Council requirements and the prominence of the bus interchange increased to encourage public transport use.
Fuel-efficient Transport	Design new and re-configured car parking within the redevelopment so that preference is given to family friendly parking spots (i.e. parent with pram parking), as well as for small cars, hybrid or alternative fuel vehicles at points of entry to the Centre.
Green Travel Plan	Educate, inform and advise patrons and staff of the sustainable transport options available through the preparation of a Green Travel Plan and integration of real time displays on surrounding public transport options.
Accessibility	Improve connections to surrounding bicycle pathways and pedestrian links to the surrounding community for all forms of mobility (e.g. wheelchair, pram, etc.) to promote alternative forms of sustainable transport.

6 Water

6.1 Objectives

The objectives of the expansion with regard to sustainable use of water resources are to:

- Reduce potable water use during operation;
- Reduce sewer discharges and pressure on local infrastructure;
- Design landscape that is relatively drought resilient;
- Employ efficiency considerations for both demand-side management (e.g. efficiency of fittings); and
- Reduce operational water costs.

6.2 Sustainability Commitments

Maximise water conservation and minimise potable water use by the following:

Key Goals	Strategies/initiatives
Potable Water Reduction	Support Manningham City Council's Water15 Sustainable Water Management Plan and the Yarra Valley Water recycled water scheme, by adopting a strong approach to potable water conservation through the combination of the following: • Selection and use of water efficient fixtures and fittings with the following minimum water efficiencies: ○ Washbasin taps: Timed controlled 6-Star WELS rated; ○ Other taps (except specials): 6 L/min; ○ Showerheads: 3-Star WELS rated; ○ Toilets: 3/4.5 litre flush or 4 star WELS rating; and ○ Urinals: Waterless or 6 star WELS rating; • Connect to and if appropriate expand the existing on-site collection of rainwater for re-use within the redevelopment for both toilet flushing and landscape irrigation.
Water Meters	Provide water metering and sub-metering provisions within the redevelopment to understand the operational water management of substantive water uses within the Centre and have this metering connected to the Building Management System (BMS) so as to provide continual comparison and tracking of actual performance against water benchmarks.
Landscape Irrigation	Adopt the following approach to landscape irrigation: • Minimise irrigation water demand through sensible selection of planting that is indigenous and that are drought tolerant; • Provide low water use irrigation systems such as below ground drip irrigation systems; and • Use rainwater as an alternative water source to minimise potable water use.
Fire System Water	Design new fire services within the Centre to collect, store and re-use 80% of the routine fire protection system test water and maintenance drain downs and fit isolation valves or shut off points for floor by floor testing of the sprinkler system.

7 Materials

7.1 Objectives

The expansion aims to minimise the environmental impact of materials selection using an approach that considers the lifecycle implications in relation to the following issues:

- Embodied energy;
- Eco-preferred content;
- Environmental impacts during product manufacture;
- Toxicity (e.g. PCB's, cadmium, lead);
- Recycled content;
- Forestry practices; and
- Environmental recognition and certification, such as Good Environmental Choice Australia (GECA) materials & products, Forest Steward Certified (FSC) / Australian Forestry Certified (AFS) certified timber, etc.

7.2 Sustainability Commitments

Address environmental impact of materials by the following:

Key Goals	Strategies/initiatives
Recycling Waste Storage	Commit to the provision of a dedicated storage area for the separation and collection of recyclables within the office building and the expansion of the Centre facilities, that: • Are adequately sized to accommodate the proposed expansion; • Meet the access requirements as required by Green Star; • Are suitably located, clearly marked, sign-posted and convenient with guaranteed access route which allows level access from all floors by goods lift, and avoids the need for manual handling of waste.
Sustainable Timber	Not use rainforest timber or old growth timber and use of Forest Steward Certified (FSC), Australian Forest Certified (AFS) and post-consumer recycled timber.
Embodied Energy	To reduce the embodied energy of the construction materials used within the redevelopment by maximising the use of recycled materials or materials with high recycled content. This would include the target use of concrete mixes with reduced absolute quantities of Portland cement as well as steel with high post-consumer recycled content.
PVC Minimisation	Minimise the environmental impact of PVC use within the development by requiring aat least 30% of all PVC used for pipe, conduit and cabling to be sourced from a manufacturer with an accredited ISO14001 Environmental Management System (EMS).

8 Land Use & Ecology

8.1 Objectives

The expansion aims to minimise impacts to or improve the local ecology, more specifically aiming to:

- Provide a socially coherent and community based development;
- Provide a native landscape suited to the local range of biodiversity and climate;
- Control erosion and pollutants in runoff;
- Protect and enhance biodiversity; and
- Minimise heat island effect.

8.2 Sustainability Commitments

Address and improve land use and urban ecology by the following:

Key Goals	Strategies/initiatives
Re-use of Land	As the proposed works represent a combination of refurbishment, building extension and previously built-on the redevelopment would be recognised as meeting the intent of Green Star in respect to building on land that has previously been developed.
Reclaimed Contaminated Land	Commit to responsibly addressing any contamination found in accordance with regulatory requirements and guidelines as part of the expansion.
Heat Island Effect	Minimise the heat island impact effect of the redevelopment through a combination of some or all of the following: • Maximising vegetation and urban landscaping; • Use and selection of cool roof and cool façade materials; • Selection of materials to promote a cool pavement outcome; and • Investigation of options to integrate green roofs.

9 Emissions

9.1 Objectives

The expansion aims to minimise the environmental emission impacts, more specifically aiming to address:

- Watercourse pollution;
- Ozone depletion / global warming; and
- Avoiding of localised emissions (e.g. light, noise pollution and ozone depleting substances).

9.2 Sustainability Commitments

Address and improve emissions by the following:

Key Goals	Strategies/initiatives
Refrigerant Ozone Depletion Potential (ODP)	Commitment to ensure that all Heating, Ventilation & Air-conditioning (HVAC) refrigerants have an Ozone Depleting Potential (ODP) of zero.
Refrigerant Leak Detection	Commit to wherever practical or appropriate HVAC systems containing refrigerants will be contained in a moderately airtight enclosure and a refrigerant leak detection system is installed to cover high risk parts of the plant.
Insulant Ozone Depletion Potential (ODP)	All thermal insulants used in the expansion will avoid the use of ozone depleting substances in both their manufacture and composition.
Stormwater Management	Civil stormwater infrastructure system(s) will meet local Council treatment and filtration requirements prior to discharge to site.
Discharge to Sewer	Reduce expansion outflows to sewer through use of high water efficiency fittings & fixtures.
Light Pollution	Design external and internal lighting within the redevelopment such that: • No light beam, generated from within the building or outside of the building boundary, being directed at any point in the sky hemisphere without falling directly onto a non-transparent surface; • The lighting design complies with Australian Standard AS4282 "Control of the Obtrusive Effects of Outdoor Lighting"; and • 95% of outdoor spaces do not exceed the minimum requirements of Australian Standard AS1158 for illuminance levels. OR • No external luminaire having an upward light output ratio that exceeds 5%; and • The lighting design complies with Australian Standard AS4282 'Control of the Obtrusive Effects of Outdoor Lighting'.

10 Public Realm & Community Infrastructure

10.1 Objectives

The expansion aims to improve the quality of the public realm and community infrastructure by:

- Improve quality of public realm;
- Create places for interaction; and
- Access to information to environmental credentials of the expansion.

10.2 Sustainability Commitments

Strategies to improve the quality of the Public Realm and Community Infrastructure by the following:

Key Goals	Strategies/initiatives
Social Interaction	Create an area for public interaction and meeting place at the reconfigured main entrance to the redeveloped centre.
Landscaping	Maximise vegetative landscape to provide soft barriers and protection to surrounding areas with respect to the visual, noise and operational requirements of the redeveloped Centre.
Information Kiosks	Integrate an educational display on the Centres environmental outcomes as part of the Centres information displays as well as within the lobby of the Commercial Office areas. In addition to providing staff, visitors and patrons with information on the beneficial steps undertaken by the redevelopment in respect to energy conservation / greenhouse gas emissions, water conservation, sustainable transport, etc., the display would also provide guidance and direction on steps that they could take to reduce their own environmental impact through behaviour change.
Internet Accessibility	Provide publicly accessible free Wi-Fi within the new Food Court area within the expansion.

Appendix A – Preliminary Green Star Point Summary

Table 1 – Preliminary Green Star – Retail Centre (v1) Credit Summary

Management (Weighting = 0.67)		Available	Attainable	TBC	Potential
Man-1	Green Star Accredited Professional	2	2		
Man-2	Commissioning Clauses	2	2		
Man-3	Building Tuning	1	1		
Man-4	Independent Commissioning Agent	1	1		
Man-5	Building Guides	2	2		
Man-6	Environmental Management	2	2		
Man-7	Waste Management	2	2		
Man-8	Waste & Recycling Management Plan	2			
Man-9	Building Management Systems	1	1		
	Weight Points	**10**	**10**	**0.00**	**0.00**

Indoor Environmental Quality (Weighting = 0.86)		Available	Attainable	TBC	Potential
IEQ-1	Ventilation Rates	3	1		1
IEQ-2	Air Change Effectiveness	1			1
IEQ-3	Carbon Dioxide Monitoring & Control	1		1	
IEQ-4	Daylight	1		1	
IEQ-5	Thermal Comfort	1	1		
IEQ-6	Hazardous Materials	1		1	
IEQ-7	Internal Noise Levels	1		1	
IEQ-8	Volatile Organic Compounds				
	- Paints	1	1		
	- Adhesives and Sealants	1	1		
	- Flooring	1	1		
IEQ-9	Formaldehyde Minimisation	1	1		
IEQ-10	Mould Prevention	1			
	Weight Points	**12**	**5.14**	**3.43**	**1.71**

Energy (Weighting = 0.89)		Available	Likely	TBC	Possible
Ene-0	Conditional Requirement	-	-	-	-
Ene-1	Greenhouse Gas Emissions	20	5	2	1
Ene-7	Energy Sub-metering	2	2		
Ene-11	Peak Electricity Demand Reduction	2		1	
Ene-12	Car Park Ventilation	3	2		
	Weight Points	**24**	**8**	**2.67**	**0.89**

Transport (Weighting = 0.67)		Available	Likely	TBC	Possible
Tra-1	Provision of Car Parking	2	2		
Tra-2	Fuel-Efficient Transport	2		1	
Tra-3	Cyclist Facilities	3	3		
Tra-4	Commuting Mass Transport	5	2	1	
Tra-5	Trip Reduction	2	1		
	Weight Points	**8**	**5.33**	**1.33**	**0.00**

Water (Weighting = 0.96)		Available	Target	TBC	Possible
Wat-1	Occupant Amenity Water	10	4	2	
Wat-2	Water Meters	3	3		
Wat-3	Landscape Irrigation	1	1		
Wat-4	Heat Rejection Water	8		4	
Wat-5	Fire System Water	1	1		
	Weight Points	**18**	**8.61**	**5.74**	**0.00**

Materials (Weighting = 0.43)		Available	Likely	TBC	Possible
Mat-1	Recycling Waste Storage	3	2		
Mat-2	Building Re-use	6			
Mat-3	Recycled-Content & Re-used Products and Materials	3			
Mat-4	Concrete	3	2		
Mat-5	Steel	2	2		
Mat-6	PVC	2	2		
Mat-7	Sustainable Timber	2	2		
Mat-8	Design for Disassembly	1			
Mat-9	Dematerialisation	1		0.43	
	Weight Points	**10**	**5.65**	**1.94**	**0.00**

Land Use & Ecology (Weighting = 0.88)		Available	Likely	TBC	Possible
Eco-0	Conditional Requirement	-	-	-	-
Eco-1	Topsoil	1			
Eco-2	Re-use of Land	1	1		
Eco-3	Reclaimed Contaminated Land	2		2	
Eco-4	Change of Ecological Value	4	1		
	Weight Points	**7**	**1.75**	**3.50**	**0.00**

Emissions (Weighting = 0.47)		Available	Likely	TBC	Possible
Emi-1	Refrigerant ODP	1	1		
Emi-2	Refrigerant GWP	2			
Emi-3	Refrigerant Leak Detection	2		2	
Emi-4	Insulant ODP	1	1		
Emi-5	Stormwater	3	2		
Emi-6	Discharge to Sewer	4	1		
Emi-7	Light Pollution	1	1		
Emi-8	Legionella	1	1		
	Weight Points	**7**	**2.80**	**1.40**	**0.00**

Innovation (Weighting = 1.00)		Available	Likely	TBC	Possible
Inn	Innovation	10	3	2	1
	Weight Points	**10**	**3.00**	**2.00**	**1.00**

The above credit summary list of predicted preliminary summary of target performance for the expansion against the Green Star – Retail Centre (v1) rating tool is graphically depicted in the following diagram.

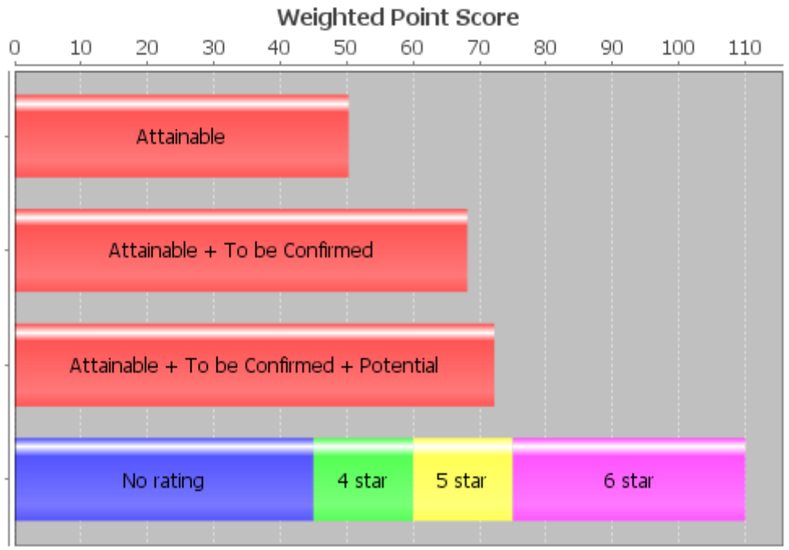

Figure 2 – Graphical Depiction of Weight Point Score

Based on the proposed initiatives being adopted and integrated into the development the following can be concluded from the predicted performance:

- The attainable credits would attain **50.29 weighted points** which is equivalent to a ***4-Star*** or ***Best Practice*** benchmark rating.
- The cumulative performance for the *Attainable* and *To be confirmed* (tbc) weighted points is **68.14 weighted points** which would meet the ***5-Star*** or ***National Excellence*** benchmark requirements. It provides for a good buffer should points be lost as the design response develops and the necessary assessments are carried out to determine available points (e.g. greenhouse gas emission reduction, etc.).
- In addition a number of additional potential sustainability initiatives and strategies have been identified that would offer a potential ***4.07 weighted points***, should further weighted points be needed to get to the desired *National Excellence* benchmark environmental performance.

Westfield Doncaster

Economic Benefits Assessment

March 2016

urbis

URBIS STAFF RESPONSIBLE FOR THIS REPORT WERE:

Director	Simon Rumbold
Associate Director	Brendan Drew
Job Code	MPE1-2277

URBIS
Australia Asia Middle East
urbis.com.au

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Executive Summary

This report presents an Economic and Benefits Assessment for a proposed expansion of Westfield Doncaster. The key findings and conclusions from the analysis are as follows:

- Westfield Doncaster has a leading role for retailing, leisure and entertainment in the east/north east region of Melbourne, and also serves a significant local role in supporting the profile and development of the Doncaster Hill Activity Centre. Scentre Group is proposing to strengthen and enhance the centre's role through a proposed expansion of approximately 61,000 sq.m of leasable floorspace, including 43,000 sq.m of shop floorspace.

- Retail is a dynamic industry that is constantly responding to changing consumer preferences and commercial needs. This is evident in the retail structure surrounding Westfield Doncaster, with major developments under construction or proposed at Eastland, Chadstone, Knox and The Glen. For regional centres such as Westfield Doncaster, it is necessary not only to keep pace with change occurring, but to exceed standards and set new benchmarks, as proposed in the latest expansion scheme.

- Westfield Doncaster serves an extensive and growing trade area population, and also attracts a significant proportion of business from outside this catchment, reflecting the centre's broad regional role. Our analysis indicates that the centre expansion will meet around 35% of additional floorspace requirements over the next decade, leaving ample market capacity for ongoing expansion of other centres.

- It is calculated that the expansion would only have a moderate effect on the market shares achieved by Westfield Doncaster. On completion of the expansion, Westfield Doncaster is forecast to attract a 16% share of total retail spending from its main trade area, with 84% of resident spending continuing to be directed to all other centres and retailers. In relation to the total trade area, the forecast market share is lower at around 10%, with over 90% of resident spending directed elsewhere.

- The results of our analysis are strongly influenced by the broad extent of Westfield Doncaster's trade area. This suggests that the additional turnover generated from the expansion will also be drawn from an extensive area, and hence would not result in any major impacts on single centres and/or locations.

- In relation to new employment generated jobs, we forecast that the proposed expansion will generate:

  - Approximately 2,040 direct construction jobs, based a projected development cost of $500 million.

  - Almost 2,900 new full time and part time workers at the centre on completion of the expansion.

  - A further 5,500 indirect jobs from flow-on employment effects.

- Overall our analysis suggests that the proposed expansion of Westfield Doncaster is appropriate and will have clear economic benefits through:

  - Improving the scale and quality of retailing serving the east/north east region of Melbourne, and allowing Westfield Doncaster to meet changing consumer requirements and trends.

  - Supporting the Westfield centre's role as a catalyst of other development objectives for the Doncaster Hill Activity Centre, as outlined in Council's *Attracting* Economic *Opportunities to Doncaster Hill, Investment Attraction Strategy.*

  - Generating significant employment benefits for the local and broader communities.

  These benefits would be realised without significant adverse impacts on the surrounding centres hierarchy.

Introduction

This report has been commissioned by Scentre Group Ltd. and supports an application to Manningham City Council for the proposed expansion of Westfield Doncaster.

Urbis has relied upon information supplied by Scentre Group, including floorspace and turnover data, plans of the proposed development and estimated investment cost for the proposal.

Urbis has undertaken our own inquiries and investigations in order to assess the economic impacts of the development.

Scentre Group is seeking approval of a new Development Plan that will allow for an expansion and additional improvements to Westfield Doncaster Shopping Centre. Key elements of the proposed development are:

- An extension of the centre towards the north, relocating the existing Myer box and incorporating new lower level retail on the sloping site.
- A new curved mall connecting the two department store anchors.
- Backfilling of some of the existing parking on the Williamson Road (western) side of the centre with additional retail floorspace, and an extension to the cinema complex above.
- A proposed commercial office tower above the shopping centre podium
- Additional carparking and traffic management works.

The plan allows for some 61,000 sq.m of additional floorspace, including an expansion of leasable shop floorspace by approximately 43,000 sq.m (retail, restaurants and cinema) and additional commercial floorspace of some 18,000 sq.m.

The key objectives of this report are to:

1. Provide an overview of the need and demand for the proposal, taking into account the existing performance of the centre and market demand for additional floorspace.
2. Assess how the proposed expansion will enable the centre to compete with other expanding higher order centres, and be the catalyst for further investment in the Doncaster Activity Centre.
3. Quantify key economic benefits associated with the proposed extension/redevelopment of the centre, including direct and indirect employment.

1 Role and Function of Westfield Doncaster

1.1 OVERVIEW

Originally developed in the late 1960's, Westfield Doncaster has emerged as one of Melbourne's leading shopping centres following its last major redevelopment in 2008. This expansion reflected a significant elevation of the centre's offer and role, with key additions including a David Jones department store, Target and Big W Discount Department Stores (DDS) and a major refurbishment and upgrade to other parts of the centre.

Prior to this expansion, Westfield Doncaster was very much an undersized and underdeveloped centre. Redevelopment was proposed for some time, but was delayed over many years due to legacy contractual issues. Over a decade or more the centre's positioning was progressively eroded by the ageing of its own offer as well as ongoing development of competing shopping centres, including Chadstone, Northland, Greensborough and other major centres, which were better aligned with the needs and preferences of Westfield Doncaster's relatively affluent market.

Westfield Doncaster now serves an extensive retail catchment and also attracts some 20% of its custom from outside its natural trade area.

The centre has assumed a primary role for higher order retail needs in the east/north east suburbs, and in many respects has raised the bar for other major shopping centres in the region. This is evidenced by a number of current proposals for major developments at key competing centres, including Chadstone and Eastland. There is now a clear need for Westfield Doncaster to continue to develop and keep pace with this evolving and more competitive market.

In addition to its retail role, Westfield Doncaster also plays an important role in supporting and promoting development in the Doncaster Hill Activity Centre.

Development in the broader Doncaster Hill precinct has substantially progressed over the past decade, including a number of commercial office buildings, several residential apartment projects, additional retail uses and a new Civic Centre. The Westfield centre will perform an important role to underpin the profile and identity of Doncaster Hill as the centre continues to develop in future.

The strategy is for Doncaster Hill to become a leading and diverse mixed-use urban village, including high density housing and employment-generating uses. Council commissioned a 2012 report from SGS Economics and Planning titled *Attracting Economic Opportunities to Doncaster Hill, Investment Attraction Strategy.*

The report recommended six strategies to attract investment and further development of Doncaster Hill. The Westfield Doncaster proposal will facilitate and potentially deliver on several of the strategies:

- **Strategy 2:** Office and showroom complexes on main roads. The office building proposed as part of the development is consistent with this strategy.
- **Strategy 3:** Anchor institutions and businesses. The provision of a substantial sized office building (18,000 sq.m approx.)
- **Strategy 5:** Transport infrastructure investment. A new PTV bus interchange will be part of the development.

1.2 COMPOSITION AND SCALE

Westfield Doncaster currently includes some 123,547 sq.m of leasable floor area, including 104,900 sq.m of retail uses. The turnover achieved by the retail tenants in the centre is in excess of $825 million and places the centre within the Top 10 shopping centres in Australia (*source: Urbis Shopping Centre Benchmarks, 2014*).

In addition to the traditional shopping uses, the centre includes extensive leisure and entertainment facilities, with a 9-screen cinema, a broad range of cafes and restaurants and a gymnasium.

Existing and Proposed Floorspace

WESTFIELD DONCASTER TABLE 1

Tenant Type	Existing sq.m	Existing % total	Proposed Increase sq.m	Total Proposed sq.m	Total Proposed % total
Department Store	33,427	27%	0	33,427	18%
Discount Department Store	15,796	13%	5,000	20,796	11%
Supermarket	8,460	7%	0	8,460	5%
Other Majors	3,900	3%	0	3,900	2%
Total Majors	61,583	50%	5,000	66,583	36%
Mini Majors	8,737	7%	24,210	32,947	18%
Speciality Shops	37,773	31%	12,790	50,563	27%
- Retail	*34,581*	*28%*	*12,790*	*47,371*	*26%*
- Non-Retail [1]	*3,193*	*3%*	*0*	*3,193*	*2%*
Cinema	5,208	4%	1,000	6,208	3%
Other Non-Retail[2]	6,988	6%	0	6,988	4%
Total Centre	**120,289**	**97%**	**43,000**	**163,289**	**88%**
Offices	3,258	3%	18,000	21,258	12%
Total Property	**123,547**	**100%**	**61,000**	**184,547**	**100%**
Total Retail (excl. cinemas)	***104,900***	***85%***	***42,000***	***146,900***	***80%***

1. Non-retail includes shopfront uses such as travel agents, banks/financial institutions, health insurance, post offices.
2. Other non-retail includes non-shopfront uses such as kids play/entertainment centre, bowling, amusements gyms/fitness centre, library, childcare etc.
Source : Urbis

2 Hierarchy of Centres in the Region

Residents of the north-eastern region of Melbourne are well served by a range of shopping centres. The major shopping centres are listed in Table 2. Neighbourhood and local centres are also distributed throughout the residential districts, and are not listed in this table.

It is notable that there are seven regional-scale shopping centres in the broad surrounding region, stretching from Northland and Greensborough in the northern suburbs, Westfield Doncaster and Eastland in the north-east with Knox, The Glen and Chadstone located in the eastern suburbs. A summary of the key centres is as follows:

- **Chadstone** is the largest suburban shopping centre in Melbourne, serves an extensive catchment and benefits from a relatively central location in Melbourne's south-eastern suburbs. The centre is around 12 km south of Westfield Doncaster and is currently undergoing a major expansion which will increase total retail floorspace to around 170,000 sq.m. While the Chadstone Activity Centre only comprises the shopping centre at present, the centre's owners are seeking to leverage the location and profile of Chadstone to develop an A-grade office tower and a hotel. In a retail context, Chadstone is a key competitor to Westfield Doncaster and its positioning will strengthen further following its expansion.

- **Eastland** is located in the Ringwood Activity Centre, approximately 12 km east of Westfield Doncaster. The centre is currently completing a significant 47,000 sq.m expansion, which will include, among other uses, a second department store (David Jones) and a new 'Town Square' precinct. Approval has also been granted for office space and a hotel, comprising a further 25,000 sq.m. A Costco mega store opened on the former market site in November 2013. The expanded Eastland/Ringwood centre will be highly competitive with Westfield Doncaster, and will support the ongoing development of Ringwood as a Metropolitan Activity Centre.

- **Northland** is located approximately 11 km north of the Melbourne CBD on Murray Road, Preston. The main catchment served by Northland is smaller than most regional centres due to its relatively poor regional access, with the centre not served by any major highways/freeways. Outside of the shopping centre, the broader Activity Centre includes a sizeable bulky concentration, but little in the way of non-retail employment.

- **Greensborough** is located approximately 20 km to the north east of Melbourne's CBD. The Activity Centre is easily accessible via arterial roads and the northern metropolitan ring road, which provides regional access. The centre is based on DDS majors and serves a sizeable sub-regional catchment.

- **The Glen** is located in Glen Waverley, approximately 20 km east of the Melbourne CBD, and comprises around 59,000 sq.m of retail floorspace. The Glen Waverley Activity Centre has a number of notable attributes, including strong road and public transport linkages. The role of the centre is limited by strong competitors. FDC recently lodged a development application for a $500 million expansion that would increase floorspace by around 17,000 sq.m.

- **Knox Activity Centre** includes the Westfield Knox Shopping Centre and is a commercial and community hub to Melbourne's outer eastern suburbs. The shopping centre is around 18 km south east of Westfield Doncaster and comprises 142,000 sq.m, including a sizeable entertainment and leisure precinct and large format retailing, and additional expansion of the centre is proposed. The centre predominantly serves local residents with daytime workers, although there is a small external office precinct onsite at Westfield Knox. The region served by the Knox Activity Centre is largely separate from the Westfield Doncaster trade area.

The region also includes a number of sub-regional shopping centres serving the intermediary retail requirements of local residents, including **Forest Hill Chase, Victoria Gardens, Stockland The Pines** and **Burwood One.**

Of note, **Box Hill** is a designated Metropolitan Activity Centre some 5 km south of Westfield Doncaster. Planning policy has always recognised Box Hill as an important mixed-use location. The activity centre includes hospitals, tertiary education institutions and state government and private sector offices. The key attributes of the centre include strong road and public transport linkages, good proximity to the CBD and diversity of uses/activities. However, the capacity for Box Hill to support a regional-scale shopping centre has always been naturally constrained by other competing centres in the region developing earlier, and land availability.

TABLE 2 – MAJOR SHOPPING CENTRES IN EAST/NORTH EAST MELBOURNE

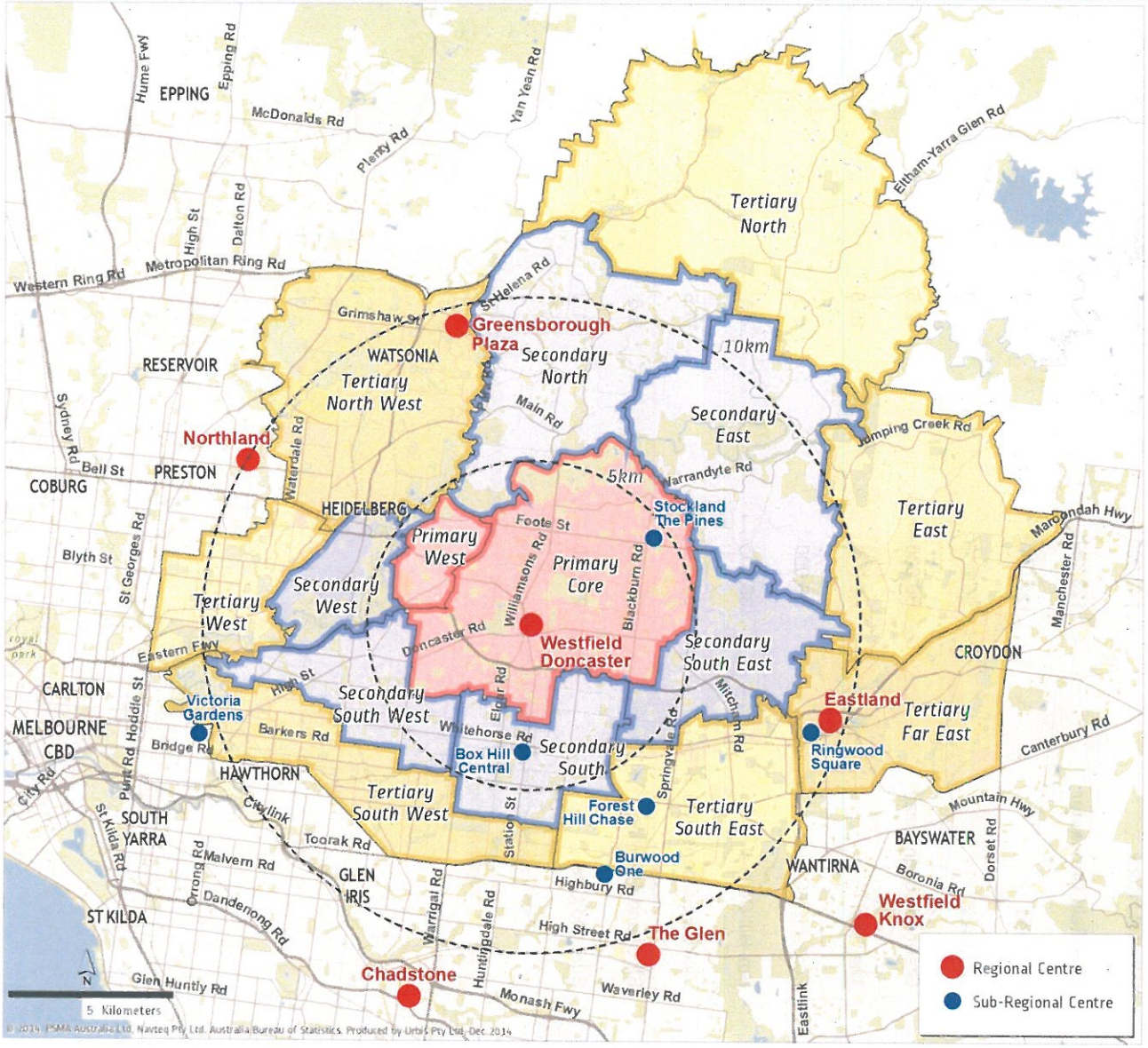
CENTRE	FLOORSPACE (SQ.M)[1]	DISTANCE FROM WESTFIELD DONCASTER (KM)[2]
Chadstone	170,000*	14.0
Westfield Knox	142,000	18.5
Westfield Doncaster	**123,547**	-
Eastland	122,000*	12.0
Northland	95,000	12.0
Greensborough Plaza	60,000	12.5
The Glen	59,000	15.5
Forest Hill Chase	58,000	9.5
Box Hill Central	38,000	4.5
Victoria Gardens (incl. IKEA)	55,000	11.5
Stockland The Pines	25,000	8.5
Burwood One	27,000	11.0

* *Floorspace on completion of current expansion.*

1. *Floorspace is approximate Gross Leasable Area and includes retail and non-retail uses*
2. *Distance by road*

WESTFIELD DONCASTER TRADE AREA AND LOCATION OF COMPETITION CENTRES

MAP 1



It is clear that the regional retail landscape is constantly evolving and changing. Growth in demand is generated by a combination of new population and increasing spending as household incomes and wealth grow over time.

Shopping centres compete for the consumer dollar and are constantly seeking to improve their offer through improvements to the facilities offered, changes in the mix of tenants in the centre, introducing new retailers and expanding the range of retail and other support facilities offered to customers. This process of constant improvement has brought benefits to consumers as well as broader economic benefits through investment and employment.

The maintenance of competitive tension between different centres is an important and necessary part of the market dynamic that drives the success of our economy.

In this context, it is unsurprising to see expansion and improvement of major shopping centres occurring in the Westfield Doncaster trade area and the surrounding region. Table 3 illustrates the range of developments for a number of the major shopping centres relevant to the trade area.

TABLE 3 – PROPOSED DEVELOPMENTS

CENTRE	FLOORSPACE INCREASE (SQ.M)[1]	DETAIL
Eastland	+47,000 sq.m, Under Construction	$325 million expansion. Adding David Jones, +150 shops/mini majors, new dining precinct, community facilities and carparking
Eastland	+25,000 sq.m, Approved	Second stage to include a 25,000 sq.m office tower and a hotel.
Ringwood	+14,500 sq.m, Completed	New Costco store opened on the former Ringwood market site in November 2013.
Chadstone	+34,000 sq.m, Under Construction	Expansion including new mini majors and specialty shops, a revamped entertainment and leisure precinct, and a separate 17,000 sq.m office tower.
Chadstone	sq.m unknown, Approved	New 11 storey hotel with 216 rooms, ancillary restaurant and conference centre.
Westfield Knox	+45,000 sq.m, Approved	Major expansion, including new mini majors and specialty shops, a new fresh food precinct, offices and a library
The Glen	+17,000 sq.m Proposed	$500 million expansion proposed to include new-to-market international retailers and a new Town Square.
Northland	Completed	Recent works included upgraded entertainment precinct, a health club, additional tenancies and expansion to fresh food hall.
Greensborough	-	Improvements to entertainment and leisure precinct.

3 Changes in Shopping Centres

Retail is a dynamic industry that needs to respond and evolve to the changing patterns of consumer behaviour, distribution, and business requirements. In this regard, the subject proposal will enable Westfield Doncaster to maintain its position and role as one of the leading shopping destinations in Melbourne.

When considering the need for upgrade and expansion of the Westfield Doncaster centre, it is relevant to consider some of the major trends occurring in the Australian retail market and how the development proposal relates to these trends.

Urbis considers there are four key trends that should be considered as context:

1. International Retailers. The entry of new international retailers to the Australian market. These include brands such as Zara, Topshop, Uniqlo, H&M, Forever 21, Williams-Sonoma, River Island, Victoria's Secret, Sephora, Muji, Apple and Samsung others are mooted to follow. Many of these international retailers require large tenancies in the range 500-2000 sq.m in size.

2. Food and Beverage. The continuing trend for Australians to eat out of home, for convenience or entertainment. Spending on food and beverage has been the fastest growing category of retail sales in Australia for the past five years. This trend has seen the opening of many new cafes and restaurants across Melbourne.

3. Mixed Use development. Australia is adopting the international trend towards mixed use development, where retail is part of integrated projects which can include residential, hotel, office, medical, education, leisure and community uses. The benefits of this form of development can be significant and include proximity of people to jobs and services, increased usage of public transport, multipurpose trips to centres, shared use of infrastructure and more efficient use of land in key locations.

4. Decentralised Employment. The Victorian Government has long promoted the decentralisation of jobs in suburban locations. The most recent planning strategy *Plan Melbourne* highlights the need to

> *"... bring forward employment opportunities in outer areas by advancing major planned investments, by planning for the associated infrastructure and investment necessary to leverage off investments, by building on comparative strengths in service-sector employment, by supporting subregions to attract investment, and by connecting outer areas to existing employment locations[1]." (p46)*

The proposed development of Westfield Doncaster is highly relevant and responds to each of these trends in the planned provision, composition and layout of the scheme. The following table provides further commentary.

[1] Plan Melbourne, Metropolitan Planning Strategy, Victorian Government 2014

MARKET TREND	WESTFIELD DONCASTER OPPORTUNITY
International Retailers	As one of Melbourne's largest and high profile shopping centres, Westfield Doncaster will be a preferred location for a number of new international retailers. The centre will need to accommodate larger tenancies, including the potential for multi-level tenancies, with double height frontages. These retailers can be located in a specific precinct which attracts shoppers and promotes new sales potential.
Food and Beverage	Shopping centres are becoming some of the most successful food and beverage destinations in major cities. The previous expansion of Westfield Doncaster incorporated a new food court and some restaurants. The potential is now to elevate this offer with a larger, more diverse range of cafes and restaurants in a modern architectural setting.
Mixed Use	Westfield Doncaster already includes some mixed use elements, such a gym/health club, a small office tower medical consulting rooms and cinemas. Additional expansion could accommodate hotel, office and medical uses.
Decentralised Employment	An expansion of the centre will create the opportunity for a more substantial office tower, which in turn will attract further employment to the Doncaster Hill precinct. Co-location with the shopping centre and other local facilities is a positive attractor for employers in either the public of private sector. Job numbers are addressed later in this report.

4 Trade Area Analysis

4.1 CATCHMENT

As noted in the previous section, the key competitors to Westfield Doncaster are generally more than 12 km from the centre. This fact, combined with the overall strength and appeal of the centre's offer, allows Westfield Doncaster to serve a broad catchment, as illustrated in Map 1 earlier.

The trade area extends well over 10 km in most directions, and around 7 km to the south where competition is stronger with Chadstone and The Glen.

A notable feature of Westfield Doncaster's trade area is the large tertiary catchment. This reflects the fact that the centre is also a popular alternative shopping destination for many residents served by a closer major shopping centre. Again this reflects the quality and appeal of Westfield Doncaster as one of Melbourne's leading centres for discretionary shopping, entertainment and leisure activities.

4.2 CATCHMENT POPULATION

As at June 2014, there were approximately 690,000 people living within the Westfield Doncaster trade area. This total includes around 114,000 people in the primary trade area and 317,000 people in the main trade area (i.e. combined primary and secondary). *[refer Table 4]*

Compared to benchmark norms, Westfield Doncaster's total trade area is around 80% larger than the average for regional centres nationally, while its main trade area is 31% larger than the average.

Furthermore, the trade area has recorded sound rates of population growth for a number of years, driven by increasing density of new housing and infill development in selected locations.

We have derived population forecasts for the trade area based on the latest Small Area Forecast Information (SAFI) as provided by forecast.id. The forecasts are broadly consistent with recent trends, and the key points to note are:

- Over the next decade, the primary trade area is forecast to increase by around 11,000 people, reflecting growth of 1% per annum. A portion of this growth will be driven by ongoing high density development in the Doncaster Hill Activity Centre and the redevelopment of the former Eastern Golf Club land.
- From 2014 to 2024, the main trade area is forecast to increase from 319,000 people to 343,000 people (+24,000 people), with a further 31,000 people forecast to be added to the tertiary trade area.
- The forecast population of 750,000 people in the total trade area in 2024 reflects an overall increase of almost 56,000 people, or +8%.

Trade Area Population, 2014-2024

WESTFIELD DONCASTER — TABLE 4

	Population			Avg. Growth p.a.		Avg. Growth p.a.	
	2014	**2019**	**2024**	**2014-19**	**2019-24**	**2014-19**	**2019-24**
Primary Trade Area	114,470	120,380	125,640	1,182	1,052	1.0%	0.9%
Secondary Trade Area	204,190	211,060	217,620	1,374	1,312	0.7%	0.6%
Main Trade Area	**318,660**	**331,440**	**343,260**	**2,556**	**2,364**	**0.8%**	**0.7%**
Tertiary Trade Area	375,290	391,660	406,510	3,274	2,970	0.9%	0.7%
Total Trade Area	**693,950**	**723,100**	**749,770**	**5,830**	**5,334**	**0.8%**	**0.7%**

1. As at June

Source : ABS; Forecast.id Small Area Forecast Information (SAFI); Urbis

With ongoing population growth, there is a requirement to develop more retail floorspace to service the growing needs of local residents. Using a high level approach of applying the national retail floorspace benchmark of 2.2 sq.m per capita to the forecast population increase:

- It is expected that new residents in the trade area will generate demand for **an additional 123,000 sq.m of retail floorspace**.

- The proposed increase in shop floorspace at Westfield Doncaster (43,000 sq.m) represents around 35% of this future additional demand.

Accordingly, the population forecasts suggest that 65% of new demand will need to be fulfilled by developments/expansions at other centres and locations in the region. A portion of this demand will be met by the centres detailed earlier where expansions are already proposed or underway, although these centres also serve markets outside the trade area. As such, these expansions will only meet some of the additional demand requirement in Westfield Doncaster's catchment.

Importantly, the numbers indicate that the proposed expansion at Westfield Doncaster will not constrain the ability for other centres and shopping locations to continue to grow and develop over the next decade.

5 Market Share Analysis

In the year ended December 2014, Westfield Doncaster generated turnover of $825 million (incl. GST). Based on the centre's estimated distribution of trade, as informed by Scentre Group's internal research, it is estimated that approximately $516 million of this turnover was drawn from residents in the main trade area, and $666 million from the total trade area.

In Table 5, the centre turnover is compared with the estimated amount of retail spending generated by trade area residents. The turnover achieved by Westfield Doncaster reflects an 11.5% market share in the main trade area and a 6.8% share in the total trade area. In view of this, the numbers suggest the following:

- Almost 89% of spending by main trade area residents is directed to locations other than Westfield Doncaster, or other retail mediums such as online. Competing larger centres, such as Ringwood and Chadstone, and local supermarket-based shopping centres would capture a share of this spending.
- A higher 93% of spending by total trade area residents is directed to other retail locations and formats.

TABLE 5 – CURRENT MARKET SHARES, WESTFIELD DONCASTER

	MAIN TRADE AREA	TOTAL TRADE AREA	TOTAL CENTRE
Retail turnover (YE December 2014, incl. GST)	$516 million	$666 million	$825 million
Trade area resident spending	$4.49 billion	$9.75 billion	-
Westfield Doncaster market share	**11.5%**	**6.8%**	-

In relation to the proposed expansion, we estimate that the development will increase Westfield Doncaster's retail turnover by around $330 million in 2019 (this amount includes GST but excludes the effects of inflation).

As a general indication of the market share that would result from this turnover increase; if $330 million were to be added to the centre's current turnover, and it is assumed that the centre maintains its current turnover distribution:

- Westfield Doncaster's market share from the main trade area market would increase by around 4.6 percentage points to 16.1%. Therefore 84% of resident spending would continue to be served by all other centres and retailers.
- The centre's market share from the total trade area would increase by only 2.7 percentage points to 9.6%, with over 90% of resident spending continuing to be directed elsewhere.

(In reality, Westfield Doncaster's post-development market shares will be lower than indicated above, as they do not account for the effects of new competition and other factors that will impact Westfield Doncaster's shares in the short term.)

The indicative market shares demonstrate that the additional turnover achieved by Westfield Doncaster is expected to result in a moderate increase in the centre's market share. This is due to the centre's extensive trade area, which suggests that additional turnover will also be drawn from a broad area and not result in any acute impacts on single centres and/or locations across the region.

Similarly, the expansion is not expected to have any significant impacts on local shopping centres in Manningham. These smaller centres, including Macedon Square, Devon Plaza, Stockland The Pines, Bulleen Plaza and Tunstall Square, have a very different role to that of Westfield Doncaster, serving localised catchments and sourcing the majority of their business from supermarket and other convenience-related spending.

While Westfield Doncaster also serves a role for daily/weekly shopping needs in Manningham, offering two supermarkets and a broad range of fresh food and convenience retailing, the centre attracts different types of visits due to its extensive offering. The centre has greater appeal for high spend shopping trips, (which are generally less frequent), while smaller centres attract more regular usage due to their relative convenience in terms of access, parking and proximity to local residents. Accordingly the proposed expansion to Westfield Doncaster is not expected to have notable impacts on smaller centres, in view of the following:

- The expansion will not alter the current role and competitive position of Westfield Doncaster to any significant extent, nor the relative strengths of the smaller centres.

- Any additional business achieved by Westfield Doncaster from food and convenience spending would likely be drawn from a broad area, reducing potential impacts on single centres and locations.

This report does however note the potential for slightly higher impacts on Stockland The Pines, which has an offer serving some basic discretionary shopping needs for residents to the north east of Doncaster. However, it is highly likely that the vast majority of new retailing added to Westfield Doncaster as part of its expansion will not compete directly with retailing at Stockland The Pines.

6 Employment Generated

Retail is an important sector in the Australian economy, and provides benefits in terms of generating new employment, both full-time and part-time. Retail is also a leading employer of younger workers and females.

Westfield Doncaster, including the office tower, currently employs around 3,500 workers, or some 2,480 full-time equivalent (FTE) jobs based on industry benchmarks. As a ratio of the centre's current leasable floorspace, this reflects around 28 workers or 20 FTE per 1,000 sq.m.

In relation to employment in Manningham:

- The unemployment rate stood at 5.9% as at March 2015, less than the Australian rate of 6.1%.
- 46% of people who work in the municipality also reside in Manningham. For the retail sector this is 39% based on 2011 Census data.

With nearly half of local workers also living locally, the subject proposal will assist in generating further employment opportunities for local residents.

The proposed development will also generate additional jobs in the broader economy. Hence the new employment generated will generally fall in one of three categories;

1. Direct Employment – during the construction phase
2. Direct Employment – ongoing jobs in the expanded shopping centre
3. Indirect Employment – in supplier industries and the broader economy

The employment and multiplier forecasts are based on input-output analysis as published by the Australian Bureau of Statistics, indexed for change in prices over time.

Direct Employment – Construction

Based on an estimated development cost of $500 million, the direct employment generated by construction of the project is estimated at 1,760 jobs (1,600 FTE based on construction industry benchmarks). Scentre Group has indicated that this construction cost is likely to be a conservative estimate; therefore the actual number of jobs generated could be higher than shown in Table 6.

Direct Employment from Construction

WESTFIELD DONCASTER TABLE 6

Development option/ Type of Employment	Cost of Construction ($M)	Jobs per $1M Invested	Direct Jobs[1]
Construction Phase	500	3.53	1,760

1. Equivalent 12 month employment, including full-time, part-time and casual positions.

Source: Urbis

Direct Employment – Ongoing Jobs

The expansion scheme incorporates an additional 61,000 sq.m of leasable floorspace, as shown in Table 7.

The employment generated by the range of uses in the expanded centre will vary according to each use. For example, specialty shops and offices support relatively high levels of employment, while uses such as cinemas, gyms and department stores require fewer employees per unit area.

Based on the composition of new floorspace, it is estimated that the development floorspace would generate ongoing employment of almost 2,900 full time and part time workers (2,170 FTE based on the retail/office composition of the additional floorspace).

The forecast direct employment reflects a ratio of around 47 workers per 1,000 sq.m of floorspace. This is higher than the current ratio, with a significant proportion of the new floorspace dedicated to uses with high worker ratios, particularly high density forms of retailing and the planned office space. at 40-60 jobs per 1,000 sq.m.

Direct Ongoing Employment

WESTFIELD DONCASTER — TABLE 7

Type of Use	Employment Per '000 Sq. m Rate Applied	Centre Expansion Incremental[1] GLA (Sq.m)	Jobs (Persons)
DDS(s)	23.5	5,000	120
Mini-Majors	40.8	24,210	990
Specialty Shops	60.7	12,790	780
Cinema	4.0	1,000	4
Office	55.6	18,000	1,000
Total Property[2]	**47.4**	**61,000**	**2,894**

1. Takes into account reduced vacancies

2. Includes non-retail and external components. Excludes additional management, cleaning & security staff

Source : Urbis

Indirect Employment

In addition to the direct jobs the development also creates wider, indirect benefits for the economy (measured in the form of indirect jobs). These jobs arise from the required inputs to construction and ongoing operation of new facilities, which need to be created to fuel demand, as well as the wages earned by people working on the construction and ongoing development of Westfield Doncaster. Wages then earned in production in other industries induce additional demand and further output, which again induces further employment in other industries.

As shown in Table 8, indirect employment arising from the production and consumption induced employment effects is estimated at:

- Around 2,770 jobs for the equivalent of 12 months from direct construction employment (around 2,280 FTE).
- Approximately 2,300 ongoing positions from direct centre employment (1,890 FTE).

Direct and Indirect Employment

WESTFIELD DONCASTER TABLE 8

Type of Employment and Use	Direct Employment	Supplier Employment *Multiplier Effects*	Total Jobs
Construction Phase[1]	1,760	2,770	4,530
Centre Employment Increase[2]	2,894	2,300	5,194

1. Equivalent 12 month employment, including full-time, part-time and casual positions.
2. Ongoing jobs as a result of the proposed expansion (i.e. the floorspace increase)

Overall, the analysis suggests that the proposal will have a significant positive effect on employment levels, from both the construction process (1,760 positions on site and 2,770 positions throughout the broader economy, both for the equivalent of 12 months) and the expanded range of uses in the centre (2,894 direct positions and 2,300 positions throughout the broader economy).

We also note that Council has sourced additional economic analysis from Remplan, including estimation of employment generation from the Westfield Doncaster project.

The Remplan analysis provides some different results to those outlined in this report, including for Direct Jobs from the estimated construction value of $500 million (1,196 jobs, versus 1,760 in this report) and indirect jobs from multiplier effects. Overall Remplan's total estimates for Direct and Indirect Jobs are:

- From the construction phase, 2,847 positions (versus 4,530 in this report).
- From Centre Employment, between 3,786 and 4,201 positions (versus 5,194 positions in this report).

These variations are a product of different inputs and assumptions. For Direct Construction Employment, Urbis has relied on input-output analysis published by the ABS. The most recent ABS data was published in 1997, and we have therefore indexed the results to reflect both increased productivity and price change in the construction sector over time.

For Indirect Employment, Urbis has sourced multiplier assumptions directly from the ABS. While we note this information has not been updated for a number of years, we believe the data still provides reasonable and comprehensible estimates for Indirect Employment and have no reason to doubt its accuracy to this point in time.

The Remplan analysis appears to be based on their own independent modelling tools for Construction and Indirect Employment. While it is not known how these tools have been developed, this report acknowledges there are multiple approaches and techniques used across the industry to derive estimates of employment generation.

From both analyses, it remains clear that the proposed development will have a significant positive effect on employment levels directly as a result of the shopping centre expansion and the associated benefits in the wider economy.

Disclaimer

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This report has been prepared with due care and diligence by Urbis and the statements and opinions given by Urbis in this report are given in good faith and in the reasonable belief that they are correct and not misleading, subject to the limitations above.

Sydney
Tower 2, Level 23, Darling Park
201 Sussex Street Sydney, NSW 2000
t +02 8233 9900
f +02 8233 9966

Brisbane
Level 7, 123 Albert Street
Brisbane, QLD 4000
t +07 3007 3800
f +07 3007 3811

Melbourne
Level 12, 120 Collins Street
Melbourne, VIC 3000
t +03 8663 4888
f +03 8663 4999

Perth
Level 1, 55 St Georges Terrace
Perth, WA 6000
t +08 9346 0500
f +08 9221 1779

Australia • Asia • Middle East
w urbis.com.au **e** info@urbis.com.au

Westfield Doncaster Master Plan
Integrated Transport & Access Plan

Client //	Scentre Group
Office //	VIC
Reference //	15M1090000
Date //	14/04/16

Westfield Doncaster

Master Plan

Integrated Transport & Access Plan

Issue: B 14/04/16

Client: Scentre Group
Reference: 15M1090000
GTA Consultants Office: VIC

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A-Dr	26/06/15	Draft for Council Issue	Joshua Haigh	Andrew Farran / Fabian Guadagnuolo	John Kiriakidis	-
A	23/10/15	Final	Joshua Haigh	Andrew Farran	John Kiriakidis	JK
B	14/04/16	Final	Joshua Haigh	Andrew Farran	John Kiriakidis	

GTAconsultants
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Executive Summary

A Master Plan is being developed for a proposed expansion of Westfield Doncaster Shopping Centre in support of further growth and development between 2015 and 2031.

The Master Plan seeks to increase the retail floor area of Westfield Doncaster by up to 43,000sqm from a total of 120,000sqm (existing) to a potential 163,000sqm (future). In addition, it is proposed to provide approximately 18,000sqm of commercial floor area.

The proposal will involve a significant investment in public transport and active travel infrastructure including an expanded bus interchange, new pedestrian and cyclist connections between the Shopping Centre and the surrounding Doncaster Hill precinct.

The proposal will also be accompanied by modifications to vehicle access arrangements, an increase in parking at the Centre for cars, bicycles, and the provision of associated new loading areas.

The car parking provision is proposed to increase from 5,338 to approximately 7,300 car spaces, car parking for the retail uses will be provided a greater rate than the current parking provision.

A comprehensive multi-modal transport modelling assessment has been completed as part of the Master Plan review including an updated analysis for the further and future development of Doncaster Hill at full build. The modelling assessment considered various modifications on the transport network including but not limited to:

1. An upgraded and relocated northern Shopping Centre access on Williamsons Road.
2. A new independent and signalised access for the exclusive use of public transport on Williamsons Road between the new northern and existing southern Shopping Centre access points.
3. A modified Doncaster Road / Fredrick Street intersection which removes the existing traffic signals and replaces them with a pedestrian operated signal system, west of Fredrick Street. Vehicular access at Fredrick Street will be limited to left-in / left-out only.
4. An upgrade of the Williamsons Road, Doncaster Road and Tram Road intersection which incorporates a third right turn lane on the north approach from Williamsons Road into Doncaster Road.

The transport evaluation completed for the Doncaster Hill precinct as part of this study indicates that the intersection of Williamsons Road, Doncaster Road and Tram Road operates as the control, limiting the overall capacity of the transport network.

This study proposes modifications at the Williamsons Road, Doncaster Road and Tram Road intersection that generally deliver improved transport operating conditions between the full build Doncaster Hill and Westfield Doncaster Master Plan development stages (the exception being the PM peak hour where there is a minor deterioration in the network operation)[1]. In fact, the resultant (proposed) transport infrastructure package proposed under the Master Plan delivers an outcome which supports a collective, precinct wide monetary contribution to improvements made between the 2031 scenario with and without the Westfield Master Plan development.

Further discussions are warranted between the Applicant and key stakeholders to explore options and mechanisms which might support the future funding of select transport works.

[1] For analytical purposes modelling contemplates full build of Doncaster Hill before superimposing projected increased in transport demand associated with the proposed Westfield Doncaster Master Plan.

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1. Introduction

1.1 Background

A Master Plan is being developed for a proposed expansion of Westfield Doncaster Shopping Centre ('the Centre').

The Master Plan seeks to increase the retail floor area of Westfield Doncaster by 43,000sqm from a total of 120,000sqm (existing) to 163,000sqm (future). In addition, it is proposed to provide approximately 18,000sqm of commercial floor area (for a total equal to 181,000sqm).

This floor area increase is to be accompanied by modifications to vehicle access arrangements to the Centre, the creation of a new bus interchange, an increase in parking at the Centre for cars and bicycles, and the provision of associated new loading areas. Further discussion and detail regarding the development proposal is outlined in Section 4 of this report.

GTA Consultants (GTA) has been engaged by Westfield Limited to assess the traffic and transport implications of the proposal including existing and future public transport, active travel and private vehicle transport modes.

1.2 Purpose of this Report

The report sets out an assessment of the anticipated parking, traffic and transport implications of the proposed development, including consideration of the:

i existing transport and parking conditions of the Centre
ii anticipated transport conditions under full development of the Doncaster Hill precinct as envisaged by the City of Manningham (as a function of predicted land use)
iii the adequacy of the proposed pedestrian, bicycle and public transport access arrangements to the Centre
iv the adequacy of the proposed bicycle parking arrangements in terms of supply (quantum) and layout
v the adequacy of the estimated car parking provision
vi the adequacy of the principles underpinning the proposed car park layout
vii the adequacy of the proposed arrangements for loading and waste collection
viii the acceptability of the transport impacts of the proposed development, including the need for mitigating road works and appropriate vehicular access.

1.3 References

In preparing this report, reference has been made to the following:

- Manningham Planning Scheme
- Australian Standard / New Zealand Standard, Parking Facilities (AS2890)
- traffic and car parking surveys undertaken by GTA Consultants as referenced in the context of this report
- an inspection of the site and its surrounds
- other documents as nominated.

2. Existing Site Context & Transport Conditions

2.1 Subject Site

2.1.1 Location

The Centre is located on a parcel of land at the north-eastern corner of Williamsons Road and Doncaster Road in Doncaster, within an *Activity Centre Zone – Schedule 1 (AC1Z)* and currently comprises in the order of 120,000sqm of floor area served by some 4,782 car parking spaces. A recent planning approval will increase car parking on the subject site by a further 556 car parking spaces and result in an expanded supply equal to 5,338 car parking spaces. This expanded supply is expected to be available and active by the end of 2015.

Vehicular access to the Centre is provided to both Doncaster Road and Williamsons Road via a total of four signalised access points. A bus interchange is provided within the Centre (along the Williamsons Road frontage) which accommodates 12 existing bus routes which service the Centre and surrounding area.

The surrounding properties are predominately commercial, with residential land use located north and east of the Centre.

The subject site and its surrounds are shown in Figure 2.1, with the surrounding land use zoning shown in Figure 2.2.

Figure 2.1: Subject Site and Surrounds

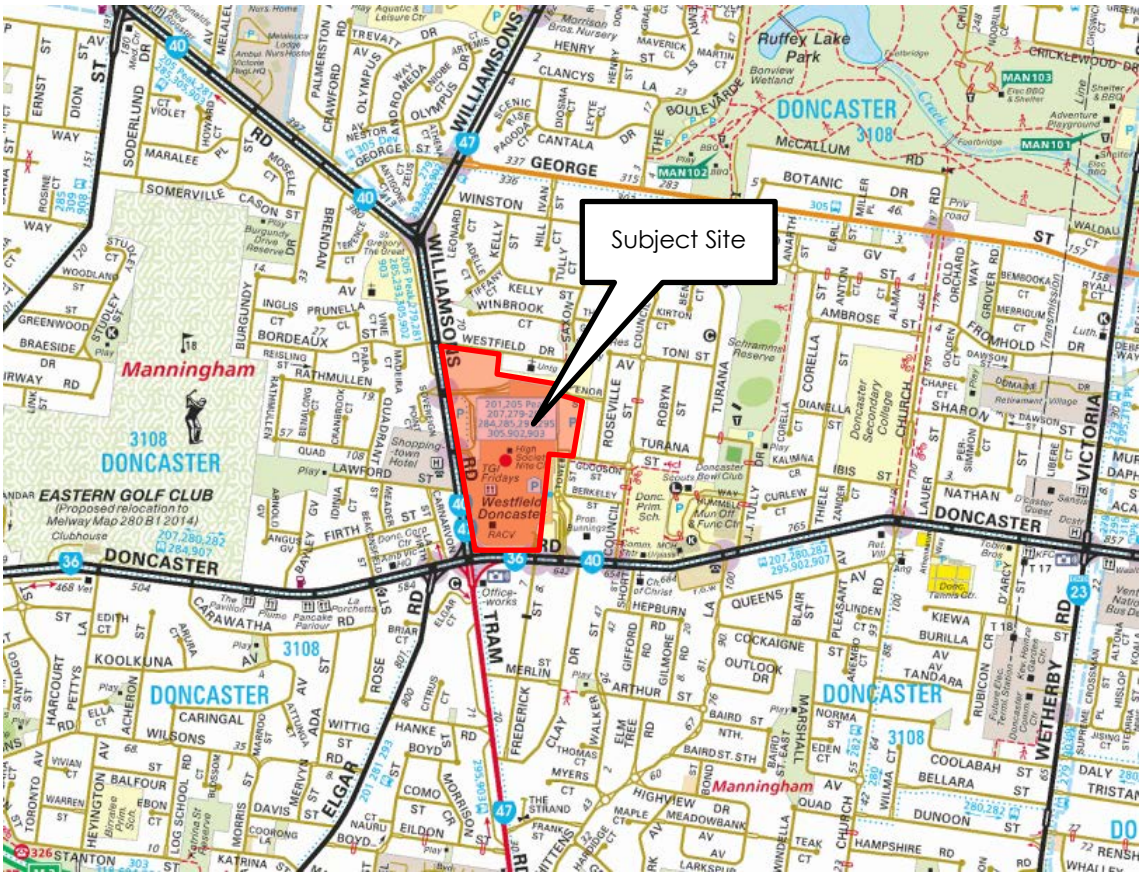
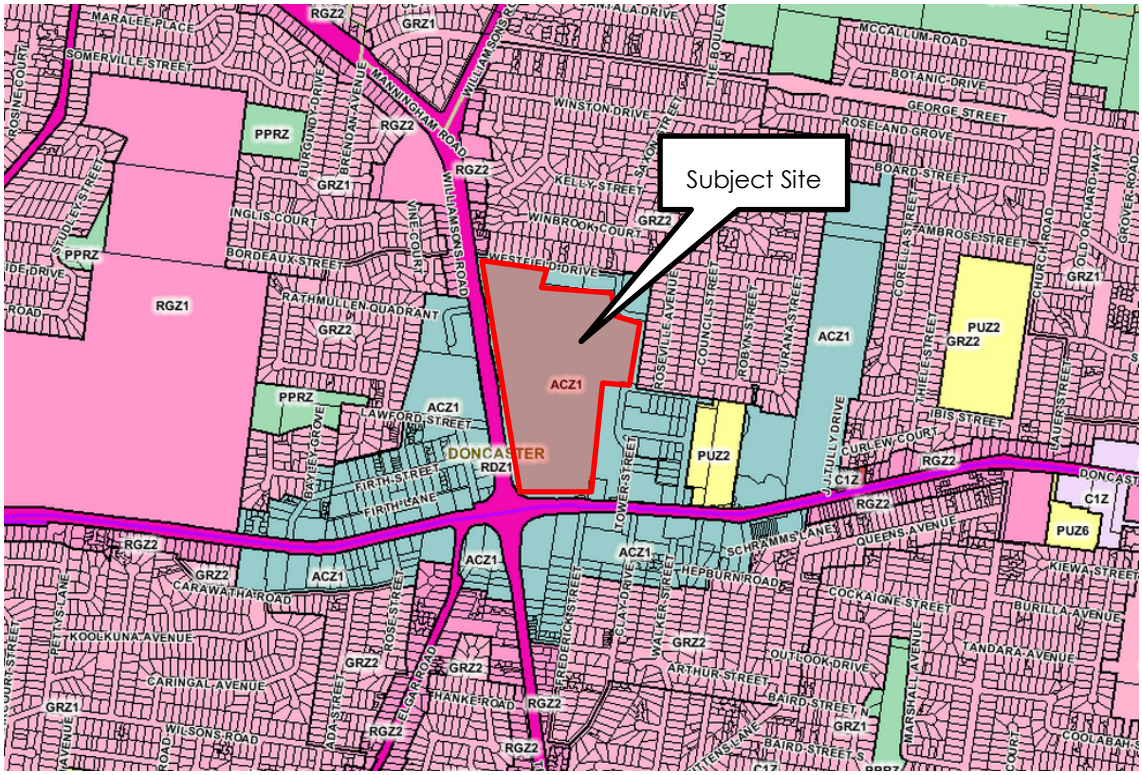


Figure 2.2: Land Use Zoning



2.2 Doncaster Hill Approved Developments & Infrastructure

In addition to development within the Doncaster Hill Activity Centre, several other key developments and transport infrastructure works have recently been approved, which are anticipated to have traffic and transport implications for the site. A brief description of these works is outlined below.

Eastern Golf Course Re-Development

The recently approved Eastern Golf Course development is located approximately 750m to the west of The Centre along Doncaster Road. The development will consist of between 700-950 residential dwellings of varying typology.

Doncaster Hill Development Approved Transport Infrastructure

- Council Street – Works associated with the Bunnings site including updates to signal phasing.
- Elgar Court – Banning of right turn from Elgar Court to Elgar Road.
- Doncaster Road – Bus jump queue lane (westbound) on Doncaster Road at Williamson Road.
- Whittens Lane – Right turn lane extension.

Doncaster Hill DCP Transport Infrastructure Items

- Doncaster Road / Bayley Grove – Signalised intersection installation.
- Tram Road / Merlin Street – Installation of signals on Tram Road at Merlin Street.
- Doncaster Road / Rose Avenue – Pedestrian operated signals in the vicinity of Doncaster Road and Rose Avenue.
- Elgar Road/Briar Court – Pedestrian Operated Signals in the vicinity of Elgar Road and Briar Court (TBC).

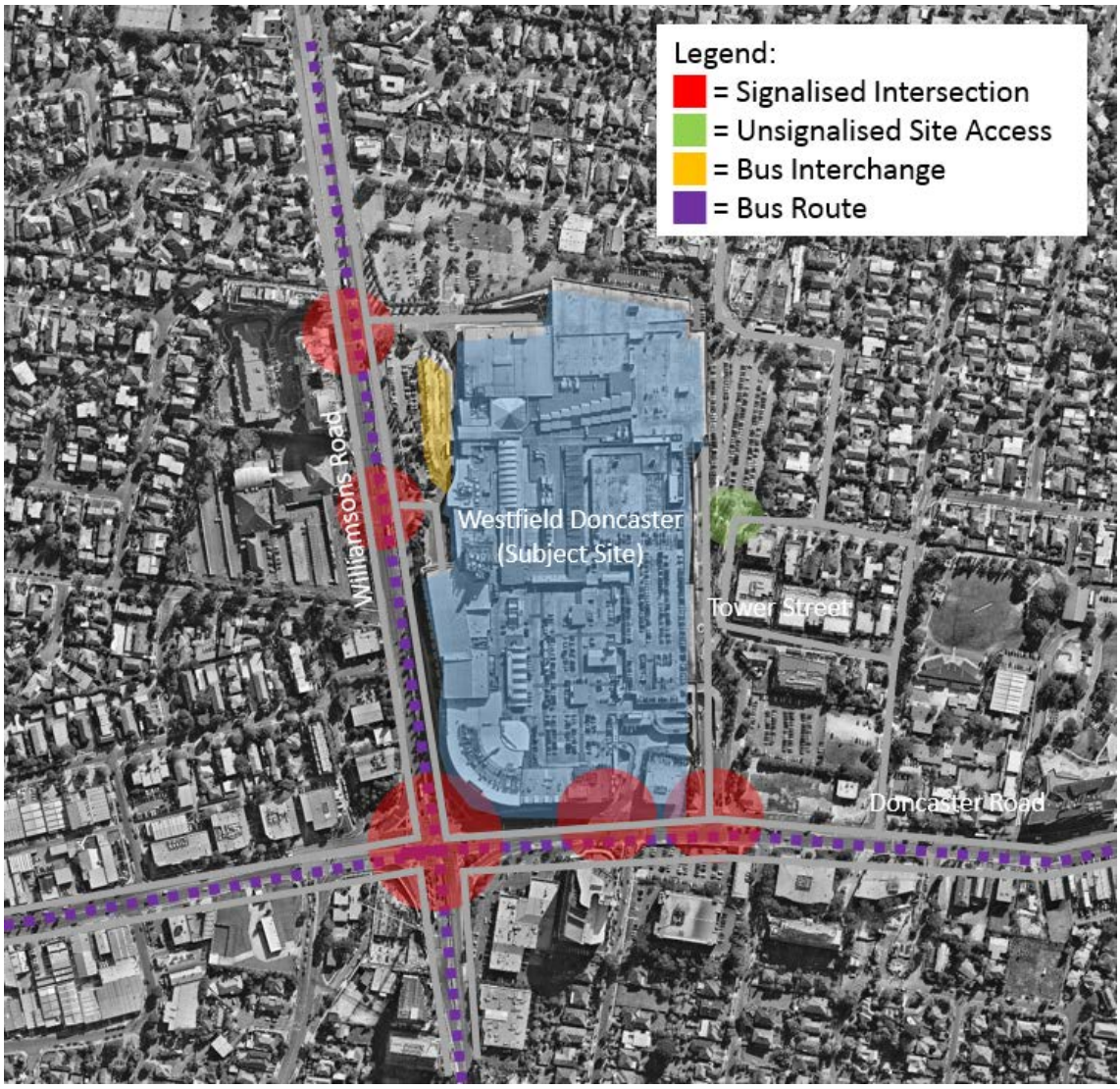
2.3 Road Network Infrastructure

2.3.1 Overview

The Centre is surrounded by an arterial road network including Williamsons Road to the west and Doncaster Road to the south.

The Centre has vehicular access via signalised intersections to both of these roads as shown in Figure 2.3.

Figure 2.3: Existing Transport Network



2.3.2 Key Roads

Williamsons Road

Williamsons Road functions as a primary arterial road and is listed as a Road Zone (Category 1) in the Manningham Planning Scheme.

Williamsons Road is a two-way road aligned in a north-south direction, and configured with three through trafficable lanes northbound and three traffic lanes southbound, to the north of Doncaster

Road. To the south of Doncaster Road, Williamsons Road features two lanes in each direction. Williamsons Road has a road reserve width of approximately 40m, adjacent the subject site.

Doncaster Road

Doncaster Road functions as a primary arterial road and is listed as a Road Zone (Category 1) in the Manningham Planning Scheme.

Doncaster Road is a two-way road aligned in an east-west direction, and configured with three through trafficable lanes eastbound and three traffic lanes westbound, to the east of Williamsons Road. To the west of Williamsons Road, Doncaster Road features two lanes in each direction. Williamsons Road has a road reserve width of approximately 40m, adjacent the subject site.

Westfield Drive

Westfield Drive functions as a local road (Council controlled) with land on the north side located within both a General Residential Zone (GRZ2) and land on the south side located in an Activity Centre Zone (ACZ1) in the Manningham Planning Scheme.

Westfield Drive is a two-way road aligned in an east-west direction, and configured with a two-lane, 6.5m carriageway set within a 15m wide road reserve (approx.).

Tower Street (Internal to Site)

Tower Street functions as a local road (Council controlled) and is located within the Activity Centre Zone (ACZ1) in the Manningham Planning Scheme.

Tower Street is located internal to the site, providing access from car parking and loading Docks to both the Williamsons Road and Doncaster Road site access intersections.

Other Roads

Other key roads within or around the Doncaster Hill Activity Centre include (refer to Figure 2.1 for location):

- Manningham Road
- Bordeaux Street
- Sovereign Point Crescent
- Merlin Street
- Frederick Street
- Council Street
- Bayley Grove
- Rose Street
- Elgar Road.

2.3.3 Surrounding Intersections

Key External Intersections

Key intersections within the vicinity of the subject site include:

- Williamsons Road / Doncaster Road / Tram Road (signalised X-intersection)
- Williamsons Road / Westfield Drive / Bordeaux Street (unsignalised X-intersection)
- Doncaster Road / Council Street (signalised X-intersection)
- Elgar Road / Doncaster Road (signalised X-intersection).

Central Access Intersections

There are a total of four access points to the site, all of which are signalised, as follows:

- Williamsons Road / Sovereign Point Court / Centre Access Road
- Williamsons Road / Bus Interchange / Shoppingtown Hotel Access
- Doncaster Road / Frederick Street / Centre Access Road
- Doncaster Road / Centre Access Road.

Other Intersections

Other intersections within the Doncaster Hill Activity Centre include:

- Lawford Street / Williamsons Road (unsignalised T-intersection)
- Doncaster Road/Clay Drive (unsignalised T-intersection)
- Doncaster Road / Short Street (unsignalised T-intersection)
- Williamsons Road / Manningham Road (signalised X-intersection)
- Merlin Street / Williamsons Road (unsignalised T-intersection)
- Rose Street / Beaconsfield Street (unsignalised X-intersection)
- Williamsons Road / Bayley Grove (unsignalised X-intersection).

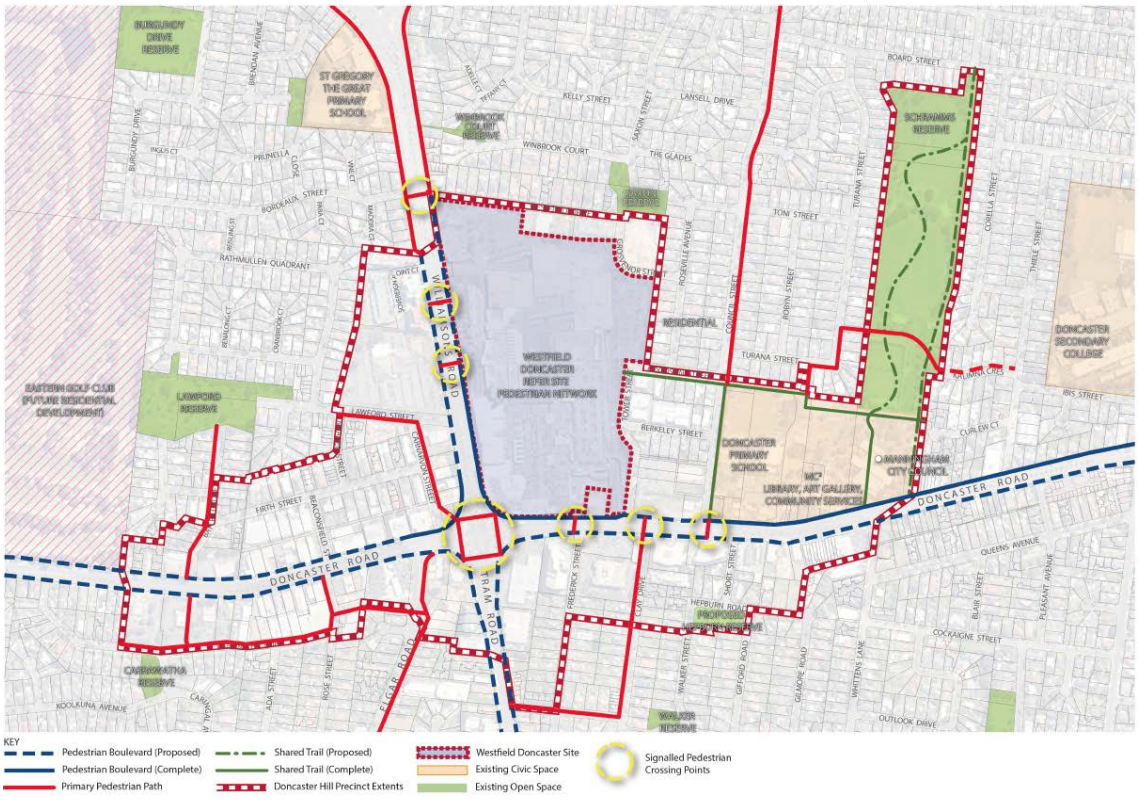
2.4 Active Travel

2.4.1 Pedestrian

In general the pedestrian network and facilities within the Doncaster Hill Activity Centre are of a good level, with footpaths on both sides of roads and crossing facilities provided at each key intersection and at regular spacing's along the major roads.

The surrounding pedestrian facilities are detailed in Figure 2.4 (the figure also has regard for the policy documents set out in Section 3). The key pedestrian desire lines are a function of the key trip generators and are also shown in the figure below.

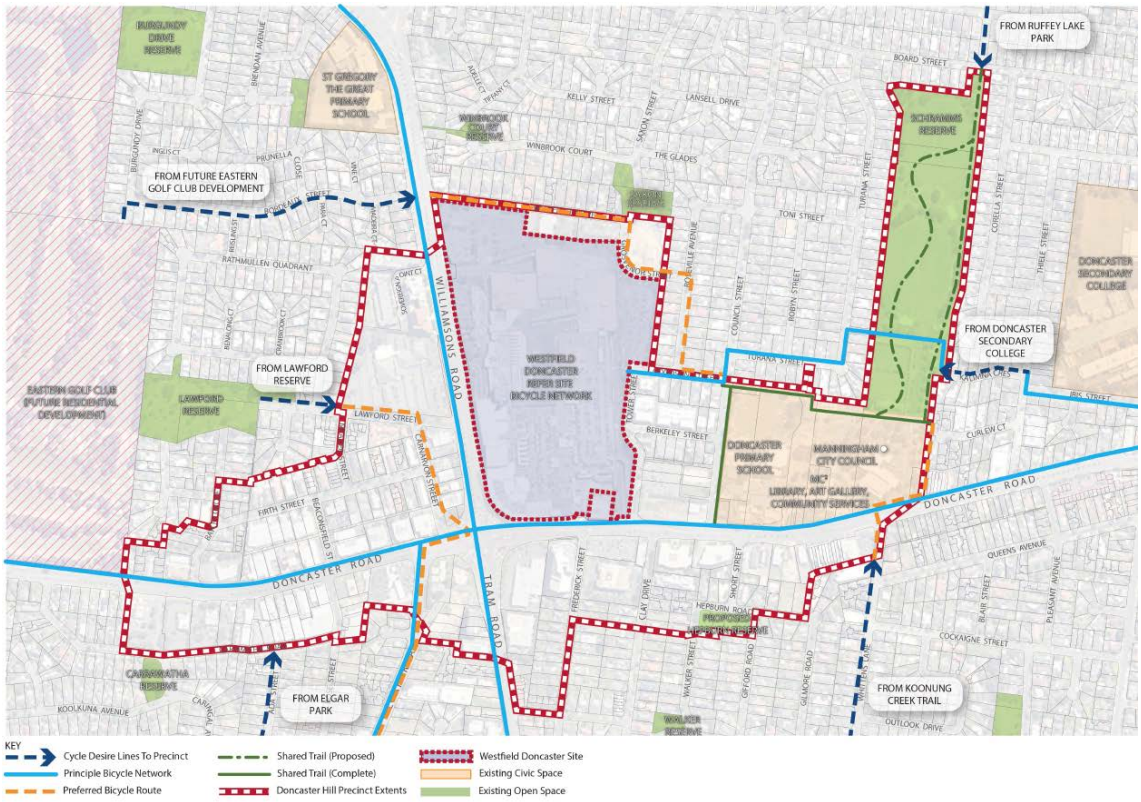
Figure 2.4: Pedestrian Network & Facilities - Surrounding Site Context



2.4.2 Cyclist

The surrounding cyclist facilities are detailed in Figure 2.5 (the figure also has regard for the policy documents set out in Section 3). The key cyclist routes to and from the surrounding land uses are also shown in the figure below.

Figure 2.5: Bicycle Network & Facilities - Surrounding Site Context



2.5 Westfield Doncaster & Existing Operating Characteristics

Further details regarding the subject site the surrounding transport network including its existing operating characteristics are provided in Appendix A, including:

- Traffic Volumes
  - Recorded & "Design Day" Traffic Volumes
  - 85th Percentile "Design Day" Traffic Volumes
  - Traffic Generation Rate
- Accident Statistics
- Car Parking
  - Supply
  - Demand
  - Car Parking Rates
- Public Transport
  - Buses
  - Existing Bus Interchange Area
  - Bus Activity and Patronage Surveys
  - Taxi Rank
- Active Travel
  - Pedestrian Infrastructure
  - Cycle Infrastructure
- Existing Modal Breakdown
  - Primary Trip Purpose Surveys

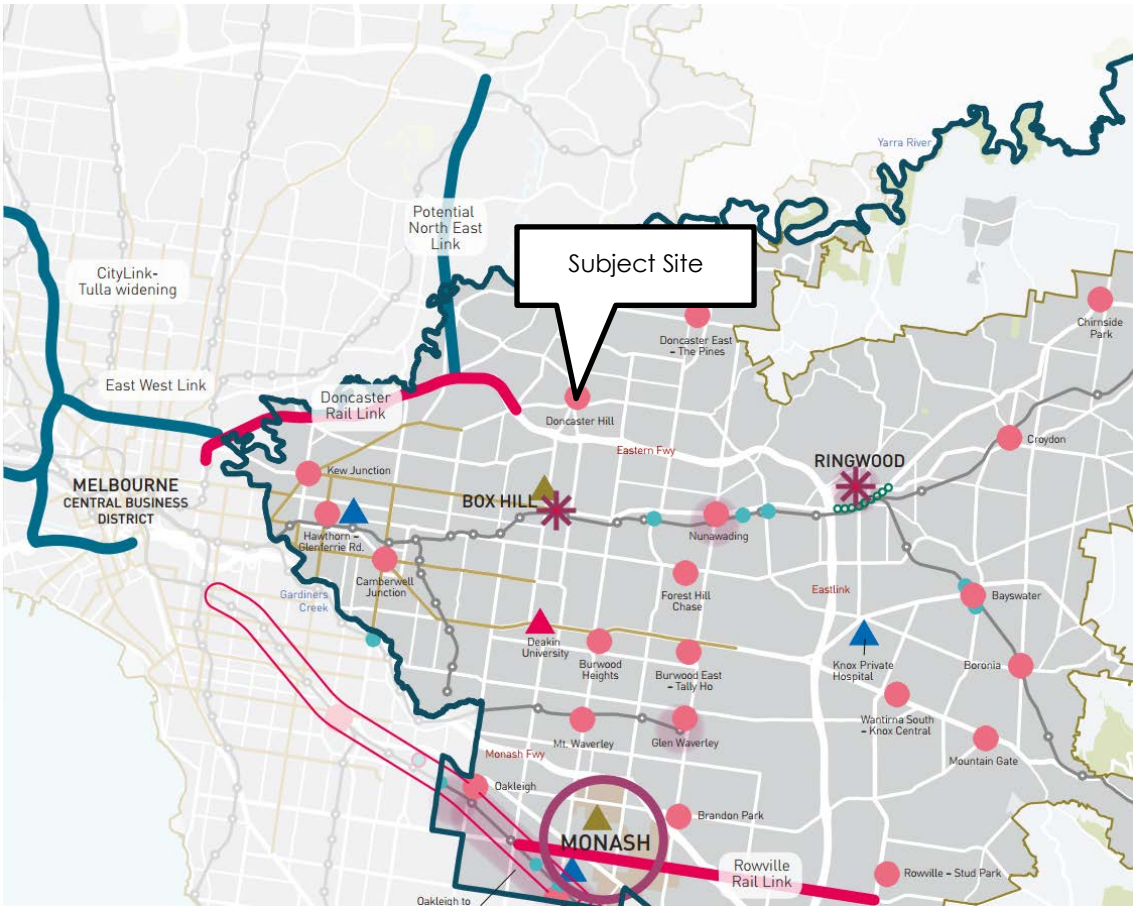
3. Transport Policy Context

3.1 Overview

The Centre is located approximately 18km northeast of the Melbourne CBD and is situated on the north-eastern corner of the Williamsons Road / Doncaster Road signalised intersection.

The location of the Centre relative to other Activities Areas is shown in Figure 3.1

Figure 3.1: Location of Westfield Doncaster Shopping Centre Relative to other Activities Areas



3.2 State Planning Policy

3.2.1 Metropolitan Planning Strategy

The Victorian Government released the Metropolitan Planning Strategy, Plan Melbourne (The Plan) in 2014. The Plan is intended to guide Melbourne's housing, commercial and industrial development through to 2050.

The Plan includes the following key concepts to cater for the anticipated population growth:

- delivering a new 'integrated economic triangle', connecting key employment clusters, industrial precincts and economic gateways
- strengthening regional cities – distributing future growth to benefit all of Victoria (regional projects)

- delivering a pipeline of large scale, city shaping infrastructure and urban renewal projects
- better use of existing assets, including increasing efficiency of road based transport and transport – land use integration
- 20 minute neighbourhoods - places where people have access to local shops, schools, parks, jobs and a range of community services within 20 minutes of their home.

The Plan is underpinned by seven objectives and a range of supporting actions. The delivery of the Plan is a central focus for the Metropolitan Planning Authority (MPA).

The Plan identifies Doncaster Hill, within which the Centre is located, as an Activity Centre.

3.2.2 Transport Integration Act 2010

The Transport Integration Act is the primary transport statute for Victoria, and has caused significant change to the way transport and land use authorities make decisions and work together. The Act enshrines a triple bottom line approach to decision making about transport and land use.

The Act requires that all transport agencies work together to achieve an integrated and sustainable transport system, and that land use agencies such as the Department of Economic Development, Jobs, Transport and Resources take account of transport issues in land use decisions. The Act has been effective to date in changing the focus of organisations that traditionally only considered a single transport mode.

The Act:

- unifies all elements of the transport portfolio to ensure that transport agencies work together towards the common goal of an integrated transport system
- provides a framework for integrated and sustainable transport policy and operations
- recognises that the transport system should be conceived and planned as a single system performing multiple tasks rather than separate transport modes
- integrates land use and transport planning and decision-making by extending the framework to land use agencies whose decisions can significantly impact on transport ("interface bodies")
- re-constitutes transport agencies and aligns their charters to make them consistent with the framework.

The Transport Integration Act forms an overarching legislative framework for transport related state planning policies and has been integrated within the Victorian Planning Provisions (VPP).

3.2.3 Victorian Planning Provisions (VPP)

Various statutory planning requirements are incorporated within the VPP. The most relevant clauses are outlined as follows:

- Clause 18.01 – Integrated Transport:
  This clause requires the preparation of an Integrated Transport Plan (ITP) for all new "major" developments. It is expected that this ITP will be largely informed by the findings of this report and be submitted to Council as a condition of any initial planning permit application being sought for the expansion or part thereof.
- Clause 52.34 – Bicycle Facilities:
  This clause aims to encourage cycling as a mode of transport through provision of convenient parking and end of trip facilities.
- Clause 52.36 – Integrated Public Transport Planning:
  This clause seeks to ensure that development supports public transport usage. As per

the requirements of Clause 52.36, Public Transport Victoria (PTV) acts as a referral authority for all major developments. PTV considers that such proposals should be consistent with the Department of Transport's "Public Transport Guidelines for Land Use and Development" and the objectives and standards in Clause 56.03-1 of the VPP.

3.2.4 SmartRoads Policy

SmartRoads is a VicRoads policy which sets 'modal' priorities on the road network and underpins many of the strategies significant to the Victorian Transport Plan surrounding the issue of public transport prioritisation.

Specifically;

"SmartRoads is an approach that manages competing interests for limited road space by giving priority use of the road to different transport modes at particular times of the day.

All road users will continue to have access to all roads. However, certain routes will be managed to work better for cars while others will be managed for public transport, cyclists and pedestrians."[2]

The SmartRoads Network Operating Plan for the area surrounding the Centre is reproduced in Figure 3.2, noting that the following transport priorities exist within the vicinity of the site:

- Pedestrian priority routes along Doncaster Road and Williamsons Road, as well as a route to the northeast that connects Schramms Reserve and Ruffey Lake Park.
- Bus priority route along Doncaster Road and Williamsons Road
- Bicycle priority routes along Doncaster Road and Williamsons Road, as well as a route along local roads to the east that connects with Church Road and George Street.

Figure 3.2: VicRoads SmartRoads Network Operating Plan

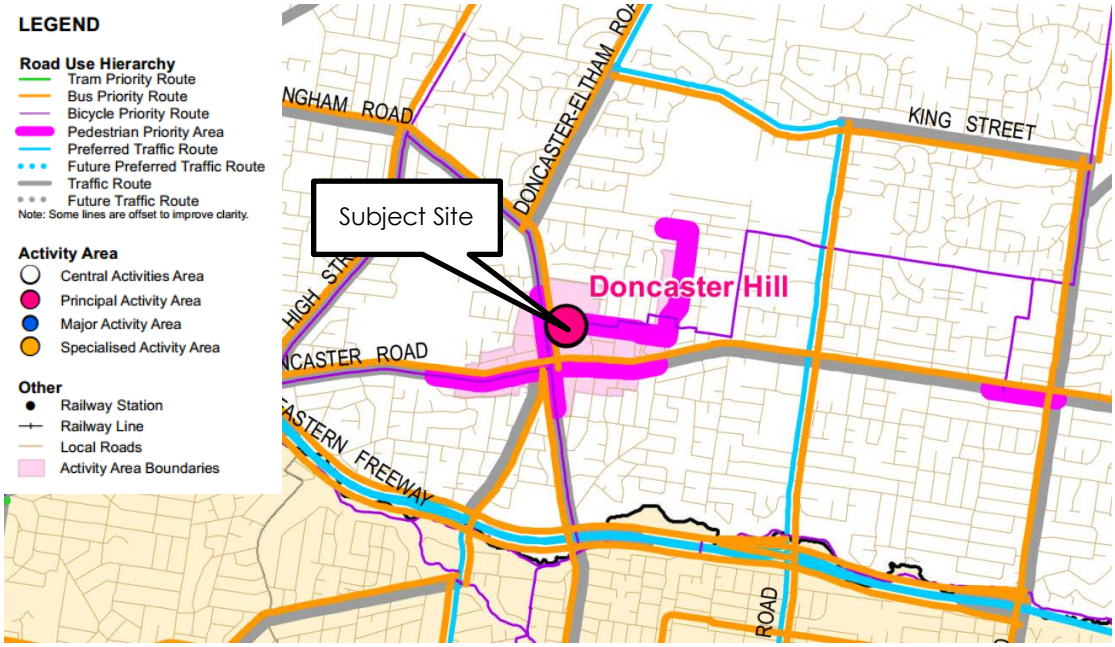


Figure 3.2 illustrates that Doncaster Road and Williamsons Road are bus and bicycle priority routes. Based on VicRoads' website, road-use priority routes (for buses and trams) have been identified to ensure:

"Trams and buses are given priority on key public transport routes that link activity centres during morning and afternoon peak periods."

[2] Sourced from VicRoads

Additionally the area surrounding the Centre is nominated as a pedestrian priority route, with the Doncaster Road and Williamsons Road nominated as a *Bicycle Priority Routes*.

3.2.5 Principal Bicycle Network

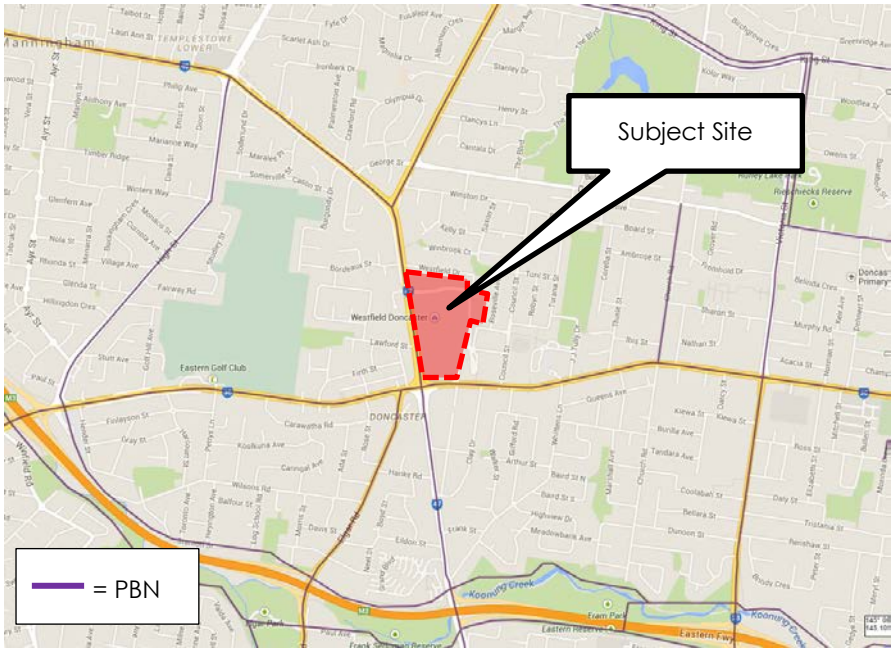
The Principal Bicycle Network (PBN) is a network of on and off-road cycling corridors that have been identified to support cycling for transport and access major destinations in metropolitan Melbourne. The PBN was reviewed and updated in 2012 by VicRoads and all local Councils.

The PBN is also a 'bicycle infrastructure planning tool' to guide State investment in the planning and development of the future metropolitan Melbourne bicycle network. In this regard, a subset of the PBN has been identified and elevated to a higher level of priority, mainly on the basis of potential for separation from motorised traffic, making these routes more attractive to less experienced bike riders. These cycling corridors are referred to as Bicycle Priority Routes (BPRs) and form part of the modal priorities for the road network set out in the VicRoads SmartRoads framework. Strategic Cycle Corridors (SCC) form another subset of the PBN, and represent an initiative outlined in Plan Melbourne to support walking and cycling in Central Melbourne. SCCs are intended to be corridors designed to provide high quality bicycle infrastructure to, and around, major activity areas in metropolitan Melbourne. Plan Melbourne outlines a subset of the SCCs for the proposed expanded central city area.

It is noted that the type of bicycle facility (i.e. on or off-road and separated or shared) has not been indicated as part of the PBN and BPRs. Rather, the PBN and BPRs show the proposed cycling network. The associated facilities should be delivered in accordance with the relevant standards and guidelines, such as the Australian Standards, Austroads Guides and VicRoads' Cycle Notes.

The PBNs in the vicinity of the study area are shown in Figure 3.3.

Figure 3.3: VicRoads Principal Bicycle Network and Bicycle Priority Routes



Source(www.maps.vic.gov.au/TransMaps/)

Figure 3.3 shows that it is proposed to develop cycling opportunities along Doncaster and Williamsons Road in the vicinity of the site, providing cycling connectivity to the Koonung Creek bike trail.

3.3 Local Planning Policy

3.3.1 Manningham Planning Scheme

Schedule 1 of the Activity Centre Zone which applies to the Centre outlines the following traffic and transport related items for the Westfield Doncaster Precinct (Precinct 4):

"Precinct Guidelines

- *Maintain and enhance an integrated public transport interchange to support both Westfield Doncaster and the greater Doncaster Hill area in a prominent and easily accessible location.*
- *Create a pedestrian friendly interface between Westfield Doncaster, Doncaster Road, Williamsons Road and Tower Street.*
- *Establish strong pedestrian entries and linkages from Westfield Doncaster to all other precincts within Doncaster Hill."*

Further to this Schedule 1 to the Incorporated Plan Overlay (IPO1) states the following which relates to matters pertaining to traffic and transport:

"Car Parking

- *Provision for car parking at the ratio of at least 6.8 spaces to each 100 square metres of leasable floor area for shop uses.*

Traffic plan

- *A traffic plan which must show:*
  - *Traffic management and traffic control works in adjoining and nearby roads when the development or any stage of the development is completed.*
  - *Means of vehicular ingress and egress to Doncaster Road and Williamsons Road.*
  - *Means of internal circulation, including details of internal access roads.*
  - *The timing of the proposed traffic works relative to the staging of the development under the development plan.*
  - *Public transport arrangements and access routes.*
  - *The traffic plan must be prepared in consultation with and to the satisfaction of the Roads Corporation."*

3.3.2 Doncaster Hill Strategy

The Doncaster Hill Strategy has been developed by Manningham City Council to provide an integrated planning response to the social, economic and environmental issues facing the Doncaster Hill Activity Centre.

Most notably, it covers the following aspects of the future development of the activity centre:

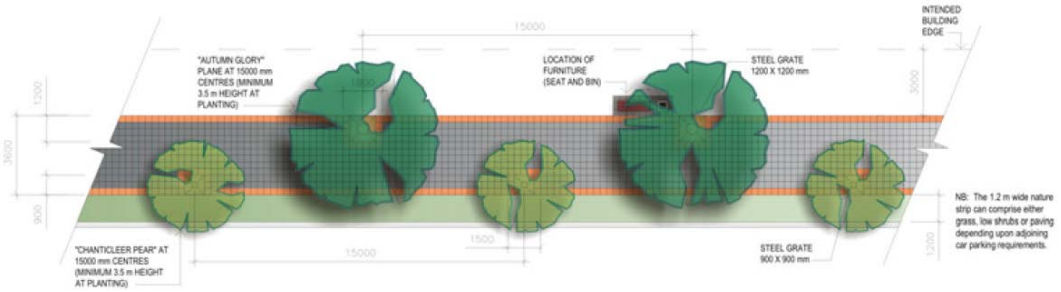
- Vision, strategic context and objectives
- Development application requirements
- Ecologically sustainable development requirements
- Urban design requirements

In terms of active transport, the following key guidance is provided within the strategy:

- Doncaster Hill offers the opportunity to provide a more sustainable and accessible transport system that will support changed travel behaviour to decrease car dependency and increase use of public transport, walking and cycling.
- Doncaster Hill aims to be pedestrian in nature with tree-lined streets alive with restaurants, cafes, shops, public art and open spaces

- Ensure that development facilitates a permeable, activated, connected, safe (includes passive surveillance) and comfortable pedestrian environment adjacent to the proposed boulevards and with strong linkages within Doncaster Hill to key trip generators and passive open space.
- Provide appropriate amenities for pedestrians and bike riders as part of new developments, including:
  - 'after trip' facilities for bicycle users, joggers, etc. (e.g. such as secure bicycle storage, showers and changing rooms)
  - access to facilities to be centrally and easily accessed
- Boulevard landscape treatments are to be provided along both sides of Doncaster Boulevard, Williamsons Road and Tram Road. The general layout of the boulevard landscape treatments is reproduced in Figure 3.4.

Figure 3.4: Doncaster Hill Boulevard Landscape Details – Sample Paving & Furniture Strip



Source: Insert between pages 49 and 50 of the Doncaster Hill Strategy

3.3.3 Manningham Integrated Transport Strategy

Manningham City Council has developed the Manningham Integrated Transport Strategy (ITS) to address identified transport issues within the Manningham municipality. The ITS aims to deliver future transport initiatives as part of the transport network. Through the availability of a broad spectrum of transport options, the plan intends to reduce greenhouse emissions as well as the following broad level objectives:

- improve urban design – with greater emphasis on bicycle and pedestrian paths
- economic growth as a result of less congestion
- safeguard liveability in Manningham
- increased access to employment, entertainment, medical, education and community facilities
- increasing public transport services.

3.3.4 Doncaster Hill Mode Shift Plan (2014)

In response to strategic transport modelling for the Doncaster Hill Activity Centre is was acknowledged that in order to support the anticipated level of development in the area there needs to be a shift away from the current level of private car use by those living, working and visiting the precinct.

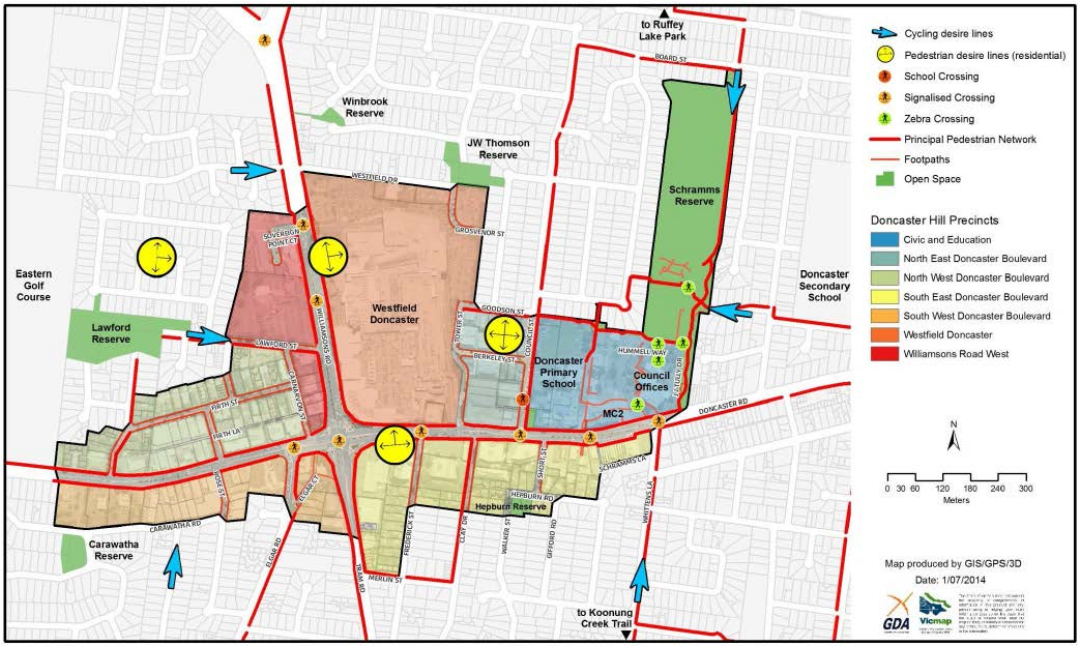
This is presented in the Doncaster Hill Mode Shift Plan 2014, and identifies that the level of mode shift away from private car use being targeted is a change from the existing 80% to a 70% mode share to car (based on 2011 ABS journey to work data). Bus travel accounts for 15% of the existing 20% non-car mode share. Ongoing improvements to public transport services and facilities are being provided, namely through the DART bus services and long-term proposal to provide a train line between Doncaster Hill and the existing Melbourne Rail Network.

In terms of active transport, the current mode share of some 5% almost solely relates to those that walk (i.e. almost no one currently cycles). However, it is noted that some 50% of all trips in Melbourne are less than 2.5km and undertaken by private car. As such, there is a significant opportunity to help achieve the desired mode shift through an increased use of active transport for these short trips of 2.5km or less.

In order to achieve this goal, the Mode Shift Plan provides an outline of how the active transport network should be developed, namely through the following high level directions and aligning facilities with the key walking and cycling desire lines for the Doncaster Hill Activity Centre, as shown in the plan reproduced in Figure 3.5:

- The development of strategies and plans targeting pedestrians should be complemented by traffic speed reduction campaigns, strategies and infrastructure
- The provision of well-spaced and convenient pedestrian operated signals at key locations along arterial roads within Doncaster Hill is required to ensure safe road crossing points.
- Boulevard treatments, as outlined in the Doncaster Hill Strategy are required to be provided where new development occurs.
- The majority of the footpath widths do not provide safe shared access for both pedestrians and off-road cyclists. It is therefore essential that the planning for the VicRoads Principal Bicycle Network through Doncaster Hill be undertaken.
- Enhanced wayfinding signage is required.

Figure 3.5: Key Walking & Cycling Desire Lines for the Doncaster Hill Activity Centre



Source: Page 26 of the Doncaster Hill Mode Shift Plan 2014

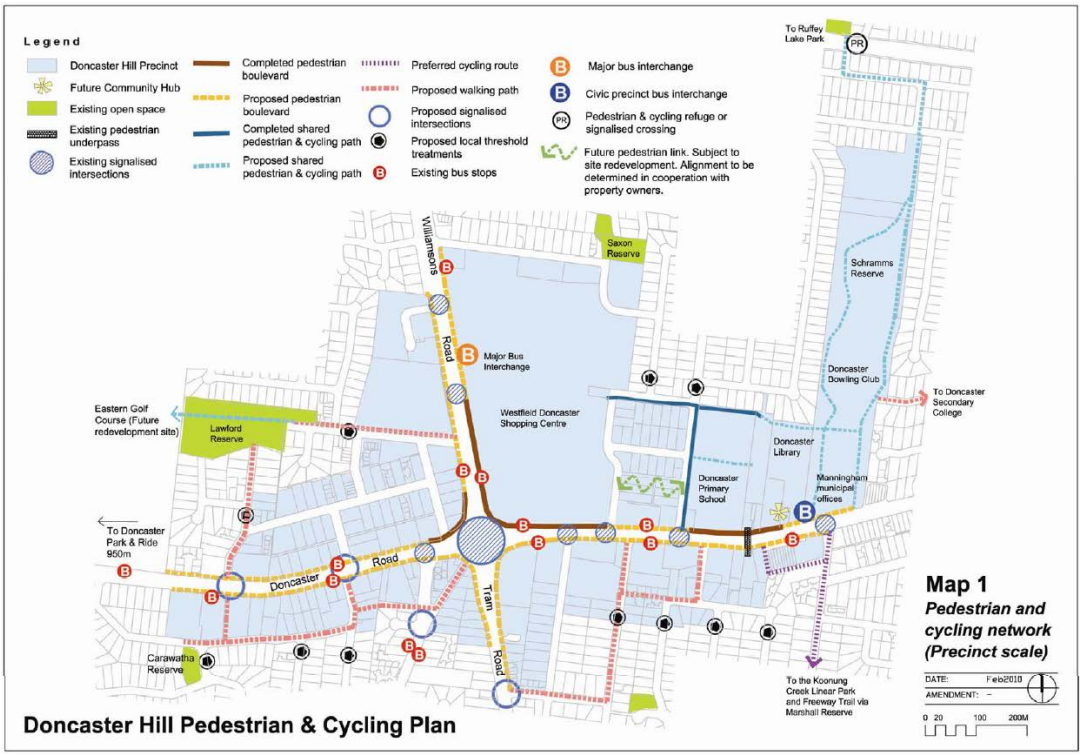
3.3.5 Doncaster Hill Pedestrian and Cycling Plan

The Doncaster Hill Pedestrian and Cycling Plan sets out the facilities, services and activities proposed to be undertaken to help facilitate the option for people who choose to walk or cycle to and within the Doncaster Hill Activity Centre. It also looks to support public transport use, as it typically requires people to walk or cycle either end of such a trip to access many trip generators in the precinct.

The core of the Plan is based around providing the proposed facilities indicated in the plan reproduced in Figure 3.6, which directly connecting the site, included the following facilities:

- Pedestrian boulevards along Doncaster Road and Williamsons Road
- Walking path along Lawford Street
- Shared pedestrian and bicycle path along south side of Goodson Street and north side of the Doncaster Primary School and Manningham Municipal Offices.

Figure 3.6: Doncaster Hill Pedestrian and Cycling Plan – Pedestrian and Cycling Network



Source: Page 13 of the Doncaster Hill Pedestrian and Cycling Plan, 2010

3.3.6 Manningham Bicycle Strategy

Manningham City Council has undertaken a review of the Manningham Bicycle Strategy to consider the progress since the last review, consider future requirements, and to encourage and support the increase in the use of bicycles as an alternative mode of transport. The strategy provides the following objectives:

- Improve on-road and off-road cycling infrastructure, to connect to key destinations and generators
- Improve end of trip facilities at key destinations and improve bicycle facilities on key routes
- Undertake educational and promotional activities to increase the community's awareness of cycling as a viable form of transport for both commuting and recreational purposes.

4. Master Plan Proposal

4.1 Land Uses

The Master Plan proposes to expand the Centre by approximately 43,000sqm of retail floor area along with 18,000sqm of commercial (office) floor area (total addition of 61,000sqm).

4.2 Sustainable Transport

It is proposed to redevelop the existing bus interchange to improve its operation and capacity. The rationale for the revised design is provided in more detail in Section 5 of this report, with a concept layout of the new bus interchange shown in Appendix B.

In addition, it is also proposed to provide improved pedestrian and bicycle access and facilities to and within the redeveloped Centre. This is further discussed in Section 6 of this report and other supporting documents prepared by others in the project team.

4.3 Car Parking

In the order of 7,300 car spaces are proposed to be provided under post-development conditions. This total will result in a net gain of some 1,962 additional car spaces over those existing (4,782) and those pending (556) delivery by the end of 2015.

4.4 Vehicle Access

Vehicular access arrangements to the redeveloped Centre are to be modified and enhanced as part of the Master Plan. These works include the relocation of the existing northernmost signalised intersection along Williamsons Road towards Westfield Drive and the introduction of a dedicated signalised access to a new bus interchange.

Traffic signals at the intersection of Doncaster Road and Fredrick Street are proposed to be removed and replaced with a signalised pedestrian crossing. Under this arrangement access to Fredrick Street and the Westfield Shopping Centre Service Area is proposed to be left-in / left-out only.

Figure 4.1 provides an overview of proposed upgrades to the external road network to support the Master Plan proposal including the relocation of intersections and the conceptual layout of the new bus interchange. Detailed plans for each of the intersections and access points are provided in Appendix B.

Figure 4.1: Master Plan Transport Infrastructure Proposal

4.5 Loading Areas

The Master Plan proposal incorporates the construction of a number of additional loading areas. These areas are discussed later in this report.

5. Transport Impact

5.1 Modelling Overview

GTA Consultants has prepared a micro-simulation model using the Aimsun software package to explore the existing and post development operating conditions of the road network surrounding the Westfield Doncaster Shopping Centre and the broader Doncaster Hill area. Consultation with VicRoads and Council has resulted in the preparation of an assessment methodology / framework for this analysis in an effort to determine and confirm the inputs and assumptions of the models. The Aimsun modelling reflects a refinement of modelling work prepared earlier by GTA for Doncaster Hill using Paramics software.

5.2 Strategic Modelling Context

The traffic distribution to/from the internal Doncaster zones have been compared for the base Aimsun and the Victorian Integrated Transport Model (VITM) demands. This indicated that the distributions generally correlate well between the two models. As such, VITM was considered appropriate to establish the broad changes in travel patterns in the future design year of 2031. As a result of network changes and land use growth within Doncaster Hill and neighbouring zones, driver behaviour through the study area is expected to be altered.

To determine the future traffic distribution, the strategic traffic model has been used as follows:

- Understand the travel patterns through the study area for existing and future conditions, including the network-wide origins and destination of traffic using key routes within and through Doncaster Hill.
- Forecast changes in future travel behaviour.
- Compare traffic volumes to understand the change in travel patterns across the study area.
- Use the future year scenario to understand long term traffic impacts with development yields provided by Council and with Westfield Master Plan development.

Having consideration to the above, the forecast traffic distribution outcomes for each zone in VITM has been associated to the respective microsimulation zones and adopted in the future year microsimulation modelling scenarios.

5.3 Transport Impact

5.3.1 Post Development Aimsun Modelling Assessment

A model of the road network surrounding the Westfield Doncaster Shopping Centre has been developed using Aimsum modelling software. It is noted that the model previously developed for Doncaster Hill utilised the Q-Paramics software package. in this regard, the Q-Paramics model has been imported into Aimsun and refined as necessary to reflect the latest traffic data set and road geometry.

By way of background, Aimsun has been used rather than Q-Paramics for a range of reasons including its superior functionality, particularly its ability to model traffic behaviour.

Given the importance of correctly linking the closely spaced signalised intersections, which also have bus priority phases embedded in the controller operation, SCATS signal control has been

used through the SCATSIM interface with Aimsun. SCATS is the platform that operates traffic signal operation on the Victorian road network and is able to be replicated within the model.

The nature of microsimulation models allow for a range of results that are able to be extracted and presented for a range of measures. This section of the report will provide the microsimulation model results for analysis and discussion:

- Network performance results – used to understand the operating performance of the network as a whole.
- Travel time comparisons – used to understand the impacts of travel times for motorists on key routes within the study area.
- Link specific information including speed, delay and level of service.

5.3.2 Existing Model Calibration and Validation

The model calibration and validation report provided in Appendix C details the adopted methodology in the development of the existing conditions Aimsun model, as well as the outcomes of the calibration and validation process.

It is noted that in order to ensure the robustness of the base models, a peer review of the existing conditions Aimsun models was undertaken by VicRoads as well as an independent reviewer (Jacobs). VicRoads' review focussed on the SCATS signal operation whilst the Jacobs review focussed on the model coding and its operation.

In summary, the peer reviews indicated that the existing conditions models have been built and calibrated using sound modelling practice, with the use of the base model considered to be "fit-for-purpose" and appropriate for future scenario testing.

5.3.3 Post Development Network Planning Options

The impacts of the development on the road network were assessed using adjusted Westfield volumes for an 85th percentile design day for all options. The post development assessments were undertaken by comparing the 'Future Base' against the additional development traffic with proposed new bus and vehicle access arrangements as well as a mitigating works option. All options were assessed for the design year 2031 which reflects the likely completion year of the proposed Westfield Master Plan and full or near full delivery of land use within the broader Doncaster Hill area.

In total, the following three options have been assessed for 2031:

i A Future Base which is the existing road network with full build out of Doncaster Hill, including the transport infrastructure works specified in the DCP.
ii A Westfield Master Plan option which includes the proposed increased floor area at the centre as well as the proposed transport infrastructure works on Williamsons Road.
iii A Westfield Master Plan option as described above in addition to a triple right turn lane on the north approach to the Williamsons Road / Doncaster Road intersection.

Table 5.1 presents a summary of all modelled options.

Table 5.1: Summary of Options

Description	Base Year: 2014		Design Year: 2031	
	Existing Conditions	85%ile Design Day	Future Base	Westfield Master Plan
Land Use				
Existing land use, Traffic volumes & Road infrastructures	✓	✓	✓	✓
Adjusted Westfield volumes for 85th percentile design day		✓	✓	✓
Approved/proposed Doncaster Hill developments (full build)			✓	✓
Eastern Golf Course development			✓	✓
Proposed Westfield Master Plan				✓
Transport Infrastructure				
Approved Doncaster Hill complementary works (DCP)			✓	✓
Redesign of Westfield bus interchange				✓
Proposed Williamsons Road site access arrangements (re-configuration)				✓
Removal of Frederick Street signals and installation of POS				✓
Triple right turn lane on the north approach of Williamsons Road / Doncaster Road				✓

POS – Pedestrian Operated Signals

5.3.4 Traffic Inputs – Doncaster Hill Precinct

To determine the forecast traffic volume for the 2031 design year, traffic generation analysis was undertaken for the approved and projected land uses within Doncaster Hill. The traffic generation rates for the new land uses were sourced from previous analysis prepared for Doncaster Hill as well as various traffic and transport reports prepared for developments within the precinct.

A summary of the adopted traffic generation rates are provided in Table 5.2.

Table 5.2: Traffic Generation Rates – for Approved and Projected Developments

Land Use	Traffic Generation Rate		
	Weekday AM Peak	Weekday PM Peak	Saturday Midday Peak
Residential dwelling [1]	0.3 movements per dwelling	0.3 movements per dwelling	0.3 movements per dwelling
Restricted Retail [2]	0.5 movements per 100 m^2 of floor area	1.97 movements per 100 m^2 of floor area	1.97 movements per 100 m^2 of floor area
Commercial/Office [3]	1.60 movements per 100 m^2 of floor area	1.20 movements per 100 m^2 of floor area	-

[1] Combination of Doncaster Hill report, Traffix report and GTA survey database.
[2] *'Review of Parking and Traffic Management within Doncaster Hill Study Findings'* prepared by GTA Consultants (dated Aug 2012).
[3] *'602-630 Doncaster Road, Doncaster – Proposed Mixed Use Development'* prepared by Traffix Group (dated Mar 2014).

Further to the traffic generation from Doncaster Hill, the traffic generated by the projected development of Eastern Golf Club (located on the periphery of Doncaster Hill) has been accounted for in the 2031 projected traffic demands. The traffic generated by this development has been sourced from *'Eastern Golf Club, Doncaster – Traffic and Transport Assessment'* prepared by Cardno dated July 2013.

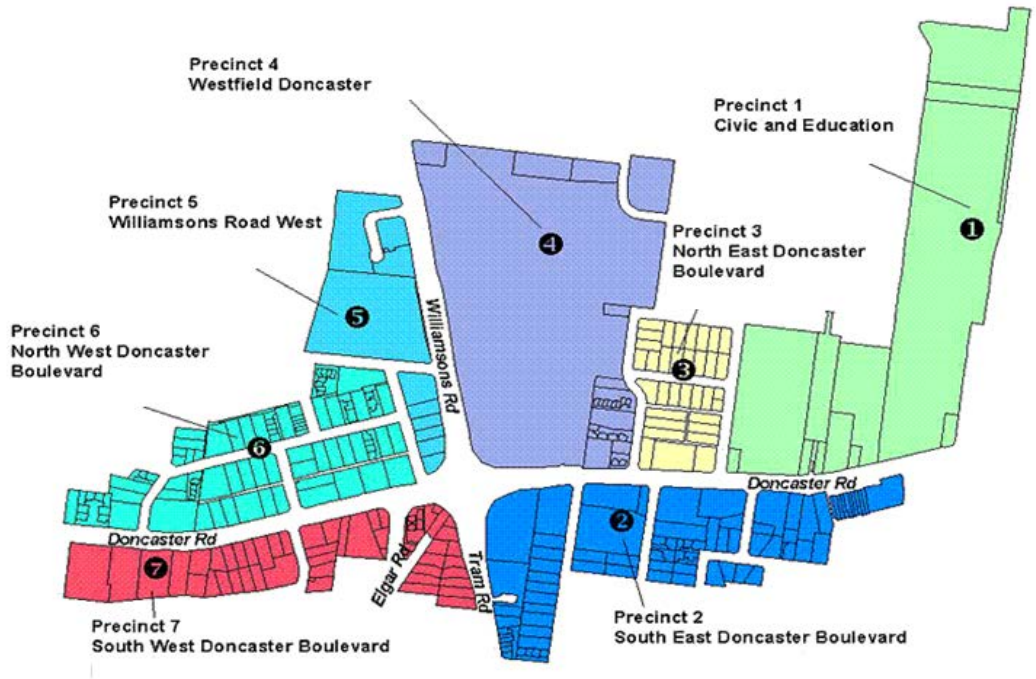
Having consideration to the sources outlined, a summary of the additional background traffic input into the microsimulation model to reflect 2031 traffic conditions is summarised in Table 5.3 with a map of the Doncaster Hill Precincts provided in Figure 5.1 . Full details on the proposed Doncaster Hill land uses and expected traffic generation is provided in Appendix D.

Table 5.3: Summary of Additional Background Traffic (2031) – Trips Per Hour

Development	Location [1]	Vehicles per Hour		
		Weekday AM Peak	Weekday PM Peak	Saturday Midday Peak
Doncaster Hill	Doncaster Hill Precinct 1	19	19	19
	Doncaster Hill Precinct 2	537	669	632
	Doncaster Hill Precinct 3	228	369	351
	Doncaster Hill Precinct 4	56	56	56
	Doncaster Hill Precinct 5	482	495	315
	Doncaster Hill Precinct 6	261	261	261
	Doncaster Hill Precinct 7	419	401	295
	Doncaster Hill Total	*2,002*	*2,270*	*1,929*
Eastern Golf Course	Eastern Golf Course	324	324	324
TOTAL		**2,326**	**2,594**	**2,253**

[1] Doncaster Hill precincts are per those set out in the Doncaster Hill Strategy

Figure 5.1: Doncaster Hill Precinct Map



5.3.5 Westfield Master Plan Traffic Generation

The process for determining the future traffic generation rates for the Westfield Master Plan involved liaison with a number of parties including Council and VicRoads. A series of workshops were held to present various data sets including existing traffic generating statistics, benchmarking of traffic generation rates for over 30 shopping centres Australia wide and considerations for the future car parking proposal for the Centre. The outcomes of this process deduced the following post development traffic generation results.

Table 5.4: Westfield Doncaster – Forecast Traffic Generation Summary

Network Peak Hour	Land Use	Post Development Traffic Volumes	Trip Discounts	Total Post Development Traffic	Existing Traffic Volumes	Additional Traffic Generated
Friday AM	Retail	2,382	-141	2,529	2020	**+509**
	Commercial	288				
Friday PM	Retail	5,429	-128	5,517	4607	**+910**
	Commercial	216				
Saturday Midday	Retail	6,262	-227	6,071	5235	**+836**
	Commercial	36				

A detailed outline of the methodology and process utilised to derive the above estimated traffic volumes is provided in Appendix E (GTA Memo to VicRoads dated 8 May 2015).

5.4 Microsimulation Model Assumptions

A range of assumptions have been included in the development of the modelling scenarios in order to provide a suitable baseline for which to assess the package of infrastructure works. These include:

- The adoption of the existing number of bus routes and their timetables in all future scenarios.
- The proportion of existing traffic accessing Westfield Doncaster car parks through the various access points has been maintained in the future models and new traffic overlaid but influenced by future predicted capacity levels.
- Adjustments to the lane utilisation on the north and south approaches to the Doncaster Road / Williamsons Road / Tram Road intersection implemented given the congested nature of the future models. This has been adopted in all 2031 scenarios.
- Whilst the time restricted (weekday commuter peaks) bus lanes are open to all traffic on Saturday, the model conservatively assumes that no vehicles utilise these lanes firstly to account for any on-street kerbside parking, as well as the observed low usage of these lanes by general traffic.
- The operation of SCATS in future scenarios has been reviewed throughout the modelling process. Some minor adjustments to the operation of the existing sites has been undertaken to suit the change in traffic demands and to ensure the most efficient signal operation is modelled in both 2031 scenarios. A general description of these changes is as follows:
    - Doncaster Road / Williamsons Road / Elgar Road – increase the attractiveness for C phase and G phase (right turn on the north approach) at the expense of the Doncaster Road phase. Reduce the phase splits for A, E and F phase.
    - Doncaster Road Fredrick Street – reduce the minimum time for Doncaster Road phase to allocate more time to the Westfield site access phases.
- All new signalised intersection have been set up with appropriate controller personalities, suitable for SCATS operation.
- Full (100%) build out of the approved and project developments for Doncaster Hill.
- A 20% reduction has been applied to the "through" (external to external) traffic travelling through Doncaster Hill, to account for the change in travel behaviour through the study area as a result of the uplift in land area and additional traffic on the road network. This is the same assumption adopted in the 'Review of Parking and Traffic Management' prepared as part of the 2012 Doncaster Hill traffic and Parking Study completed for Council.

- No further change in "through" traffic following the delivery of the Westfield Doncaster Master Plan.

5.5 Microsimulation Model Results

As nominated previously in this report, three development options have been assessed for the future design year 2031. Whilst the results for all of the options modelled and presented in Table 5.1 are provided in Appendix F, a comparison of the operating characteristics for the Future Base and the Westfield Master Plan are presented in the body of this report for brevity and to avoid any added confusion around a range of intermediary scenarios.

The microsimulation model results for all options listed in Table 5.1 have been reported in this section including (as previously outlined) statistics on:

- Network performance for general traffic (cars)
- Travel time for general traffic (cars)
- Queue lengths (defined by the average speed of vehicles)
- Public transport performance (network and travel times).

It is important to note that a future base model for the 2031 design year has been modelled which forms a base line to which the options should be compared against.

Lastly, given the variability of the adaptive signal control (SCATS) which results in slight variations to model outcomes for the same seed value, the following model results represent the median result of five of a single seed number run. Further discussion on the variability of SCATS and model results is provided in the model calibration and validation report attached in Appendix C.

5.5.1 Network Performance (Passenger Vehicle – General Traffic)

This section of the report sets out the operating conditions in terms of overall network performance. The key network performance parameters assessed and presented in Table 5.5 are 'average speed' and 'average travel time'.

It is noted that the network statistics in this section have been reported for general traffic only (i.e. cars). For ease of reference, the network performance results have been presented for the critical peak hours of each (2hr) peak with full results presented in Appendix F.

Table 5.5: Key Network Performance Statistics (km/h)

Peak Period	Option / Scenario		
	Existing Condition 2014	Future Base (2031)	Westfield Master Plan (2031)
Average Speed (km/h)			
Weekday AM	34.6	24.0	31.4
Weekday PM	27.3	17.7	17.2
Saturday Midday	28.0	15.5	17.4
Average Travel Time Per Vehicle (sec)			
Weekday AM	227	280	226
Weekday PM	247	334	336
Saturday Midday	221	336	315

Table 5.5 indicates that there would be a decrease in network performance for each of the peaks between 2014 (85th %ile Design Day) and 2031 (Future Base Case), this is prevalent in the key performance indicator of average speed. This is predominantly due to the increase in traffic

generation as a result of the level of approved and projected developments within Doncaster Hill external to the Centre.

When comparing the Westfield Master Plan model with the Future Base model, the weekday AM peak results indicate notable improvements to the network operation, with a 7.4km/h (+30%) increase in average network speed and 54 second (-19%) reduction in average travel time.

During the more congested weekday PM peak, the Westfield Master Plan option decreases the performance of the network when compared to the Future Base with a 2.5km/h (-3%) decrease in average speed with a small loss of 2 seconds (+0.006%) in average travel time.

The network performance outcomes of the Saturday peak are similar to the weekday AM peak in that there is an increase in average speed (+12%) and average travel time of 21 seconds (-14%).

Appendix F presents the key network statistics for all of the modelled options. A review of these statistics indicates that significant improvements are made to the network at least during two of the three modelled periods following the implementation of the full mitigating works package including the triple right turn movement from Williamsons Road (north) and the removal of a fully signalised intersection at Doncaster Road and Frederick Street.

Overall, the network performance results indicate that there will be a deterioration in network performance under the Future Base and Westfield Master Plan scenarios. However, the results indicate a better performance outcome with the proposed expansion to Westfield, including the supportive transport infrastructure works, when compared to the Future Base.

In addition to the Key Network Performance Statistics presented in Table 5.5, the full results provided in Appendix F report the following network statistics:

- Average delay time of all vehicle trips on roads within the model
- Average speed of all vehicles on roads within the model
- Total travel time by all vehicles
- Total travelled distance by all vehicles
- Vehicles inside (total number of remaining vehicles in the model at the end of the simulation)
- Vehicles outside (total number of completed trips)
- Vehicles waiting to enter (total number of vehicles yet to enter the model network at the end of the simulation).

5.5.2 Travel Times (Passenger Vehicle – General Traffic)

Point-to-point car travel times from the microsimulation models have been obtained for three key routes described below and presented in Figure 5.1.

- Route 1: Doncaster Road (between Bayley Grove & Council Street)
- Route 2: Tram Road & Williamsons Road (between Merlin Street & George Street)
- Route 3: Elgar Road & Williamsons Road (between Hanke Road & George Street)

Figure 5.2: Travel Time Route Map

The results of the point-to-point car travel times obtained from the microsimulation models are shown in Table 5.6 to Table 5.8.

Table 5.6: Passenger Car Travel Time Results (seconds) – Weekday AM Peak (8:15am to 9:15am)

Route	Direction	2014	2031	
		85th Percentile Design Day	Future Base	Westfield Master Plan
Route 1: Doncaster Road (between Bayley Grove & Council Street)	Eastbound	114	129	119
	Westbound	81	93	92
Route 2: Tram Road & Williamsons Road (between Merlin Street & George Street)	Northbound	190	353	220
	Southbound	238	692	215
Route 3: Elgar Road & Williamsons Road (between Hanke Road & George Street)	Northbound	267	232	265
	Southbound	317	1,075	279

The Westfield Master Plan access arrangements on Williamsons Road appear to have little or no impact on northbound travel times with generally comparable travel times with the future base on both routes. However, with the introduction of the triple right turn on the Williamsons Road north approach to the Doncaster Road / Williamsons Road intersection has significant improvements to southbound travel times occur as a result of the additional capacity provided. Route 2 southbound and Route 3 southbound have recorded a 477 second and 796 second decrease to travel times, respectively.

Table 5.7: Car Travel Time Results – Weekday PM Peak (4:45pm to 5:45pm)

Route	Direction	2014	2031	
		85th Percentile Design Day	Future Base	Westfield Master Plan
Route 1: Doncaster Road (between Bayley Grove & Council Street)	Eastbound	120	384	410
	Westbound	81	192	146
Route 2: Tram Road & Williamsons Road (between Merlin Street & George Street)	Northbound	280	302	279
	Southbound	334	547	596
Route 3: Elgar Road & Williamsons Road (between Hanke Road & George Street)	Northbound	380	288	313
	Southbound	597	854	464

Table 5.7 indicates that the Westfield Master Plan mitigating works package delivers mixed results with some routes experiencing an increase in travel times and others a reduction during the weekday PM peak.

Of particular note, the addition of the Frederick Street works and the introduction of the triple right turn results in significant improvements to travel times for key movements as evidenced in the 390 second decrease in travel time for Route 3 southbound.

It is noted that whilst the triple right turn increases right turn capacity and helps mitigate the current right turn issues which extend throughout the corridor in its absence, the design delivers some additional delay to left turn movements (north-to-east) as the exclusive deceleration lane has essentially been converted as a shared through and left turn lane. This results in longer left turn queues compared to existing conditions.

Table 5.8: Passenger Car Travel Time Results – Saturday Midday Peak (12:30pm to 1:30pm)

Route	Direction	2014	2031	
		Existing	Future Base	Westfield Master Plan
Route 1: Doncaster Road (between Bayley Grove & Council Street)	Eastbound	131	459	422
	Westbound	89	145	116
Route 2: Tram Road & Williamsons Road (between Merlin Street & George Street)	Northbound	150	274	166
	Southbound	212	512	328
Route 3: Elgar Road & Williamsons Road (between Hanke Road & George Street)	Northbound	227	223	260
	Southbound	411	821	348

Table 5.8 indicates that during the Saturday midday peak, marginal increases to travel times can be expected along Williamsons Road northbound (Route 3 northbound). Similar to the other peak hours, the triple right turn implementation improves the southbound travel times on Williamsons Road significantly, and in general all travel times in this option are materially better to the Future Base.

In addition to the data presented in Tables 5.6 to Table 5.8, Figure 5.2 to Figure 5.7 provide a graphical comparison of the travel time performance of each route under the three key assessment scenarios.

Figure 5.3: Route 1 – Doncaster Road Eastbound (Travel Time – sec)

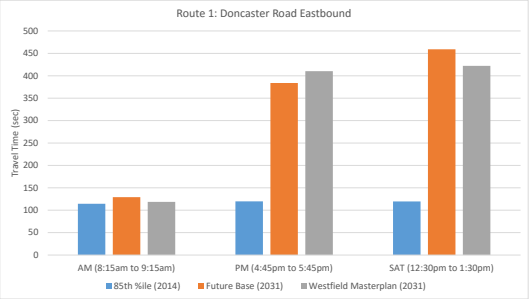


Figure 5.4: Route 1 – Doncaster Road Westbound (Travel Time – sec)

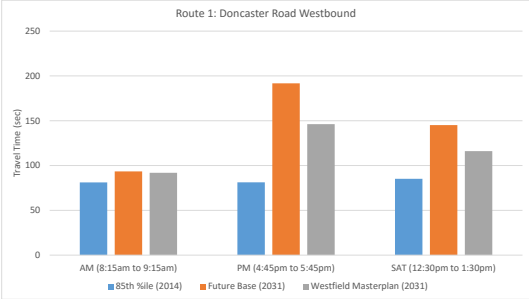


Figure 5.5: Route 2 – Tram Road and Williamsons Road Northbound (Travel Time – sec)

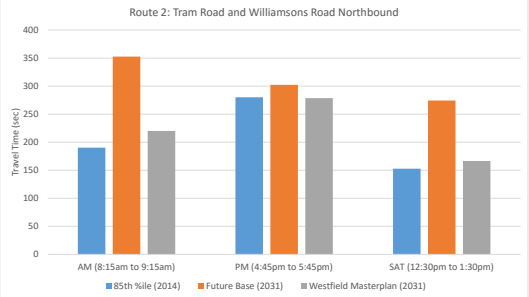


Figure 5.6: Route 2 – Tram Road and Williamsons Road Southbound (Travel Time – sec)

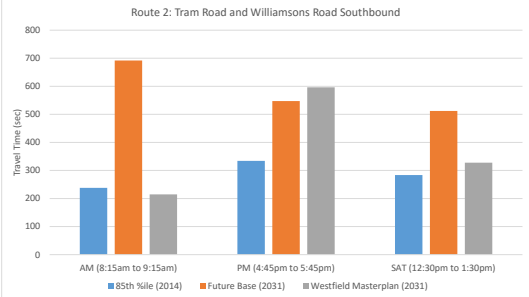


Figure 5.7: Route 3 – Elgar Road and Williamsons Road Northbound (Travel Time – sec)

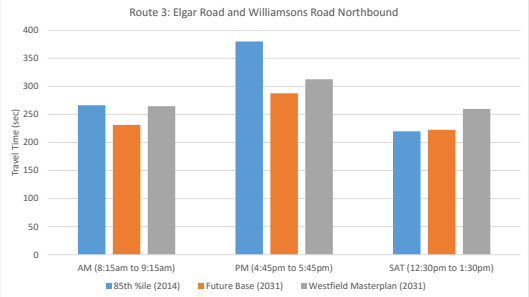
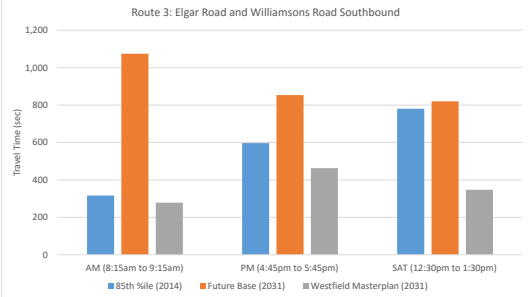


Figure 5.8: Route 3 – Elgar Road and Williamsons Road Southbound (Travel Time – sec)



5.5.3 Queue Length Analysis

An analysis of queue lengths has also been undertaken by reviewing the average speed of vehicles across links in the model network. This review is attached as Appendix F.

5.5.4 Public Transport Performance

Network Performance (Bus)

Similar to the network performance analysis for general vehicles (passenger cars) presented earlier in this section, the operating performance of public transport services (bus) has also been extracted from the model and analysed. Table 5.9 summarises the key network performance indicator of average speed for buses in the modelled network.

Table 5.9: Bus Network Performance

Peak	Network Statistic	2014	2031	
		85th Percentile Design Day	Future Base	Westfield Master Plan
Weekday AM Peak (8:15am to 9:15am)	Average Speed (km/h)	16.2	12.1	13.3
Weekday PM Peak (4:45pm to 5:45pm)	Average Speed (km/h)	12.7	10.1	9.5
Saturday Midday Peak (12:30pm to 1:30pm)	Average Speed (km/h)	12.3	10.1	11.3

Table 5.9 shows findings similar to the results for general passenger vehicle traffic. Given that buses are generally afforded priority within the study area (bus lanes and bus jump lanes), it is expected that there would be only a small impact on the operating performance of buses, with the exception of Williamsons Road at the frontage of Westfield Doncaster which has limited or no bus priorities at intersections. Not surprisingly, whilst competition remains for the same road space between general traffic and buses, the effect on travel time between the two (either positive or negative) will be similar.

Travel Times (Bus)

The bus travel times for the following key routes have been extracted from the models:

- Bus Route 281 (southbound only) – Manningham Road to Elgar Road between Crawford Road and Hanke Road
- Bus Route 293 (northbound and southbound) – Elgar Road to Williamsons Road between Rose Street and Eucalypt Avenue
- Bus Route 902 (northbound and southbound) – Doncaster Road to Williamsons Road between Whittens Lane and Eucalypt Avenue
- Bus Route 903 (northbound and southbound) – Tram Road to Manningham Road between Hanke Road and Burgundy Drive
- Bus Route 907 (eastbound and westbound) – Doncaster Road between Carawatha Road and Whittens Lane.

It is noted that the reported travel times include movements within the bus interchange, with future dwell times at the interchange consistent with existing conditions. Table 5.10 to Table 5.12 summarises the bus travel time results for each peak period.

Table 5.10: Bus Travel Time Results (seconds) – Weekday AM Peak (8:15am to 9:15am)

Route	Direction	2014	2031	
		85th Percentile Design Day	Future Base	Westfield Master Plan
Route 281	Southbound	679	1,615	623
Route 293	Northbound	555	564	814
	Southbound	813	1,728	776
Route 902	Northbound	552	657	870
	Southbound	680	1,027	775
Route 903	Northbound	437	770	687
	Southbound	561	907	642
Route 907	Eastbound	153	366	418
	Westbound	298	357	333

Table 5.11: Bus Travel Time Results (seconds) – Weekday PM Peak (4:45pm to 5:45pm)

Route	Direction	2014	2031	
		85th Percentile Design Day	Future Base	Westfield Master Plan
Route 281	Southbound	1,101	1,461	916
Route 293	Northbound	700	814	956
	Southbound	1,146	1,515	1,041
Route 902	Northbound	796	1,052	1,022
	Southbound	751	1,101	1,485
Route 903	Northbound	731	759	832
	Southbound	737	1,033	1,382
Route 907	Eastbound	155	690	584
	Westbound	316	421	334

Table 5.12: Bus Travel Time Results (seconds) – Saturday Midday Peak (12:30pm to 1:30pm)

Route	Direction	2014	2031	
		85th Percentile Design Day	Future Base	Westfield Master Plan
Route 281	Southbound	1,269	1,412	974
Route 293	Northbound	546	695	653
	Southbound	1,564	1,650	1,226
Route 902	Northbound	-	-	-
	Southbound	1,093	1,332	1,327
Route 903	Northbound	853	758	685
	Southbound	688	1,107	1,126
Route 907	Eastbound	154	555	469
	Westbound	259	374	320

The results presented in the tables above demonstrates a mix of results which includes some increases in bus travel times between 2014 and 2031 given the change in travel demands at intersections, particularly the Doncaster Road / Williamsons Road / Tram Road intersection.

Notwithstanding, the bus travel times in the Westfield Master Plan are generally lower than the Future Base option suggesting that efforts to alleviate traffic congestion in the future will directly improve the performance of buses within the network.

5.5.5 Modelling Summary

Overall, the microsimulation model results indicate that before the implementation of the Westfield Master Plan, traffic conditions on the road network within the Doncaster Hill study area will be congested as a result of the level of approved and projected developments as part of the Doncaster Hill strategy.

Observations of the model operation and analysis of the results suggest that the Doncaster Road / Williamsons Road / Tram Road / Elgar Road intersection controls (or meters) the overall performance of the balance of the network. Given the structure of the road network, the majority of traffic demand is required to travel through this intersection.

The addition of some 2,000 to 2,500 vehicles per hour in any road network without any notable capacity improvement works would likely result in a deterioration to operating performance, as is the case in this assessment. Notwithstanding, the modelling assessment provides an appropriate means to undertake a relative assessment of the proposed Westfield Master Plan and its impact with the addition of changes required to serve its altered access and other capacity generating modifications.

The implementation of the transport infrastructure improvements outlined to occur as part of the Master Plan development deliver for the most part improved transport operating conditions through the Doncaster Hill road network. In fact, the resultant (proposed) transport infrastructure package proposed under the Master Plan delivers an outcome which indicates a basis for a collective, precinct wide monetary contribution given the improvements that are made between the 2031 scenario with and without the Westfield Master Plan development. Further discussions are warranted between the Applicant and key stakeholders to explore options and mechanisms which might support the future funding of select transport works.

Lastly, the overall benefit of the proposed Master Plan road works can be further appreciated by the adopted modelling methodology which:

i Accounts for a displacement of through-traffic (equal to 20%) for the Doncaster Hill 2031 modelling scenario (Future Base). This is consistent with previous modelling assessments prepared for Manningham City Council in support of the Doncaster Hill Transport Study (2012),

ii No further displacement of through traffic under the Westfield Doncaster Master Plan Scenario, and

iii The absence of any mode shift change for the employees and customers associated with the Centre between 2014 and 2031.

On the third observation, Council's Doncaster Hill Mode Shift Plan documents a vision to help achieve a sustainable transport future through the changing of travel behaviours by encouraging increased public transport use and reduced levels of car dependency. This reference document indicates that alternative non-car based travel (walking, cycling and public transport) currently accounts for 19.6% of daily travel patterns. The purpose of the Doncaster Hill Mode Shift Plan is to identify actions to encourage a mode shift of 30% to sustainable transport modes, prior to full development of the precinct.

As a consequence, it would be prudent to note that any mode shift benefit gained in the precinct will provide a commensurate improvement to the operation of the road network in both the base case scenarios and Master Plan scenario.

6. Sustainable Transport

6.1 Public Transport

6.1.1 New Bus Interchange

Location of New Interchange

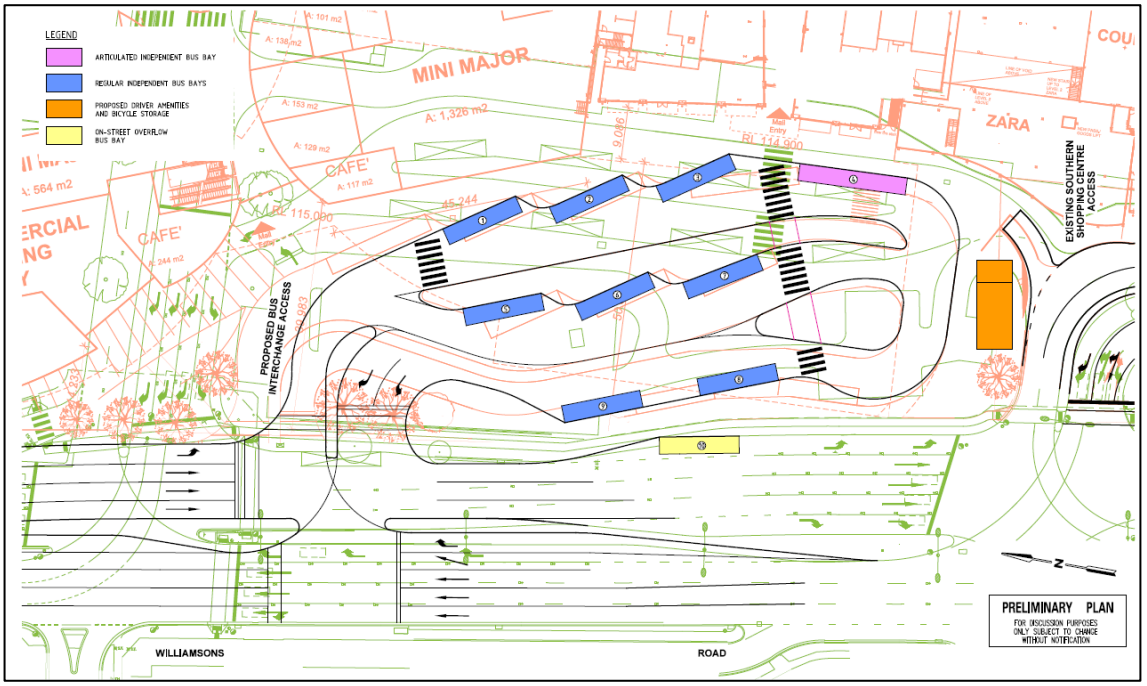
As part of the Master Plan proposal, it is proposed to alter the location and configuration of the existing bus interchange to improve its operation, accessibility and storage capacity.

It is currently proposed to relocate the bus interchange to the north of its current location, with a dedicated signalised intersection providing access to the interchange.

The proposed location is expected to improve the overall accessibility for patrons to Westfield Doncaster by bus by providing a high-quality interchange at a location central to and integrated with the Centre. It is intended that the facility will be provided on the ground level and provide full weather protection (i.e. undercover) for passengers.

The proposed general location of the bus interchange, relative to the existing location, is illustrated in Figure 6.1.

Figure 6.1: Indicative Bus Interchange Location (Existing/Post Development)



For planning purposes, the final location and design of the bus interchange is yet to be determined, with discussions with the relevant authorities recommended before any planning permit is issued for development.

Design of New Interchange

An indicative concept plan of the bus interchange is provided in Appendix B. The current concept design of the bus interchange represents an evolving (through a co-ordinated working group approach) design and incorporates the following key features:

- A total of nine bus bays operating within a loop system, including:
  - six sawtooth bays and three parallel bays
  - a bay capable of accommodating articulated buses
- Potential for the provision of bus driver facilities and shelters (subject to ongoing discussions with PTV).
- Additional and enhanced pedestrian paths and crossing points to provide direct connectivity to/from the Williamsons Road and the active frontage of Westfield Doncaster.

Support of the proposed provision of nine bus bays is considered to be appropriate given the analysis and discussions presented in Appendix A of this report which indicates the following:

i A maximum of eight buses were recorded within the bus interchange at any one time with the average number of buses within the interchange recorded at just two.

ii All bus services running to and from the Centre currently have significant capacity to accommodate additional patrons (noting that the most occupied bus route had a recorded maximum occupancy of 40% - Route 903).

6.1.2 Bus Driver Facilities

In addition to the proposed interchange, the Master Plan incorporates a new dedicated area for bus driver amenities as well as bicycle storage at the interchange. The specifics around the extent of facilities provided in this area shall be determined at the detailed planning stage of the project.

6.2 Active Travel

A review of the existing and proposed active travel measures are provided in Appendix H. The key findings from the review is provided below.

6.2.1 Walking

Consideration has been given to where the desire lines associated with the surrounding site context shown in Figure 2.4 interface with the site and how they align with the key pedestrian entrances to the shopping centre building proper. These are broadly shown in Figure 6.2.

Figure 6.2: Pedestrian Network & Facilities – Site Interface & Internal Access Arrangements

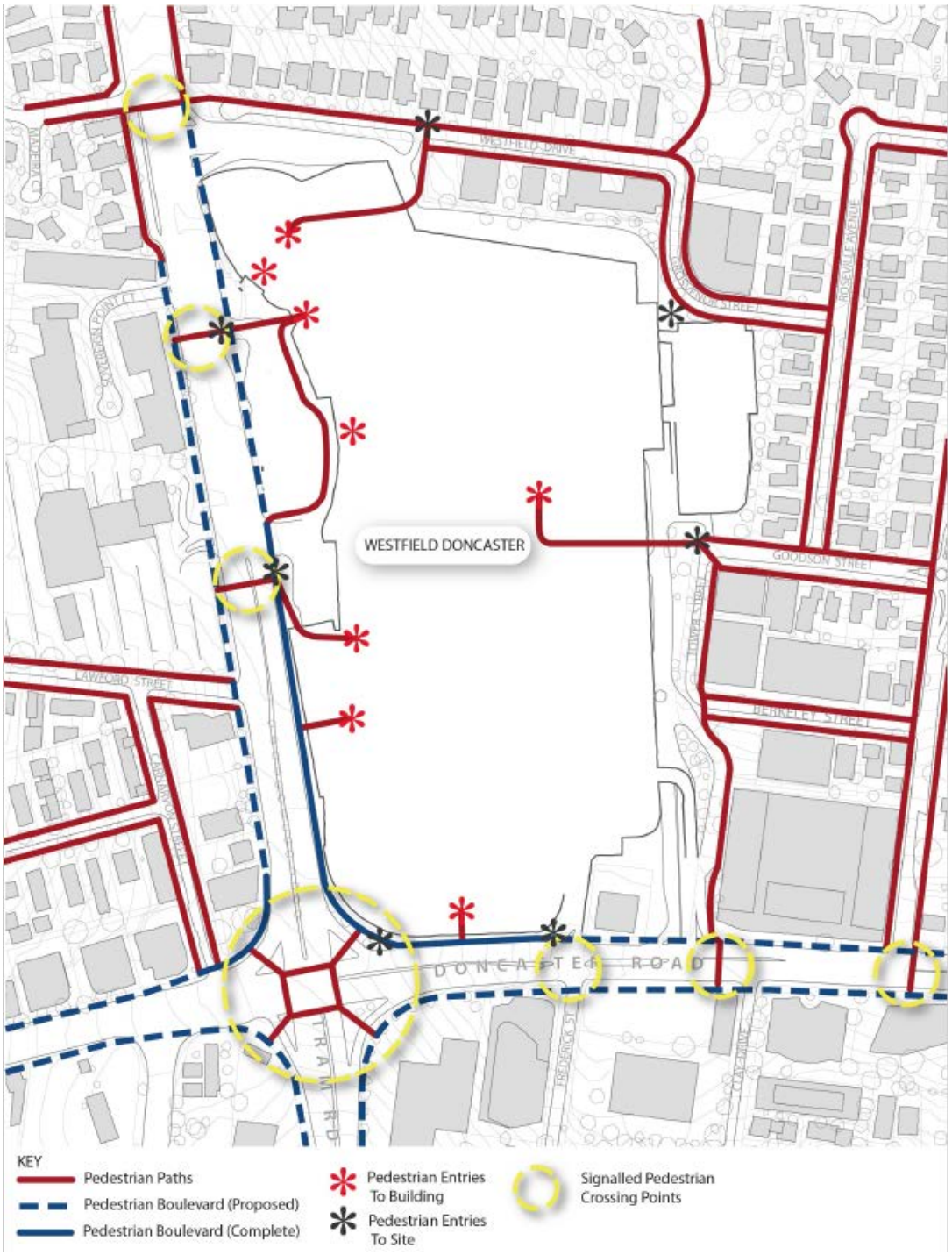


Figure 6.2 indicates that the site has a high level of access from Doncaster Road and Williamsons Road through the pedestrian boulevard treatments and regular signalised crossing facilities. In terms of access from the other frontages, they are of a lower level but considered to be appropriate given the likely level of demand being generated by the proximate land uses.

These pedestrian facilities proposed along the road frontages and internal to the site in Figure 6.2 are what can be expected to be generally provided as part of the Master Plan.

It is noted that given the terrain and existing constrains, not all facilities or to a standard that is considered desirable may be possible, such as the pedestrian boulevard along the Williamsons Road frontage of the site, which is constrained by the proposed bus interchange improvements and the existing building that will remain.

6.2.2 Cycling

On the basis of the 'Preferred Bicycle Routes' identified in Figure 2.5, consideration of how to provide suitable levels of access to, and location of, end-of-trip facilities is provided in Figure 6.3.

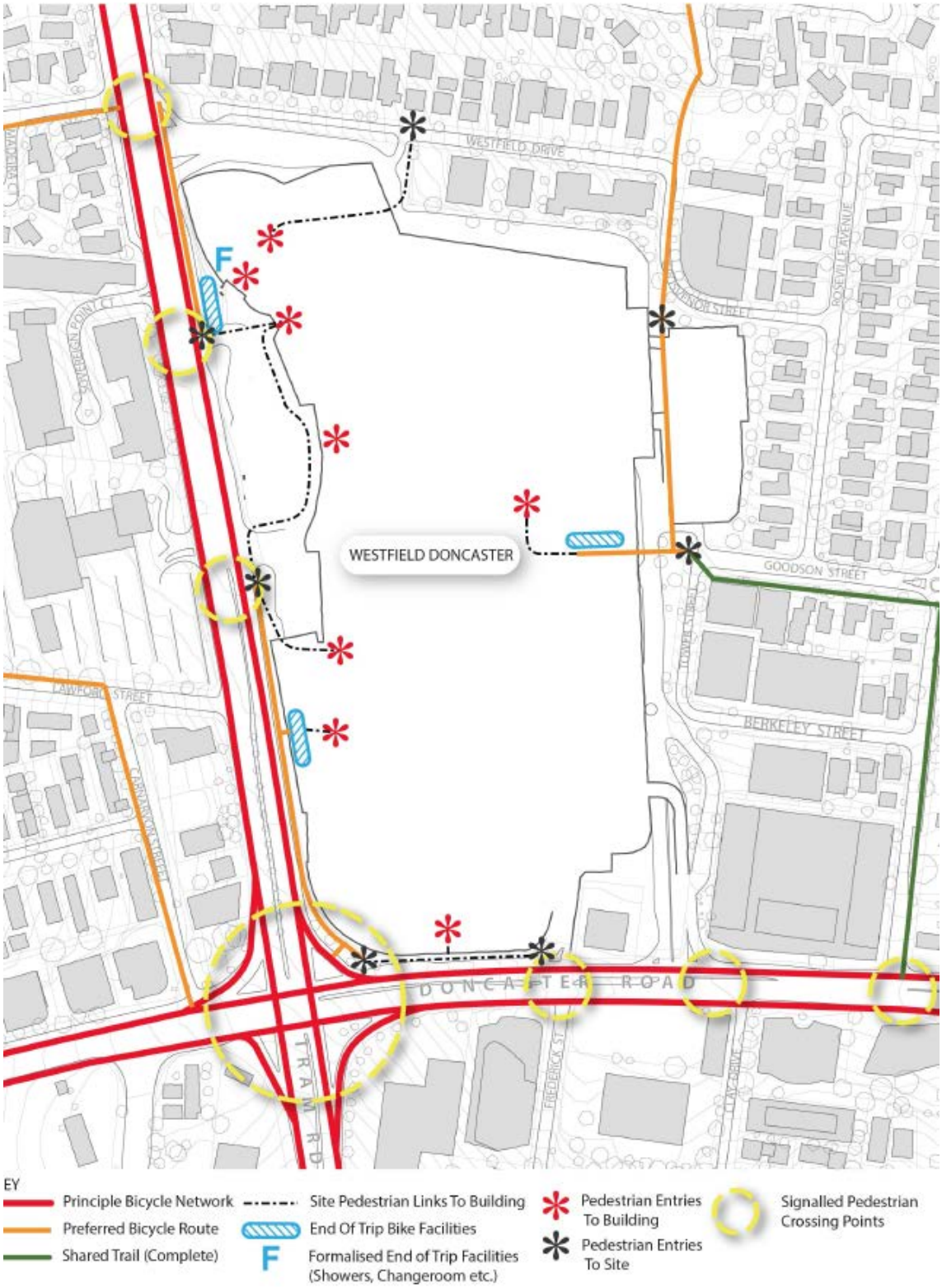
There are three locations that end-of-trip facilities are provided around the centre as follows:

- Southwest corner - along Williamsons Road opposite Lawford Street
- Northwest corner - along Williamsons Road opposite Sovereign Point Court
- Midway along the eastern side – opposite Goodson Street

It is proposed that a northwest facility be provided with staff and visitor bicycle parking as well as end of trip facilities (i.e. showers and change rooms). The remaining two locations would provide staff and visitor bicycle parking.

It is noted that for the locations along Williamsons Road cyclists will need to travel for short distances along the pedestrian boulevards from the surrounding network to access the parking facilities. This is considered appropriate when supporting the last section of trips terminating within the site. It wouldn't be recommended that through routes for cyclists be encouraged to use the pedestrian boulevard facilities as it will reduce the level of comfort and service to pedestrians, who should be prioritised in this area.

Figure 6.3: Bicycle Network & Facilities - Site Interface & Internal Access Arrangements



6.3 Impacts of Growth on the Sustainable Transport Network

6.3.1 Bus Services

Detailed surveys of the existing bus interchange provided in Appendix A of this report indicate that there is substantial room for growth in the network before the requirement for additional bus facilities are required. Discussions with PTV, Council and the operators indicate that the provision of a nine bus bay interchange is sufficient to accommodate current and foreseeable future demands.

In addition, the microsimulation modelling results presented in Section 5 of this report indicate that bus travel times in the Westfield Master Plan option are generally lower than the Future Base option suggesting that by mitigating some of the traffic congestion in the future would also improve the performance of buses.

6.4 Other (Taxis)

As demonstrated from observations of the existing taxi rank provided in Appendix A of this report, there is currently not a high demand for taxis at the Centre. In this regard it is acknowledged that any proposed taxi rank facility will need to be provided in a location which is:

- Prominent and highly visible,
- Accessible by those from within and external to the Centre,
- Co-located with other transport interchange services such as the proposed new bus interchange facility along Williamsons Road,
- Caters for increased demands in an effort to reduce private motorised travel to and from the Centre.

The specific provision and location of the future taxi facility will require further evaluation and planning and will be detailed in the future planning permit applications for approval by the Responsible Authority and other required key stakeholders.

7. Car Parking & Access

7.1 Car Parking

7.1.1 Existing and Proposed Master Plan Provision

The Centre currently provides for 4,782 on-site car parking spaces with detailed parking demand results provided in Appendix A. A summary of the existing and future retail floor areas, car parking provisions and associated car parking rates (spaces per 100sqm) is provided in Table 7.1 and Figure 7.1.

Table 7.1: Existing and Proposed Retail Car Parking Rates

Scenario	Retail Floor Area	No. of Car Parking Spaces	Car Parking Rate
Existing Conditions	123,549sqm	4,782 spaces	3.87 spaces per 100sqm
Completion of Stage 1 Car Park	123,549sqm	5,338 spaces	4.32 spaces per 100sqm
Completion of Proposed Expansion	166,549sqm	6,800 spaces	4.09 spaces per 100sqm

Figure 7.1: Summary of Existing and Proposed Retail Parking Provision

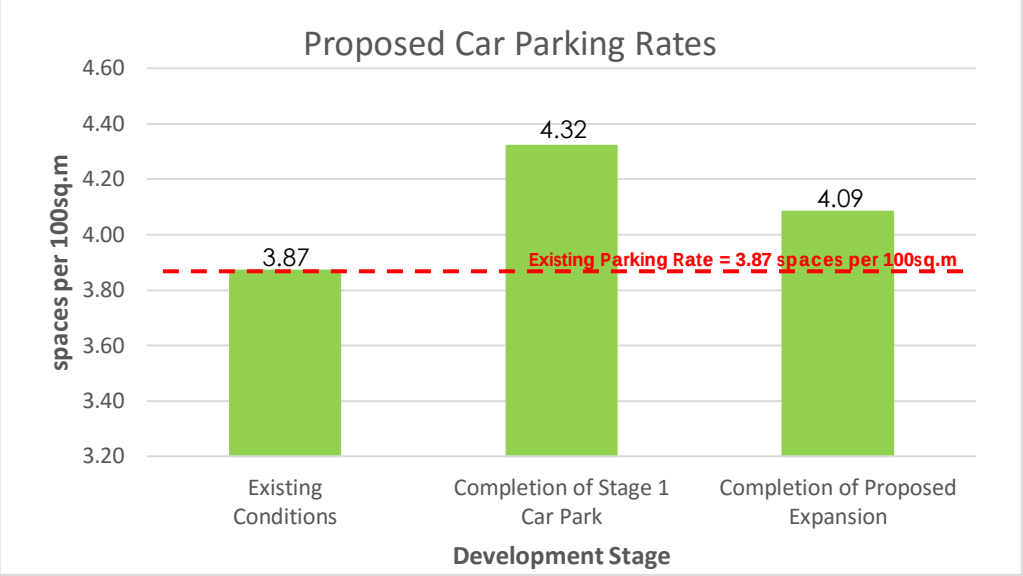


Table 7.1 and Figure 7.1 indicates that following the completion of the Master Plan retail car parking will be provided at a rate of 4.09 spaces per 100sqm. It is noted that the future car parking rate is greater than the currently provided rate of 3.87 spaces per 100sqm.

In addition, approximately 630 spaces are proposed to be assigned to the commercial (office) component of the Master Plan. These spaces will be allocated to tenants of the 18,000sqm of commercial floor area (a rate of 3.5 spaces per 100sqm).

The proposed Master Plan car parking provision is summarised in Table 7.2.

Table 7.2: Proposed Car Parking Provision

Use	Floor Area	No. of Car Parking Spaces	Car Parking Rate
Retail	166,549sqm	6,800 spaces	4.09 spaces per 100sqm
Commercial	18,000sqm	630 spaces	3.5 spaces per 100sqm
Total	**184,549sqm**	**7,430 spaces**	**-**

As part of the Master Plan there is a commitment to ensure that car parking for the retail uses will continue to be provided at a rate greater than the existing parking provision of 3.87 spaces per 100sq.m. Office car parking will be provided at a rate consistent with that presented in Clause 52.06 of the Manningham Planning Scheme.

7.1.2 Layout & Design

The proposed layout of new car parking areas is proposed to be designed in accordance to Australian Standard for Off-street Car Parking Facilities (AS/2890.1), with typical dimensions of car spaces being 2.6m wide by 5.4m long and with a 6.8m aisle. These dimensions exceed those specified in the Manningham Planning Scheme and are considered to be acceptable.

All car parking areas will be assessed as part of any future planning permit application.

7.2 Vehicle Access

Vehicular access arrangements to the redeveloped Centre are to be modified and enhanced as part of the Master Plan. These works include the relocation of the existing northernmost signalised intersection along Williamsons Road towards Westfield Drive and the introduction of a dedicated signalised access to a new bus interchange.

Appendix B provides an overview of proposed upgrades to the external road network to support the Master Plan proposal.

8. Conclusions

Based on the research and investigations completed under this study, the following conclusions have been made:

1. The Master Plan seeks to increase the floor area of Westfield Doncaster by 43,000sqm from a total of 120,000sqm (existing) to 163,000sqm (post-development). In addition, it is proposed to provide approximately 18,000sqm of commercial floor area (total equal to 181,000sqm).
2. A recent planning approval will increase car parking on the subject site by a further 556 car parking spaces and result in an expanded supply equal to 5,338 car parking spaces. This expanded supply is expected to be available and active by the end of 2015.
3. Preliminary planning for the Master Plan anticipates an ultimate provision of car parking equal to approximately 7,430 car parking spaces.
4. An upgraded and expanded bus interchange facility is proposed under the Master Plan on Williamsons Road with access provided on an exclusive basis through the provision of a new signalised intersection.
5. Vehicular access to the Centre is proposed to be provided to both Doncaster Road and Williamsons Road via a total of three signalised access points for general traffic. Revisions to access on Williamsons Road are proposed with a revised spacing and the addition of one new signalised intersection for exclusive use of public transport (buses). Traffic access at Fredrick Street is also proposed to be altered through the removal of traffic signals and their replacement with a signalised pedestrian crossing facility. Access to and from Fredrick Street is proposed to be left-in / left-out with the same proposed for the Westfield Shopping Centre Service Area on the north side of Doncaster Road.
6. Updated land use forecasts developed during the preparation of this review for Doncaster Hill (by Manningham City Council) indicate a material uplift in residential and commercial land use is expected since the preparation of the last land use assessment strategy for the precinct.
7. Various state and local policies underpin and guide the re-development of the Doncaster Hill area including the Westfield Doncaster Shopping Centre. These policy guidelines set the context for traffic and transport planning outcomes associated with land use growth in the precinct.
8. The intersection of Doncaster Road, Williamsons Road and Tram Road is most influential in determining the through-put of traffic in and out of the Doncaster Hill area. This intersection effectively meters traffic and transport demand through the precinct.
9. Road works are proposed at the intersection of Doncaster Road, Williamsons Road and Tram Road in the form of a triple right turn facility (north to west) to assist with alleviating transport impacts associated with the Master Plan and further development within Doncaster Hill.
10. The implementation of the transport infrastructure improvements outlined to occur as part of the Master Plan development deliver for the most part improved transport operating conditions through the Doncaster Hill road network. In fact, the resultant (proposed) transport infrastructure package proposed under the Master Plan delivers an outcome which indicates a basis for a collective, precinct wide monetary contribution given the improvements that are made between the 2031 scenario with and without the Westfield Master Plan development. Further discussions are warranted between the Applicant and key stakeholders to explore options and mechanisms which might support the future funding of select transport works.

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Appendix A

Existing Conditions

A.1 Traffic Volumes

A.1.1 Recorded & "Design Day" Volumes

Recorded Volumes

GTA commissioned traffic movement counts at the following intersections surrounding the Centre, from 7:00am – 10:00am and 3:30pm-6:30pm on Friday 5 September and Friday 12 September 2014 and from 11:00am – 2:00pm on Saturday 6 September and Saturday 13 September 2014:

- Williamsons Road / Manningham Road
- Williamsons Road / Bordeaux Street / Westfield Drive
- Williamsons Road / Centre Access / Sovereign Point Court
- Williamsons Road / Centre Access / Shoppingtown Hotel Access
- Doncaster Road / Tram Road / Williamsons Road
- Tram Road / Merlin Street
- Doncaster Road / Bayley Grove
- Doncaster Road / Rose Street / Beaconsfield Street
- Doncaster Road / Elgar Road
- Doncaster Road / Frederick Street / Centre Access
- Doncaster Road / Centre Access
- Doncaster Road / Council Street
- Tower Street Roundabout (internal to site)

The Friday AM, PM and Saturday midday peak hour traffic volumes are presented in Appendix G.

A.1.2 85th Percentile "Design Day" Volumes

To determine whether the survey data obtained in September 2014 was representative of 85th percentile (design day) conditions, GTA obtained Friday and Saturday door count data for the Centre for the 12 month period from September 2013 to August 2014.

This data was obtained in order to ascertain the '85th percentile' activity level to consider the relationship between Centre patronage on the surveyed Friday and Saturday and the 85th percentile Friday and Saturday.

Table A.1 presents a comparison between the 85th percentile day of week door counts and the survey day door counts and indicates that the September 2014 survey results should be factored up by the factors shown to represent an 85th percentile design day.

Table A.1: Door Count Data (85th Percentile Trading Days – Friday and Saturday)

	Survey Day		85th Percentile Day		Factor	
	Friday 5th September 2014	Saturday 6th September 2014	Friday (September 2013-August 2014)	Saturday (September 2013-August 2014)	Friday	Saturday
Pedestrian Demand	51,877	50,764	56,045	54,056	1.08	1.06

Table A.1 indicates the following factors would be applicable to attain 85th percentile conditions from the March surveys:

- Friday: 1.08
- Saturday: 1.06

It should be noted, however, that this factoring approach is highly conservative, with similar approaches adopted for recent expansions at Chadstone Shopping Centre indicating that the

adoption of such factors is likely to result in traffic conditions closer to the 90-95th percentile. This conservatism is due to many factors, including (but not limited to) the fact that the Centre is open for longer hours on days of peak patronage (e.g. near Christmas). Moreover, it is noted that this approach also ignores the fact that passing (non-Centre related) traffic volumes are generally lower on the abutting road network in such periods; thus adding to the conservatism of this approach.

Notwithstanding this conservatism, the surveyed traffic volumes have been adjusted by the factors presented within Table A.1 to represent the 85th percentile volumes.

These factored (base) volumes are presented in Appendix G and indicate the following total traffic volumes into and out of the Centre:

- Friday AM
- Friday PM
- Saturday Lunch

A.1.3 Traffic Generation Rate

On the basis of the 85th percentile traffic volumes presented in Appendix G, the resulting traffic generation rates are shown in Table A.2.

Table A.2: Existing Centre Traffic Generation Rate

Peak Period	Peak Time	IN/OUT Volumes (Total)	85th %ile Factor (Door Count)	Factored Volume	Existing Centre Floor Area (sqm)	Centre Vehicle Generation Rate
Friday AM	8:15am-9:15am	1870	1.08	2020	123547	1.64
Friday PM	3:45pm-4:45pm	4266	1.08	4607		3.73
Saturday Midday	11:30am-12:30pm	4939	1.06	5235		4.24

Table A.2 shows that the Centre currently generates traffic at the following rates:

- AM Peak Hour: 1.64 vehicle movements/100sqm of retail floor area
- PM Peak Hour: 3.73 vehicle movements/100sqm of retail floor area
- Saturday Midday Peak Hour: 4.24 vehicle movements/100sqm of retail floor area.

A.2 Accident Statistics

A review of the reported casualty accident history for the roads and intersections adjoining the subject site has been sourced from VicRoads CrashStats accident database.

This database records all accidents causing injury that have occurred in Victoria since 1987 (as recorded by Victorian Police) and categorises these accidents as follows:

- Fatal injury: at least one person was killed in the accident or died within 30 days as a result of the accident.
- Serious injury: at least one person was sent to hospital as a result of the accident.
- Other injury: at least one person required medical treatment as a result of the accident.

A summary of the accidents in the vicinity of the Centre for the last available five year period (January 2009 – December 2013) is presented in Table A.3.

Table A.3: Casualty Accident History

Location	Number of Accidents		
	Fatality	Serious Injury	Other Injury
Nearby Intersections			
Williamsons Road / Bordeaux Street	-	4	3
Williamsons Road / Sovereign Point Court	-	-	3
Williamsons Road / Lawford Street	-	-	1
Williamsons Road / Station Street	-	2	12
Doncaster Road / Frederick Street	-	-	1
Doncaster Road/Tower Street	-	-	2
Roads Fronting Site			
Williamsons Road btw Bordeaux Street & Manningham Road	-	-	5
Williamsons Road btw Manningham Road & Sovereign Point Court	-	-	1
Williamsons Road btw Sovereign Point Court & Unnamed	-	-	1
Williamsons Road btw Unnamed & Lawford Street	-	1	3
Williamsons Road btw Lawford Street & Doncaster Road	-	-	1
Doncaster Road btw Williamsons Road & Frederick Street	-	-	2
Doncaster Road btw Frederick Street & Tower Street	-	1	-
TOTAL	**-**	**8**	**35**

Table A.3 indicates in the last available five year period, eight serious injury and 35 other injury accidents have occurred within the vicinity of the Centre.

With regard to the accident history presented in Table A.3, a number of these accidents have occurred in the same location. The following similarities have been identified:

- Williamsons Road / Bordeaux Street
  - two individual accidents involving rear end collisions
  - two individual accidents involving right near collisions.
- Williamsons Road / Station Street
  - three individual accidents involving left rear collisions of vehicles in slip lanes
  - two individual accidents involving rear end collisions
  - two individual accidents involving right through collisions.

A.3 Car Parking

A.3.1 Supply

GTA Consultants compiled an inventory of available car parking associated with the Centre, recording a total of 4782 car spaces.

It is noted that the parking inventory area was split into seven sub-precincts. The location of these individual areas as well as the supply of each respective car parking area is shown in Figure A.1 and summarised in Table A.4.

Figure A.1: Map of Survey Area

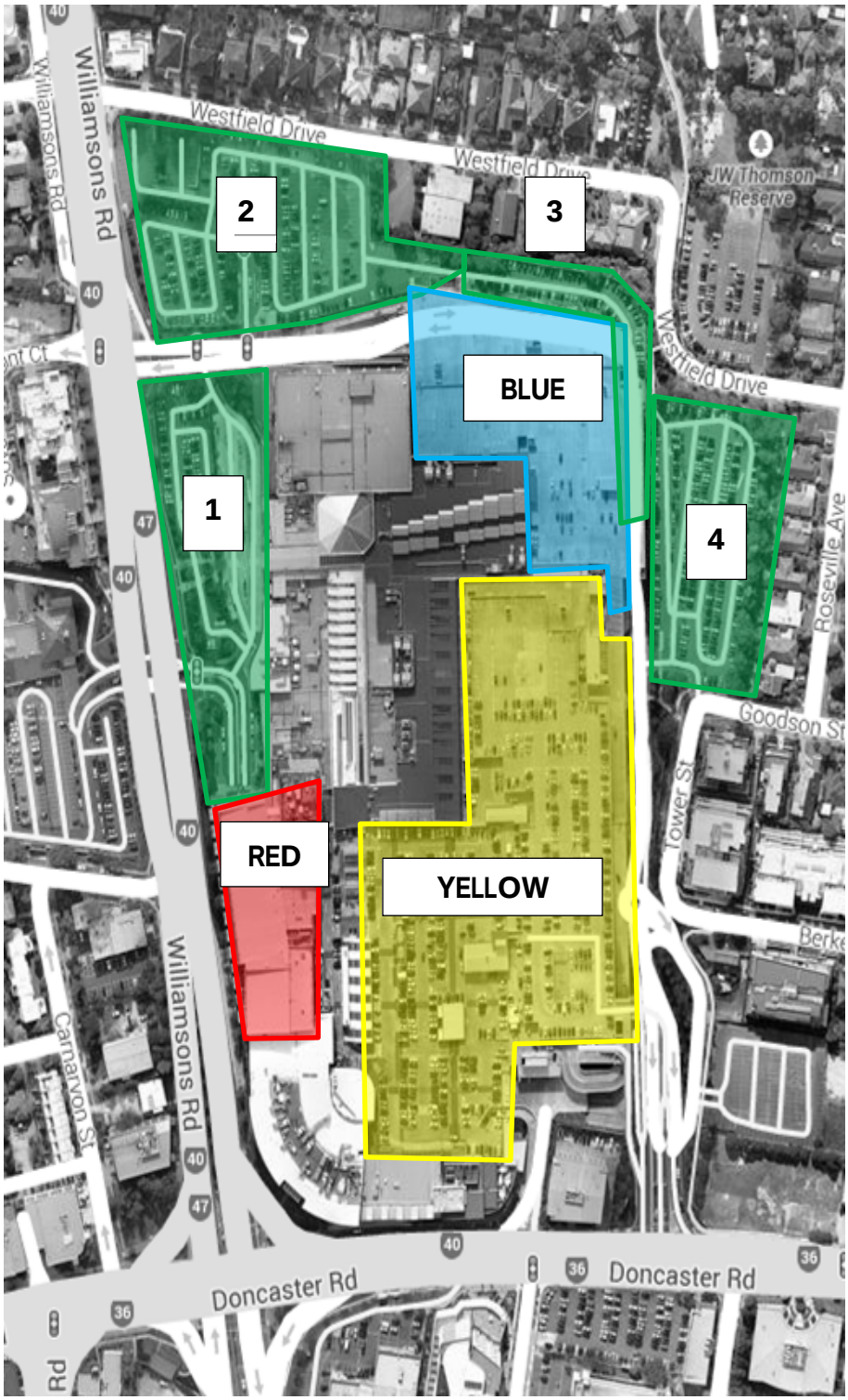


Table A.4: Car Parking Supply by Area

Area	Supply
1	76 spaces
2	401 spaces
3	100 spaces
4	281 spaces
Yellow	1987 spaces
Blue	1649 spaces
Red	288 spaces
Total	**4,782 spaces**

A.3.2 Demand

Parking demand surveys covering all areas within the Centre were undertaken by GTA, during the following periods:

- Friday 5 September 2014: 9:00am – 9:00pm
- Saturday 6 September 2014: 9:00am – 6:00pm.

A summary of the total on-site car parking demands for each of these periods is provided in Figure A.2. This figure indicates the following:

- An overall peak parking demand of some 4,214 vehicles (88% occupancy) was recorded at 2:00pm on Saturday 6 September.
- The peak Friday demand occurred at 1:00pm, with a recorded demand of some 4096 vehicles (86% occupancy).
- Demands during the evening period were substantially higher on the Friday (relative to the Saturday evening period) but still lower than the daytime demands. The reduction of parking demand during the Saturday evening peak is most reasonably explained by trading hours at the Centre which support operation until 9:00pm on a Friday and 6:00pm on a Saturday.
- For reference, variations by time of day and car parking area are also shown in Figure A.2 to Figure A.4.

These figures indicate that parking demand varies across the Centre with sub-precinct areas experiencing some variability. In isolation, the Blue Car Park experiences the lowest level of utilisation. The Blue Car Park is available to the public and contains a Kmart Tyre and Auto, Car wash, as well as the Centres Valet Parking Service. The low level of utilisation in this area appears to be due to the low level of uptake of the Valet Parking area as well as low levels of utilisation of the Blue Car Park roof levels.

Figure A.2: Existing Car Parking Demands by Time of Day

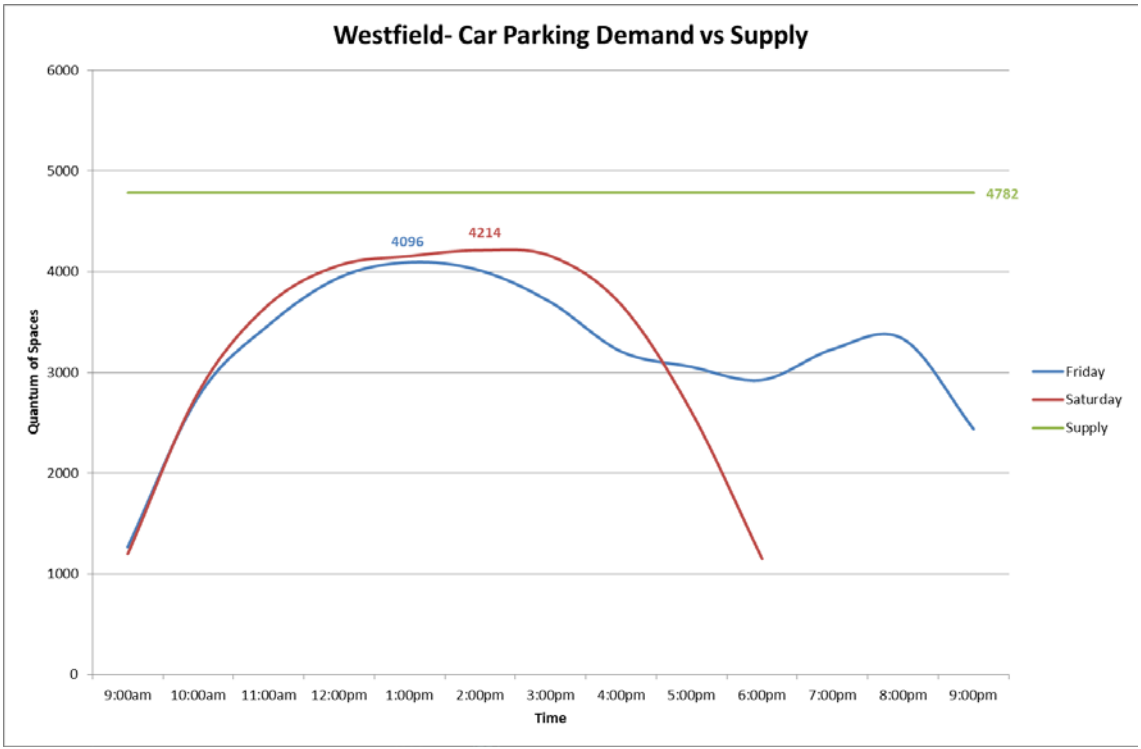


Figure A.3: Friday Midday Peak Demands

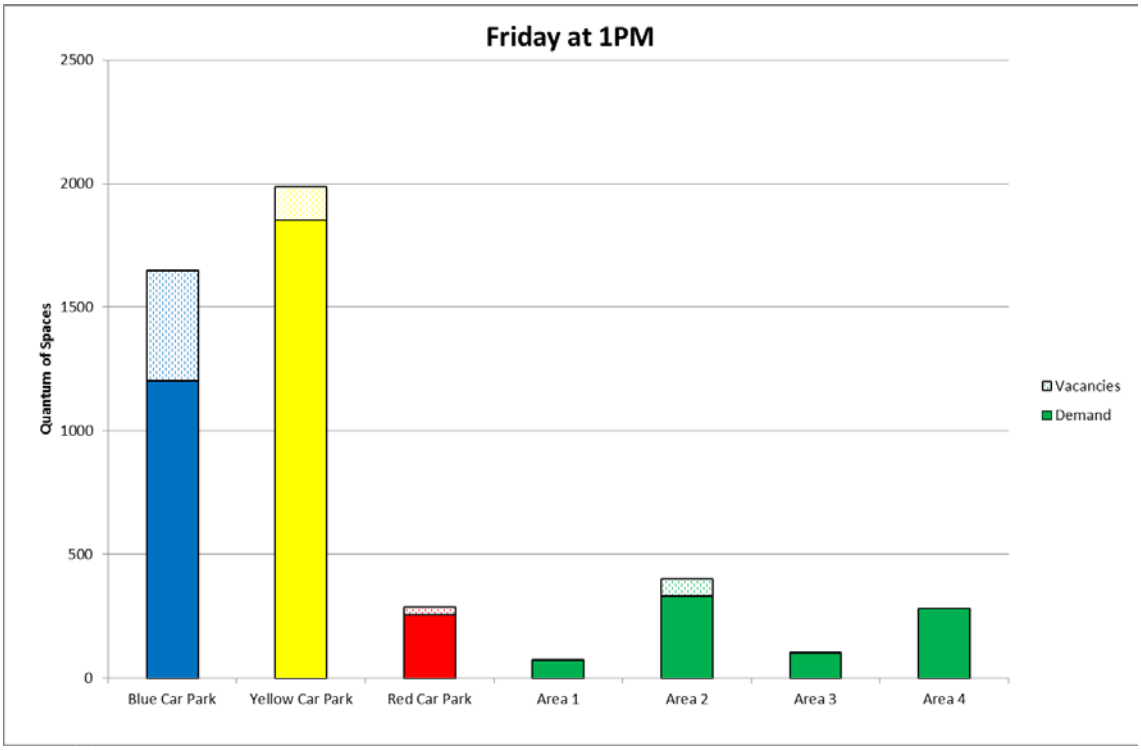
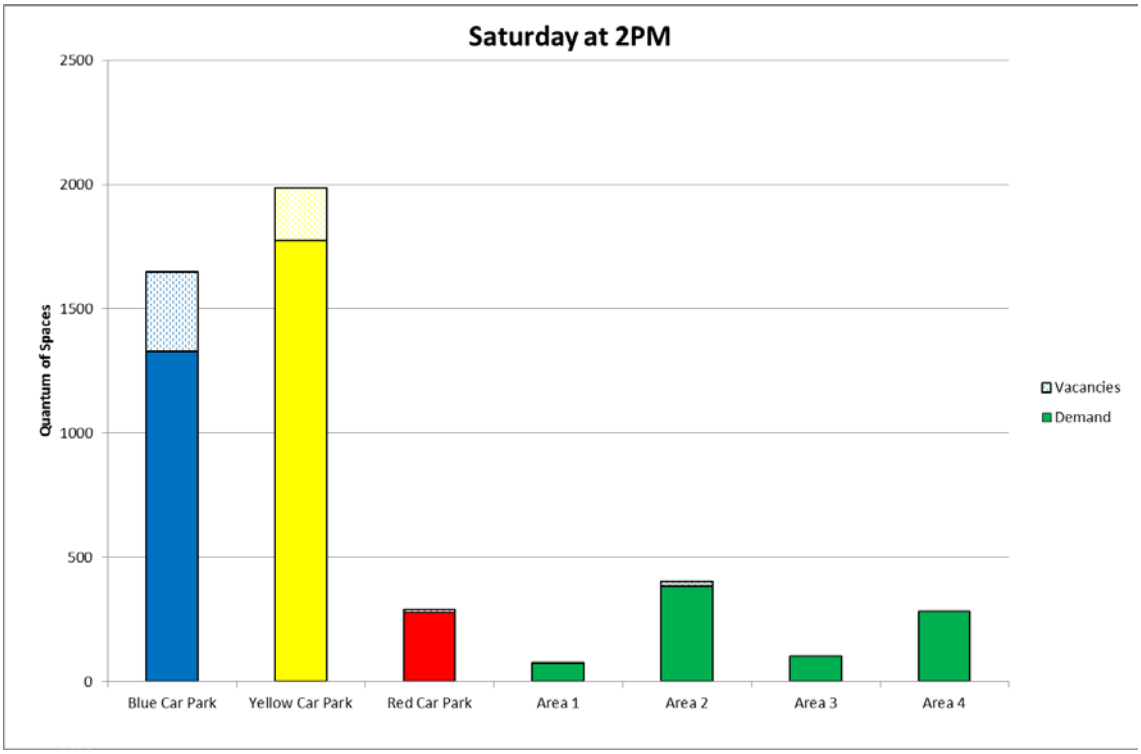


Figure A.4: Saturday Midday Peak Demands



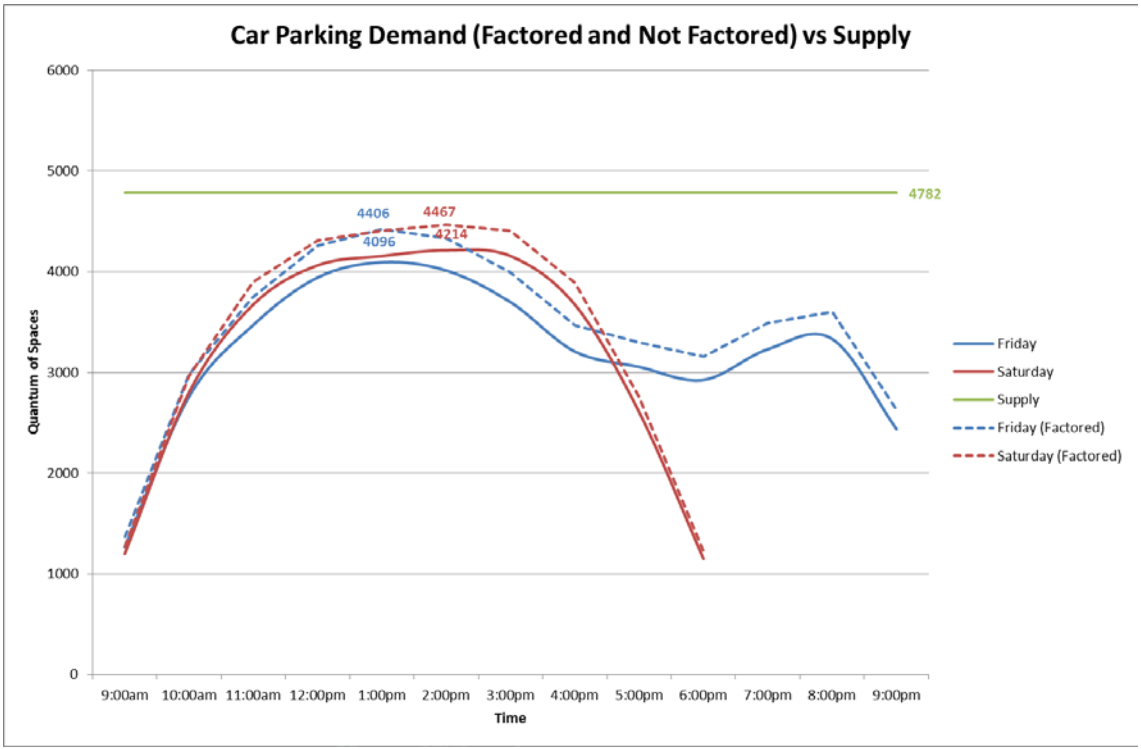
Finally it is noted that GTA also conducted parking surveys of surrounding streets and did not find any evidence of overspill parking from the Centre. Operationally, this is not surprising given the size of these parking areas in relation to the Centre as well as the various restrictions associated with on-street parking in the area.

A.3.3 85th Percentile Demands

In order to develop an activity profile which represents the 85th percentile design day, the September 2014 survey results have been factored upwards using the factors previously calculated in Table A.1.

Figure A.5 provides an outline of the estimated 85th percentile parking activity levels for the Centre.

Figure A.5: 85th Percentile Car Parking Demands



As shown in Figure A.5 application of these factors to the recorded demands would indicate that the following (approximate) 85th percentile parking demands could be expected for the Centre:

- 85th Percentile Friday: 4,406 vehicles
- 85th Percentile Saturday: 4,467 vehicles

This analysis suggests that the existing car parking supply of 4,782 spaces would satisfy the 85th percentile car parking demand.

A.4 Public Transport

A.4.1 Buses

Figure A.6 shows the Centre in relation to the existing bus routes that operate within its vicinity, whilst Table A.5 summarises the key road based routes and major destinations that can be reached using these services.

Figure A.6: Nearby Public Transport Services

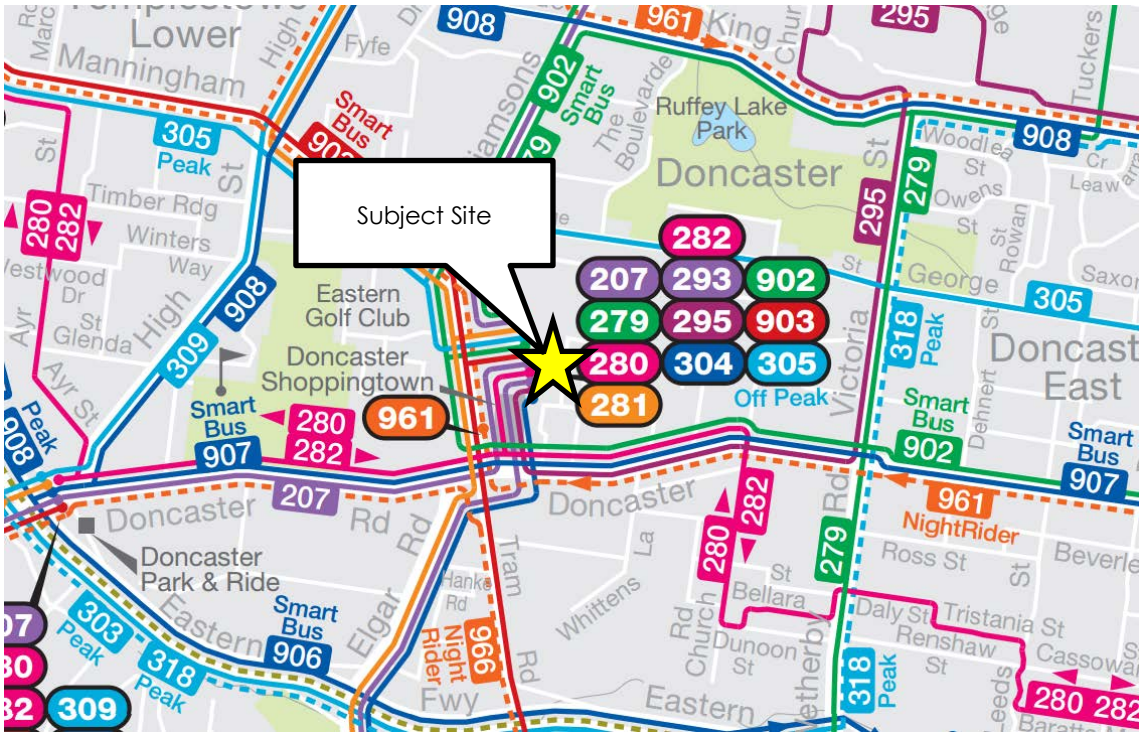


Figure A.6 indicates that a total of 12 bus routes operate in the vicinity of the Centre, of these routes, it is noted that the 902, 903 and 907 routes are SMARTBUS services which run over extended hours and at a higher frequency (refer to Table A.5). Further, the 907 route does not currently operate through the on-site bus interchange with the closest stop on the corner of Doncaster Road and Williamsons Road directly adjacent the Centre.

Table A.5: Road Based Public Transport Provision

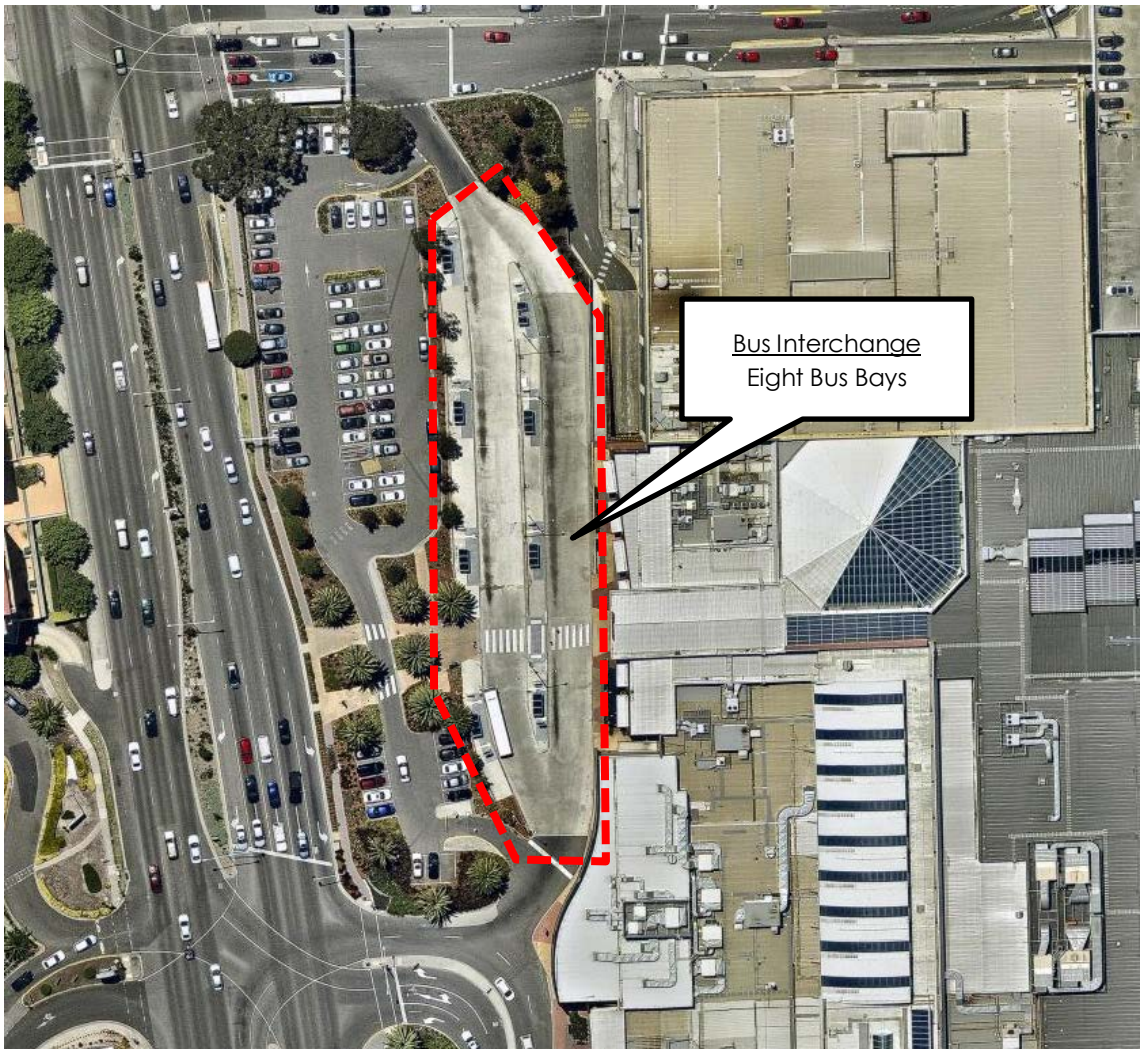
Route Number	Route Description	Significant Destinations On Route	Service Span First Service/Last Service		Frequency On/Off Peak	
			Week day	Week end	Week day	Week end
207	City to Doncaster Shoppingtown via Kew Junction	Kew Junction/Doncaster Park & Ride/CBD	5:15am / 11:08pm	6:30am / 10:52pm	15min / 20min	30min
279	Box Hill to Doncaster Shoppingtown via Middleborough Road	Box Hill Station/Templestowe Shops	5:35am / 11:42pm	8:00am / 8:20pm	15min - 20min	60min
280	Manningham Loop via Tunstall Square SC, Shoppingtown (clockwise)	Templestowe SC/Doncaster Park & Ride/The Pines SC	7:33am / 5:36pm	8:30am / 4:30pm	30min	60min
281	Templestowe to Deakin University	Templestowe SC/Box Hill Hospital/Deakin University	6:49am / 6:43pm	7:47am / 5:47pm	20min	60min
282	Manningham Loop via Templestowe Village SC, Shoppingtown (anti-clockwise)	The Pines SC/Doncaster Park & Ride/Tunstall Square SC	7:50am / 6:21pm	9:53am / 4:35pm	30min	60min
293	Box Hill to Greensborough via Doncaster Shoppingtown	Greensborough Station/Box Hill Central	6:14am / 9:13pm	8:22am / 7:14pm	30min	60min
295	Doncaster Shoppingtown to The Pines SC via Templestowe	The Pines SC	7:30am / 6:30pm	8:00am / 6:00pm	30min	60min
304	City to Doncaster Shoppingtown via Belmore Rd and Eastern Fwy	CBD/Balwyn East SC	5:57am / 7:35pm	7:40am / 5:43pm	12min / 30min	60min
305	City to The Pines SC via Eastern Fwy	CBD/The Pines SC	6:09am / 11:37pm	7:46am / 9:41pm	15min	30min
902	Chelsea to Airport West (SMARTBUS Service)	Airport West SC/ /The Glen SC	5:11am / 12:03am	6:34am / 9:07pm	12min - 15min	30min
903	Altona to Mordialloc (SMARTBUS Service)	Altona Gate SC/DFO Essendon/Austin Hospital/Box Hill Central/Chadstone SC	5:10am / 12:13am	7:41am / 9:52pm	8min	30min
907	City to Mitcham via Doncaster Road (SMARTBUS Service)	Mitcham Station/Doncaster Park & Ride/CBD	5:29am / 11:28pm	7:19am / 8:44pm	10min - 15min	30min

A.4.2 Existing Bus Interchange Area

The Centre has one bus interchange located at the northwest entrance to the Centre, accessed from Williamsons Road.

The bus interchange provides eight bus bays as shown in Figure A.7. The layout of this bus interchange permits independent access to the bays.

Figure A.7: Existing Bus Interchange Location



A.4.3 Bus Activity and Patronage Surveys

GTA conducted bus patronage surveys at the bus interchange as well as the bus stops surrounding the Centre on the following days:

- Friday 5 September 2014 from 7:00am-10:00am and 3:30pm-6:30pm
- Saturday 6 September 2014 from 11:00am-2:00pm

The surveys focussed on recording the maximum number of buses within the interchange at any one time, the number of patrons using the bus interchange, and the number of bus services and their demand/capacity.

Table A.6 has been prepared to summarise the maximum number of buses recorded and the frequency of these recordings during the surveyed period, with further information presented in Figure A.8, Figure A.9 and Figure A.10 on the following pages.

Table A.6: Summary of Number of Buses within Existing Bus Interchange

Peak Hour	Maximum Number of Buses	Frequency of Maximum	Average Number of Buses
Friday 7:00am-10:00am (3 hours)	5	1	1
Friday 3:30pm-6:30pm (3 hours)	8	1	2
Saturday 11:00am-2:00pm (3 hours)	6	2	1

Table A.6 indicates a maximum of eight buses were recorded during the bus interchange at any one time, with this recorded only once during the Friday PM peak. Additionally the average number of buses utilising the interchange was a maximum of 2 during the Friday PM peak.

Figure A.8: Existing Bus Interchange Occupancy – AM Peak Period

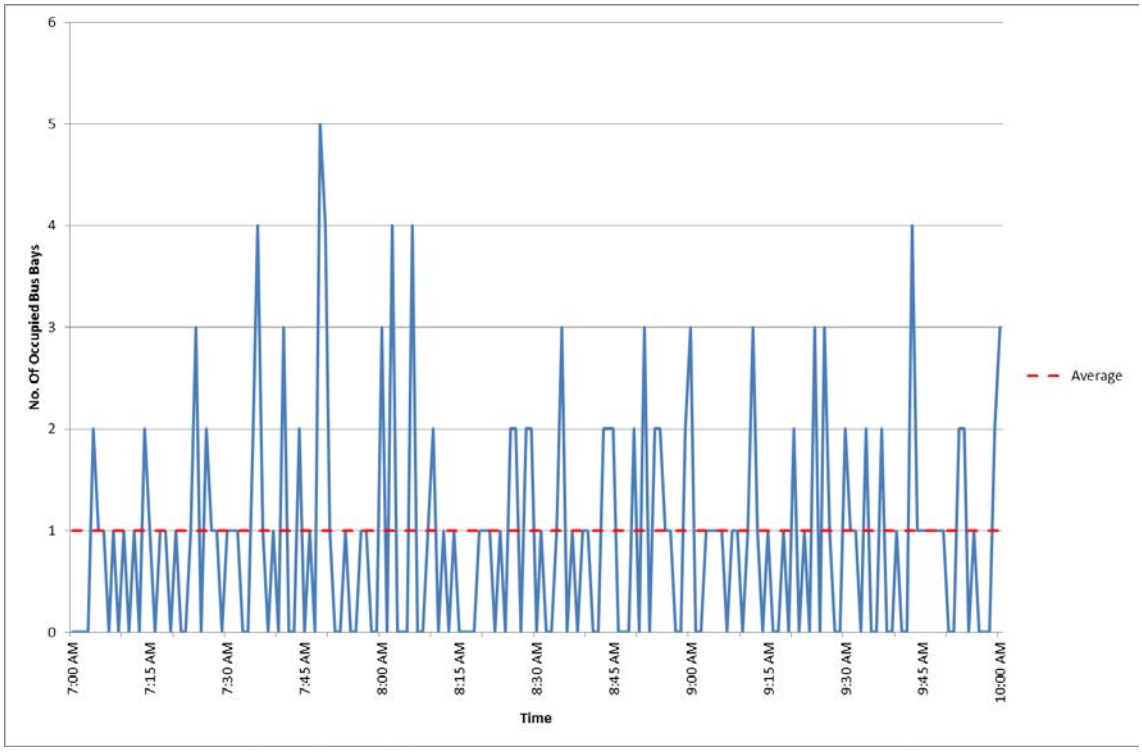


Figure A.9: Existing Bus Interchange Occupancy – PM Peak Period

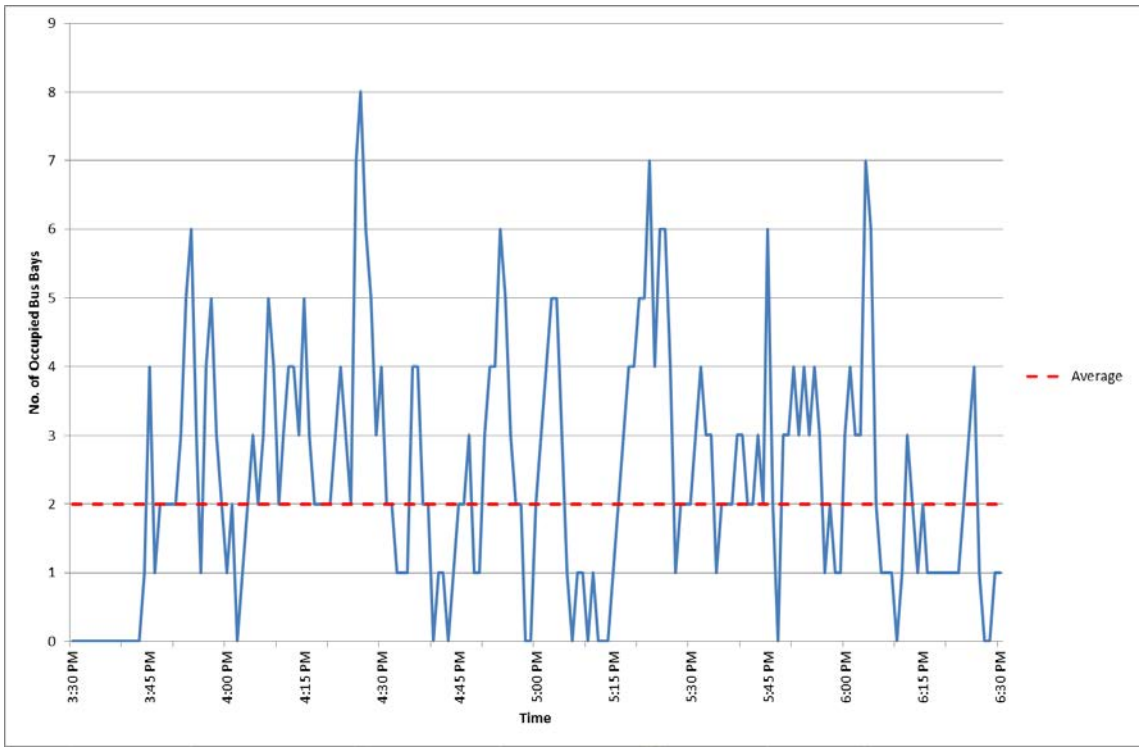
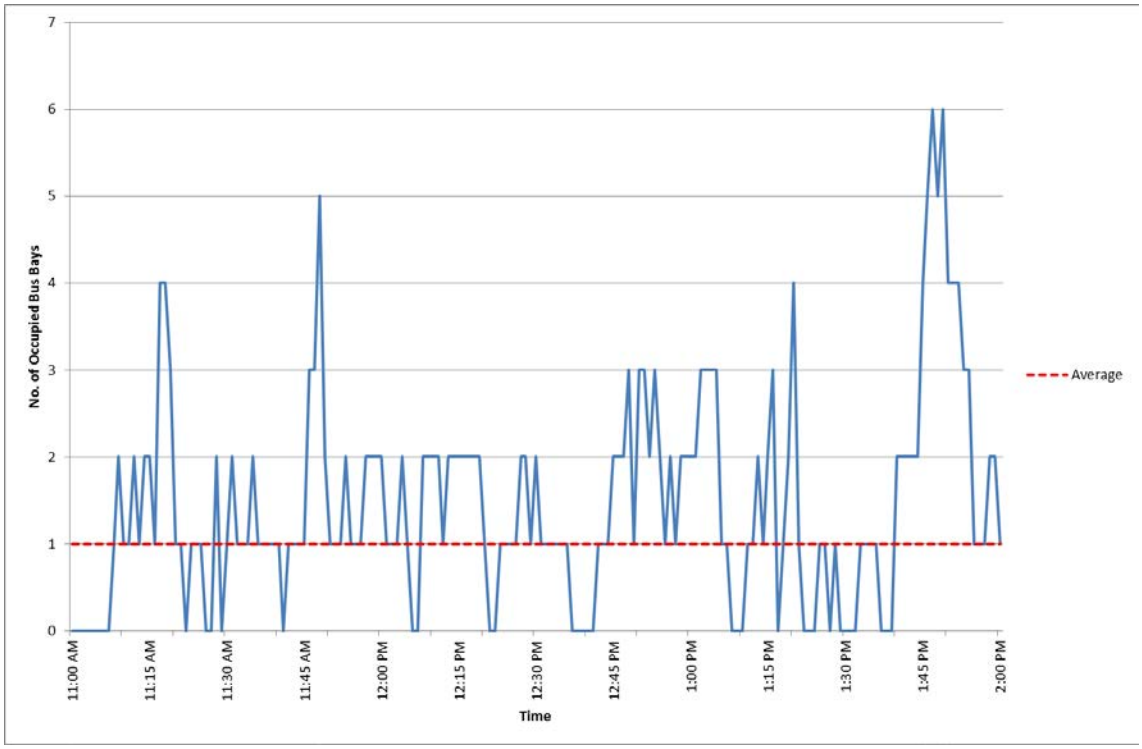


Figure A.10: Existing Bus Interchange Occupancy - Saturday



In addition, Figure A.11 and Figure A.12 have been prepared to show activity levels (the number of people getting on and off bus services) at the bus interchange.

Figure A.11: Patronage at Bus Interchange (Friday)

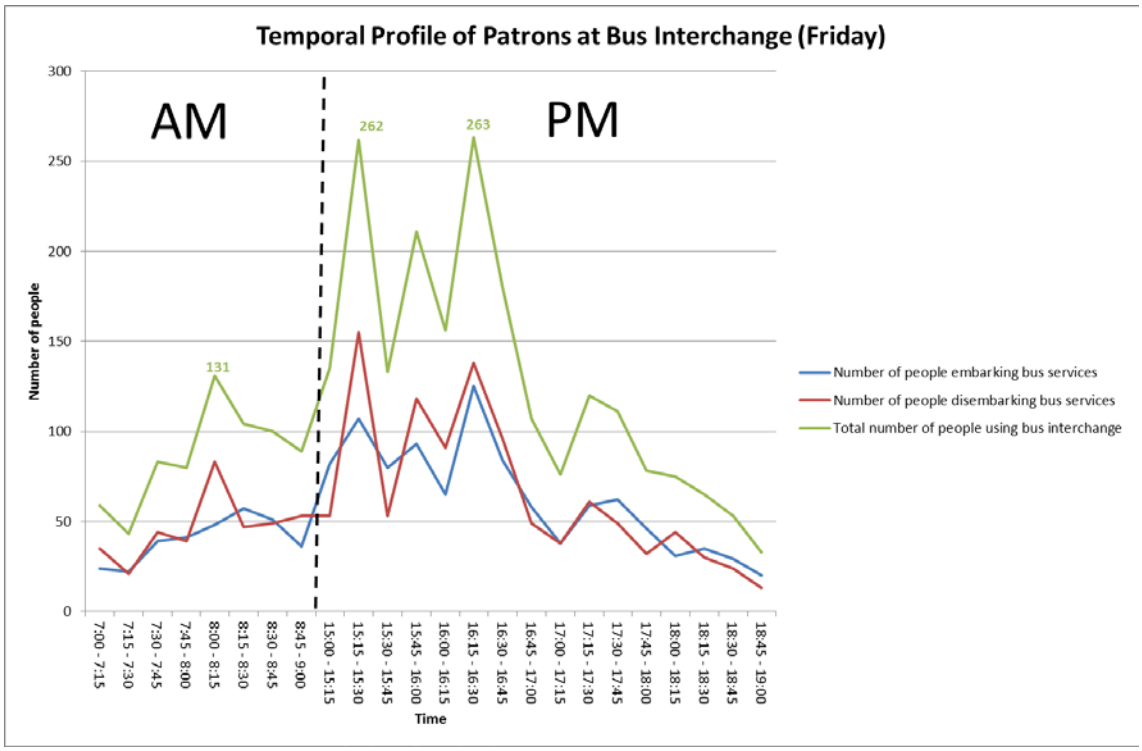


Figure A.12: Patronage at Bus Interchange (Saturday)

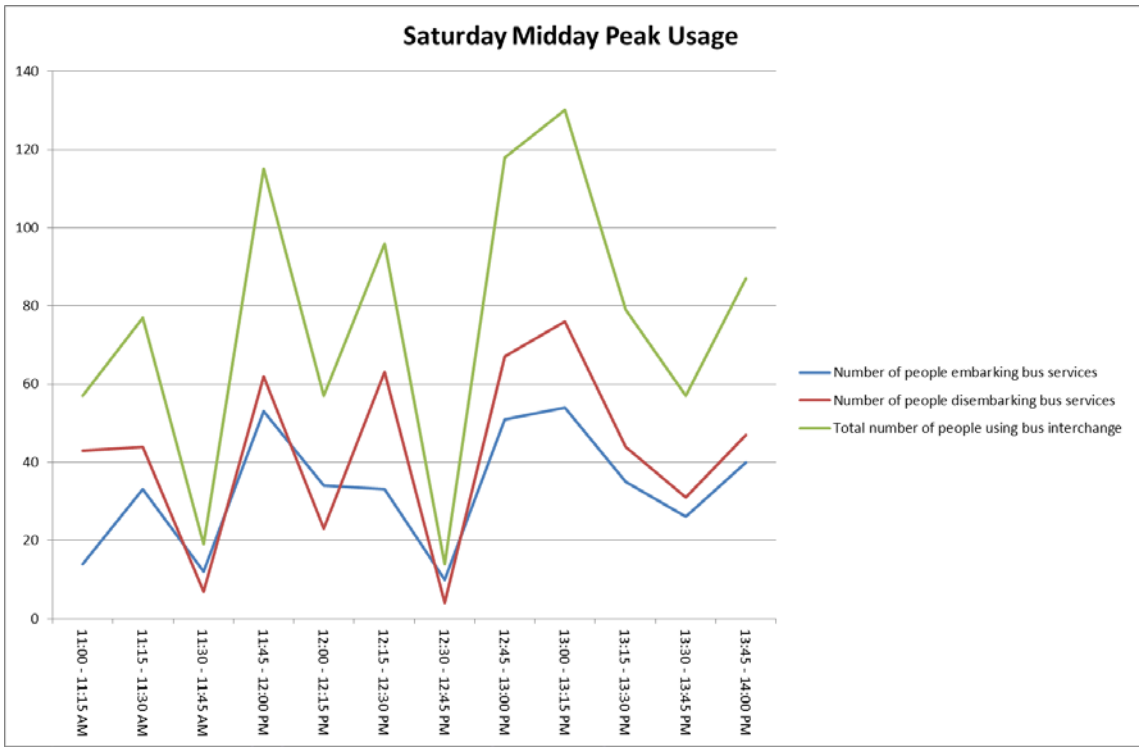


Figure A.11 and Figure A.12 indicate that utilisation of the bus interchange is greatest during the Friday PM period with peak 15 minute demands approximately double those recorded during the Friday AM period and on Saturday.

Furthermore, GTA also assessed the current number of bus services which arrive / depart the bus interchange during all peak periods. In undertaking this assessment, GTA has calculated the average capacity of buses utilising the interchange (70) in order to estimate the capacity of each bus route for both arrival and departure. Counts were also conducted of the number of passengers on each bus service upon arrival as well as departure.

Figure A.13 to Figure A.18 have been prepared to show the passenger demand, available capacity (bus capacity minus passenger demand) as well as the occupancy percentage of each bus route during the recorded peak hours.

These figures show that the 902 and 903 bus routes run at the greatest frequencies, and that the 903 SMARTBUS has the greatest occupancy during all peak periods (noting, however, that this occupancy peaks at approximately 40% during the Saturday Midday peak period).

Overall, these figures show that there is significant capacity available on all bus routes during the peak times for both arrivals and departures, with only the 902,903 and School Bus Routes experiencing a demand of greater than 25% on arrival or departure.

Figure A.13: Friday Morning Peak Hour (7:45am-8:45am) - Arrival

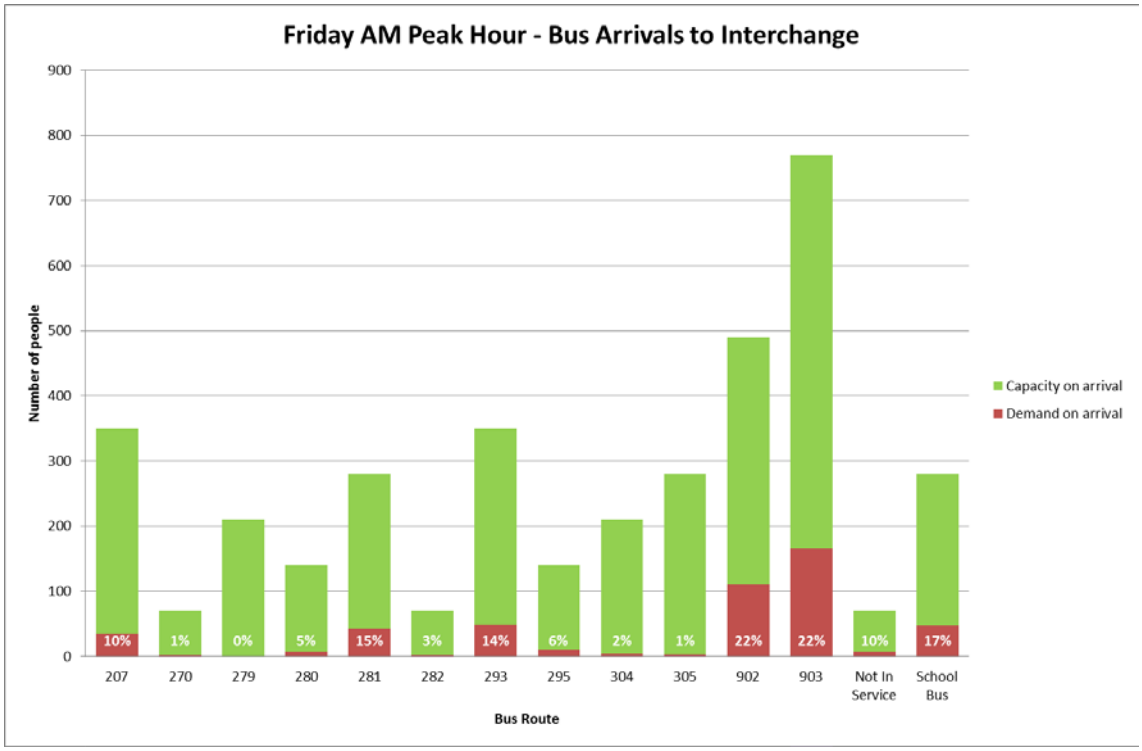


Figure A.14: Friday Morning Peak Hour (7:45am-8:45am) - Departure

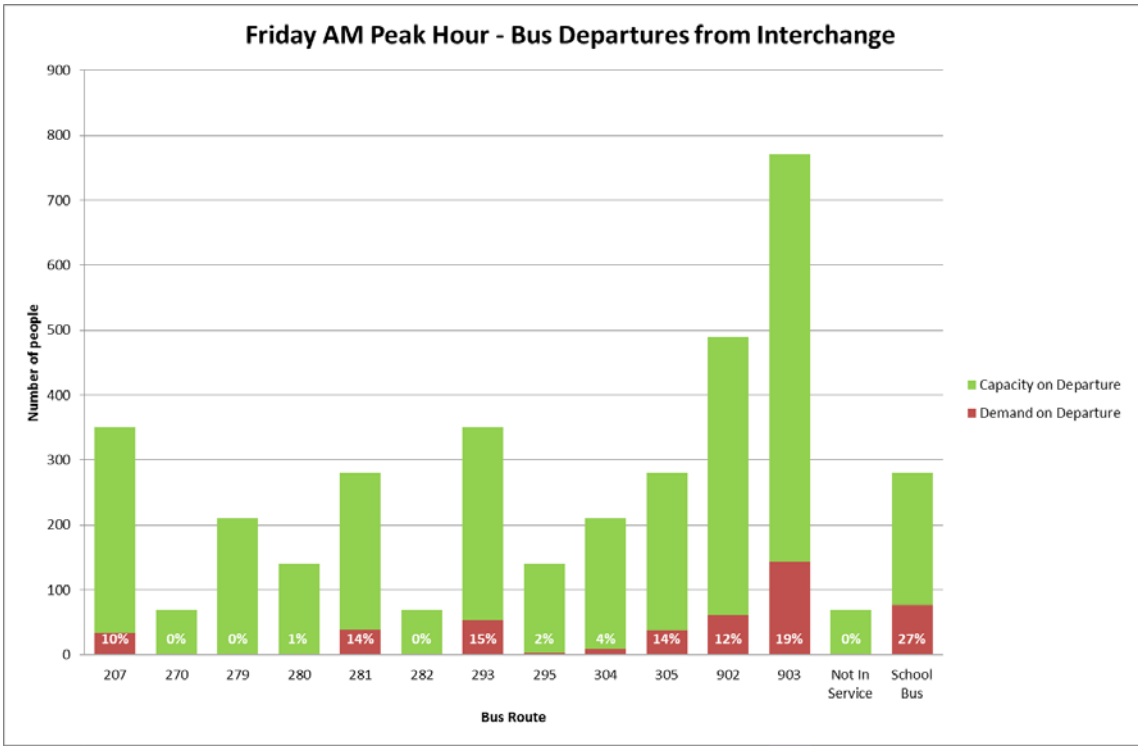


Figure A.15: Friday Afternoon Peak Hour (3:45pm – 4:45pm) – Arrival

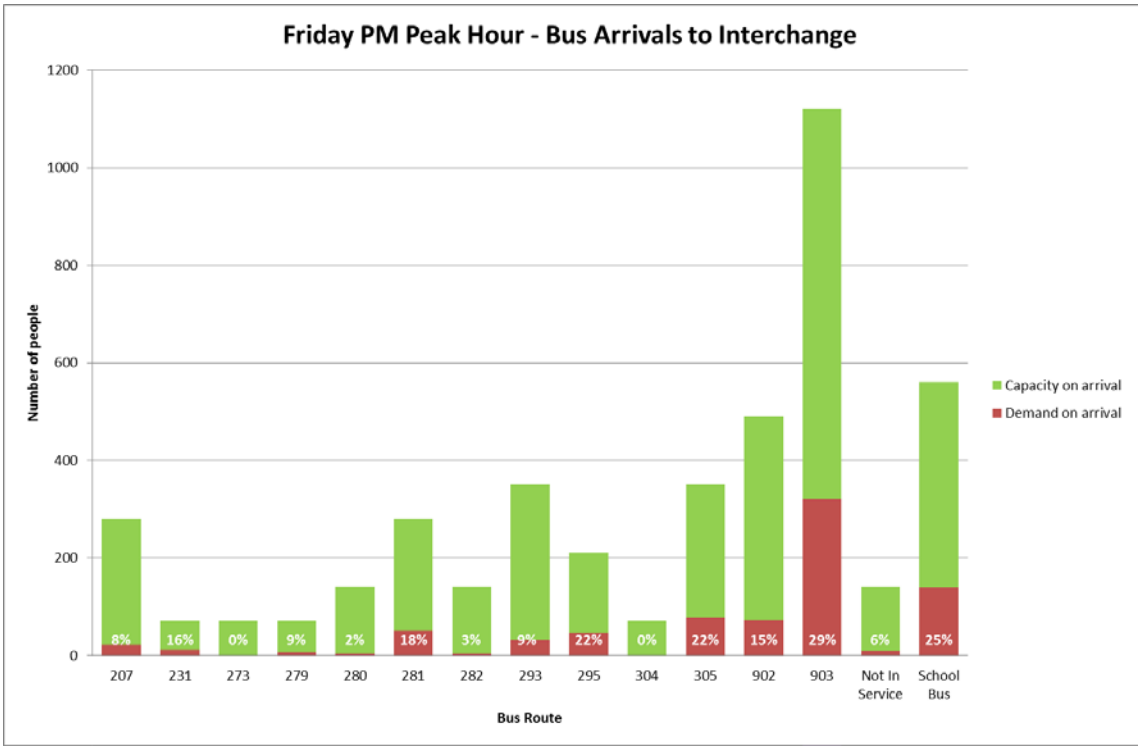


Figure A.16: Friday Afternoon Peak Hour (3:45pm-4:45pm) - Departure

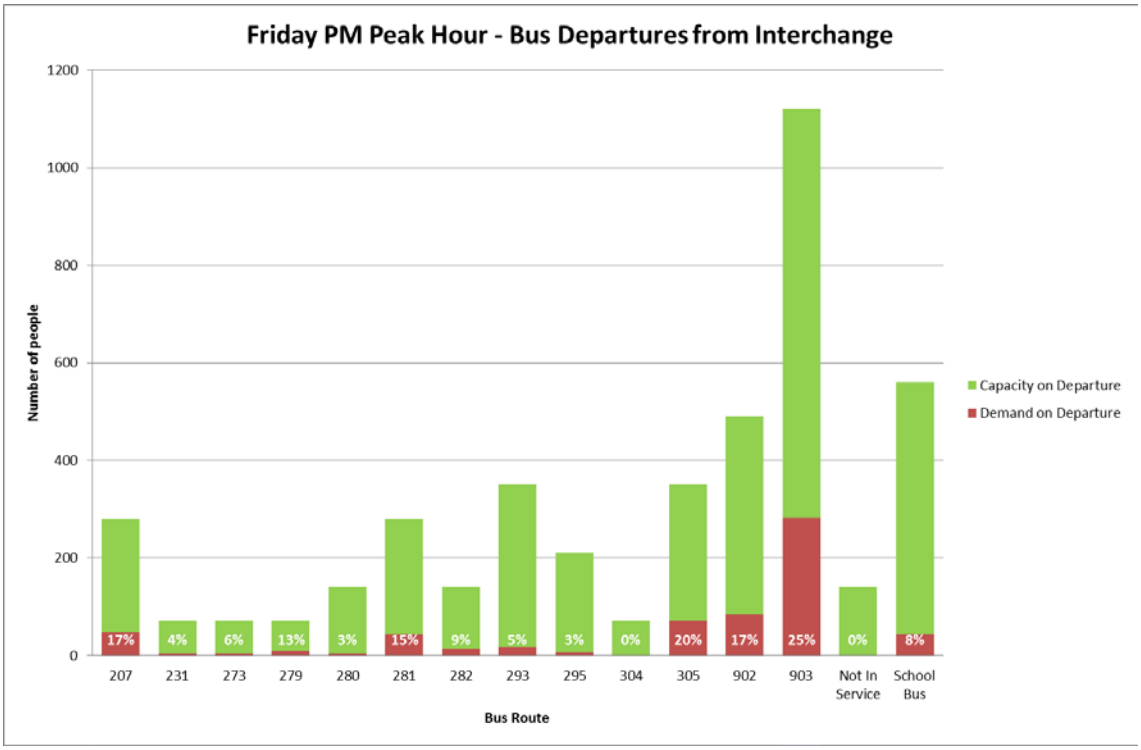


Figure A.17: Saturday Peak Hour (12:45pm –1:45pm) - Arrival

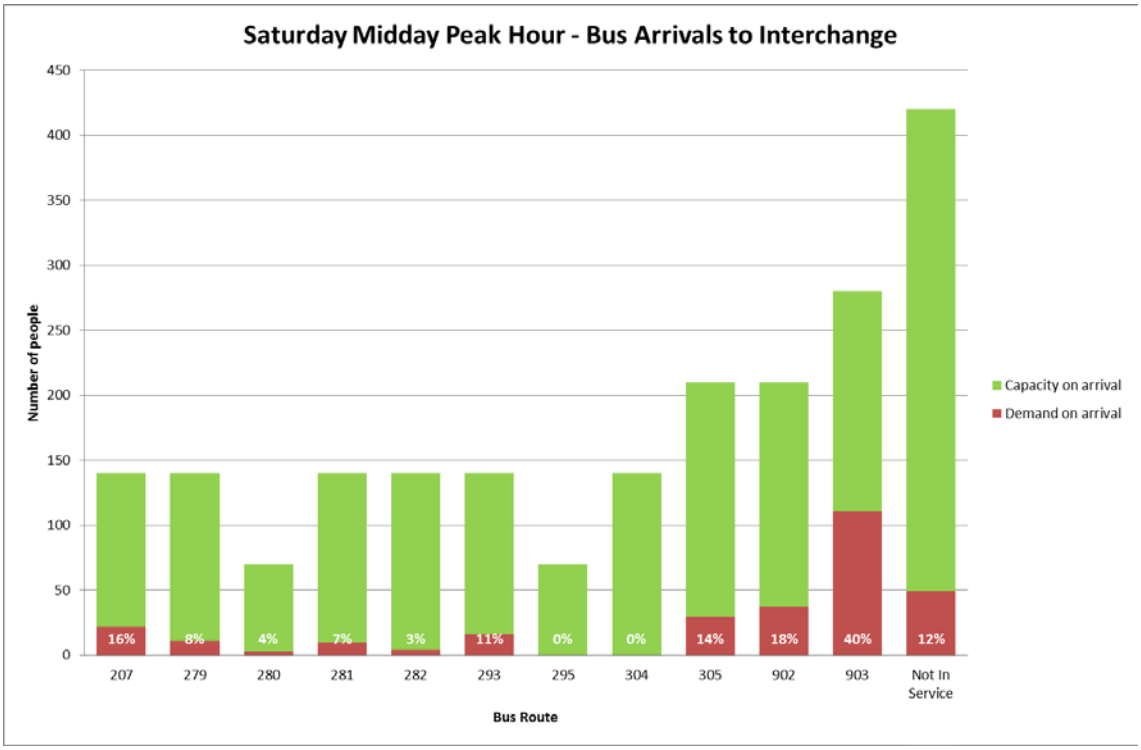
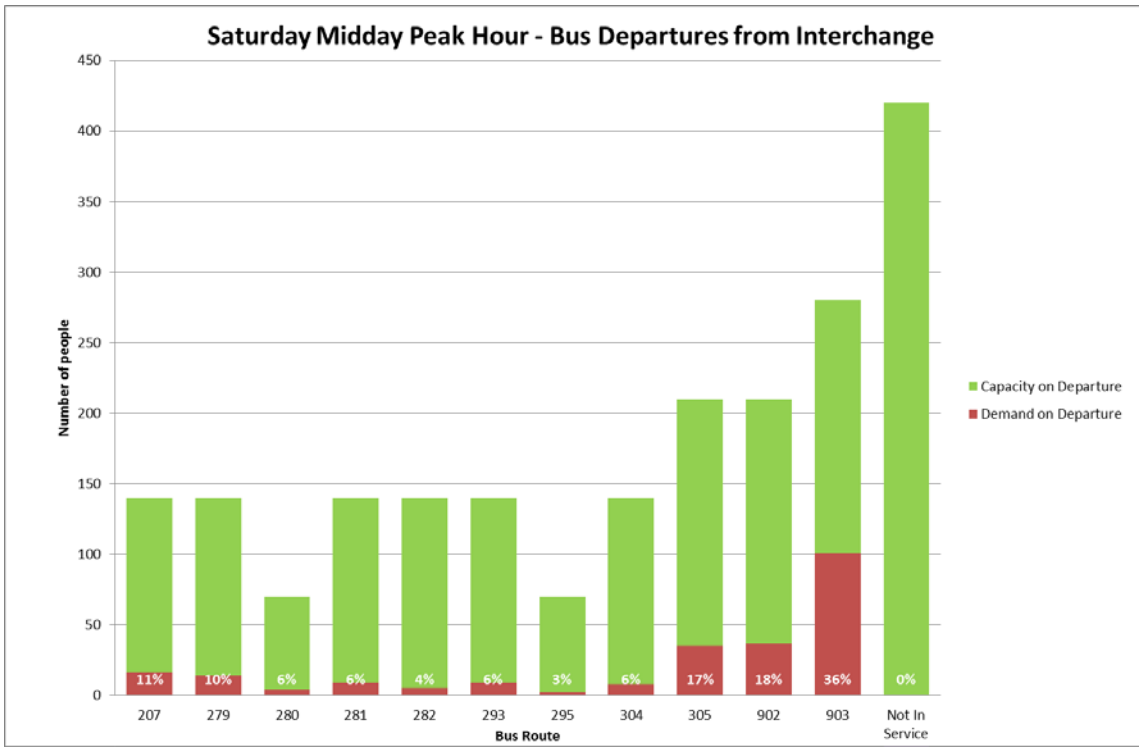


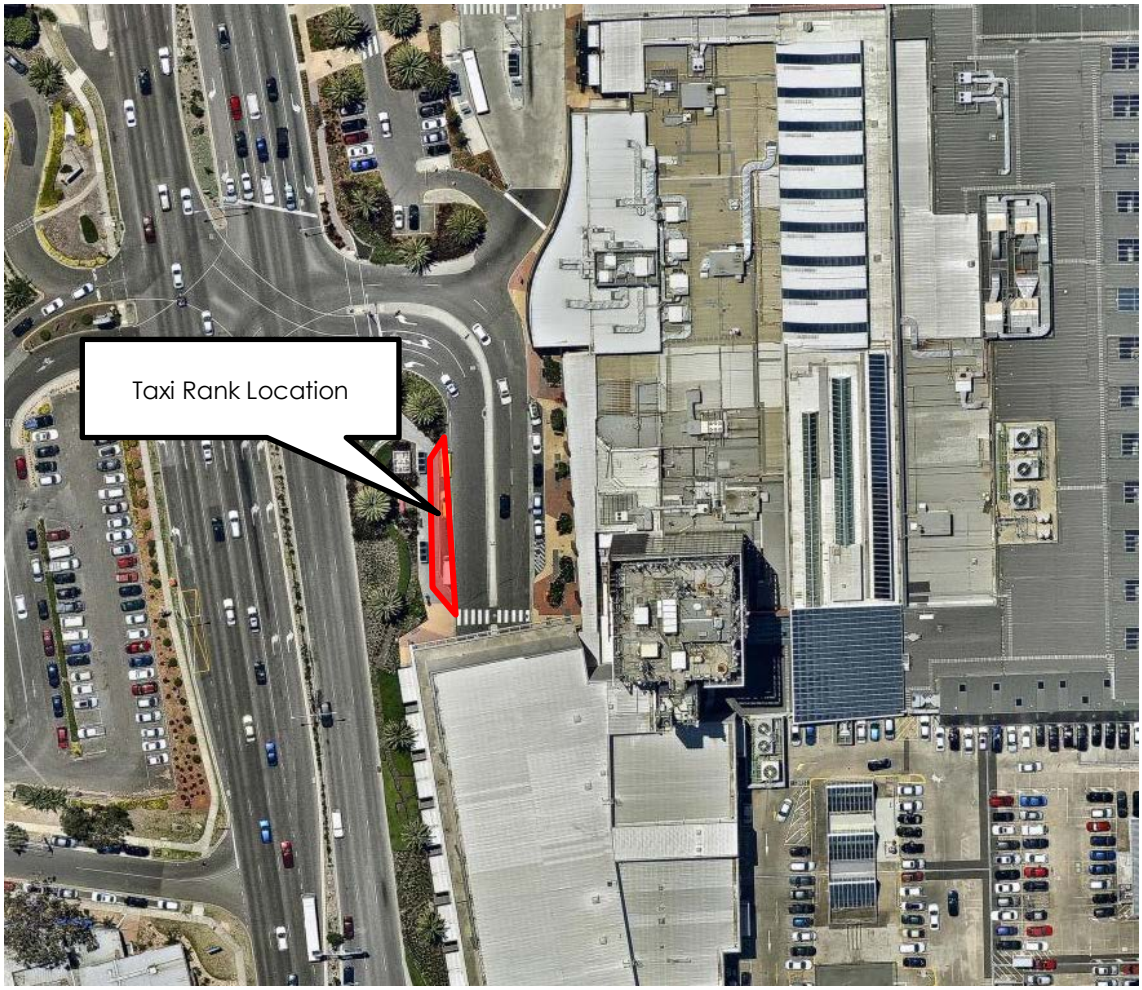
Figure A.18: Saturday Peak Hour (12:45pm-1:45pm) - Departure



A.4.4 Taxi Rank

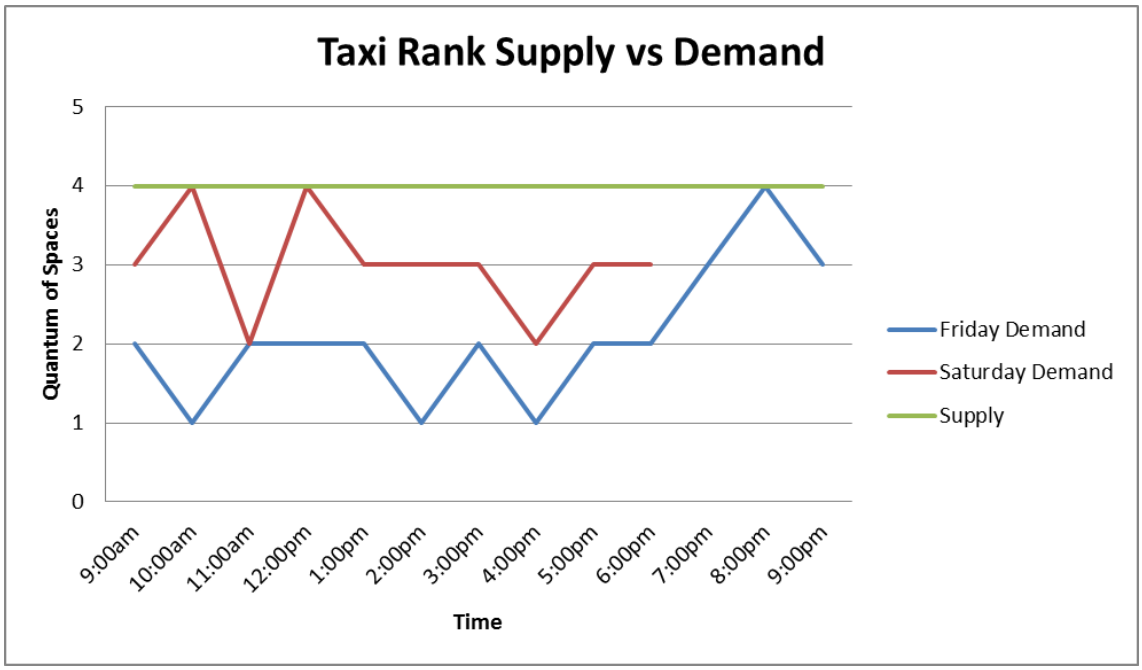
A taxi rank is provided within the Centre, and is located to the southwest of the Centre as shown in Figure A.19.

Figure A.19: Existing Taxi Rank Location



The occupancy of the taxi rank was recorded during the car parking surveys identified in Section 3.6 above. Figure A.20 below shows the surveyed occupancy of the taxi rank for Friday 5 September and Saturday 6 September 2014.

Figure A.20: Taxi Rank Supply vs Demand



As shown in Figure A.20 above the Taxi Rank reaches capacity once on Friday and twice on Saturday with Taxi rank demand generally higher on Saturday compared to Friday.

A.5 Active Travel

A.5.1 Pedestrian Infrastructure

Pedestrian paths are located on all roads in the vicinity of the site, with signalised pedestrian crossings provided at the following locations:

- Williamsons Road / Doncaster Road
- Williamsons Road / Shoppingtown Hotel / Westfield Doncaster Access
- Williamsons Road / Westfield Doncaster Access / Sovereign Point Court
- Doncaster Road / Westfield Doncaster Access / Frederick Street
- Doncaster Road / Westfield Doncaster Access.

A.5.2 Cycle Infrastructure

The Principal Bicycle Network (PBN) is a network of on and off-road cycling corridors that have been identified to support cycling for transport and access major destinations in metropolitan Melbourne. The PBN was reviewed and updated in 2012 by VicRoads and all local Councils.

The PBN is also a 'bicycle infrastructure planning tool' to guide State investment in the planning and development of the future metropolitan Melbourne bicycle network. In this regard, a subset of the PBN has been identified and elevated to a higher level of priority, mainly on the basis of potential for separation from motorised traffic, making these routes more attractive to less experienced bike riders. These cycling corridors are referred to as Bicycle Priority Routes (BPRs) and form part of the modal priorities for the road network set out in the VicRoads SmartRoads framework. Strategic Cycle Corridors (SCC) form another subset of the PBN, and represent an initiative outlined in Plan Melbourne to support walking and cycling in Central Melbourne. SCCs are intended to be corridors designed to provide high quality bicycle infrastructure to, and

around, major activity areas in metropolitan Melbourne. Plan Melbourne outlines a subset of the SCCs for the proposed expanded central city area.

It is noted that the type of bicycle facility (i.e. on or off-road and separated or shared) has not been indicated as part of the PBN and BPRs. Rather, the PBN and BPRs show the proposed cycling network. The associated facilities should be delivered in accordance with the relevant standards and guidelines, such as the Australian Standards, Austroads Guides and VicRoads' Cycle Notes.

The PBN and BPRs in the vicinity of the study area are shown in Figure A.21[3].

Figure A.21: VicRoads Principal Bicycle Network and Bicycle Priority Routes

Source (www.maps.vic.gov.au/TransMaps/)

Figure A.21 indicates that the subject site is located within close vicinity to PBN routes along Williamsons Road, Doncaster Road and Goodson Street. It should be noted however, no dedicated bicycle infrastructure exists in the immediate vicinity of the subject site.

[3] Further information regarding the PBN and BPRs is available at https://www.vicroads.vic.gov.au/traffic-and-road-use/cycling/bicycle-network-planning

A.6 Existing Modal Breakdown

A.6.1 Primary Trip Purpose Surveys

Questionnaire surveys were conducted by GTA on Friday 5 September 2014 between 7:00am-10:00am and 3:30pm-6:30pm and on Saturday 6 September 2014 between 11:00am-2:00pm. The surveys were undertaken at the south-western and north-western access points as well as within the Centre, as shown in Figure A.22 below. A total of 309 responses were collected from a broad demographic of customers and traders at the Centre. A summary of the number of customer and staff responses collected is shown in Figure A.23.

Figure A.22: Questionnaire Survey Locations

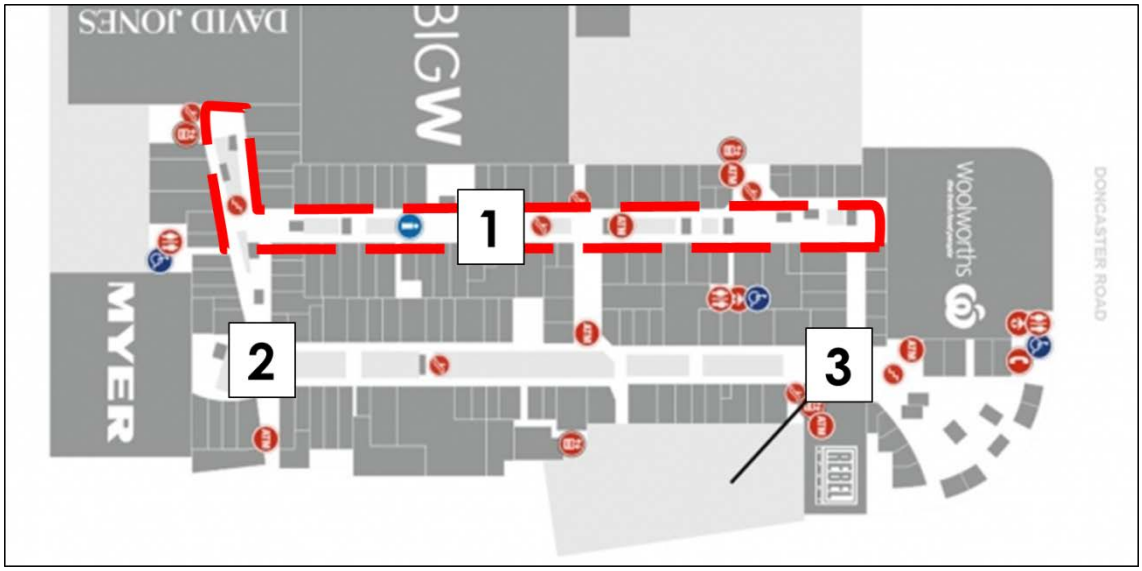
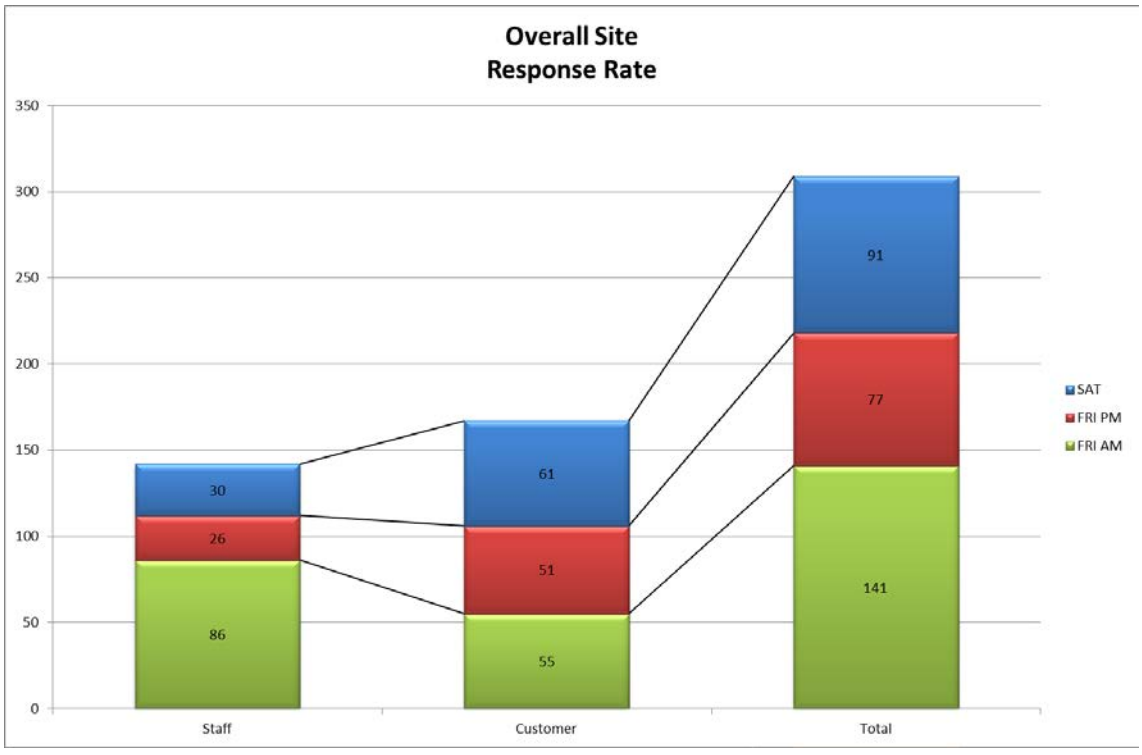


Figure A.23: Questionnaire Survey Response Rate



The surveys sought responses to eight questions regarding their travel to Westfield Doncaster and their intentions while present. These questions are reproduced as follows:

- What is your primary reason for visiting Westfield Doncaster today?
- Are you travelling elsewhere as part of your journey to/or from Westfield Doncaster?
- Is your visit to Westfield Doncaster the primary reason for your journey?
- How long do you plan to stay here?
- How did you travel here today?
- Why did you use this mode of transport?
- If you travelled by car:
  - Where did you park if not in the Shopping Centre?
  - How many occupants were in the car including yourself?
  - What might be required for you to arrive/depart by another form of transport?
- If they travelled by mode other than car:
  - Will you depart using the same mode of transport?
  - If no, please specify mode.

Based on the information gathered from the survey, it is possible to deduce a modal breakdown of persons travelling to the site, including a comparison of staff mode choice behaviours and customer mode choice.

Figure A.24, Figure A.25 and Figure A.26 provide a summary of the responses from the questionnaire surveys.

Further details of these surveys can be provided upon request.

Figure A.24: Customer Modal Choice

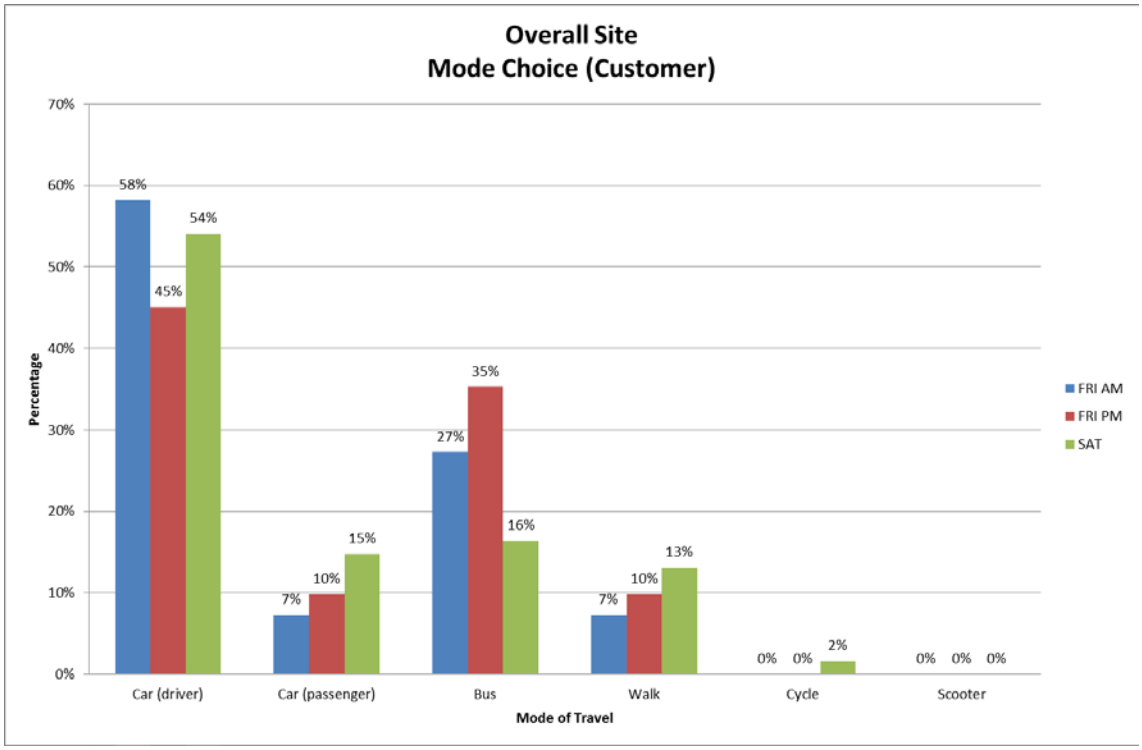


Figure A.25: Staff Modal Choice

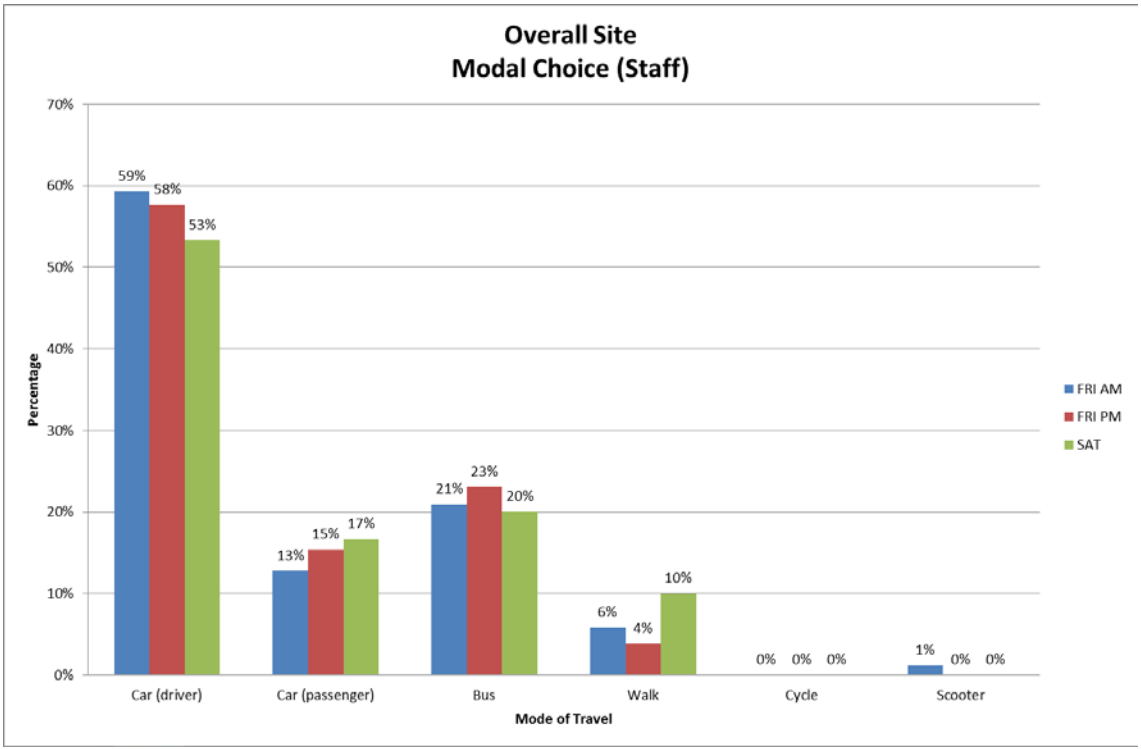


Figure A.26: Combined Staff & Customer Modal Choice

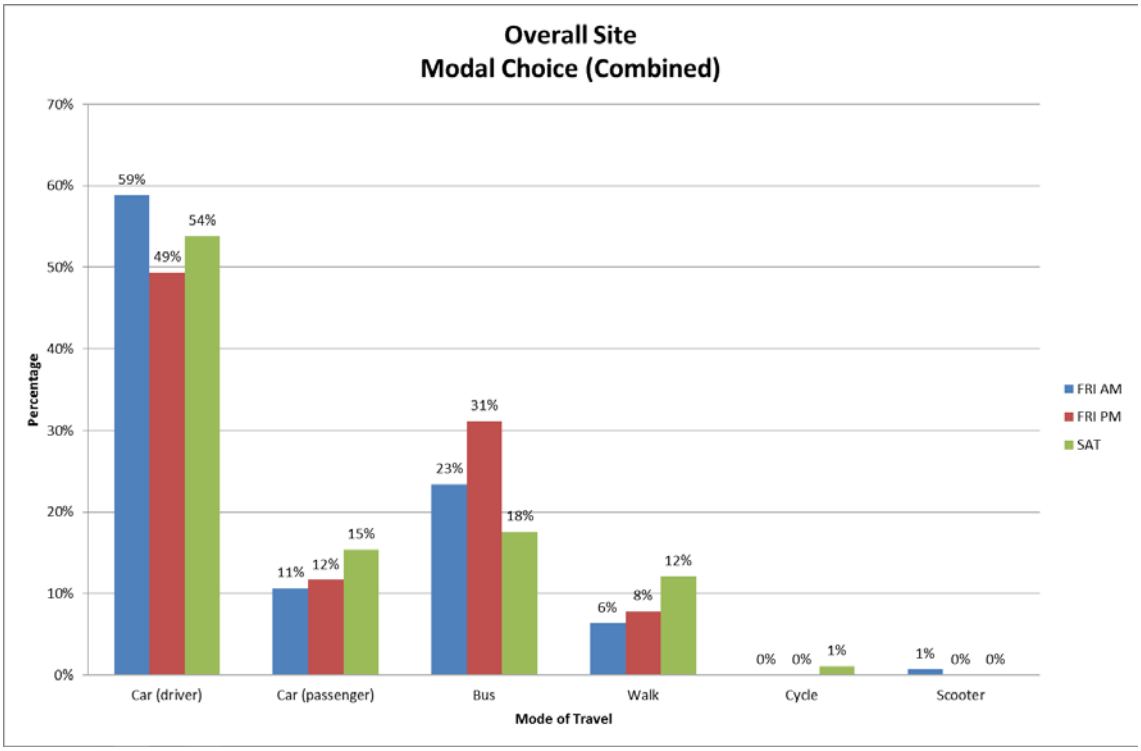


Figure A.24, Figure A.25 and Figure A.26 above indicate similar travel choices are made by both customers and staff. Figure A.26 shows that 30% of respondents in the Friday AM, 39% of respondents in the Friday PM and 31% of respondents on the Saturday used a travel mode other than car to get to/from Westfield Doncaster, with a high proportion of these trips undertaken by bus.

Appendix B

Proposed Transport Infrastructure Works & Bus Interchange Design

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN

GROSVENOR STREET
GOODSON STREET
BERKERLEY STREET
COUNCIL STREET
ROAD
TOWER STREET
DRIVE
CLAY DRIVE
EXISTING EASTERN ACCESS ROAD
FREDERICK STREET
WESTFIELD
PROPOSED NORTHERN ACCESS ROAD
PROPOSED BUS INTERCHANGE ACCESS ROAD
EXISTING SOUTHERN ACCESS ROAD
WILLIAMSONS
ROAD
DONCASTER
BORDEAUX STREET
SOVEREIGN POINT COURT
HOTEL SHOPPING-TOWN ACCESS
LAWFORD STREET

PLOTTED BY : brendankilinko ON 19/10/2015 AT 2:20:35 PM

AMENDMENTS					
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WESTFIELD DONCASTER - MASTERPLAN

OVERALL CONCEPT LAYOUT

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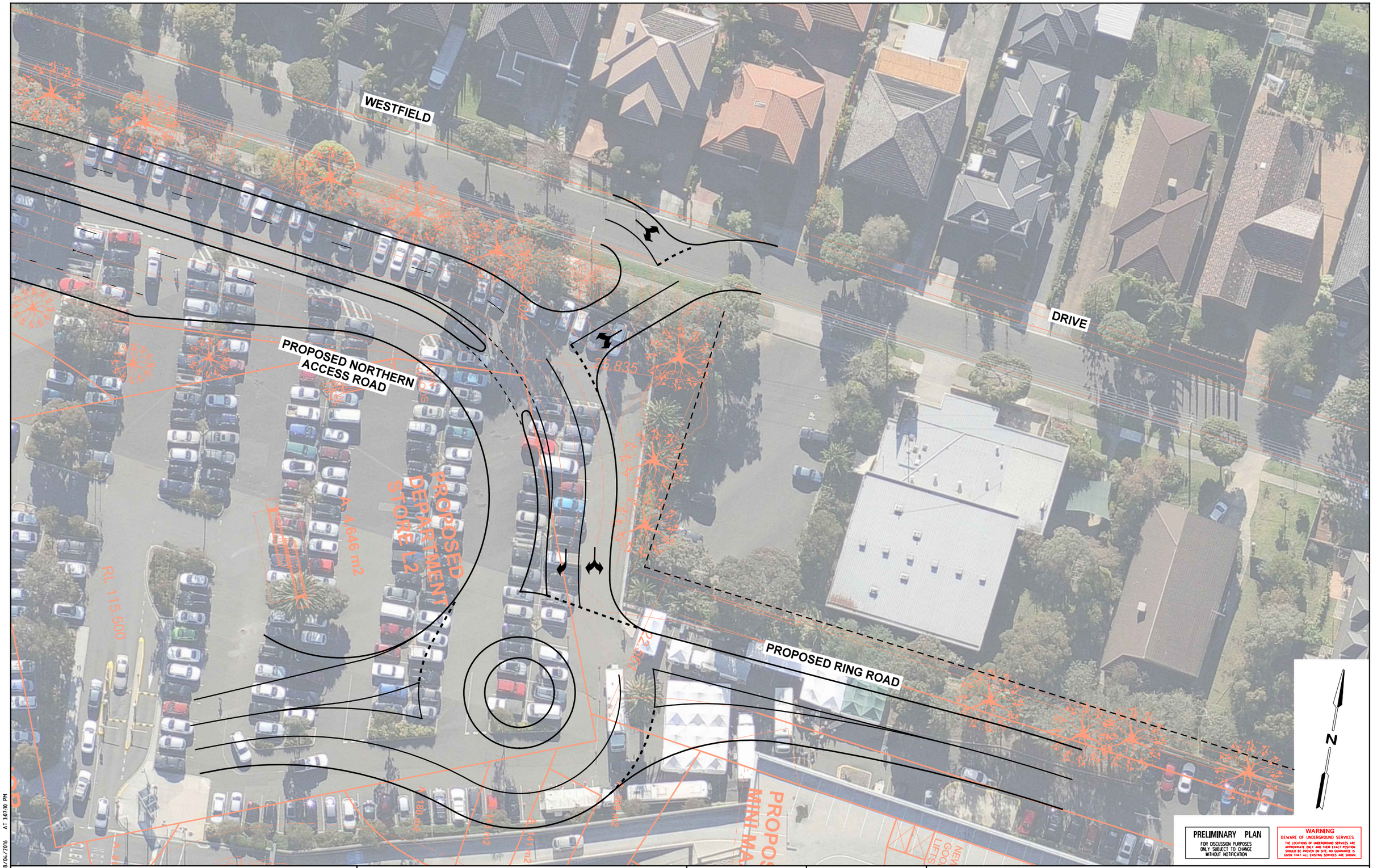

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WESTFIELD DONCASTER - MASTERPLAN

WESTFIELD DRIVE & PROPOSED NORTHERN ACCESS ROAD

CONCEPT LAYOUT

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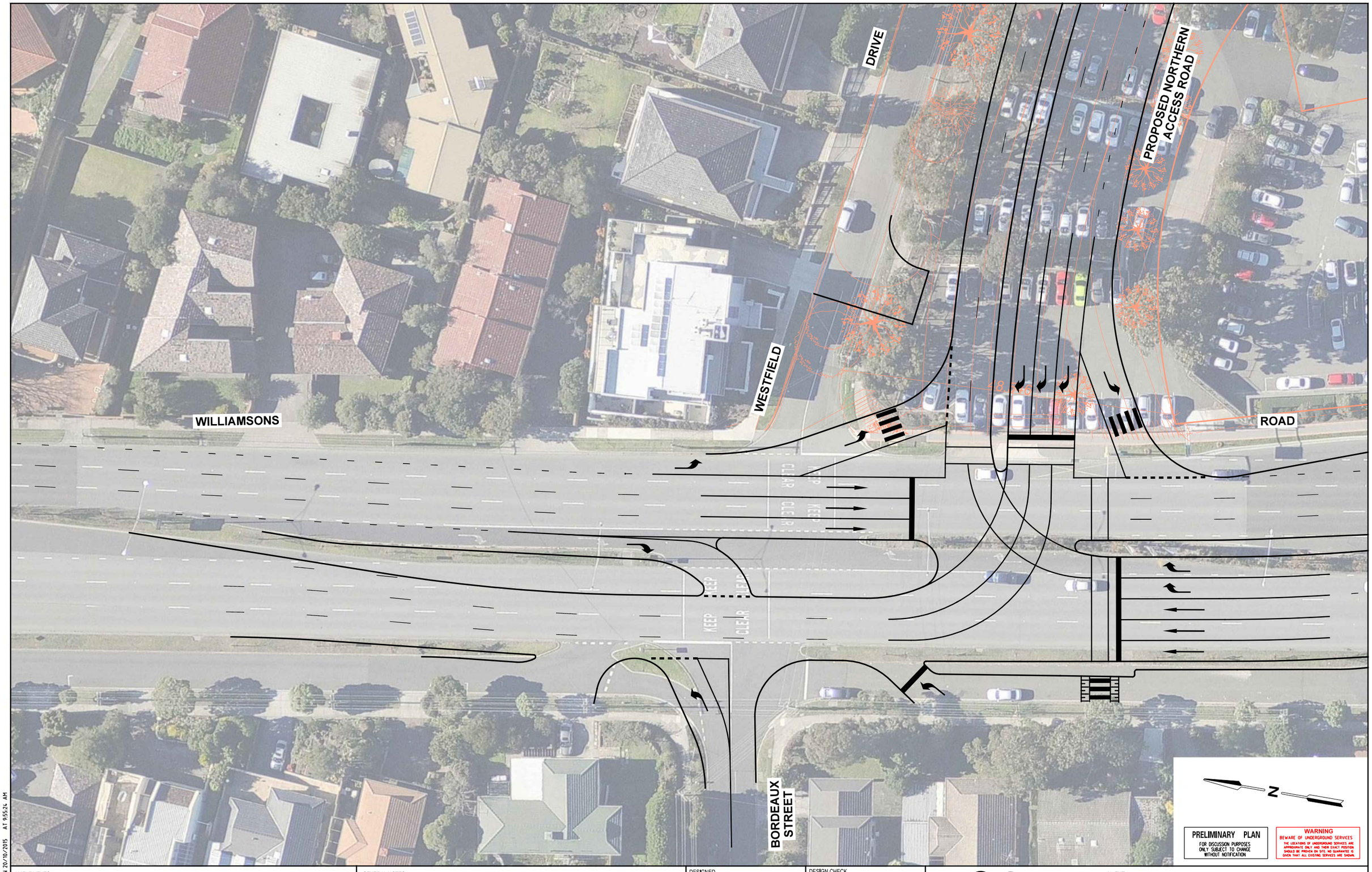

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WILLIAMSONS ROAD & PROPOSED NORTHERN ACCESS ROAD

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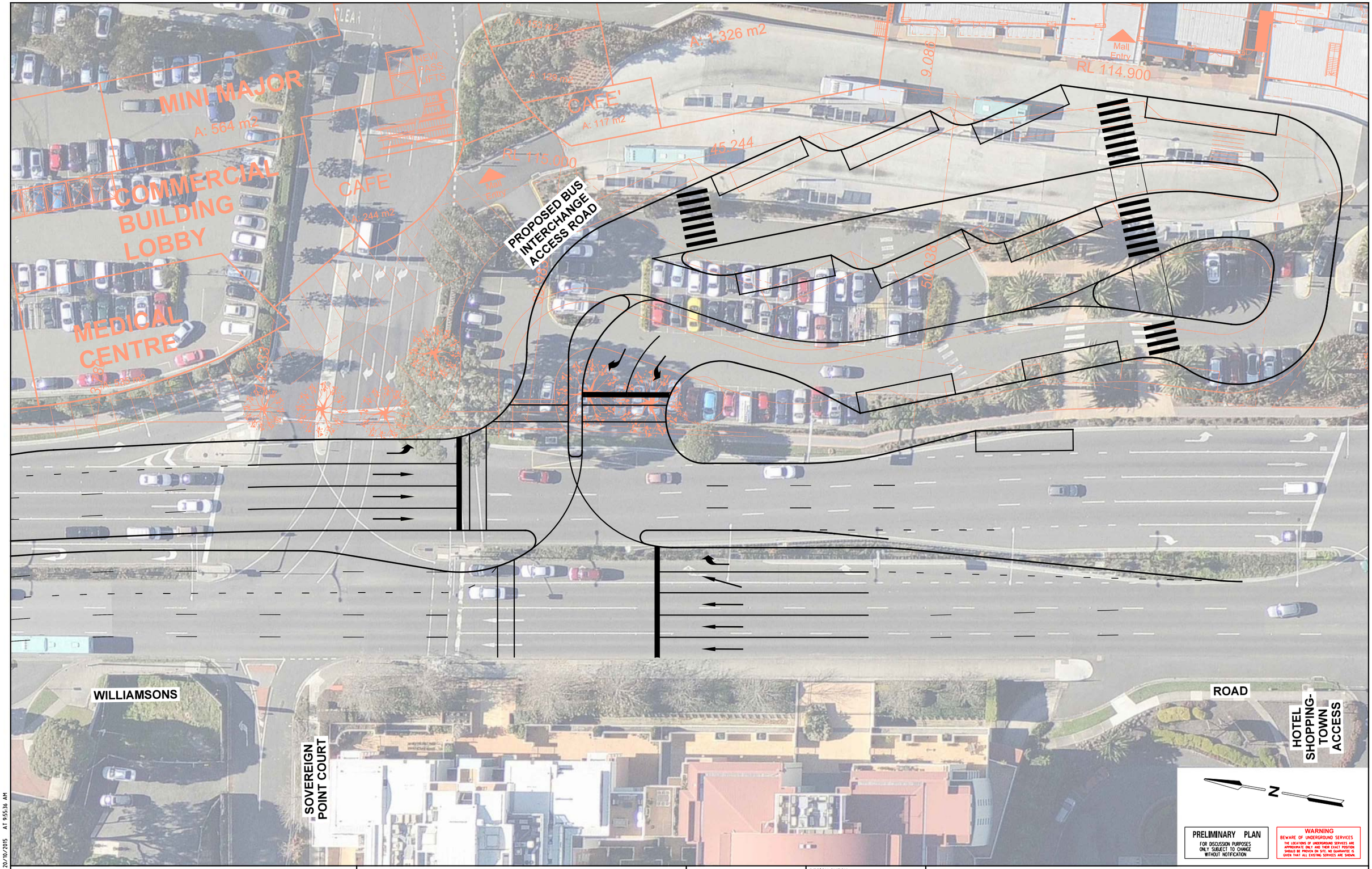

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WILLIAMSONS ROAD & PROPOSED BUS INTERCHANGE ACCESS ROAD

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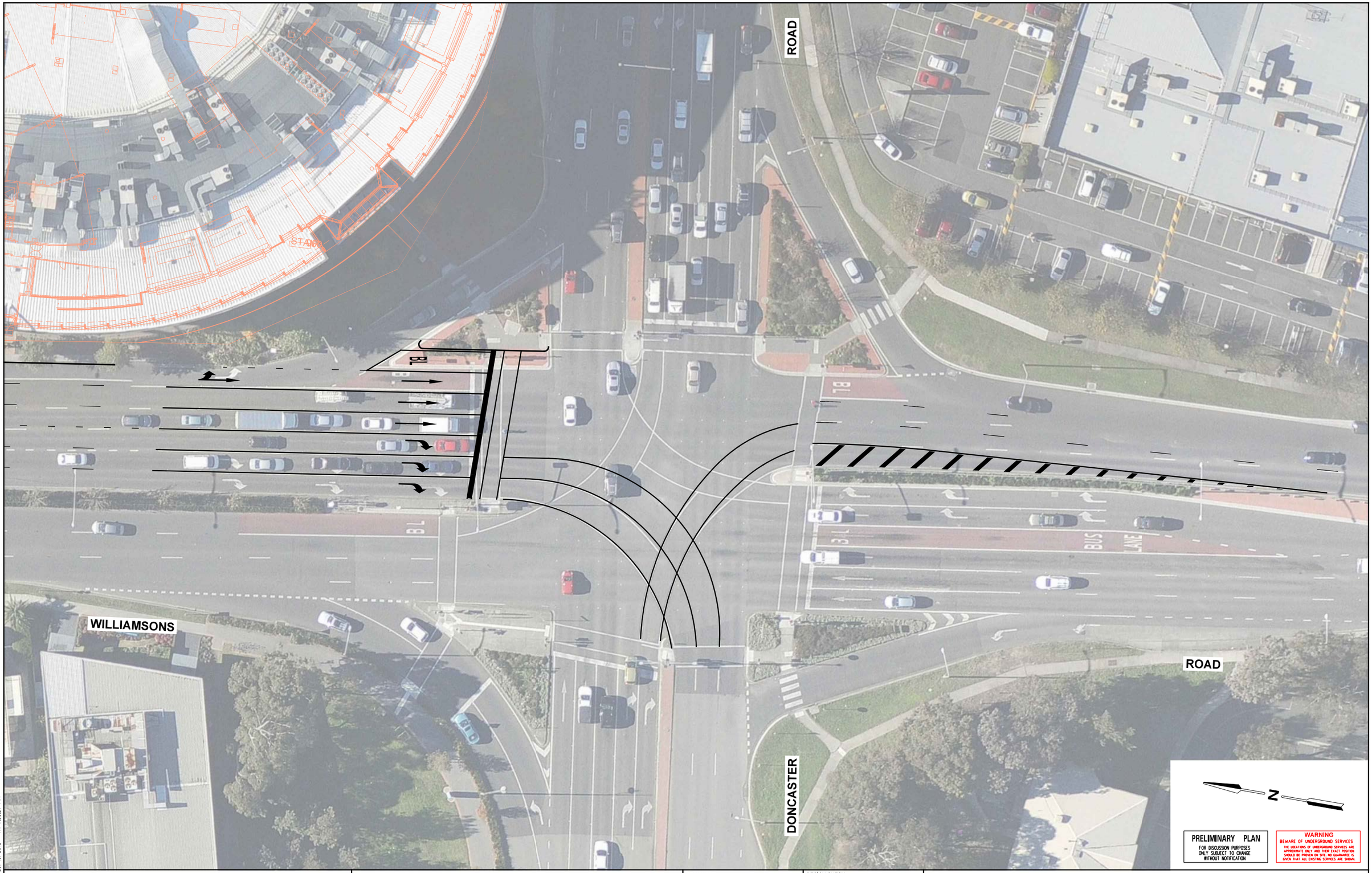

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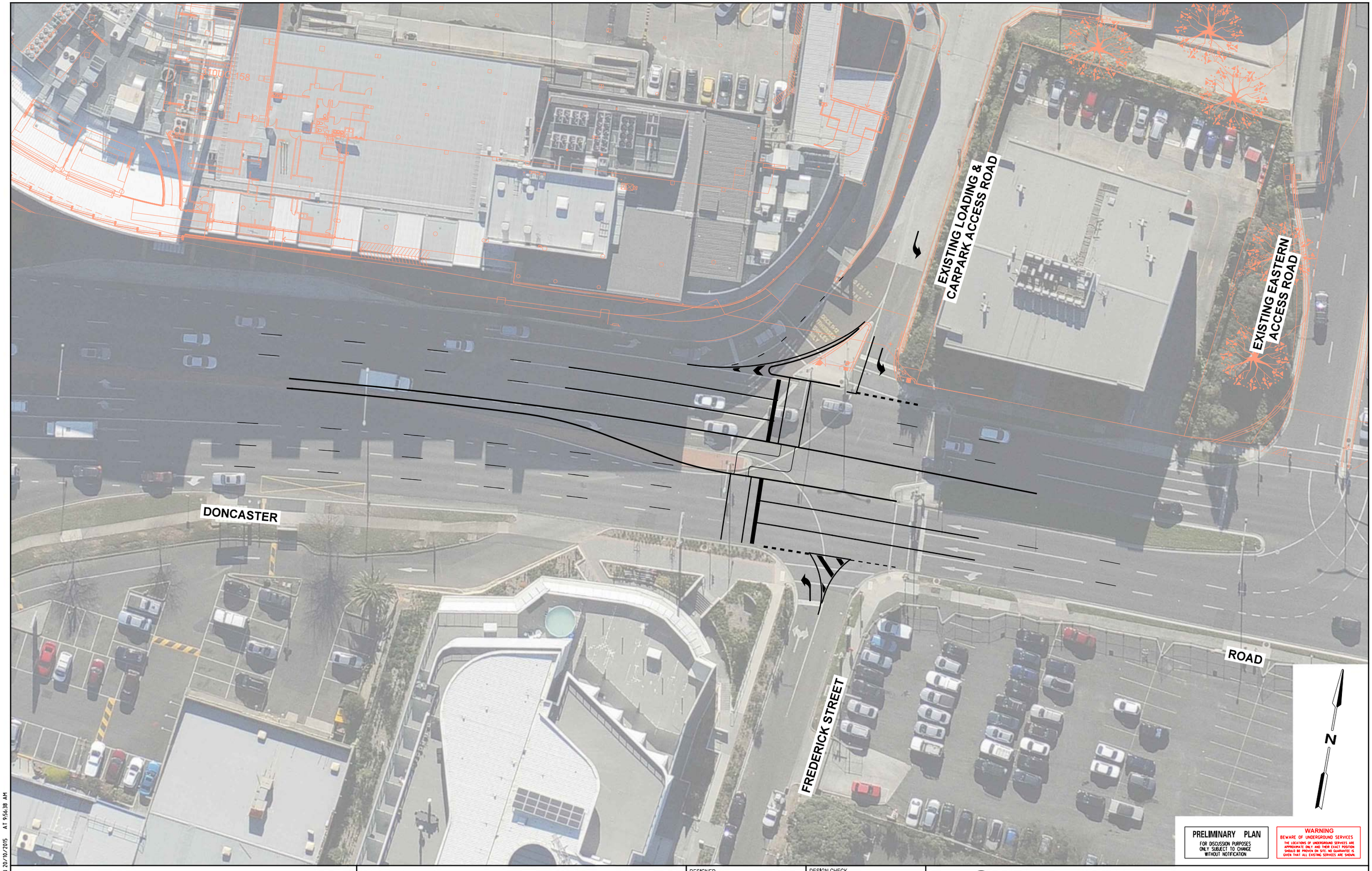

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DONCASTER ROAD & FREDERICK STREET

CONCEPT LAYOUT

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Appendix C

Calibration and Validation Report

GTAconsultants

Westfield Doncaster Masterplan Microsimulation Model Calibration & Validation Report

Client // Westfield Limited (VIC)
Office // VIC
Reference // 15M1090100
Date // 21/04/15

Westfield Doncaster Masterplan

Microsimulation Model

Calibration & Validation Report

Issue: A 21/04/15

Client: Westfield Limited (VIC)
Reference: 15M1090100
GTA Consultants Office: VIC

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A-Dr	6/03/15	Draft	Bryan Li	Reece Humphreys	Reece Humphreys	
A	21/04/15	Final	Bryan Li	Reece Humphreys	Reece Humphreys	

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1. Introduction

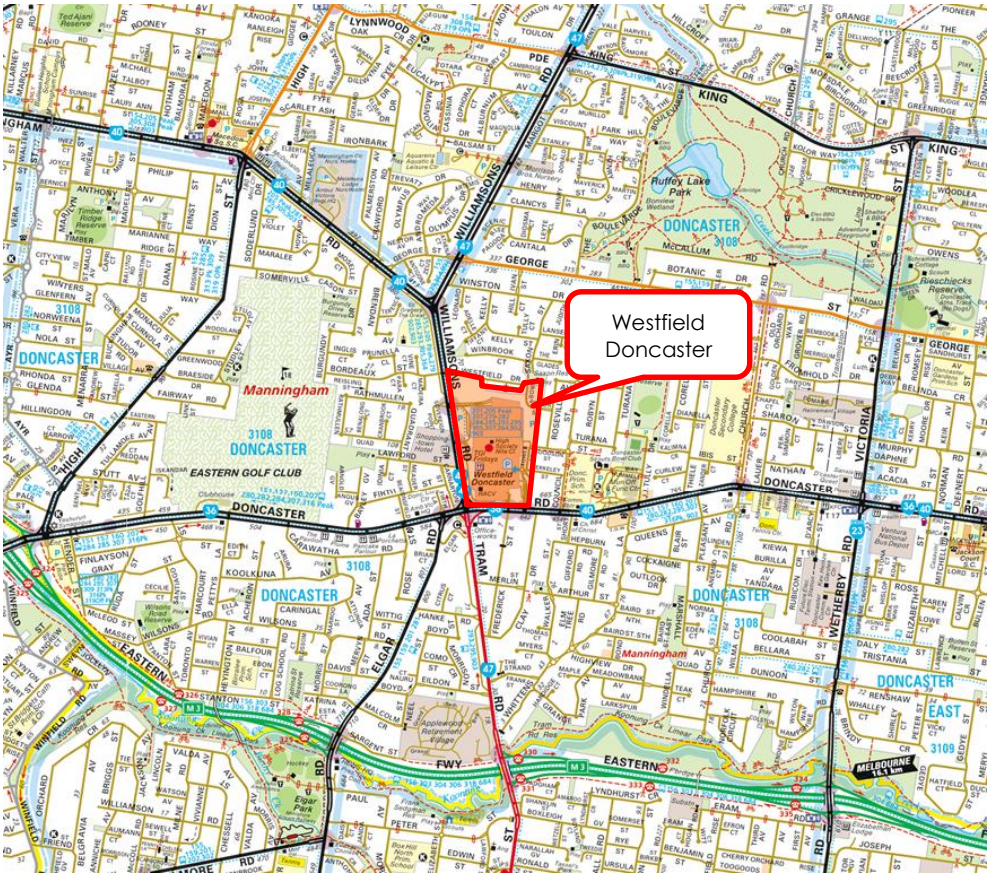
1.1 Background

Westfield is currently contemplating options for the future growth and development of Westfield Doncaster Shopping Centre (the "Centre") via the preparation of a (15 year) Masterplan. The Centre currently comprises in the order of 117,000sqm of floor area, and is served by some 4,800 car parking spaces with direct (multiple) signalised access to both Doncaster Road and Williamsons Road. The proposal of an additional 30,000sqm and 2,000 car spaces (approximately) will require consultation and engagement with the relevant authorities to obtain in principle support for endorsement.

Microsimulation modelling of the road network surrounding Westfield Doncaster has been requested by the Transport Stakeholder working group (VicRoads, Public Transport Victoria and Council) to assess the traffic and transport impacts of the proposal. It is noted that GTA has previously assessed Doncaster Hill and Westfield Doncaster utilising the Q-Paramics software package. However, in order to provide a better multi-modal, route-choice and operational model for this updated assessment, an updated model has been developed in the Aimsun software package.

Figure 1.1 illustrates the location of the subject site and its surrounding environs.

Figure 1.1: Subject Site



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1.2 Purpose of this Report

This report sets out an overview of the model development, calibration and validation process and includes the following:

- the data collection and analysis process (Section 2)
- an overview of the model area and model development process (Section 3)
- the development of the network (Section 4)
- the development of the demand matrices (Section 5)
- the calibration and validation process and criteria (Section 6)
- the calibration and validation results (Section 7).

It is noted that this report provides a detailed description of the model development process and its calibration and validation results, and as such is predominantly aimed at a technical audience.

1.3 Peer Review

To ensure the robustness of the base models, a peer review of the existing conditions Aimsun models has been undertaken by VicRoads as well as an independent reviewer (Jacobs). It is noted that this model has been developed using SCATS for signal control, and as such the VicRoads review focussed on the SCATS operation whilst the Jocobs review focussed on the model coding and its operation.

VicRoads have indicated that they are satisfied with the model development and calibration and validation procedures adopted by GTA, in particular the signal control.

Jacobs have completed their peer review of the existing conditions models per their report titled *Doncaster Hill Aimsun Model Peer Review – Review Report*, dated 13 April 2015, which concluded the following:

> *"Based on the outcomes of this review and the feedback from GTA; the Doncaster Hill microsimulation model accords with the modelling practices outlined in the RMS Modelling Guidelines (2013) and is suitable for use in the assessment of future option scenarios."*

Jacobs also recommended that the model documentation be updated to include some additional analysis on the following, which has now been addressed as referenced below:

- Approach to coding U-turns (refer Section 4.2)
- Approach to dwell time coding (refer Section 4.4)
- Use of force-turn traffic management actions (refer Section 5.4.2)
- Documentation of calibration results under "core area" criteria (refer Section 7.3 and Appendix C)
- Analysis of variability under SCATS signal control (refer Section 7.2.1).

A summary of GTA's response to Jacobs review has also been provided in Appendix A.

2. Transport Data Collection

2.1 Overview

Comprehensive surveys were undertaken for the entire project, however those that relate to the development of the existing conditions Aimsun models are summarised in Table 2.1. The following sections provide further detail on the scope and methodology of the data collected, with full summaries of the data provided in Appendix B.

Table 2.1: Transport Data Collection Summary

Data Type	Source	Survey Dates	Survey Times
Turning Movement Counts	Skyhigh	Friday 5/09/2014 Saturday 6/09/2014 Friday 12/09/2014 Saturday 13/09/2014 Friday 19/09/2014 Saturday 20/09/2014	7:00am to 10:00am, 3:30pm to 6:30pm 11:00am to 2:00pm 7:00am to 10:00am, 3:30pm to 6:30pm 11:00am to 2:00pm 7:00am to 10:00am, 3:30pm to 6:30pm 11:00am to 2:00pm
SCATS Detector Volume Data	VicRoads	3/09/2014 to 10/09/2014	24/7
SCATS Signal Data	VicRoads	Friday 12/09/2014 Saturday 13/09/2014	24/7
Travel Time Surveys	GTA Consultants	Friday 5/09/2014 Saturday 6/09/2014	7:00am to 10:00am, 3:30pm to 6:30pm 11:00am to 2:00pm
Pedestrian Surveys	Skyhigh	Friday 5/09/2014 Saturday 6/09/2014 Friday 19/09/2014 Saturday 20/09/2014	7:00am to 10:00am, 3:30pm to 6:30pm 11:00am to 2:00pm 7:00am to 10:00am, 3:30pm to 6:30pm 11:00am to 2:00pm
Site Observations	GTA Consultants	Friday 5/09/2014 Saturday 6/09/2014	7:00am to 10:00am, 3:30pm to 6:30pm 11:00am to 2:00pm

Figure 2.1: Transport Data Collection Locations

2.2 Turning Movement Counts

Classified intersection turning movement counts using video cameras were commissioned at the following 12 intersections (graphically shown in Figure 2.1):

i Williamsons Road / Manningham Road
ii Williamsons Road / Westfield Drive / Bordeaux Street
iii Williamsons Road / Westfield Site Access (North) / Sovereign Point Court
iv Williamsons Road / Westfield Site Access (South) / Shoppingtown Hotel
v Doncaster Road / Bayley Grove
vi Doncaster Road / Beaconsfield Street / Rose Street
vii Doncaster Road / Elgar Road
viii Williamsons Road / Doncaster Road / Tram Road
ix Doncaster Road / Frederick Street / Westfield Site Access
x Doncaster Road / Tower Street / Westfield Site Access
xi Doncaster Road / Council Street
xii Tram Road / Merlin Street

The counts were initially undertaken on Friday 5th September 2014 and Saturday 6th September 2014 for the respective peak periods:

- Weekday AM peak (7:00am to 10:00am)
- Weekday PM peak (3:30pm to 6:30pm)
- Saturday Midday peak (11:00am to 2:00pm).

It is noted that due to some unforeseen issues with the weather during the weekday AM peak on the above dates which obscured some of the video footage at certain intersections[1], these intersections were re-counted the following one to two weeks to verify traffic volumes. The traffic volumes for these intersections used as part of the calibration and validation were adjusted to reflect the volumes of the entire data set and initial dates of the survey.

2.3 SCATS Data

SCATS data for signalised intersections within the study area was obtained from VicRoads. The data included detector volume data, layout data and signal phasing and timing data. The SCATS data provided is summarised in the following sub-sections:

2.3.1 SCATS Detector Volume Data

SCATS detector volume data was obtained for all signalised intersections within the study area. This data was obtained for a one week (7 days) period covering the dates and times of the intersections counts specified above. This data was used to cross-check the classified turning movement data collected as well as check lane utilisation was appropriately modelled.

In addition, the SCATS detector volume data was also used to justify the appropriateness of the day of the survey as compared to other days of the week. This analysis is presented in Section 2.7.2.

2.3.2 SCATS Signal Data

The SCATS controller operation specification sheets was obtained from VicRoads to assist with the coding signalised intersections as well as understand the current operation of each intersection in full detail. This data provides information on the following:

- lane configuration
- phasing
- detector locations and numbers
- signal groups
- bus priority
- pedestrian walk times and activation.

2.3.3 SCATSIM Data Files

As will be discussed later in this report, SCATS signal control has been used as part of the modelling assessment in order to best reflect current intersection operation. As such, the following data was obtained from VicRoads to supplement the SCATSIM module:

- The latest version of the SCATS Central database file (SCMS.mdb)
- SCATS LX files for SCATS region(s) within the study area
- SCATS personality (.sft) files for all intersections within the study area
- Raw M68 SCATS personality files for each intersection
- SCATS time of day command files – sys.tc
- SCATS sys.prom file

[1] The intersections of Doncaster Road / Tram Road / Williamsons Road, Doncaster Road / Frederick Street / Westfield Access and Williamsons Road / Westfield Drive / Bordeaux Street were re-counted due to the weather obscuring video footage.

2.4 Travel Time Surveys

Travel times surveys were undertaken on the same days as the traffic volume data collection across three bi-directional routes during the following peak times:

- Weekday AM peak (7:00am to 10:00am)
- Weekday PM peak (3:30pm to 6:30pm)
- Saturday Midday peak (11:00am to 2:00pm).

Travel times were recorded using a GPS device in each vehicle travelling along the specified route (one vehicle per bi-directional route). In order to obtain representative travel time data, the drivers were instructed to maintain a speed consistent with other road users, whilst observing the posted speed limits.

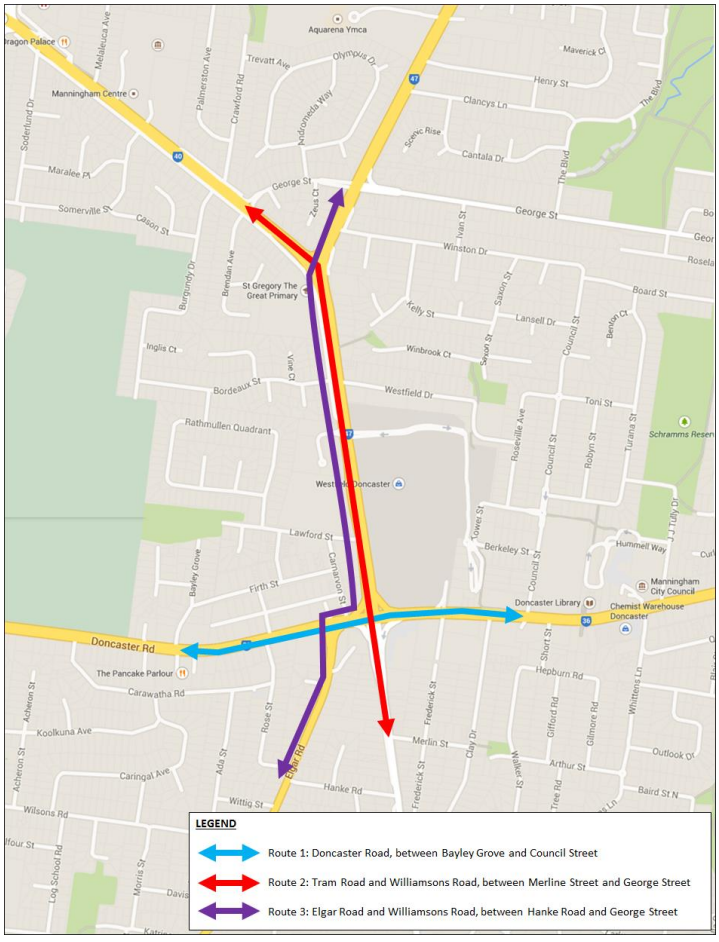
The travel time survey routes are described below and shown graphically in Figure 2.2:

i Route 1 – Doncaster Road, between Bayley Grove and Council Street (eastbound and westbound).

ii Route 2 – Tram Road and Williamsons Road, between Merlin Street and George Street (northbound and southbound).

iii Route 3 – Elgar Road and Williamsons Road, between Hanke Road and George Street (northbound and southbound).

Figure 2.2: Travel Time Survey Routes



Each route was broken down into segments and the GPS data from the travel times were analysed as vehicles pass the centre point of each signalised intersection on its route. A summary

of the travel time survey results is provided in Table 2.2, whilst a detailed description of the routes and a breakup of each route into segments, along with the associated recorded travel times is provided in Appendix B.

Table 2.2: Summary of Travel Time Survey Results

Peak	Time	Route	No. of Runs	Travel Time (seconds)		
				Avg	Min	Max
Weekday AM	7:15am to 9:15am	Doncaster Road Eastbound	6	94	59	164
		Doncaster Road Westbound	6	85	64	110
		Tram Road and Williamson Road Northbound	5	191	173	209
		Tram Road and Williamson Road Southbound	4	191	137	251
		Elgar Road and Williamson Road Northbound	6	282	216	324
		Elgar Road and Williamson Road Southbound	5	291	185	461
	8:15am to 9:15am	Doncaster Road Eastbound	8	134	75	169
		Doncaster Road Westbound	6	76	58	134
		Tram Road and Williamson Road Northbound	4	201	149	269
		Tram Road and Williamson Road Southbound	4	262	245	293
		Elgar Road and Williamson Road Northbound	4	326	281	379
		Elgar Road and Williamson Road Southbound	3	307	257	358
Weekday PM	3:45pm to 4:45pm	Doncaster Road Eastbound	5	152	92	253
		Doncaster Road Westbound	6	136	125	146
		Tram Road and Williamson Road Northbound	4	244	231	269
		Tram Road and Williamson Road Southbound	4	311	249	376
		Elgar Road and Williamson Road Northbound	4	318	253	390
		Elgar Road and Williamson Road Southbound	5	408	320	564
	4:45pm to 5:45pm	Doncaster Road Eastbound	7	125	84	214
		Doncaster Road Westbound	7	134	130	144
		Tram Road and Williamson Road Northbound	3	238	188	306
		Tram Road and Williamson Road Southbound	3	333	277	371
		Elgar Road and Williamson Road Northbound	4	351	298	402
		Elgar Road and Williamson Road Southbound	4	372	286	510
Saturday Midday	11:30am to 12:30pm	Doncaster Road Eastbound	5	164	69	205
		Doncaster Road Westbound	6	115	92	140
		Tram Road and Williamson Road Northbound	6	179	168	211
		Tram Road and Williamson Road Southbound	6	241	182	279
		Elgar Road and Williamson Road Northbound	5	256	221	316
		Elgar Road and Williamson Road Southbound	5	374	226	446
	12:30pm to 1:30pm	Doncaster Road Eastbound	6	185	134	279
		Doncaster Road Westbound	6	116	80	142
		Tram Road and Williamson Road Northbound	6	167	141	189
		Tram Road and Williamson Road Southbound	6	225	141	278
		Elgar Road and Williamson Road Northbound	4	285	255	312
		Elgar Road and Williamson Road Southbound	4	336	201	542

2.5 Pedestrian Surveys

As indicated in Figure 2.1 above, pedestrian counts were undertaken at each of the intersections that turning movement counts were collected. In addition, given the importance of capturing pedestrian data for the shopping centre, additional pedestrian surveys were undertaken at the major access points to Westfield. This information was included in the model and is considered appropriate to induce the necessary delays and queues that the pedestrian crossings and walk times may have on the intersection operation.

2.6 Site Observations

Site observations were undertaken throughout each of the surveyed peak periods to observe general traffic conditions, queue lengths, driver behaviour, lane utilisations, road geometry and any restrictions (parking, clearways etc.). These observations were used as a reference to assist with the model development and calibration and validation processes.

A summary of the observed traffic conditions, particularly in the core area adjacent to the Westfield shopping centre is provided in Table 2.3.

Table 2.3: Summary of Site Observations

Peak	Key Observations
Weekday AM Peak	Early morning fog on the day of the survey resulted in more cautious driving thus slower than expected speeds on roads.
	Northbound kerbside lane closed throughout the AM peak on Williamsons Road between Westfield southern access and just north of the Westfield northern access due to construction works.
	40km/h school zone near the Williamsons Road / Manningham Road intersection between 8:00am and 9:30am.
	Right turn queues on the north approach to the Doncaster Road / Williamsons Road / Tram Road intersection queue up to the end of the storage lane at times during the AM.
	Southbound queues on Williamsons Road from the Westfield southern access extend beyond the upstream intersection.
	Right turn queues on the south approach to the Doncaster Road / Williamsons Road / Tram Road intersection queue up to the back of the storage lane at times during the AM.
	Right turn queues on the east approach to the Doncaster Road / Williamsons Road / Tram Road and Doncaster Road / Tower Street intersections queue up to and beyond the back of the storage lane at times during the AM.
	Slow moving queues eastbound and westbound on Doncaster Road in the vicinity of Westfield.
Weekday PM Peak	40km/h school zone near the Williamsons Road / Manningham Road intersection between 2:30pm and 4:00pm.
	Northbound queues on Elgar Road extend near Hanke Road at times during the PM.
	Eastbound queues on Doncaster Road from Elgar Road extends past Beaconsfield Street and can reach the Shell service station at times.
	Right turn queues on the north approach to the Doncaster Road / Williamsons Road / Tram Road intersection queue extend beyond the storage lane at times during the PM. Traffic takes more than one cycle to clear the intersection if at the back of the queue.
	Southbound queues on Williamsons Road from the Westfield southern access extend beyond the upstream intersections.
	Queues on the south approach to the Doncaster Road / Williamsons Road / Tram Road intersection extend near Merlin Street at times.
	Right turn queues on the east approach to the Doncaster Road / Tower Street intersection extend beyond the back of the storage lane and past Council Street at times.
	Tower Street queues extend up to the curve of the ramp into Westfield at times.
	Westfield queues at the Frederick Street access extend down the ramp on to Doncaster Road at times.

Peak	Key Observations
Saturday Midday Peak	Northbound kerbside lane closed until 11:30am on Williamsons Road between Westfield southern access and just north of the Westfield northern access due to construction works.
	Kerbside parking on Doncaster Road eastbound between Beaconsfield Street and Elgar Road through the Saturday peak.
	Eastbound queues on Doncaster Road from Elgar Road extends up to Beaconsfield Street.
	Right turn queues on the north approach to the Doncaster Road / Williamsons Road / Tram Road intersection queue extend beyond the storage lane at times during the Saturday. Traffic takes more than one cycle to clear the intersection if at the back of the queue.
	Right turn queues on the east approach to the Doncaster Road / Tower Street intersection extend beyond the back of the storage lane and past Council Street at times.
	Tower Street queues extend up to the curve of the ramp into Westfield at times.
	Westfield queues at the Frederick Street access extend down the ramp on to Doncaster Road at times.
	Westfield queues at the Westfield northern access queue onto Williamsons Road at times when the internal pedestrian crossing is activated.

2.7 Data Analysis

2.7.1 Data Storage Architecture

The traffic volume, SCATS and travel time data outlined in Section 3 formed the basis of the Aimsun model development, calibration and validation process. It was therefore essential that this data was processed correctly for input into the model and stored in an efficient way for easy access and future reference.

The traffic data for input into the Aimsun microsimulation model, the Real Data Set (RDS), was primarily drawn from the classified intersection turn counts which would determine the traffic volumes by approach and turning movement proportions at key intersections

A RDS was generated for each modelled period and involved data being broken down into hourly intervals and stored in spreadsheet format.

2.7.2 Peak Periods

In order to confirm the critical peak hour(s) and days that would be modelled for the weekday AM, weekday PM and Saturday midday, the SCATS detector volume data was evaluated for the following key intersections:

- Williamsons Road / Manningham Road
- Williamsons Road / Westfield Site Access (North) / Sovereign Point Court
- Williamsons Road / Westfield Site Access (South) / Shoppingtown Hotel
- Doncaster Road / Elgar Road
- Williamsons Road / Doncaster Road / Tram Road
- Doncaster Road / Frederick Street / Westfield Site Access
- Doncaster Road / Tower Street / Westfield Site Access
- Doncaster Road / Council Street

Figure 2.3 presents the weekly traffic profile of the total SCATS detector volumes at the abovementioned intersections.

Figure 2.3: Weekly Traffic Profile

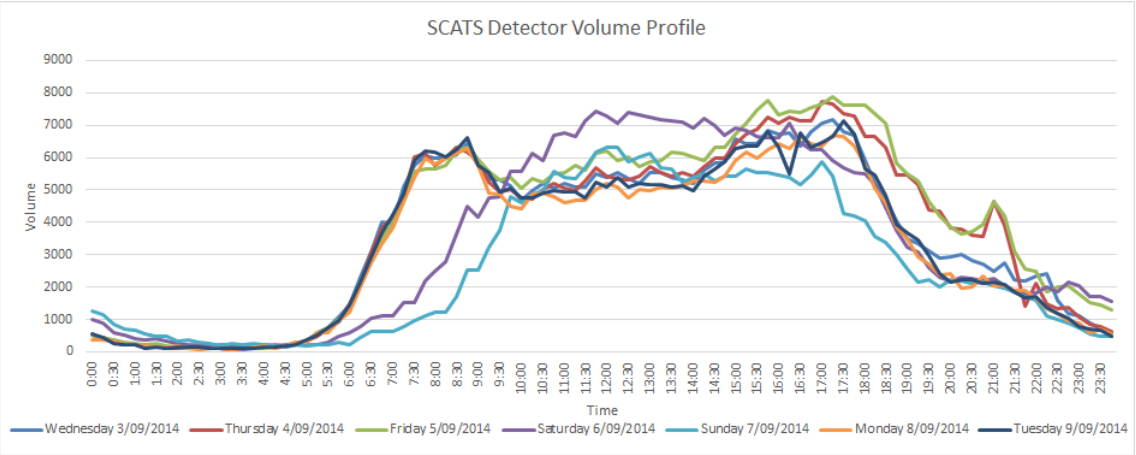
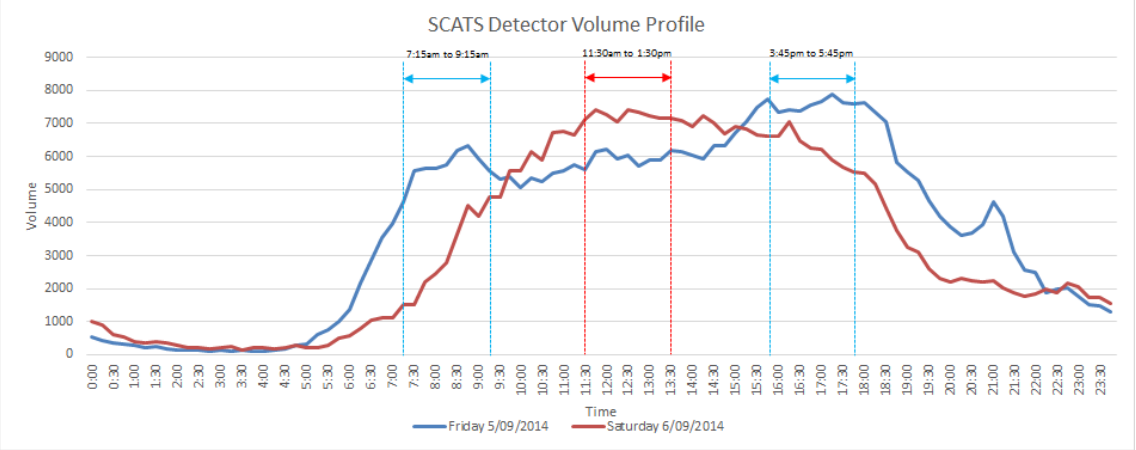


Figure 2.3 indicates that during the weekday AM peak period, traffic volumes at these intersections are consistent with almost identical peak volumes and times. However, it is clear that during the weekday PM peak both the Thursday and Friday peak volumes are higher than the other days of the week due to Westfield Doncaster being open till late on these days, with the Friday having a more extended peak and marginally higher volumes. The figure also indicates that the weekend peak definitely occurs on a Saturday during the lunchtime period. The above supports the chosen days to undertake the collection of transport data.

The resultant overall traffic profiles on the day of the surveys for the abovementioned intersections is shown in Figure 2.4.

Figure 2.4: Overall Traffic Volume Profile



This analysis assisted with the determination of the correct peak periods to be modelled having consideration to the commuter peak as well as the Westfield shopping centre peak. Based on the above, the times identified as being appropriate for modelling and suitably capture the existing peak times on the road network are as follows:

- Weekday AM Peak 7:15am to 9:15am
- Weekday PM Peak 3:45pm to 5:45pm
- Saturday Midday Peak 11:30am to 1:30pm

In addition to the above, the Westfield Doncaster traffic volumes has been assessed during the surveyed peak periods to evaluate whether the shopping centre peak correlates with the

commuter peaks identified above. Figure 2.5 has been prepared to illustrate the Westfield Doncaster movements at the signalised access points based on the intersection turn counts.

Figure 2.5: Westfield Doncaster Traffic Profile

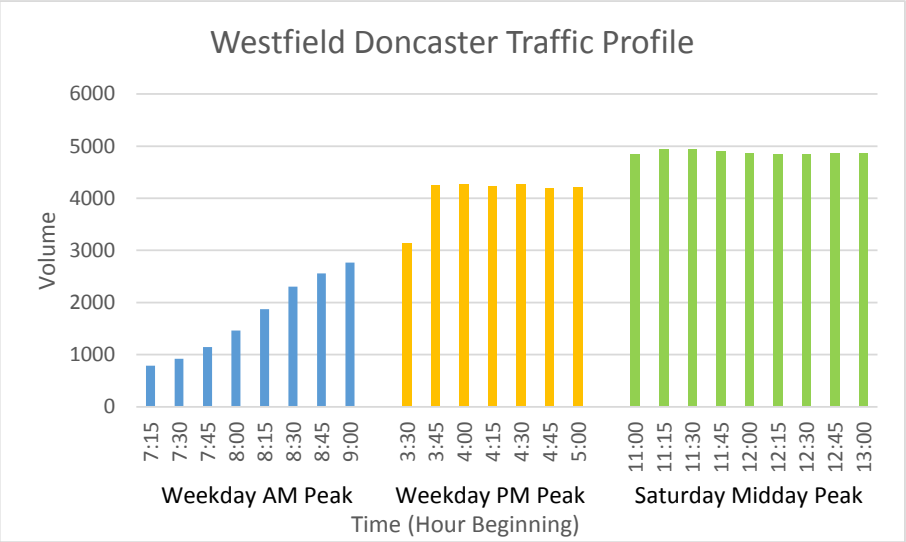


Figure 2.5 shows that the weekday PM and Saturday midday peak volumes for Westfield Doncaster traffic are generally consistent throughout the entire peak period and correlates with the adopted peak times discussed above. It is noted that during the weekday AM peak, Westfield Doncaster volumes increase throughout the AM peak which is consistent with the opening hours of the shopping centre. Although the Westfield Doncaster traffic may not be at the highest during the adopted peak times for the weekday AM peak, it was considered more important to model the commuter peak rather than the shopping centre peak in the AM, particularly given that the AM peak is generally considered the less critical peak for shopping centre developments.

3. Model Overview

3.1 History of Modelling in Doncaster

GTA has previously undertaken microsimulation modelling in the Doncaster area as part of our involvement in the Doncaster Hill study (2001 and 2011) and other studies related to Westfield Doncaster (2012 onwards). The microsimulation modelling was developed utilising the Q-Paramics software package initially for the Doncaster Hill study in 2001 and evolved to form the basis of assessment for the updated 2011 Doncaster Hill study and most recently to assess various development proposals for Doncaster Hill on behalf of Manningham City Council (Council).

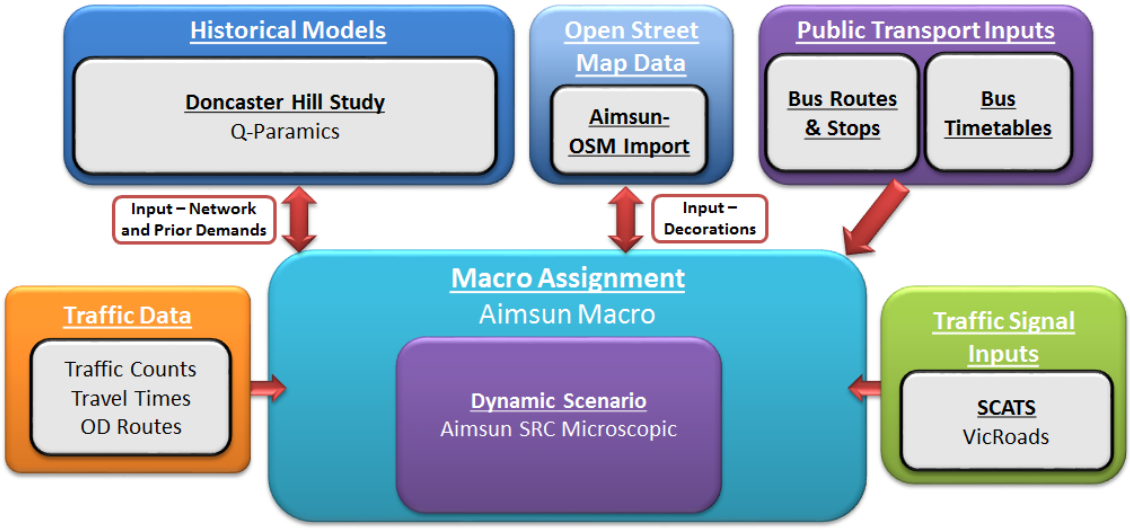
Given the latest recommendation to update the Westfield Doncaster models to reflect more recent traffic conditions, GTA has taken this opportunity to further refine the modelling process and convert the model into Aimsun. It is noted that the decision to pursue Aimsun rather than retain the model in Q-Paramics was due to technical support being ceased for the supplementary packages associated with Q-Paramics (Azalient plug-ins), especially as these were a major component of the previously developed models. In addition, the functionality of Aimsun, particularly its ability to model dynamic traffic, is superior in Aimsun.

As such, we are confident that the use of Aimsun will provide a robust multi-modal, route-choice model for this assessment.

3.2 Model Methodology

The adopted modelling methodology provides a suitable platform that will be serving both transport planning and traffic engineering needs. Figure 3.1 illustrates the adopted modelling approach, with more detailed discussion on all these components provided in the remainder of this report.

Figure 3.1: Modelling Architecture



The macroscopic models represent traffic as a flow, whereas the microscopic models describe the behaviour of individual drivers, their vehicles and their interactions.

3.3 Time Periods

The Aimsun model was developed to represent a two hour period for three peaks as follows:

- Weekday AM peak period – 7:15am to 9:15am
- Weekday PM peak period – 3:45pm to 5:45pm
- Saturday midday peak period – 11:30am to 1:30pm.

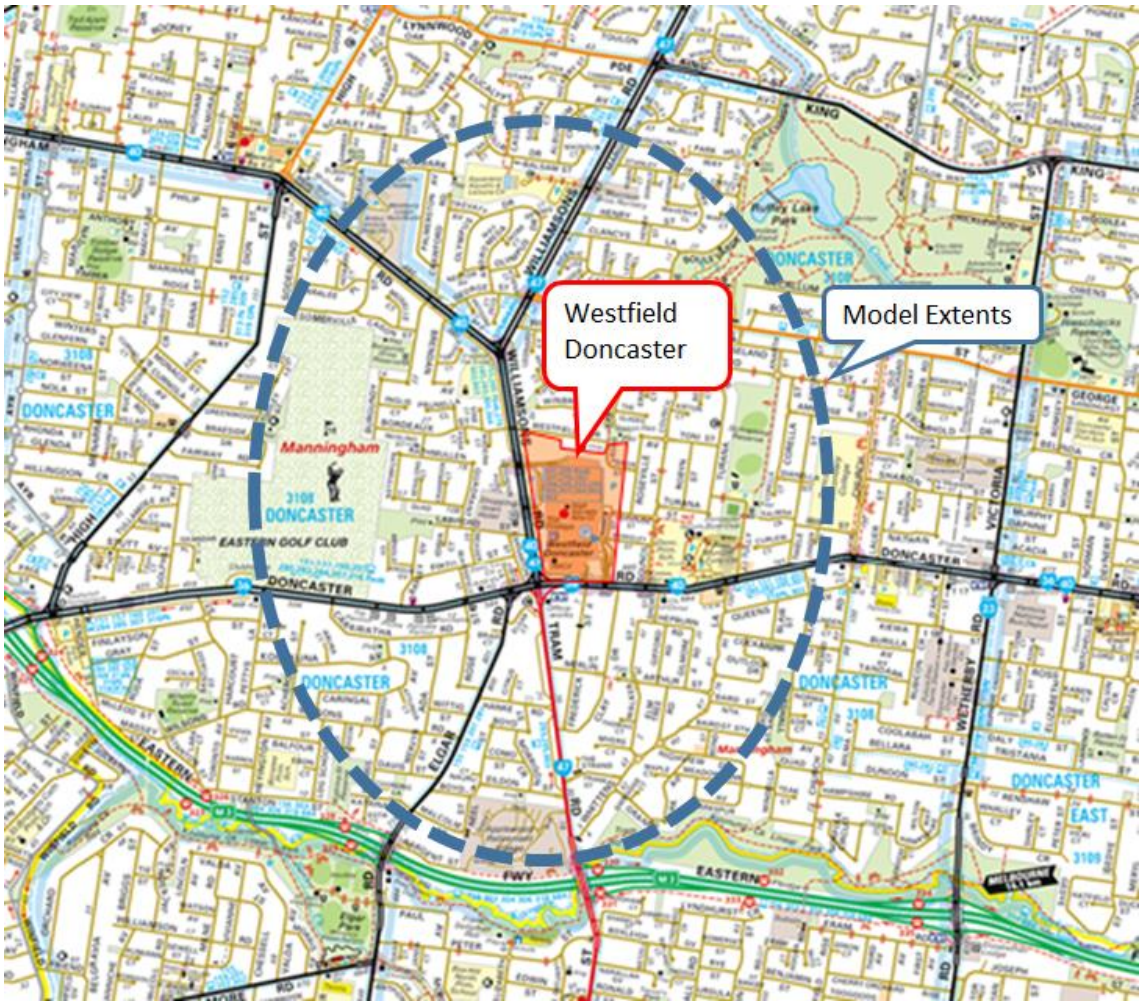
The times have been selected based on a combination of the peak volumes recorded in the study area as well as the level of congestion, as discussed in Section 2.

3.4 Model Extent

The Aimsun model extent is shown in Figure 3.2. The extents of the existing conditions microsimulation model includes key intersections within the study area which satisfactorily consider the existing and future year options testing in terms of vehicle queue lengths and delays. This includes the key intersections of:

- Williamsons Road / Manningham Road
- Williamsons Road / Westfield Drive / Bordeaux Street
- Williamsons Road / Westfield Site Access (North) / Sovereign Point Court
- Williamsons Road / Westfield Site Access (South) / Shoppingtown Hotel
- Williamsons Road / Doncaster Road / Tram Road
- Doncaster Road / Elgar Road
- Doncaster Road / Frederick Street / Westfield Site Access
- Doncaster Road / Tower Street
- Doncaster Road / Council Street

Figure 3.2: Model Extent



It is noted that the model extents cover most roads contain all major and arterial road contained within the extent illustrated in Figure 3.2, and only key local roads that provide access to significant land uses in the area (e.g. Westfield Doncaster, specialty retail, office buildings, schools).

These extents were tabled with the Transport working group which were considered acceptable.

4. Network Development

4.1 Importation of Data into Aimsun

As discussed in Section 2.2, the road network structure was imported into Aimsun from the previously developed Q-Paramics model. The entire area covers the Westfield Doncaster site access points to Doncaster Road and Williamsons Road, as well as the surrounding network. The importation process from Q-Paramics was mainly for the purposes of obtaining and streamlining the following:

- road network geometry (configuration and number of lanes)
- road hierarchy
- link capacities.

All other coding procedures would be thoroughly reviewed and refined to ensure that the road network reflects the most recent layout.

4.2 Network Coding

The network details of the imported Q-Paramics network has been enhanced by including latest geometrical details, such as the correct number of lanes on each link, turn bays and appropriate lane connectivity. A thorough review of all the Q-Paramics inputs has been undertaken to ensure that they are still relevant. In addition, specific vehicle delay functions (VDF) were applied to each link attribute based on the road type hierarchy.

It is noted that upon review of the Q-Paramics import, changes to the road hierarchy were made to better represent the default road classes specified in Aimsun. This also ensured that capacities were representative of the actual road type. That is, arterial roads have higher capacity, thus more attractiveness, than local roads. Generally speaking, arterial roads have been coded as having a capacity of 900 vehicles per hour, whilst local roads were coded with a 400 vehicles per hour capacity. This assisted with the determination of correct and realistic paths when running the simulation.

Further, the coding of U-turns in the model were generally avoided as they typically represent unwanted routing issues, particularly when running dynamic simulations. However, interrogation of the transport data indicated that a relatively high number of U-turn movements were undertaken by motorists at specific locations within the network in order to access locations that do not have direct connections from the primary road network.

As such, whilst there was no specific criteria adopted to determine the inclusion of a U-turn movement, U-turns were coded at strategic locations in the modelled road network where they were considered warranted to access certain roads or land uses that were not directly accessible due to the structure of the roads. These key locations are summarised as follows:

- North and south approaches to the Williamsons Road / Westfield Drive / Bordeaux Street intersection – a high number of U-turns were undertaken on the north approach during all peaks in order to access the service road providing access to a Primary School and residential land uses. U-turns on the south approach were predominately associated with traffic entering Westfield Doncaster or southbound vehicles from Sovereign Point Court which has a right turn ban onto Doncaster Road.

- West approach to the Doncaster Road / Beaconsfield Street / Rose Street intersection – high number of U-turns accessing land uses and parking located on the south side of Doncaster Road.
- East and west approaches to the Doncaster Road / Council Street intersection – reasonably high number of U-turns providing access to roads not directly accessible due to the median strip.

Figure 4.1: Aimsun Modelled Network

4.3 Zoning System

The model zoning system comprises a total of 48 zones within the study area, including 32 internal zones, seven external zones and nine Westfield Doncaster zones.

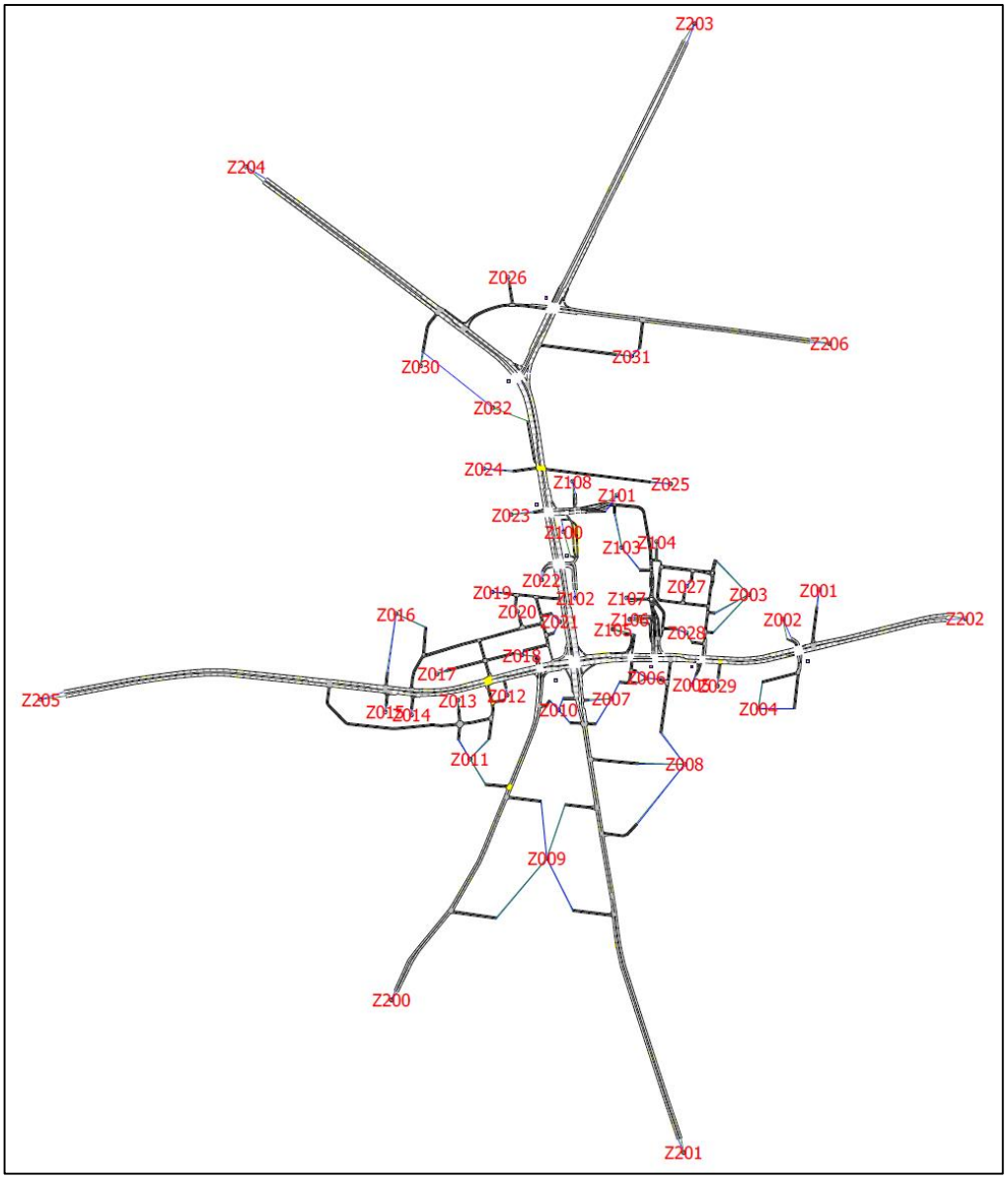
For the purposes of microsimulation modelling, it is pertinent that wherever possible, connections are made from the zone to the road section entrance or exit as this provides a more realistic behavioural representation of vehicle trips entering and exiting road networks. Where multiple connections to zones exist, manual proportions were preferred and have been applied to each of the connectors to better match the surveyed traffic volume data where applicable, otherwise the default "best entrance" method has been adopted.

Figure 4.2 presents the zoning system for the model within the study area, whilst Table 4.1 provides a summary of the zone structure.

Table 4.1: Zone Structure

Zone Type	Zone Numbers
Internal / Other	1, 8, 9, 11, 23 to 32
External	200 to 206
Doncaster Hill	2 to 7, 10, 12 to 22
Westfield Doncaster	100 to 108

Figure 4.2: Microsimulation Model Zoning System



4.4 Public Transport

Following the development of the road network structure, public transport routes have also been incorporated. The process relied on a number of sources as follows:

- Public transport routes and timetable – PTV website
- Public transport stops – Aerial photography and site observations.

The bus and tram service timetable information of each route within the study area was incorporated into the model. The timetable information included arrival times at each stop for all services which can enable the establishment of route frequencies.

The dwell times of buses at stops have been generally coded with a dwell time of 20 seconds ± 5 seconds. This has been based on historical survey data of bus travel time surveys as well as on site observations which indicated an average dwell time of approximately 18 seconds for each stop. A deviation of five seconds was considered appropriate to account for variance in dwell times.

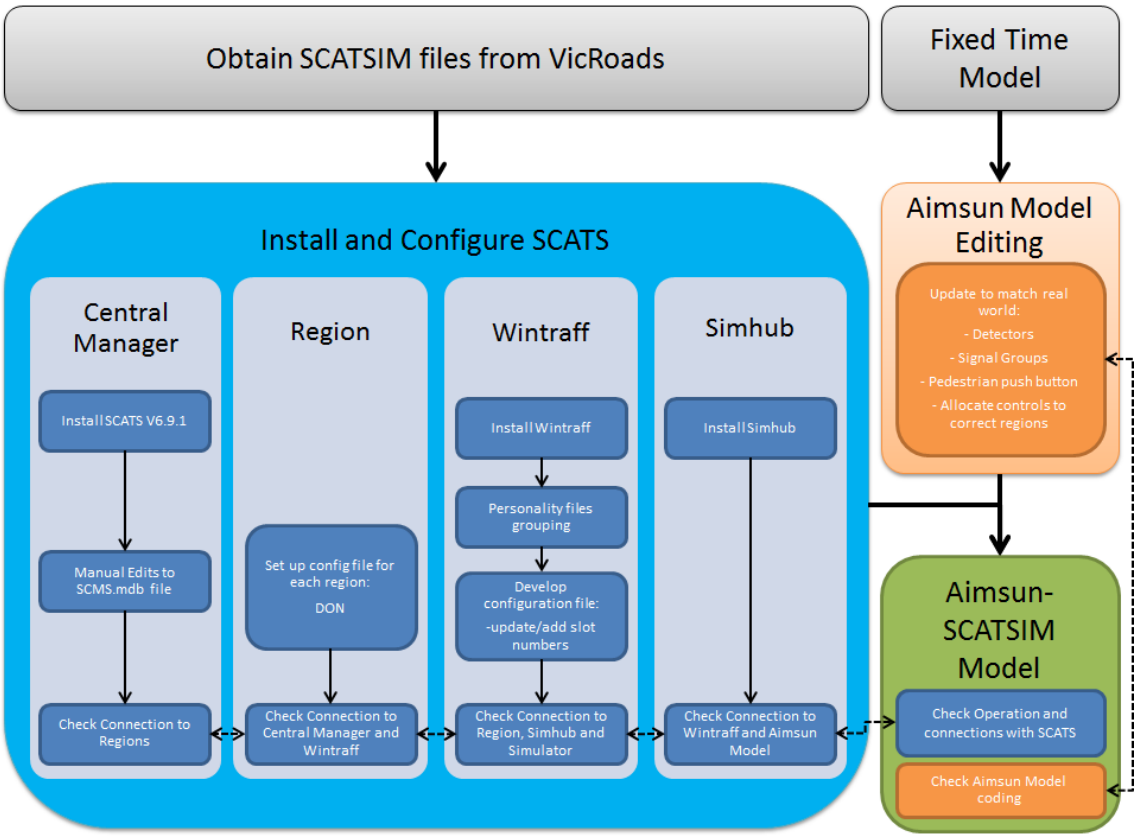
In addition, dwell times at the Westfield Doncaster bus interchange have been increased for specific routes as necessary to reflect layover times based on the abovementioned sources.

4.5 Signal Control

All signalised intersections within the study area are controlled by SCATS (Sydney Coordinated Adaptive Traffic System) which allows for adaptive phase times, cycle times and offsets that respond to fluctuating traffic conditions, public transport demands and improving the efficiency of individual intersections. Given the importance of correctly linking the closely spaced signalised intersections, which also have bus priority phases embedded in the controller operation, SCATS signal control has been used through the SCATSIM interface with Aimsun.

As discussed in Section 2.3.2, a host of SCATS data files was obtained from VicRoads to enable SCATS to communicate with Aimsun and ensure that the correct split plans, offsets, timings, phase arrangements are modelled to reflect existing conditions. Figure 4.3 outlines the process to set up SCATS in Aimsun.

Figure 4.3: SCATSIM Process



The SCATS set up was thoroughly reviewed and monitored with the assistance of GTA's SCATS operator throughout the model development ensuring that no major alarms occur during the

simulation or breakdown of communication between SCATS and Aimsun. The following summarises some of the manual overrides that had to be applied in SCATS in order to remove some of the initial alarms:

- Fallback – sites external to the study area that are linked to sites within the study area were causing these sites to exit Masterlink and fallback. As such, the "propagate fallback" function had to be unchecked on the external sites to ensure intersections do not fallback and retain their proper operation (refer to Figure 4.4).
- Software version – for some sites, the SCATS LX file specifies the site to operate with controller type 4 (VC4), however SCATSIM is expecting controller type 5 (VC5). VC4 is a pre-dated controller type of which SCATSIM does not recognise. As such, the software version of the site had to be manually adjusted to VC5 for those sites that have VC4 in its specification (refer to Figure 4.5).

Figure 4.4: Remove Propagate Fallback

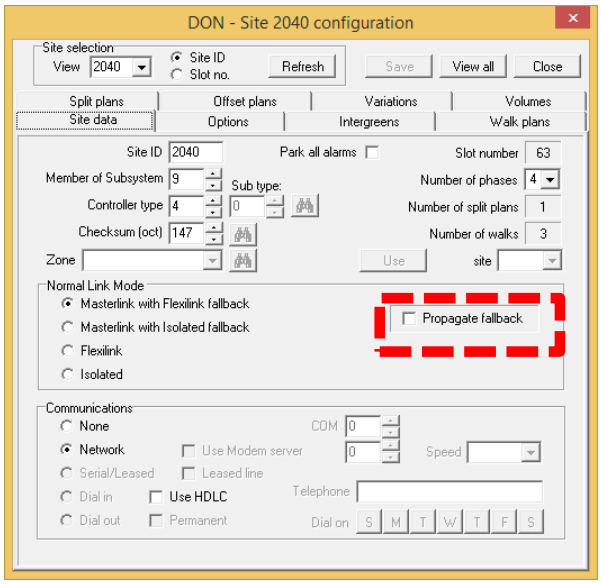
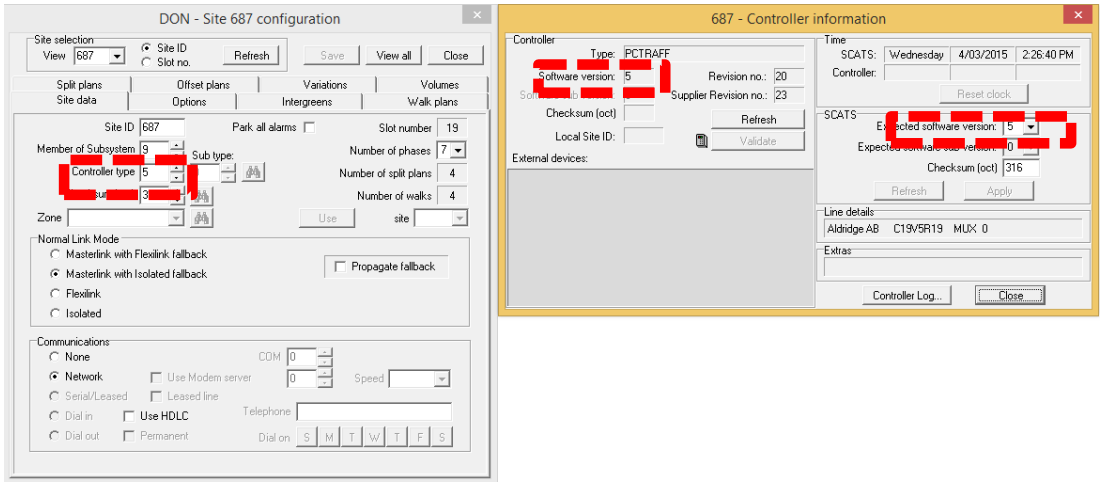


Figure 4.5: Controller Type Specification



It is important to note that the use of SCATS in a dynamic model limits the ability of the model to be able to exactly replicate model results repeatedly, and every model run has a minor variation in its operation and ultimately the results. This is due to SCATS being adaptive to the conditions it

experiences, whilst a dynamic model also allows route choices to be altered depending on conditions within the model.

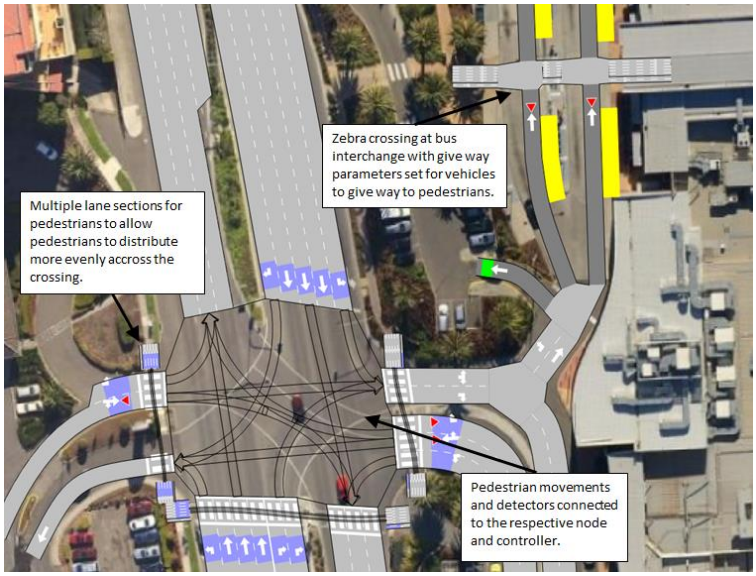
4.6 Pedestrians

Pedestrian movements at key intersections and Westfield access points were included in the model to ensure that the necessary delays and queues that the pedestrian crossings and walk times may have are replicated in the modelling assessment. Pedestrians were coded as separate vehicle type, rather than using the Legion module.

It was found that running the models using the Legion based pedestrian configurations slowed down the simulation speeds significantly and would intermittently cause SCATS to lose connection with Aimsun. As such, it was considered sufficient to model the crossing volumes at signalised intersections to ensure that the appropriate phase extensions and delays to vehicles were captured in the model.

Figure 4.6 shows an example from the model illustrating how the pedestrian crossing were coded.

Figure 4.6: Coding Pedestrian Crossings



4.7 Boom Gates

Ramp meters have been used to model the effects of boom gates at the Westfield Doncaster car park access points. An example of this is shown in Figure 4.7 below where a nominated mean dwell time of five seconds with a variation of 0.5 seconds has been set based on site observations. The significance of the boom gates in the models can be summarised as follows:

- Entrance to car park (exiting model network) – at some locations, queues from the boom gates were observed to extend onto the road network, and as such had to be reflected in the model. It is noted that for some boom gates, the mean dwell time had to be increased to ensure the correct queuing was replicated in the model (e.g. Frederick Street site access).
- Exiting car park (entering model network) – metering traffic entering the network as boom gates normally would at car parks.

Figure 4.7: Coding Boom Gates at Westfield Car Park Access

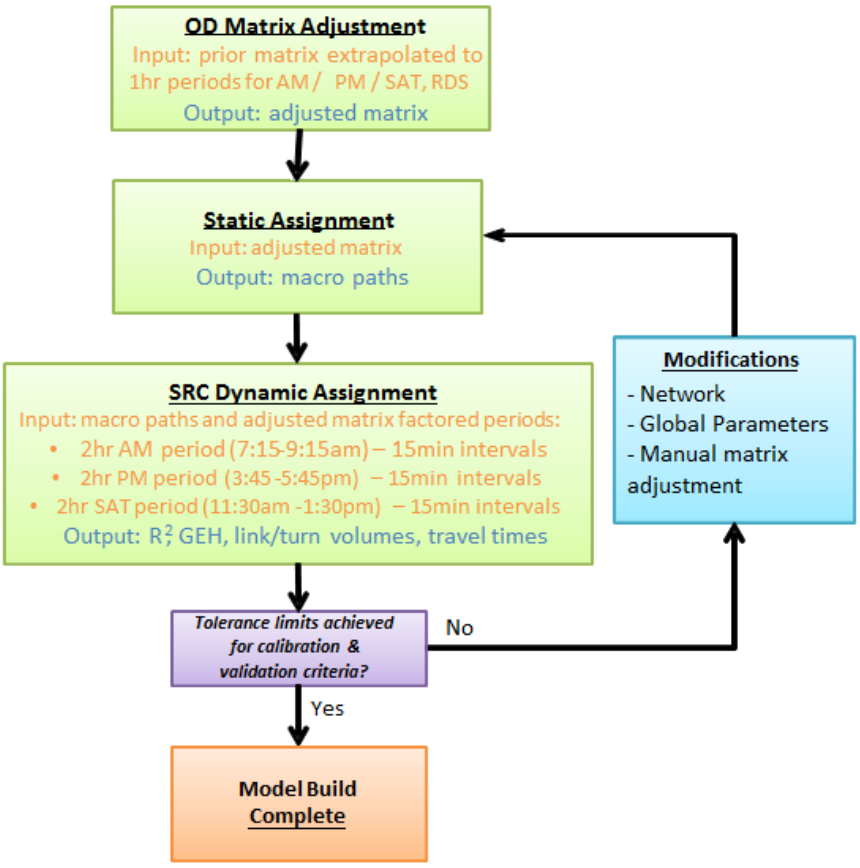
5. Development of Demand Matrices

5.1 Overview

The "prior" vehicle demand matrices were sourced from the previous Doncaster Hill model for the weekday AM and PM peak periods (2 hours). A Saturday peak model had not been developed previously, and as such the weekday PM peak prior matrix was also used for the Saturday midday peak given the similarities in Westfield traffic patterns.

Essentially, a cyclic three layered traffic demand refinement process was undertaken in establishing a calibrated and validated base Aimsun model of the study area. This process is summarised in Figure 5.1.

Figure 5.1: Traffic Demand Refinement Process



5.2 Matrix Adjustment

Using the Aimsun's Static Adjustment tool, the prior matrix was refined to better match the traffic counts in the network.

The Real Data Set input for the Macro Adjustment comprised of all link and turn traffic counts captured within the study area from the following sources:

- turning movement counts
- link counts (based on turning movement counts)

It should also be noted that data identified to have erroneous errors was removed from the Real Data Set.

The initial Macro Adjustments of the prior matrices for the weekday AM peak, weekday PM peak and Saturday midday peak achieved the following results, noting that an R^2 value of 1.0 is considered to accurately represent a good correlation).

Table 5.1: Macro Adjustment Results

Peak	Peak Period	R^2 Value	Slope
Weekday AM Peak	7:15am to 8:15am	0.9983	Y = 1.27701 + 0.99986x
	8:15am to 9:15am	0.9967	Y = -10.844 + 1.00967x
Weekday PM Peak	3:45pm to 4:45pm	0.9980	Y = -0.748985 + 1.00304x
	4:45pm to 5:45pm	0.9979	Y = -2.16986 + 1.00265x
Saturday Midday Peak	11:30am to 12:30pm	0.9939	Y = 3.10802 + 1.0008x
	12:30pm to 1:30pm	0.9963	Y = 1.86725 + 0.998251x

The regression plots for each of the peaks are presented in Figure 5.2 to Figure 5.7.

Figure 5.2: AM Macro Adjustment Regression Plot (7:15am to 8:15am)

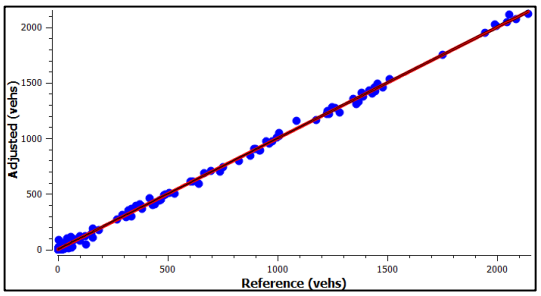


Figure 5.3: AM Macro Adjustment Regression Plot (8:15am to 9:15am)

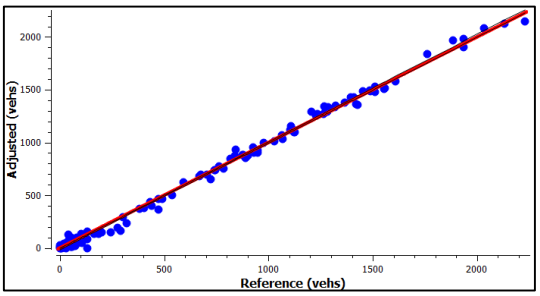


Figure 5.4: PM Macro Adjustment Regression Plot (3:45pm to 4:45pm)

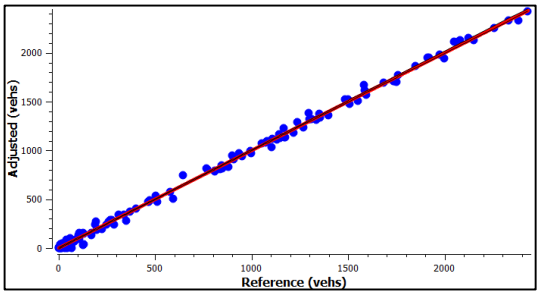


Figure 5.5: PM Macro Adjustment Regression Plot (4:45pm to 5:45pm)

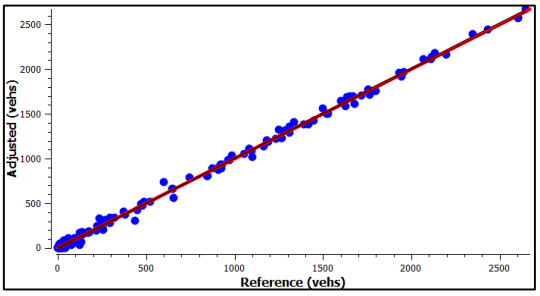


Figure 5.6: SAT Macro Adjustment Regression Plot (11:30am to 12:30pm)

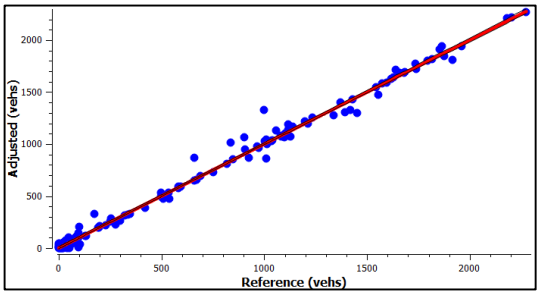
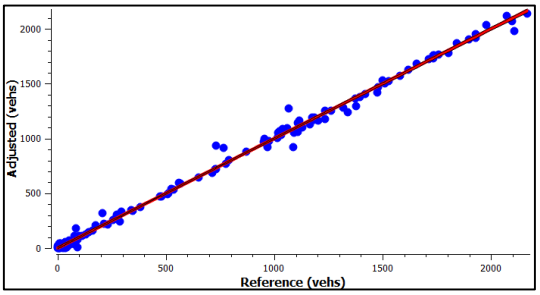


Figure 5.7: SAT Macro Adjustment Regression Plot (12:30pm to 1:30pm)



It should be noted that the parameters applied for the initial macro adjustments include:

- infinite allowable deviation (default)
- fixed OD pair cells for "known" movements.

The regression plots presented above show that the adjusted matrices for the respective peaks have a good fit to the observed traffic data, thus presenting a good starting point for the calibration and validation of the existing conditions models. Manual matrix adjustment has also been undertaken following the adjustment process to further refine the demands when modelled in the microsimulation scenarios.

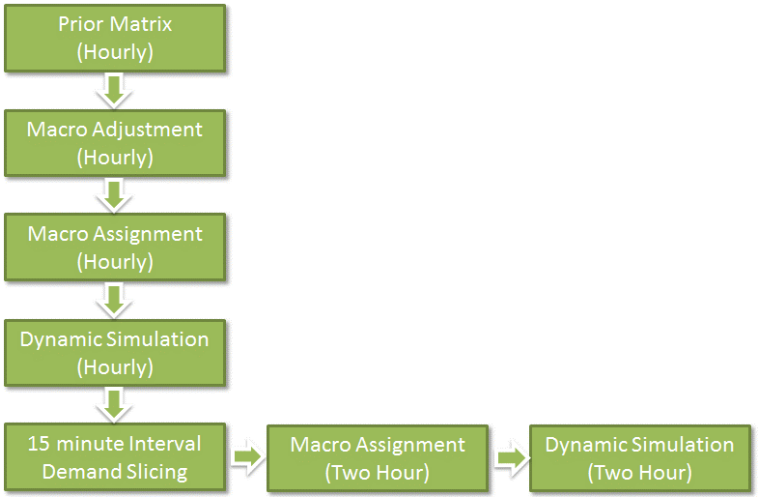
5.3 OD Matrix Expansion

The demand matrices for the three time peak periods (weekday AM, weekday PM and Saturday midday) were expanded to cover the peak periods. The expansion of base demands included proportioning the hourly demand matrices into 15-minute intervals.

The proportion of traffic demand for each 15-minute interval was derived from the traffic profile at each entry link (cordon) into the study area, based on the available traffic data. As such, the profile of traffic in the network has been assumed to be governed by the origin rather than the destination. This methodology has been discussed and agreed with VicRoads in previous projects and considered to be appropriate to model the varying demands within the study area.

Figure 5.8 illustrates the matrix development and expansion methodology.

Figure 5.8: Matrix Expansion Methodology



5.4 Assignment Method

5.4.1 Macro Assignment

Prior to running the dynamic scenario in microsimulation, a macro assignment experiment was run to generate an initial path assignment file (APA file) for use as a starting point for the dynamic scenario. This provided a suitable base from which the vehicles in the dynamic scenario should follow. A sanity check of the paths generated in the macro assignment was undertaken by utilising the select link analysis and path assignment tools, pinpointing reasons for the unrealistic paths or bad matches between the RDS comparison results. To ensure unrealistic paths were eliminated the following were implemented:

- Volume Delay Functions (VDF) on certain road types:
  - Arterial (Doncaster Road, Williamsons Road, Elgar Road): VDF Section 25
  - Street (all local roads): VDF Section 40
  - Westfield Shopping Centre (Westfield Doncaster internal roads): VDF Section 40
- Reduced capacities on local roads (100 to 400 vehicles per hour per lane) and Westfield Shopping Centre roads (400 vehicles per hour per lane).

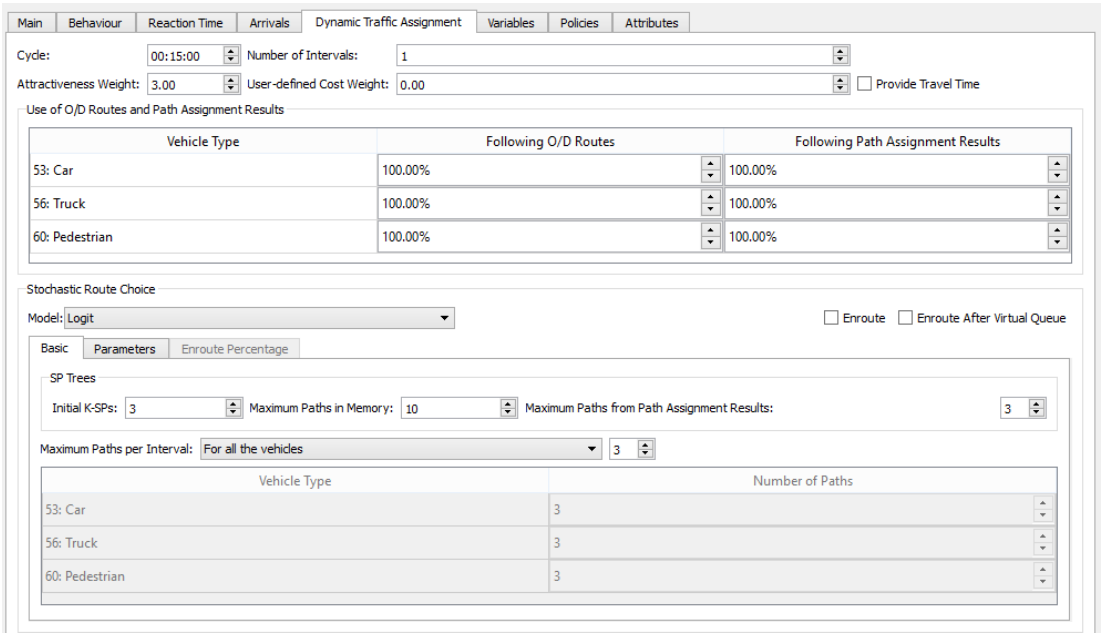
5.4.2 Stochastic Route Choice Assignment

Stochastic Route Choice (SRC) dynamic traffic assignment (DTA) within the Aimsun microsimulation models was used to run the microsimulation models. DTA was preferred over Dynamic User Equilibrium (DUE) as it is considered that DUE would generally be better suited for highly congested city conditions where multiple alternate routes are available.

Furthermore, DTA was considered to be appropriate for the modelling given the limited number of available or legitimate traffic routes for each OD pair. In DTA, each vehicle released into the model network selects a preferred route and reacts to the traffic conditions within the model, changing its route if deemed appropriate (i.e. lower cost route available). In addition, each vehicle would perceive their travel cost through the network differently, thus adding an element of randomness for individual vehicles. This provides a realistic representation of the actual driver behaviour where drivers have their own perception on when to make the decision and change their route and avoid delays.

Figure 5.9 illustrates the dynamic traffic assignment parameters that were applied to each of the peak models to perform the modelling.

Figure 5.9: Dynamic Traffic Assignment Parameters



During the model development process, the following process was undertaken to ensure that the demands were suitable for each of the peaks:

- Each replication was assessed in terms of R^2, regression slope, number of vehicles waiting to enter, number of vehicles in the network and the number of vehicles that went through.

- Validity of the SRC paths were assessed against select link analysis, pinpointing reasons for the worst matches between RDS comparison results.
- Should the results of the SRC dynamic scenario replication not be satisfactory, a review of some key parameters was undertaken after each run to better calibrate the model. This included parameters such as:
    - look-ahead distances for turn movements to ensure vehicles remained in the correct lane as observed on-site
    - capacity restraints (within reason) to avoid vehicles taking abnormal routes
    - adjustment of centroid connector proportions
    - driver reaction times to better match the amount of queuing and throughput observed on-site
    - forced turn traffic management conditions applied to eliminate paths/routes that are clearly unnecessary. Some examples of key forced turns applied in the model are summarised in the following:
        - forced turn 85464 – to prevent vehicles with a destination to zone 203 (Williamsons Road north) from travelling through the internal Westfield Doncaster Ring Road.
        - forced turn 85465 – to prevent vehicles with a destination to zone 202 (Doncaster Road east) from travelling through the internal Westfield Doncaster Ring Road.
        - forced turn 85597 – force left turning traffic to utilise the left turn slip lane from Williamsons Road north to Doncaster Road east.
        - forced turn 86609/86610 – to help prevent rat running of vehicles through the local road network.
        - forced turn 86626 – apply a distribution of vehicles to the two access points into the same zone.
        - forced turn 86646 – ensure vehicles utilise the main road to exit the site and not the adjacent access road (per on-site observations).

6. Calibration and Validation Process and Guidelines

6.1 Calibration and Validation Process

As simulation models are stochastic, they can produce different outcomes depending on their starting conditions. Due to this stochastic behaviour, it is necessary to assess how the model behaves under a variety of starting conditions (referred as seeds) using the same input parameters. The ability of a model to produce consistent results for a number of seed values is referred as the model stability, which has been assessed in Section 7.1.

The conventional method, as specified in the RMS Traffic Modelling Guidelines, in the calibration and validation of existing conditions models is to process the models for five seed values and determine the median seed based on the vehicle hours travelled (VHT), or total travel time, network statistic from the five seeds. This median seed is then used to present the of calibration and validation results. However, the variability of SCATS signal control in a dynamic model, this leads to difficulty in the replication of results for the same seed value.

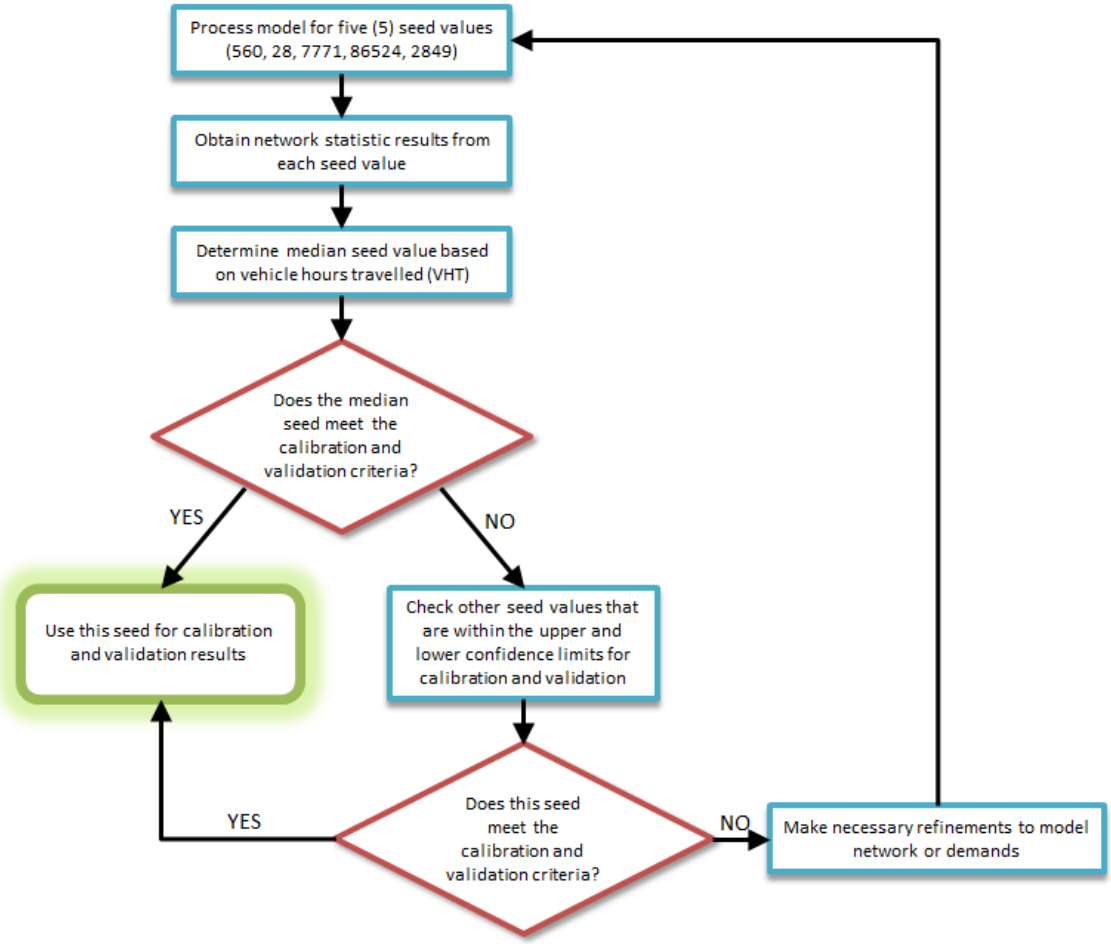
As such, whilst we have strived to adopt the median seed for calibration and validation purposes, some flexibility to the adopted seed value has been applied to produce a more robust modelling assessment based on the one seed value. Our approach considers the five seed runs to demonstrate model stability, however consideration has also been given to a seed value that sits within the upper and lower confidence limits (95%), which may better represent the conditions observed on site, rather than the median.

The five seed values processed for the weekday AM, weekday PM and Saturday midday peak models are as follows:

- Seed Number 1: 560
- Seed Number 2: 28
- Seed Number 3: 7,771
- Seed Number 4: 86,524
- Seed Number 5: 2,849

The flowchart presented in Figure 6.1 broadly illustrates our approach.

Figure 6.1: Approach to Determine an Appropriate Seed Value



6.2 Calibration and Validation Guidelines

The aim of the microsimulation modelling is to obtain the best possible match between the model results and the field measurements. Calibration and validation targets were developed based on the performance requirements.

The calibration and validation process was carried out in accordance with the criteria set out in the Roads and Maritime Services, Traffic Modelling Guidelines, dated March 2013. These guidelines represent the latest comprehensive set of guidelines released in Australia.

Specifically, the targets set out in the guidelines are shown in Table 6.1.

Table 6.1: Microsimulation Modelling Calibration and Validation Criteria

Item	Criteria
Network Wide Link and Turn Volumes	Tolerance limits for individual link and turn volumes: o 85% of individual link or turn volumes to have a GEH ≤ 5 o All individual link and turn volumes should have GEH ≤ 10 Plots of observed versus modelled hourly flows: o Slope value to be included with plots o R^2 value to be included with plots and be > 0.9
Core Area Link and Turn Volumes	Tolerance limits for individual link and turn volumes: o Flows < 99 – to be within 10 vehicles of observed value o Flows 100 to 999 – to be within 10% of observed value o Flows 1000 to 1999 – to be within 100 vehicles of observed value o Flows > 2000 – to be within 5% of observed value 100% of observations to be within tolerance limits. Plots of observed versus modelled hourly flows: o Slope value to be included with plots o R^2 value to be included with plots and be > 0.95
Travel Time Average	o Average modelled travel time to be within 15% or one minute (whichever is greater) of average observed journey time for full length of route. o Average modelled travel time to be within 15% of average observed travel time for individual sections. o Average and 95% confidence intervals to be plotted for observed and modelled travel times for each journey time route (to modellers and RMS satisfaction).
Visual Checks	Key locations to review in terms queuing, pedestrian movements and vehicle-pedestrian interaction.

The link and turn volumes set out in Table 6.1 were utilised to calibrate the model, whilst the travel times, visual audits were used to validate the model.

7. Calibration and Validation Results

7.1 Model Stability

In order to demonstrate the stability of the model over five seed runs, an assessment of the five seeds has been undertaken which are based on the Vehicle Hours Travelled (VHT), or Total Travel Time, network statistic. The following sections provide scatter plot results for the VHT, whilst the descriptive statistical results for each of the peaks are also presented.

Weekday AM Peak

Figure 7.1: Weekday AM Peak – Scatter Plot for VHT

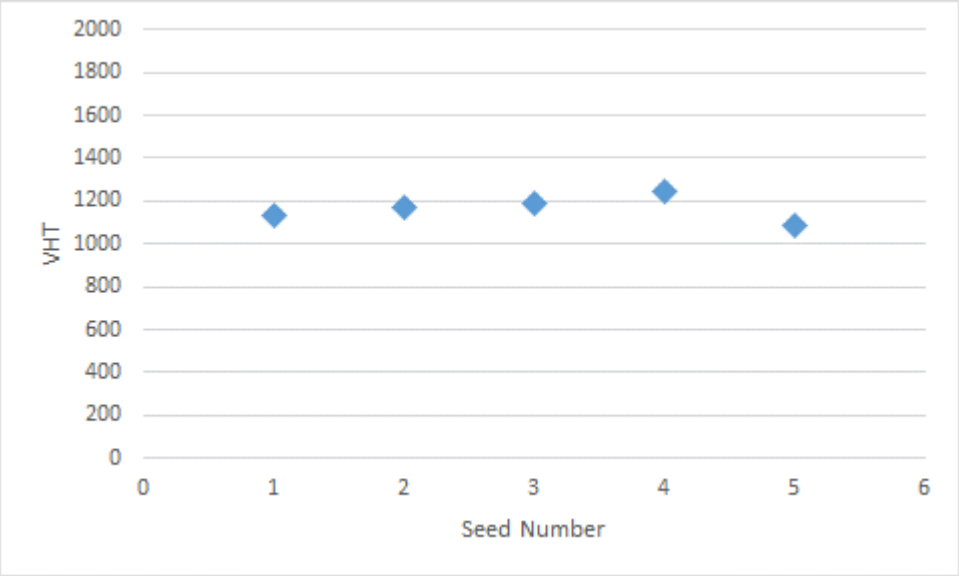


Table 7.1: Weekday AM Peak – Descriptive Statistical Results for VHT

Statistic	Results
Number of Runs	5
Mean	1,164.99
Standard Deviation	57.64
Range	153.69
Minimum	1,088.27
Maximum	1,241.96
95% Confidence Limit	50.52
Lower Confidence Limit	1,114.47
Upper Confidence Limit	1,215.50
Median	1,172.84

The results of the model stability analysis for the weekday AM peak illustrate some variation in the VHT results without large shifts in value which is in line with a typical variation in day-to-day traffic volumes.

In addition to the VHT, an assessment was undertaken to establish if the number of runs (5) in the analysis is sufficient to accurately assess the differences between the base and post development models. The results of this assessment for the weekday AM peak are presented in Table 7.2.

Table 7.2: Weekday AM Peak – Required Number of Runs Assessment

Statistic	Results
Initial Number of Runs	5
Mean	1,164.99
Standard Deviation	57.64
95% Confidence Limit	50.52
T statistic	0.066
Number of additional runs for the chosen confidence level (N1)	0.006

The results in Table 7.2 illustrate that the number of additional runs required to increase the confidence level are well less than one, and as such the results of five model runs for the weekday AM peak provide a sufficient level of statistical confidence, and will be suitable for future scenario comparison.

Weekday PM Peak

Figure 7.2: Weekday PM Peak – Scatter Plot for VHT

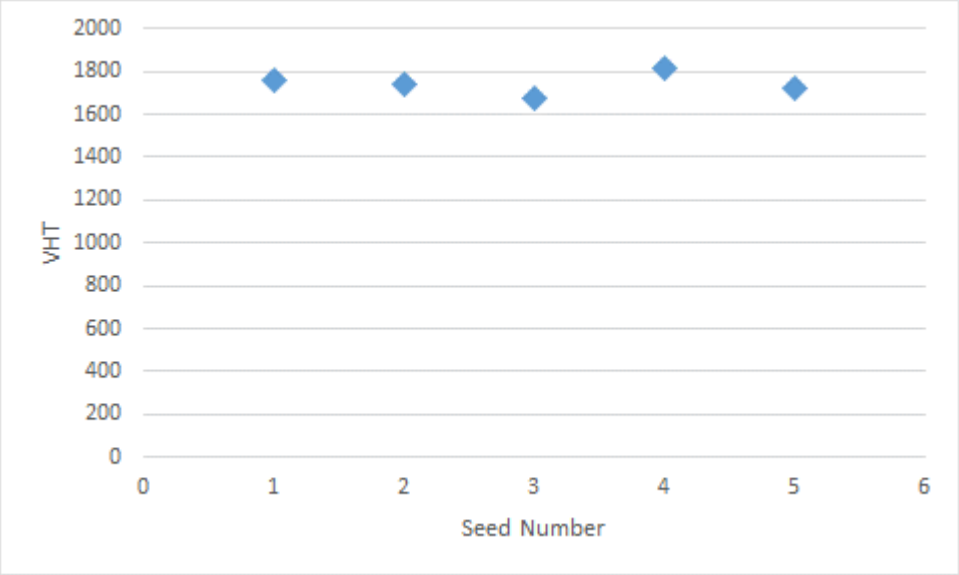


Table 7.3: Weekday PM Peak – Descriptive Statistical Results for VHT

Statistic	Results
Number of Runs	5
Mean	1,740.89
Standard Deviation	52.89
Range	145.27
Minimum	1,673.34
Maximum	1,818.61
95% Confidence Limit	46.36
Lower Confidence Limit	1,694.52
Upper Confidence Limit	1,787.25
Median	1,735.74

The results of the model stability analysis for the weekday PM peak illustrate some variation in the VHT results without large shifts in value which is in line with a typical variation in day-to-day traffic volumes.

In addition to the VHT, an assessment was undertaken to establish if the number of runs (5) in the analysis is sufficient to accurately assess the differences between the base and post development models. The results of this assessment for the PM peak are presented in Table 7.4.

Table 7.4: Weekday PM Peak – Required Number of Runs Assessment

Statistic	Results
Initial Number of Runs	5
Mean	1,740.89
Standard Deviation	52.89
95% Confidence Limit	46.36
T statistic	0.066
Number of additional runs for the chosen confidence level (N1)	0.006

The results in Table 7.4 illustrate that the number of additional runs required to increase the confidence level are well less than one, and as such the results of five model runs for the weekday PM peak provide a sufficient level of statistical confidence, and will be suitable for future scenario comparison.

Saturday Midday Peak

Figure 7.3: Saturday Midday Peak – Scatter Plot for VHT

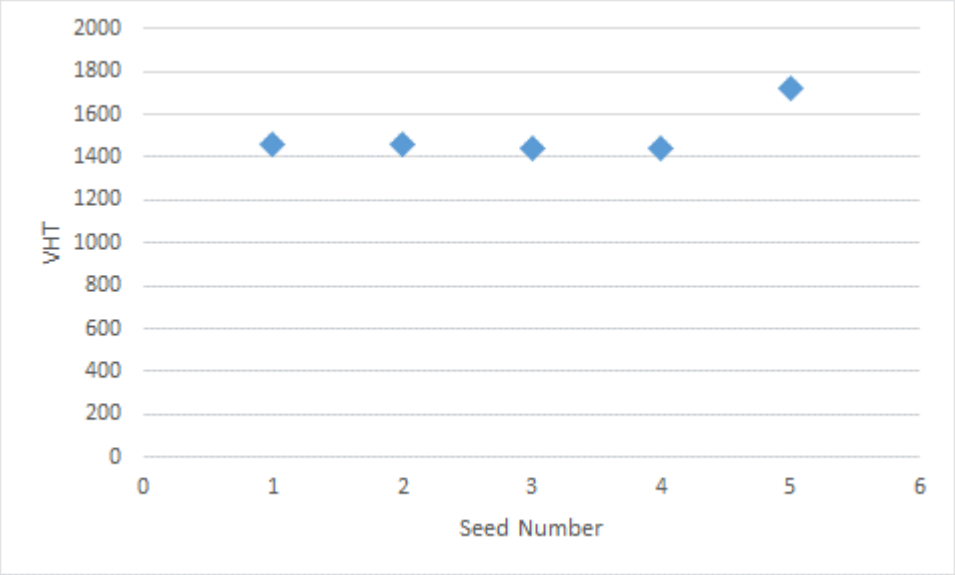


Table 7.5: Saturday Midday Peak – Descriptive Statistical Results for VHT

Statistic	Results
Number of Runs	5
Mean	1,505.42
Standard Deviation	119.58
Range	277.97
Minimum	1,440.61
Maximum	1,718.58
95% Confidence Limit	104.82
Lower Confidence Limit	1,400.60
Upper Confidence Limit	1,610.24
Median	1,459.78

The results of the model stability analysis for the Saturday midday peak illustrate some variation in the VHT results without large shifts in value which is in line with a typical variation in day-to-day traffic volumes. In particular, seed value 5 shows that it is potentially an outlying run.

In addition to the VHT, an assessment was undertaken to establish if the number of runs (5) in the analysis is sufficient to accurately assess the differences between the base and post

development models. The results of this assessment for the Saturday midday peak are presented in Table 7.6.

Table 7.6: Saturday Midday Peak – Required Number of Runs Assessment

Statistic	Results
Initial Number of Runs	5
Mean	1,505.42
Standard Deviation	119.58
95% Confidence Limit	104.82
T statistic	0.066
Number of additional runs for the chosen confidence level (N1)	0.006

The results in Table 7.6 illustrate that the number of additional runs required to increase the confidence level are well less than one, and as such the results of five model runs for the Saturday midday peak provide a sufficient level of statistical confidence, and will be suitable for future scenario comparison.

7.2 Adopted Seed Number

As discussed in Section 6.1, the method in choosing a single seed value to carry through in the calibration and validation of the existing conditions model has not only been based on the median value of the five seed runs, but also considers the upper and lower confidence limits. Table 7.7 outlines the adopted seed value and how it compares to the statistics of the five seed runs.

Table 7.7: Adopted Seed Number vs Five Seed Run Statistics

Peak	VHT Statistics of Five Seed Runs				Adopted Seed	
	Mean	95% Confidence Limit	Lower Confidence Limit	Upper Confidence Limit	VHT	Seed Value
Weekday AM Peak	1,164.99	50.52	1,114.47	1,215.50	1,172.84	Seed Number 2 (28)
Weekday PM Peak	1,740.89	46.36	1,694.52	1,787.25	1,735.74	Seed Number 2 (28)
Saturday Midday Peak	1,505.41	104.82	1,400.60	1,610.24	1,464.16	Seed Number 1 (560)

As indicated in Table 7.7, the adopted seed value for each of the peaks sit within the lower and upper confidence limits of the five seed runs. As such, it is considered that the adopted seed values are appropriate to take forward in the calibration and validation of the existing models.

It is noted that the adopted seed values for the weekday AM and weekday PM peaks are the median seed value.

7.2.1 Model Stability for the Adopted Seed Number

The use of SCATS signal control has been proven to be unable to produce repeatable results in simulation packages, even when using the same model inputs and seed numbers. This variability in results is impacted even more with the introduction of dynamic traffic assignment. It is important to consider this variability in the base models and have consideration for it in future options testing to ensure model outputs are representative and unbiased.

As such, an assessment of model stability, based on the VHT parameter, has been undertaken for the adopted seed value (run five times) in order to understand the degree of variation that can be expected.

Weekday AM Peak

Figure 7.4: Weekday AM Peak – Scatter Plot for VHT (Adopted Seed Number)

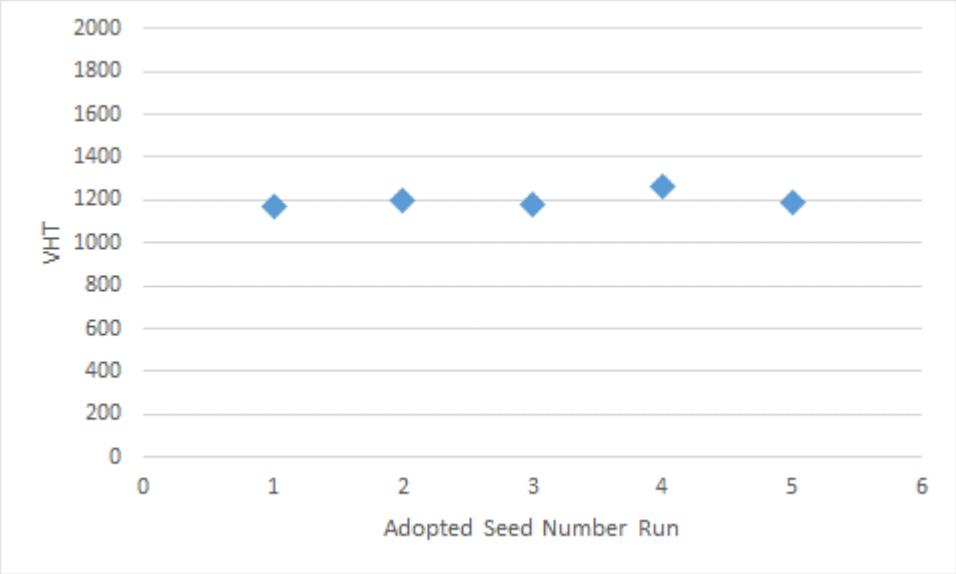


Table 7.8: Weekday AM Peak – Descriptive Statistical Results for VHT (Adopted Seed Number)

Statistic	Results
Number of Runs	5
Mean	1,200.64
Standard Deviation	36.50
Range	91.00
Minimum	1,172.84
Maximum	1,263.84
95% Confidence Limit	31.99
Lower Confidence Limit	1,168.65
Upper Confidence Limit	1,232.64
Median	1,187.02

The adopted seed number model stability analysis for the weekday AM peak illustrates minor variation in the VHT results. As such, the model in the weekday AM peak is considered stable with minor variations in SCATS signal timings and vehicle arrivals.

Weekday PM Peak

Figure 7.5: Weekday PM Peak – Scatter Plot for VHT (Adopted Seed Number)

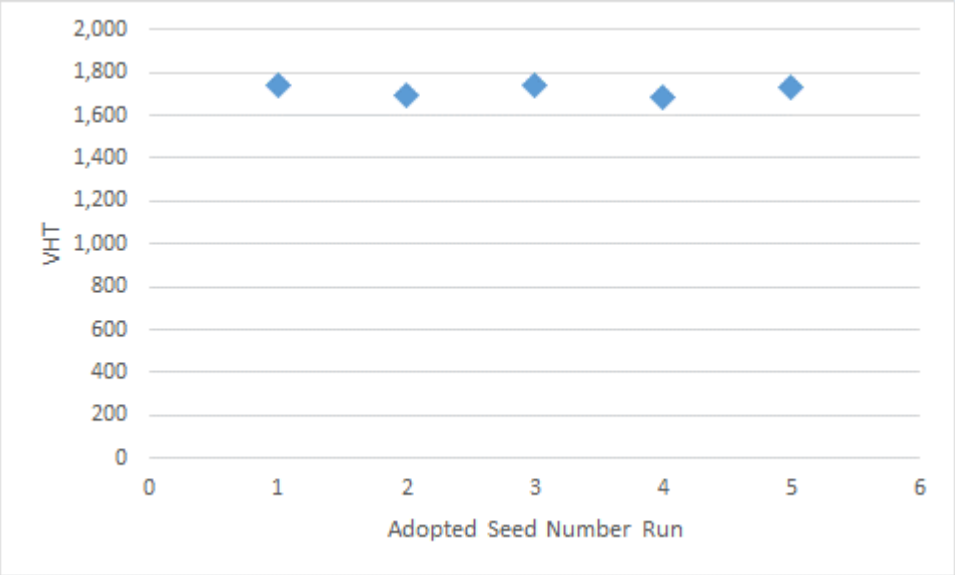


Table 7.9: Weekday PM Peak – Descriptive Statistical Results for VHT (Adopted Seed Number)

Statistic	Results
Number of Runs	5
Mean	1,716.02
Standard Deviation	27.09
Range	55.69
Minimum	1,683.57
Maximum	1,739.26
95% Confidence Limit	23.75
Lower Confidence Limit	1,692.27
Upper Confidence Limit	1,739.77
Median	1,731.97

The adopted seed number model stability analysis for the weekday PM peak also illustrates minor variation in the VHT results. As such, the model in the weekday PM peak is considered stable with minor variations in SCATS signal timings and vehicle arrivals.

Saturday Midday Peak

Figure 7.6: Saturday Midday Peak – Scatter Plot for VHT (Adopted Seed Number)

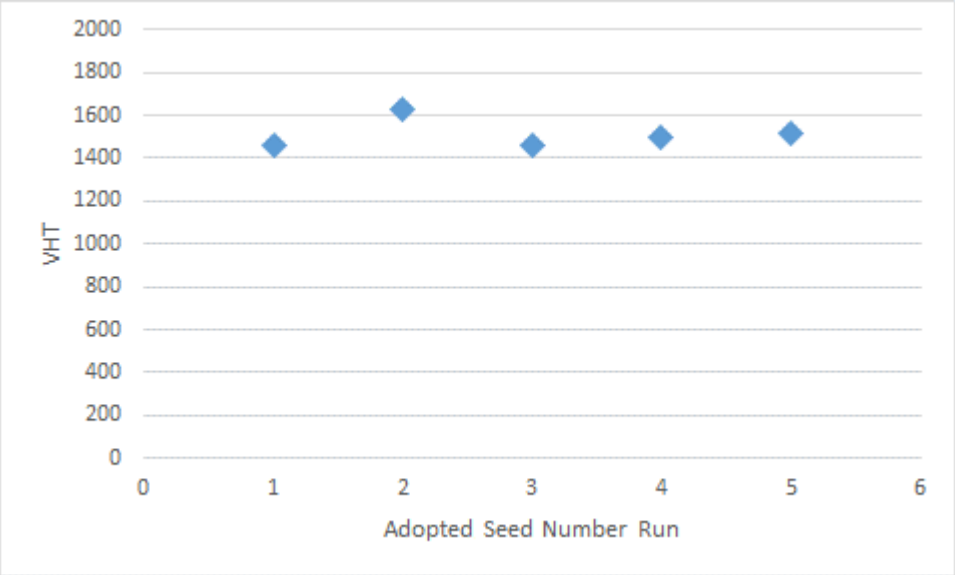


Table 7.10: Saturday Midday Peak – Descriptive Statistical Results for VHT (Adopted Seed Number)

Statistic	Results
Number of Runs	5
Mean	1,512.19
Standard Deviation	67.48
Range	168.35
Minimum	1,455.39
Maximum	1,623.74
95% Confidence Limit	59.15
Lower Confidence Limit	1,453.04
Upper Confidence Limit	1,571.34
Median	1,498.50

The adopted seed number model stability analysis for the Saturday midday peak illustrates some variation in the VHT results, with the second model run showing the highest deviation from the other runs. However, this deviation is only 11% from the median and as such, the model is considered relatively stable.

7.3 Model Calibration Results

The following tables and figures summarises the comparison of the modelled turn flows against the surveyed (observed) turning movement counts, and how well they meet the network wide criteria specified in Section 6.2. A full list of the turning movement calibration results are provided in Appendix C.

Table 7.11: Turn Flow Calibration Result

Peak	Time	Measure and Criteria		
		85% of individual Link or Turn Counts	All Individual Link or Turn Counts	R^2
		GEH ≤ 5	GEH ≤ 10	> 0.90
Weekday AM Peak	7:15am to 8:15am	93%	100%	0.9847
	8:15am to 9:15am	93%	100%	0.9880
Weekday PM Peak	3:45pm to 4:45pm	90%	100%	0.9952
	4:45pm to 5:45pm	97%	100%	0.9966
Saturday Midday Peak	11:30am to 12:30pm	96%	100%	0.9961
	12:30pm to 1:30pm	96%	100%	0.9945

Table 7.11 indicates that the turn flow calibration criteria is being met for all peak periods with more than 85% of turns having a GEH ≤ 5, and all turns having a GEH ≤ 10. This suggests a high level of correlation between the modelled and observed turn flows.

In addition to the above, a modelled versus observed traffic volume comparison has been undertaken in the form of a R^2 and scatter plot analysis for each of the peak hours. It is typically recommended that an R^2 value greater than 0.95 be achieved before a model is considered to be calibrated appropriately, whilst the guidelines recommend a value greater than 0.9. Figure 7.7 to Figure 7.12 present the modelled versus observed traffic volume plots for the weekday AM, weekday PM and Saturday midday peaks, which indicate that the modelled traffic volumes have been calibrated against observed volumes to a suitable standard with all R^2 values above 0.95 for both peak hours.

Figure 7.7: Turn Flow Comparison – Weekday AM Peak (7:15am to 8:15am)

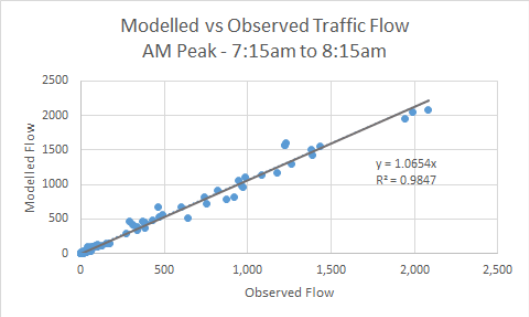


Figure 7.8: Turn Flow Comparison – Weekday AM Peak (8:15am to 9:15am)

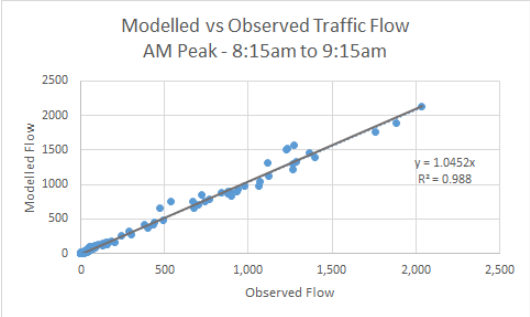


Figure 7.9: Turn Flow Comparison – Weekday PM Peak (3:45pm to 4:45pm)

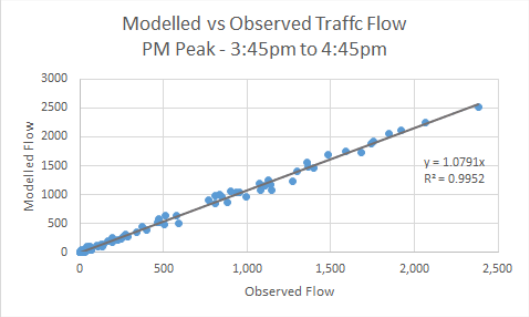


Figure 7.10: Turn Flow Comparison – Weekday PM Peak (4:45pm to 5:45pm)

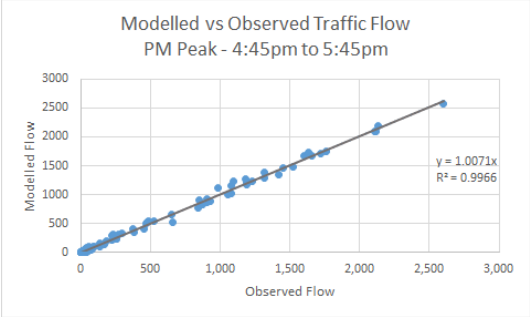


Figure 7.11: Turn Flow Comparison – Saturday Midday Peak (11:30am to 12:30pm)

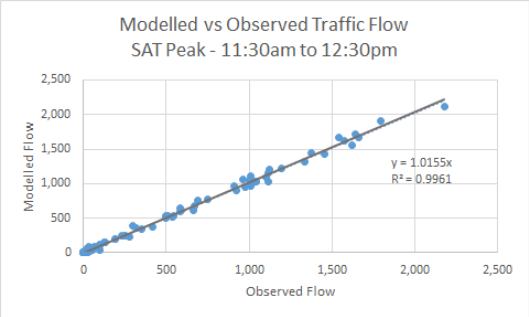
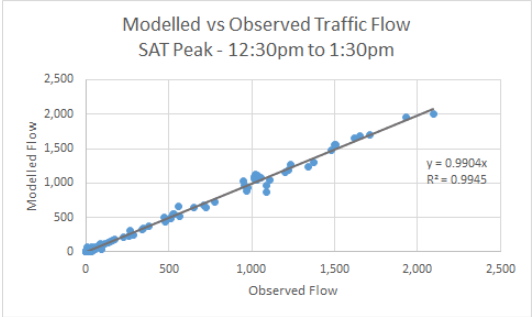


Figure 7.12: Turn Flow Comparison – Saturday Midday Peak (12:30pm to 1:30pm)



Given the above, the results of the turn flow calibration are considered satisfactory for all peak periods and meet the network wide calibration criteria.

The calibration results have also been checked against the "core area" criteria which are presented in Appendix C. It is noted that whilst the RMS guidelines suggest that 100% of the core area targets should be met, it is our belief that the core area targets are too stringent and require considerable time and budget to achieve, of which studies like this are restricted. How much more we would gain from meeting the core area criteria should be considered, especially for master planning studies such as this.

Notwithstanding, the core area calibration results presented in Appendix C do indicate that the majority of data points meet the criteria, particularly for flows less than 99 vehicles, however noting that discrepancies do exist when comparing against the core area criteria. It is further noted that being only marginally outside the relevant threshold (for example one vehicle or 1%) constitutes a failure for the model to be calibrated appropriately, thus highlighting the stringent nature of the criteria.

Overall, whilst the core area calibration results do not meet all of the criteria, it is still considered that the base models are sufficiently calibrated with a high level of correlation with the network wide criteria.

7.4 Model Validation Results

7.4.1 Travel Times

Travel times surveys were undertaken along key routes within the study area as discussed in Section 2 of this report. These routes have been used to undertake a comparison between the modelled and observed travel times in order to demonstrate that the existing conditions models closely represent the existing conditions in terms of travel times for cars within the study area. The following discusses the outcomes of the travel time validation for cars along the routes illustrated in Figure 2.2, based on meeting the standard within 15% or 60 seconds criteria. Full detailed results of the travel time comparisons are provided in Appendix D, which also includes an assessment of the cumulative travel times against the 95th percentile confidence limits.

Table 7.12 to Table 7.14 present the full section travel time comparisons for each of the modelled peak periods.

Table 7.12: Car Travel Time Validation Summary – Weekday AM Peak

Peak Period	Route	Direction	Average Observed Travel Time (s)	Average Modelled Travel Time (s)	Difference		Meets Criteria?
					Relative (s)	%	
7:15am to 8:15am	Doncaster Road	Eastbound	94	129	35	37%	Yes
		Westbound	85	94	9	10%	Yes
	Tram Road and Williamsons Road	Northbound	191	225	34	18%	Yes
		Southbound	191	197	6	3%	Yes
	Elgar Road and Williamsons Road	Northbound	282	241	-41	-14%	Yes
		Southbound	291	305	14	5%	Yes
8:15am to 9:15am	Doncaster Road	Eastbound	134	145	11	9%	Yes
		Westbound	76	105	29	38%	Yes
	Tram Road and Williamsons Road	Northbound	201	215	15	7%	Yes
		Southbound	262	217	-45	-17%	Yes
	Elgar Road and Williamsons Road	Northbound	326	268	-59	-18%	Yes
		Southbound	307	333	26	8%	Yes

The results presented in Table 7.12 indicates that the travel times on all routes during the weekday AM peak period meets the requirements set out in the validation criteria. For each of the time periods in the weekday AM peak, the modelled travel time routes for the entire route are all within 15% or 60 seconds of the observed travel time which meets the requirements.

Table 7.13: Car Travel Time Validation Summary – Weekday PM Peak

Peak Period	Route	Direction	Average Observed Travel Time (s)	Average Modelled Travel Time (s)	Difference		Meets Criteria?
					Relative	%	
3:45pm to 4:45pm	Doncaster Road	Eastbound	152	155	3	2%	Yes
		Westbound	136	133	-3	-2%	Yes
	Tram Road and Williamsons Road	Northbound	244	297	53	22%	Yes
		Southbound	311	332	21	7%	Yes
	Elgar Road and Williamsons Road	Northbound	318	258	-61	-19%	No
		Southbound	408	356	-52	-13%	Yes
4:45pm to 5:45pm	Doncaster Road	Eastbound	125	156	31	25%	Yes
		Westbound	134	121	-13	-10%	Yes
	Tram Road and Williamsons Road	Northbound	238	244	6	3%	Yes
		Southbound	333	307	-25	-8%	Yes
	Elgar Road and Williamsons Road	Northbound	351	348	-3	-1%	Yes
		Southbound	372	327	-44	-12%	Yes

The results presented in Table 7.13 indicates that the travel times on all routes during the weekday PM peak period generally meets the requirements set out in the validation criteria. For each of the time periods in the weekday PM peak, the modelled travel time routes for the entire route are all within 15% or 60 seconds of the observed travel time, with the exception of the northbound Elgar Road and Williamsons Road route in the first weekday PM peak hour.

It is noted that this route is marginally outside (one second) the threshold to consider the travel time route to be validated and as such is considered satisfactory. Furthermore, Figure 7.13 below has been prepared to show that the sectional travel times (1 – 7) and the full travel times (8) are within the minimum and maximum observed travel time, suggesting that the route has been modelled reflective of existing conditions.

Figure 7.13: Elgar Road and Williamsons Road Northbound – Weekday PM Peak (3:45pm to 4:45pm)

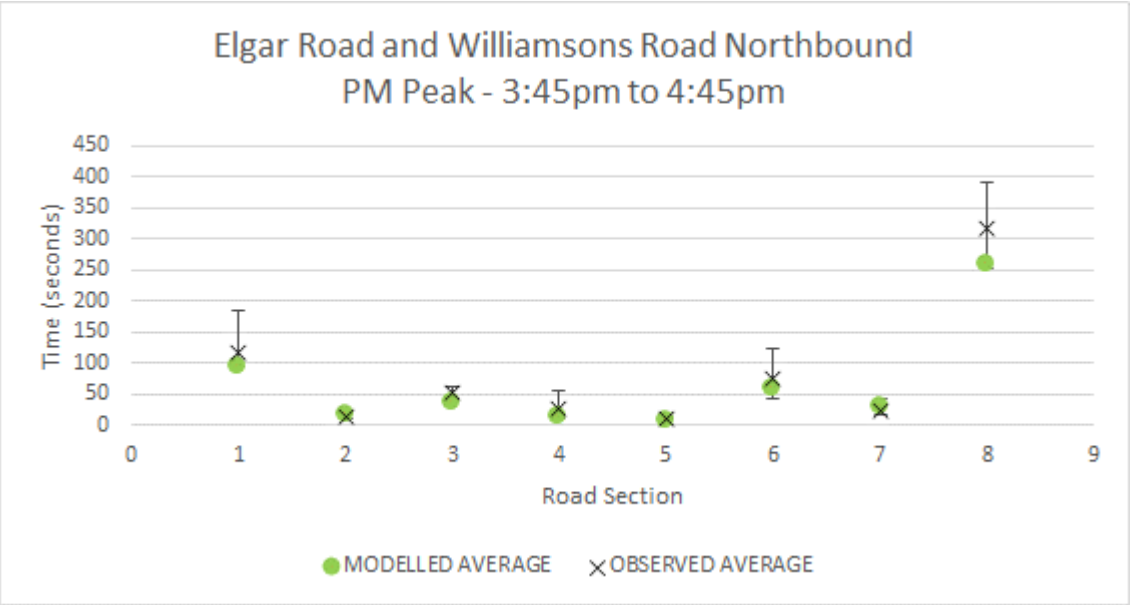


Table 7.14: Car Travel Time Validation Summary – Saturday Midday Peak

Peak Period	Route	Direction	Average Observed Travel Time (s)	Average Modelled Travel Time (s)	Difference		Meets Criteria?
					Relative	%	
11:30am to 12:30pm	Doncaster Road	Eastbound	164	181	16	10%	Yes
		Westbound	115	123	9	8%	Yes
	Tram Road and Williamsons Road	Northbound	179	183	3	2%	Yes
		Southbound	241	207	-34	-14%	Yes
	Elgar Road and Williamsons Road	Northbound	256	223	-33	-13%	Yes
		Southbound	374	410	36	10%	Yes
12:30pm to 1:30pm	Doncaster Road	Eastbound	185	227	42	23%	Yes
		Westbound	116	130	14	12%	Yes
	Tram Road and Williamsons Road	Northbound	167	197	31	18%	Yes
		Southbound	225	211	-13	-6%	Yes
	Elgar Road and Williamsons Road	Northbound	285	229	-56	-20%	Yes
		Southbound	336	286	-50	-15%	Yes

The results presented in Table 7.14 indicates that the travel times on all routes during the Saturday midday peak period meets the requirements set out in the validation criteria. For each of the time periods in the Saturday midday peak, the modelled travel time routes for the entire route are all within 15% or 60 seconds of the observed travel time which meets the requirements.

In addition, time-distance plots have been provided in Appendix D to present a comparison of the sectional modelled and observed travel times for all travel time routes. The following figures present the time-distance plots for a number of key travel time routes during each respective peak period.

Figure 7.14: Travel Time Comparison: Doncaster Road Eastbound – Weekday AM Peak (8:15am to 9:15am)

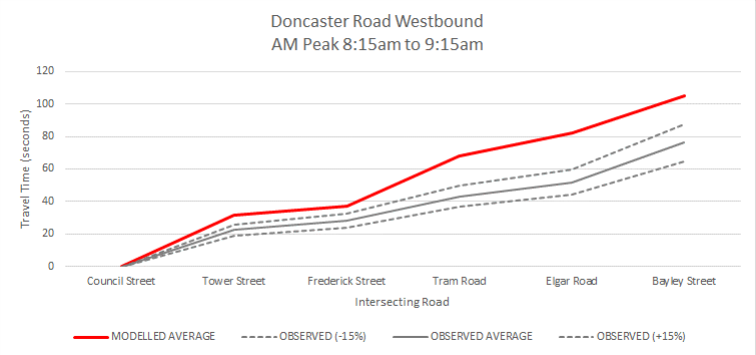


Figure 7.15: Travel Time Comparison: Tram Road and Williamsons Road Southbound – Weekday AM Peak (8:15am to 9:15am)

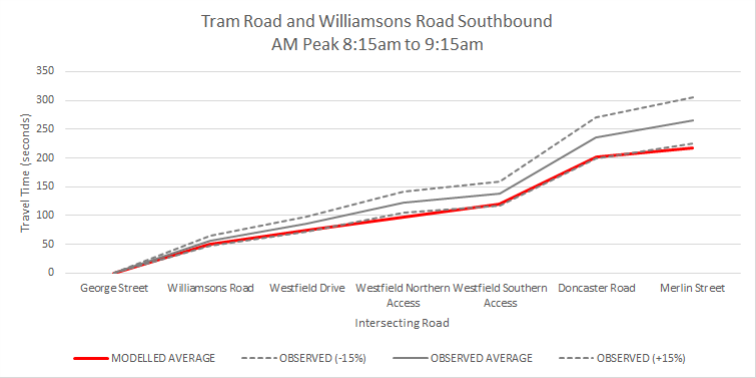


Figure 7.16: Travel Time Comparison: Elgar Road and Williamsons Road Southbound – Weekday AM Peak (8:15am to 9:15am)

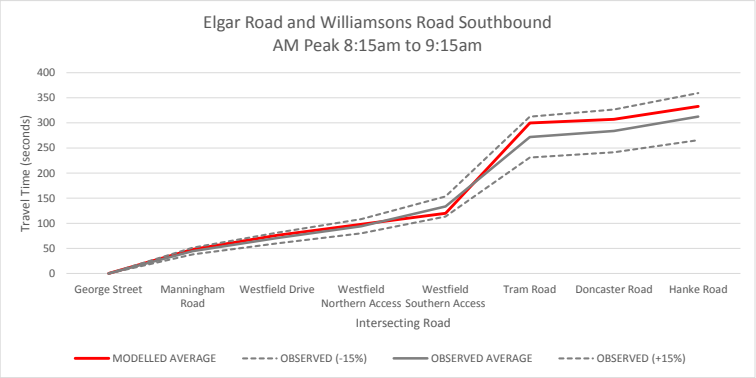


Figure 7.14 indicates that the modelled travel time for the Doncaster Road westbound route in the AM peak is slower than that observed on the day of the survey. Nevertheless, this is still within the limits of the validation criteria. Figure 7.15 and Figure 7.16 indicates that the modelled travel times for southbound direction along Tram Road / Williamsons Road and Elgar Road / Williamsons Road are within 15% of the observed average.

In addition, the delays experienced by cars within sections of the travel time routes have been captured appropriately in the model when compared to the observed conditions during the weekday AM peak.

Figure 7.17: Travel Time Comparison: Doncaster Road Eastbound – Weekday PM Peak (3:45pm to 4:45pm)

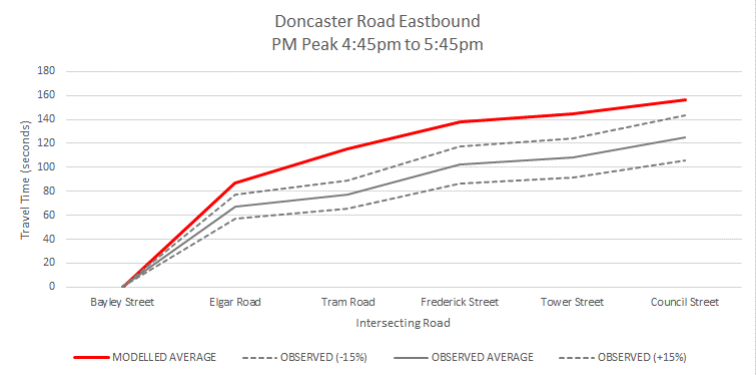


Figure 7.18: Travel Time Comparison: Tram Road and Williamsons Road Southbound – Weekday PM Peak (3:45pm to 4:45pm)

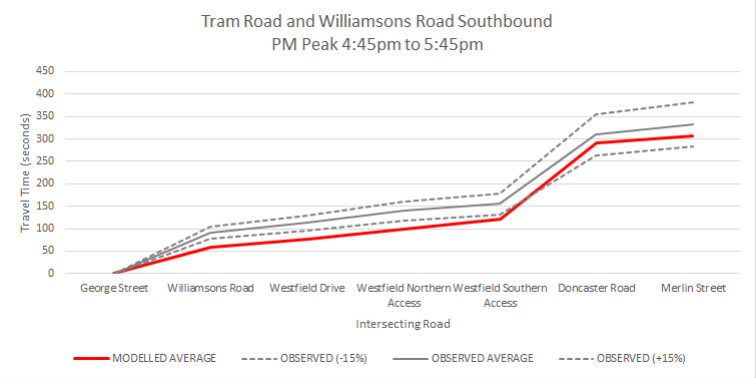


Figure 7.19: Travel Time Comparison: Elgar Road and Williamsons Road Southbound – Weekday PM Peak (3:45pm to 4:45pm)

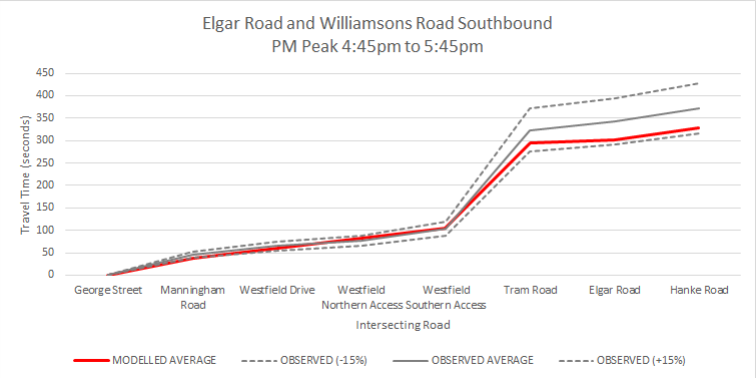


Figure 7.17 indicates that the modelled travel time for the Doncaster Road eastbound route in the weekday PM peak is slower than that observed on the day of the survey. Notwithstanding, this also sits within the limits of the validation criteria. Similar to the weekday AM peak, Figure 7.18 and Figure 7.19 indicates that the modelled travel times for southbound direction along Tram Road / Williamsons Road and Elgar Road / Williamsons Road are generally within 15% of the observed average.

In addition, the delays experienced by cars within sections of the travel time routes have been captured appropriately in the model when compared to the observed conditions during the weekday PM peak.

Figure 7.20: Travel Time Comparison: Doncaster Road Westbound – Saturday Midday Peak (12:30pm to 1:30pm)

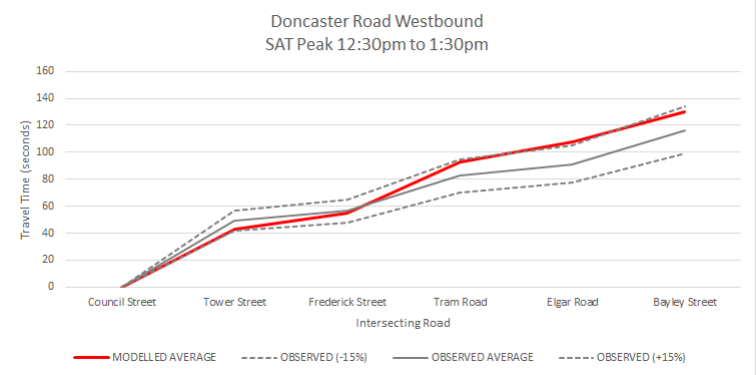


Figure 7.21: Travel Time Comparison: Tram Road and Williamsons Road Northbound – Saturday Midday Peak (12:30pm to 1:30pm)

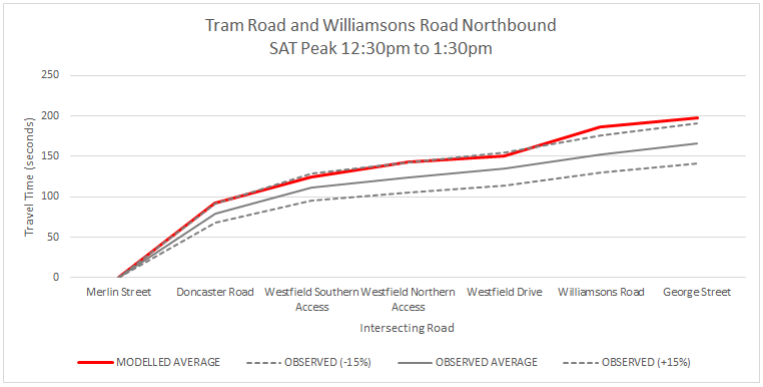


Figure 7.22: Travel Time Comparison: Elgar Road and Williamsons Road Southbound – Saturday Midday Peak (12:30pm to 1:30pm)

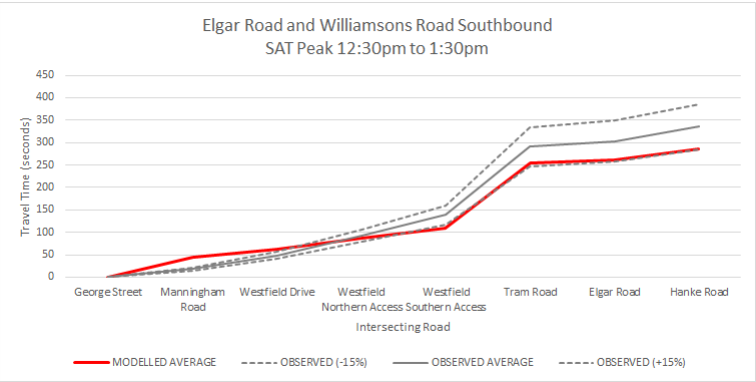


Figure 7.20 to Figure 7.22 indicates that the modelled travel times along Doncaster Road westbound, Tram Road / Williamsons Road northbound and Elgar Road / Williamsons Road southbound are generally within 15% of the observed average.

In addition, the delays experienced by cars within sections of the travel time routes have been captured appropriately in the model when compared to the observed conditions during the Saturday midday peak.

7.4.2 Signal Timings

Whilst not a specific validation criteria, it is considered important that signal times adopted in the model reflect the current operating conditions, particularly given the use of SCATS signal control. As such, SCATS Access has been set up to record intersection diagnostic monitor (IDM) data during the simulation period for each signalised intersection and compared to the actual SCATS outputs from the day of the surveys.

The following tables summarises the signal timing comparison for key intersections based on an hourly phase times for the weekday AM, weekday PM and Saturday midday peak, with full results provided in Appendix E.

The signal timing comparisons indicate that the average, minimum and maximum modelled phase times closely reflect the actual signal data recorded on site. As such, it is considered that the coding of the signalised intersection is satisfactory and replicates existing operating conditions.

Table 7.15: Weekday AM Peak Signal Timing Comparison

Peak Hour	Intersection	Phase	SCATS History Phase Times (sec) Observed Data				SCATS IDM Phase Times (seconds) Modelled Data			
			Freq.	Avg	Min	Max	Freq.	Avg	Min	Max
7:15am to 8:15am	Williamsons Road / Westfield Site Access (North) / Sovereign Point Court (TCS 318)	A	33	79	53	98	32	84	56	105
		B	0	0	0	0	0	0	0	0
		C	34	21	13	33	32	23	13	34
		D	7	15	11	19	6	12	11	12
		E	9	13	12	13	11	13	8	17
	Williamsons Road / Westfield Site Access (South) / Shoppingtown Hotel (TCS 319)	A	33	61	30	110	32	67	36	111
		B	11	15	13	16	13	15	13	17
		C	27	29	16	38	31	23	12	35
		D	29	20	14	49	28	21	14	28
	Williamsons Road / Doncaster Road / Tram Road / Elgar Road (TCS 325)	A	30	16	15	17	28	16	12	16
		B	29	26	20	33	28	27	21	33
		C	28	28	22	36	28	26	19	30
		D	3	11	11	11	4	11	9	11
		E	28	12	12	13	28	13	10	18
		F	29	14	8	17	28	15	5	18
		G	30	27	18	39	28	29	17	36
	Doncaster Road / Frederick Street / Westfield Site Access / Tower Street (TCS 326)	A	29	79	59	99	28	78	63	101
		B	21	19	18	20	20	19	17	19
		C	28	21	14	30	28	23	14	26
		D	0	0	0	0	0	0	0	0
		E	23	13	11	18	27	13	9	18
8:15am to 9:15am	Williamsons Road / Westfield Site Access (North) / Sovereign Point Court (TCS 318)	A	31	77	59	99	29	82	54	95
		B	0	0	0	0	0	0	0	0
		C	32	28	13	34	29	30	18	33
		D	6	13	11	15	1	12	12	12
		E	16	13	12	16	10	14	12	18
	Williamsons Road / Westfield Site Access (South) / Shoppingtown Hotel (TCS 319)	A	31	31	32	91	28	59	31	91
		B	9	9	15	16	11	16	14	17
		C	32	32	15	38	28	32	16	35
		D	32	32	15	27	28	21	14	25
	Williamsons Road / Doncaster Road / Tram Road / Elgar Road (TCS 325)	A	28	28	15	16	27	16	15	16
		B	27	27	28	33	27	24	21	34
		C	28	28	22	35	27	27	22	32
		D	3	3	11	11	2	11	11	11
		E	28	28	12	14	27	13	12	14
		F	28	28	8	17	27	14	9	17
		G	28	28	14	35	27	31	26	40
	Doncaster Road / Frederick Street / Westfield Site Access / Tower Street (TCS 326)	A	27	27	45	81	27	60	34	77
		B	28	28	18	20	26	19	18	19
		C	28	28	16	34	27	24	14	26
		D	0	0	0	0	0	0	0	0
		E	28	28	11	31	27	23	13	30

Table 7.16: Weekday PM Peak Signal Timing Comparison – 3:45pm to 4:45pm (4:45pm to 5:45am)

Peak Hour	Intersection	Phase	SCATS History Phase Times (sec) Observed Data				SCATS IDM Phase Times (seconds) Modelled Data			
			Freq.	Avg	Min	Max	Freq.	Avg	Min	Max
3:45pm to 4:45pm	Williamsons Road / Westfield Site Access (North) / Sovereign Point Court (TCS 318)	A	31	65	46	85	31	77	64	91
		B	0	0	0	0	0	0	0	0
		C	32	30	19	40	31	24	13	37
		D	4	12	11	13	15	12	6	16
		E	28	20	12	31	19	15	12	22
	Williamsons Road / Westfield Site Access (South) / Shoppingtown Hotel (TCS 319)	A	31	50	26	66	31	54	32	75
		B	14	15	13	16	14	16	13	17
		C	32	36	18	38	31	32	20	36
		D	31	21	15	24	30	23	17	29
	Williamsons Road / Doncaster Road / Tram Road / Elgar Road (TCS 325)	A	28	16	15	16	27	16	15	16
		B	28	32	29	36	27	29	23	33
		C	27	29	22	36	27	29	22	32
		D	4	11	11	12	2	11	11	11
		E	27	13	12	14	27	14	12	14
		F	27	16	13	17	27	16	13	18
		G	28	23	15	28	27	24	22	27
	Doncaster Road / Frederick Street / Westfield Site Access / Tower Street (TCS 326)	A	27	65	26	108	28	62	29	90
		B	22	19	18	20	23	19	17	19
		C	27	25	14	29	28	25	14	29
		D	9	12	8	23	12	11	9	22
		E	27	20	14	35	28	22	15	29
4:45pm to 5:45pm	Williamsons Road / Westfield Site Access (North) / Sovereign Point Court (TCS 318)	A	32	69	45	88	29	81	62	103
		B	0	0	0	0	0	0	0	0
		C	32	27	15	38	29	22	14	35
		D	8	12	11	17	16	12	11	15
		E	24	16	12	21	11	15	12	24
	Williamsons Road / Westfield Site Access (South) / Shoppingtown Hotel (TCS 319)	A	32	46	28	83	29	54	30	73
		B	21	15	13	16	13	16	13	17
		C	32	34	16	38	29	34	16	35
		D	32	20	15	30	29	21	16	25
	Williamsons Road / Doncaster Road / Tram Road / Elgar Road (TCS 325)	A	28	16	15	16	26	16	16	16
		B	27	33	31	37	26	29	25	34
		C	27	30	24	36	26	29	23	33
		D	4	11	11	11	3	11	11	11
		E	28	13	12	14	26	14	12	18
		F	28	17	13	17	26	16	10	17
		G	28	20	14	26	26	25	22	31
	Doncaster Road / Frederick Street / Westfield Site Access / Tower Street (TCS 326)	A	27	63	26	99	26	65	50	96
		B	21	19	18	20	17	19	18	19
		C	28	26	25	30	26	27	25	34
		D	13	12	8	24	7	17	9	23
		E	28	21	14	31	26	20	12	29

Table 7.17: Saturday Midday Peak Signal Timing Comparison

Peak Hour	Intersection	Phase	SCATS History Phase Times (sec) Observed Data				SCATS IDM Phase Times (seconds) Modelled Data			
			Freq.	Avg	Min	Max	Freq.	Avg	Min	Max
11:30am to 12:30pm	Williamsons Road / Westfield Site Access (North) / Sovereign Point Court (TCS 318)	A	32	58	37	83	30	78	62	92
		B	0	0	0	0	0	0	0	0
		C	32	27	16	35	30	26	14	33
		D	3	12	11	14	9	13	12	15
		E	33	23	13	34	20	18	12	25
	Williamsons Road / Westfield Site Access (South) / Shoppingtown Hotel (TCS 319)	A	32	47	25	79	30	57	37	73
		B	21	15	13	16	13	17	13	17
		C	32	33	16	38	30	34	29	35
		D	33	20	15	28	29	22	14	25
	Williamsons Road / Doncaster Road / Tram Road / Elgar Road (TCS 325)	A	30	16	15	16	28	16	11	16
		B	29	28	22	33	28	30	28	32
		C	29	27	24	33	28	29	25	29
		D	0	0	0	0	0	0	0	0
		E	30	13	13	14	28	14	13	14
		F	30	14	8	17	28	13	6	17
		G	30	23	16	32	28	28	22	34
	Doncaster Road / Frederick Street / Westfield Site Access / Tower Street (TCS 326)	A	29	56	25	89	27	64	24	101
		B	24	19	17	20	19	19	17	19
		C	30	25	15	29	27	27	25	32
		D	8	16	10	22	6	11	9	18
		E	30	20	11	33	27	22	12	33
12:30pm to 1:30pm	Williamsons Road / Westfield Site Access (North) / Sovereign Point Court (TCS 318)	A	33	58	31	81	28	80	60	98
		B	0	0	0	0	0	0	0	0
		C	34	28	16	37	28	26	14	34
		D	5	12	11	12	9	12	12	14
		E	32	20	12	31	16	18	13	24
	Williamsons Road / Westfield Site Access (South) / Shoppingtown Hotel (TCS 319)	A	33	48	23	74	28	56	42	70
		B	17	15	13	16	14	16	13	17
		C	34	31	16	38	28	35	29	35
		D	34	20	15	25	28	21	16	25
	Williamsons Road / Doncaster Road / Tram Road / Elgar Road (TCS 325)	A	28	16	15	16	27	16	15	16
		B	28	32	28	36	27	28	25	33
		C	29	28	22	33	27	27	22	31
		D	2	11	11	11	2	11	11	11
		E	29	13	12	14	27	14	12	14
		F	29	14	8	17	27	14	10	17
		G	28	21	14	36	27	26	19	33
	Doncaster Road / Frederick Street / Westfield Site Access / Tower Street (TCS 326)	A	28	60	34	86	27	67	28	89
		B	22	19	18	20	9	19	18	19
		C	29	25	20	29	27	26	20	30
		D	12	13	8	20	10	10	9	15
		E	28	21	12	32	27	22	12	32

7.4.3 Congestion Validation

The following lane density plots provide an indication of the congestion on the modelled road network during each of the modelled peak hour periods illustrating the flow/density relationship. These plots were validated against the observed conditions throughout the model calibration and validation process to ensure that delays and congestion in the network has been accurately modelled, as well as monitoring queue lengths during the model simulation.

Figure 7.23: Simulated Flow/Density – Weekday AM Peak (7:15am to 8:15am)

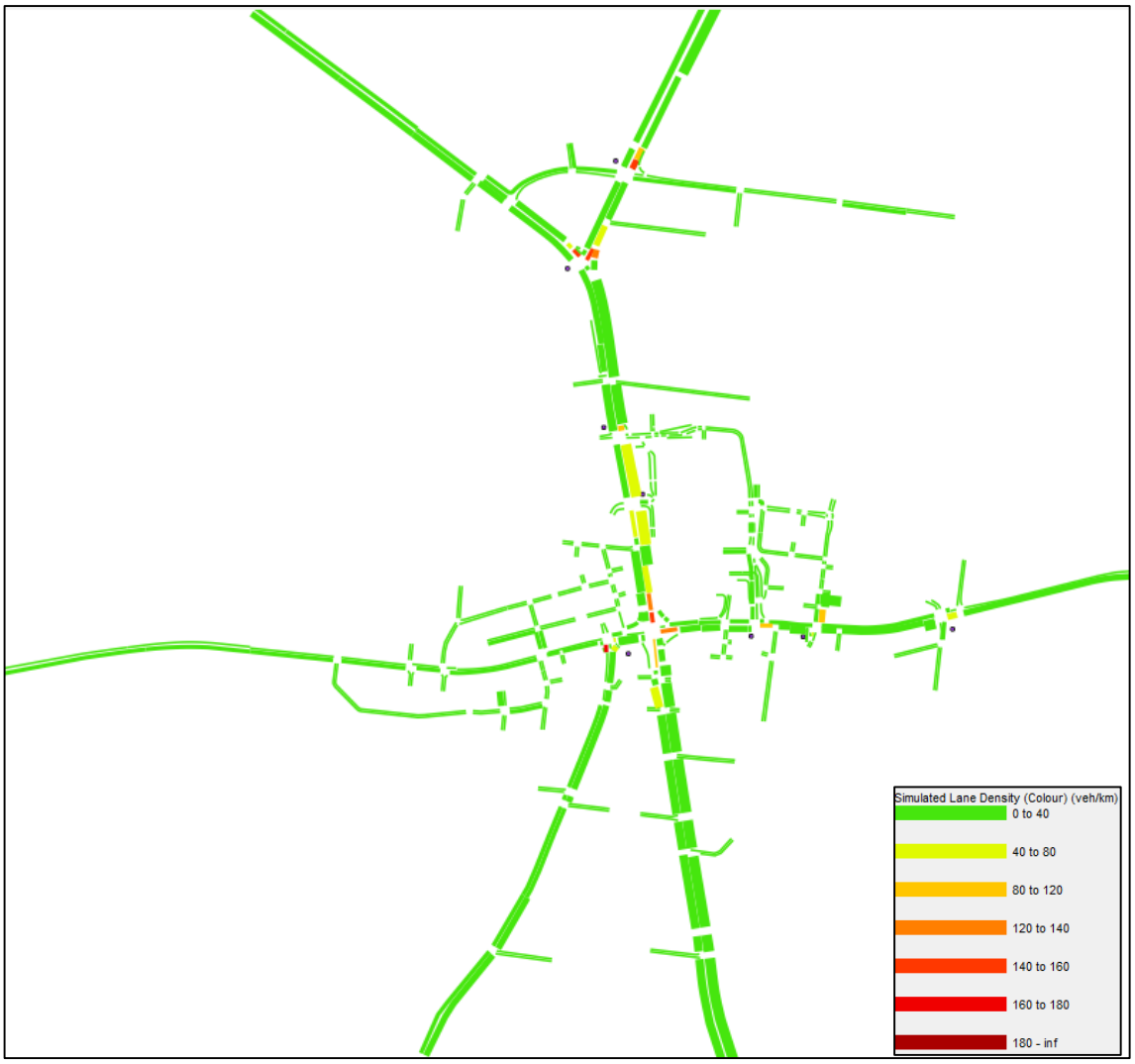


Figure 7.24: Simulated Flow/Density – Weekday AM Peak (8:15am to 9:15am)

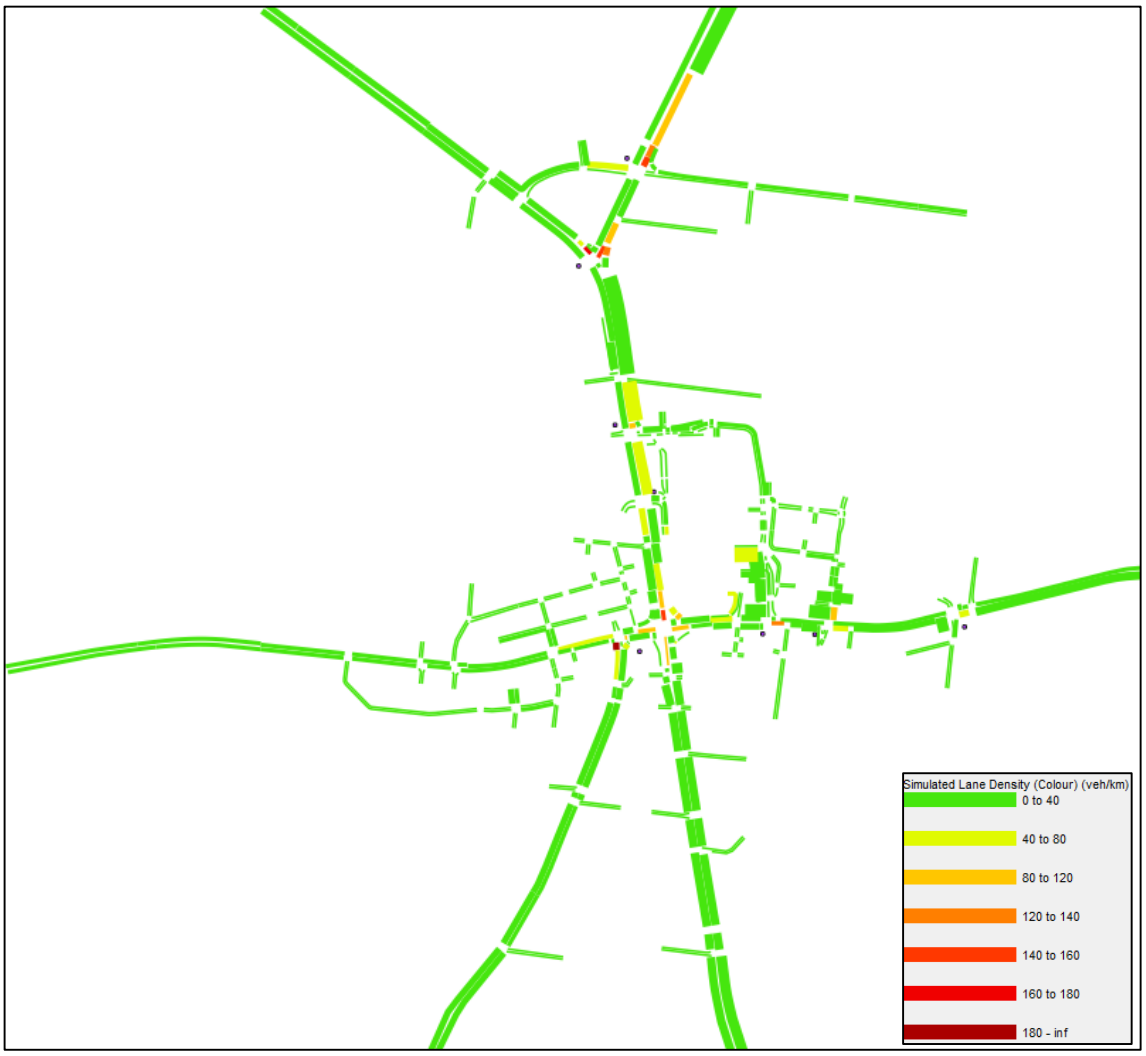


Figure 7.25: Simulated Flow/Density – PM Peak (3:45pm to 4:45pm)

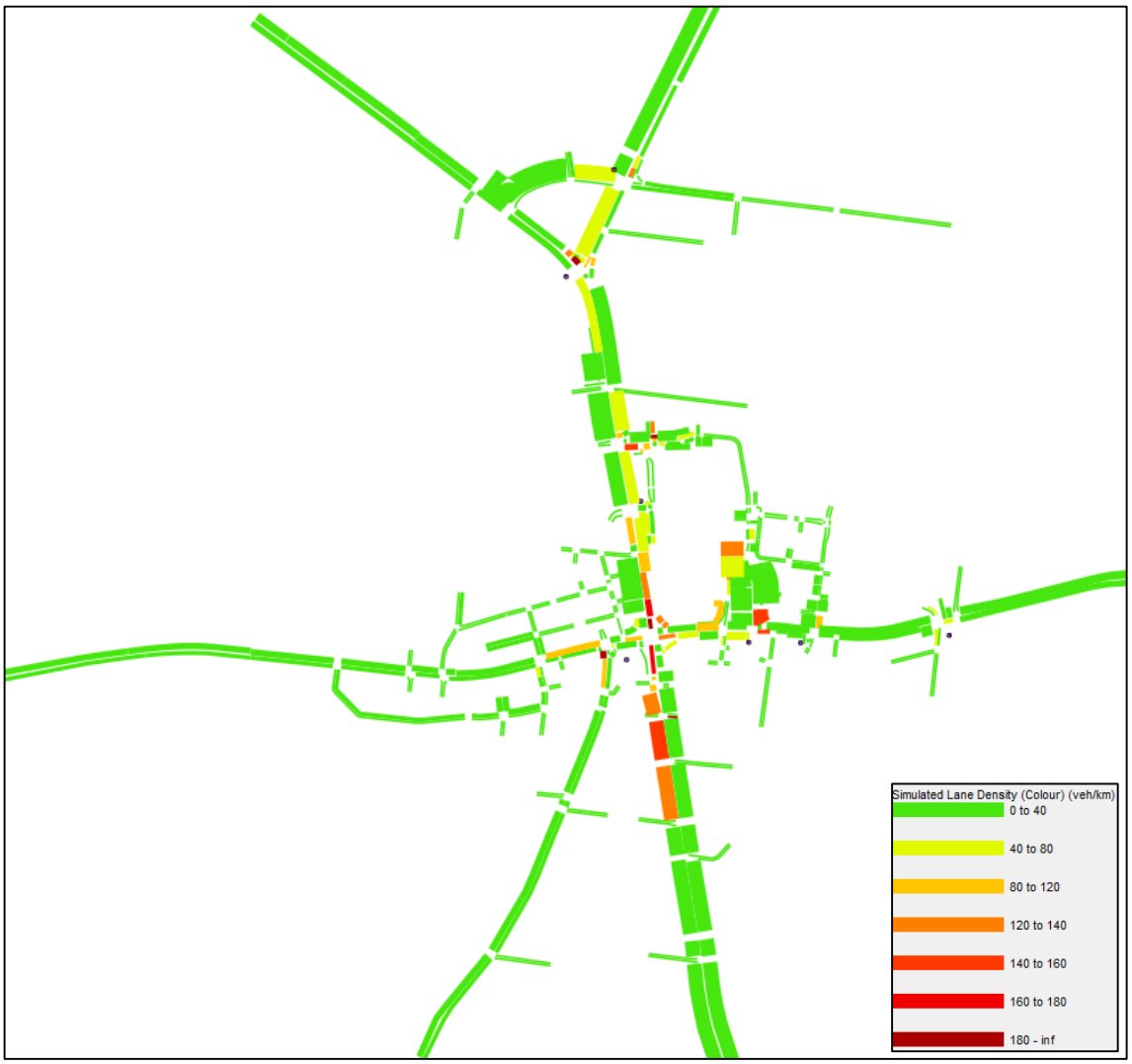


Figure 7.26: Simulated Flow/Density – PM Peak (4:45pm to 5:45pm)

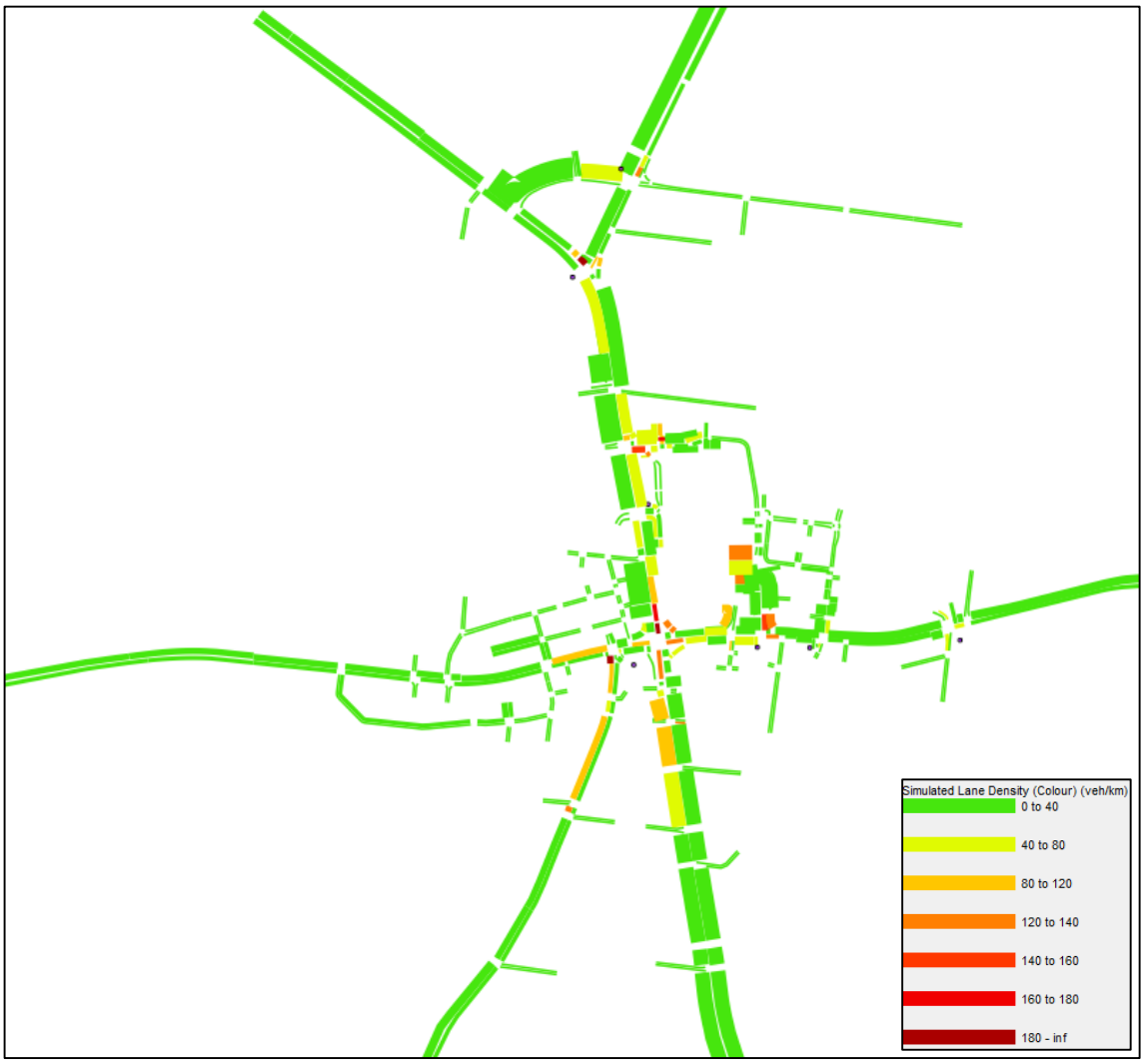


Figure 7.27: Simulated Flow/Density – Saturday Peak (11:30am to 12:30pm)

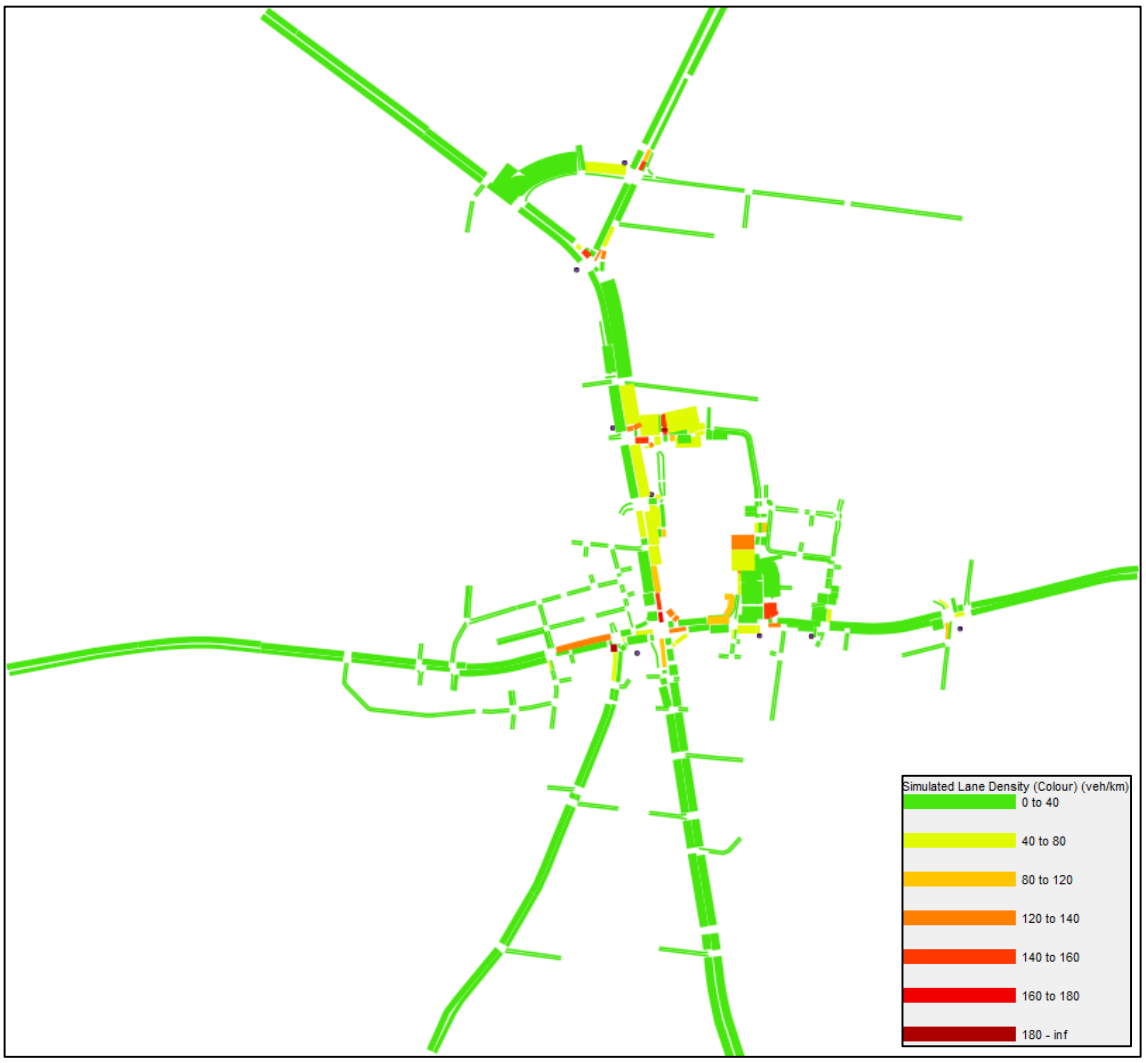
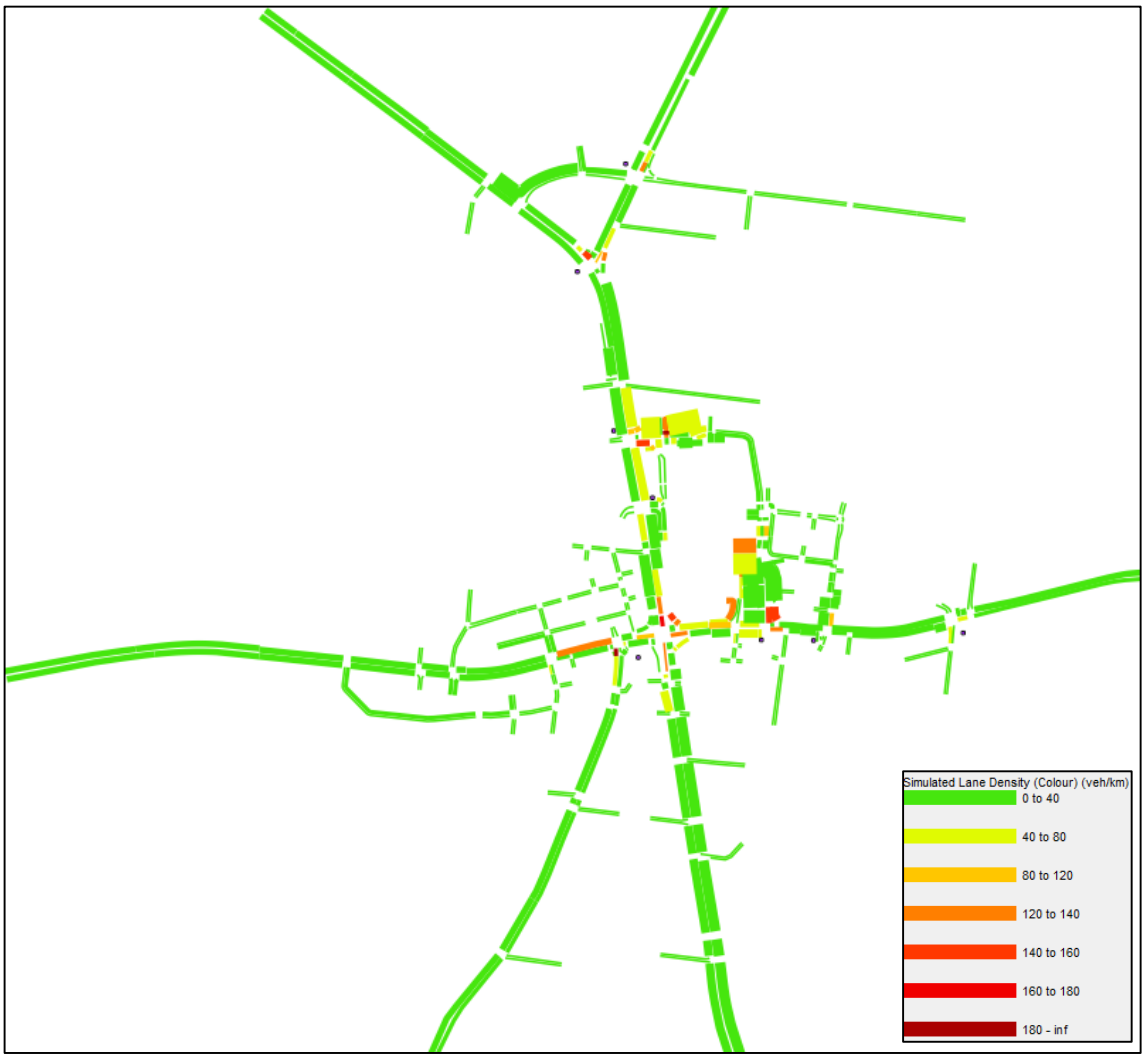


Figure 7.28: Simulated Flow/Density – Saturday Peak (12:30pm to 1:30pm)



8. Conclusion

This report has presented and discussed the calibration and validation results of the Aimsun microsimulation model as part of the Westfield Doncaster Masterplan.

The calibration topics that were covered include:

- data collection
- existing traffic conditions
- development of the base model network
- development of the base model demand matrices
- model calibration and validation
- calibration and validation results.

The results presented in this report show that the model demonstrates an excellent 'goodness of fit' with the observed traffic conditions indicating that the model performs well at the network wide level.

The traffic volume comparisons for each of the peaks indicate a high level of correlation between the modelled and observed traffic flows with all targets being met.

The travel time analysis illustrates a reasonably high level of correlation between the modelled and observed travel times, with any discrepancies considered to be minor and justifiable as indicated in the context of this report.

It is our view that the model was successfully developed and is fit for its intended purpose, which is to assess the operation of the road network surrounding Westfield Doncaster. The model can be used to provide robust estimates of changes in road-based demands and network wide travel patterns.

Further, it is important to note that the use of SCATS in a dynamic model limits the ability of the model to be able to exactly replicate model results, and every model run would likely have minor differences in its operation and ultimately the results. This is due to SCATS being adaptive to the conditions it experiences, whilst a dynamic model also allows route choices to be altered depending on conditions within the model. Moving forward into options testing, future scenarios will also consider statistical measures to ensure confidence in the model operation and outputs.

Appendix A

Response to Jacobs Peer Review

GTAconsultants

GTA Response to Jacobs Peer Review of the Base Aimsun Models for Westfield Doncaster

Jacobs Reference	Jacobs Comment	Significance[1]	GTA Response
Section 3.3 – Travel Time Surveys	Travel time data has been collected based on a small number of observations. This should be taken into account when analysing and comparing with modelled travel times, as these observed travel time may not be a representative sample of the true distribution of travel time along the surveyed routes.	Minor	Noted.
Section 4.2 – Intersection controls	The coding of u-turns at traffic signals is not universal. Documentation should be updated to list the relevant criteria for coding u-turn movements.	Minor	Section 4.2 of the calibration and validation report has been updated to include more detail on the coding of u-turns.
	Intersecting right turn trajectories should be adjusted to remove overlap.	Minor	Noted. GTA have amended the model accordingly, but is considered to have no impact on the calibration and validation outcome.
	Existing right turn bay on Doncaster Road into site access on the southern side of Bayley Grove has not been coded.	Minor	Noted. This was not included in the model as intersection counts were not undertaken at this location. On-site observations indicated that it is not a critical movement.
Section 4.3 – Model Settings and Parameters	A very low global reaction time has been used, with large changes to this reaction times at stops and traffic lights on critical; approaches. This may not be necessary with a less aggressive global reaction time.	Minor	Noted.
Section 5 – Public Transport	Model documentation should include commentary on assumptions for bus dwell times.	Minor	Section 4.4 of the calibration and validation report has been updated to provide additional information on the coding of bus dwell times.
Section 6 – Traffic Assignment	Model documentation should include commentary on the use of forced turn traffic management actions used in the base model scenarios.	Minor	Section 5.4.2 of the calibration and validation report has been updated to provide additional discussion on the application of forced turns within the model.
Section 8.1 – Calibration	Calibration results should be checked to confirm that they meet the "core area" criteria.	Minor	Section 7.3 of the calibration and validation report has been updated to acknowledge the core area criteria and its compliance with results presented in Appendix B.
Section 8.2 - Validation	Cumulative travel time comparisons against 95th percentile confidence limits of observed data would be appropriate. Further investigation of signal operation at select intersections with differences in observed and modelled phase splits should be undertaken.	Minor	Cumulative travel time comparisons with 95th percentile confidence limits have been provided as part of Appendix C. Investigation into the signal timing comparisons indicate that the differences are consistent with day-to-day variations in SCATS signal timings. VicRoads' have also indicated that they are satisfied with the coding of signals in their review.
Section 8.3 – Model Stability and Repeatability	Calibration and validation report should provide additional analysis of variability under SCATS signal operation.	Minor	Section 7.2.1 of the calibration and validation report has been updated to include an analysis of model stability for the same seed value over five model runs.

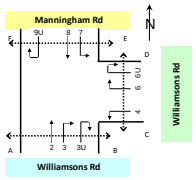
[1] Minor – non-confirming element is not critical to the valid operation of the model.
Major – non-confirming element is critical to the valid operation of the model, but may be reasonably explained.
Critical – non-conforming element is critical to the valid operation of the model and cannot be reasonably explained.

Appendix B

Transport Data Collection

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 1. Williamsons Rd / Manningham Rd
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	**Class 1**	**Class 2**	**Class 3**
	Cars	Trucks	Buses



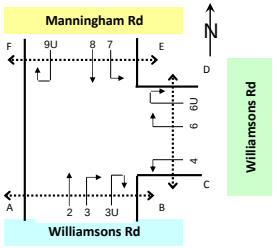
SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	**Williamsons Rd**												**Williamsons Rd**											
Direction		**Direction 2 (Through)**				**Direction 3 (Right Turn)**				**Direction 3U (U Turn)**				**Direction 4 (Left Turn)**				**Direction 6 (Right Turn)**				**Direction 6U (U Turn)**			
Time Period		Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15		144	3	0	**147**	82	7	2	**91**	0	0	0	**0**	239	7	2	**248**	58	1	2	**61**	1	0	0	**1**
7:15 to 7:30		162	7	3	**172**	103	4	5	**112**	0	0	0	**0**	306	7	3	**316**	72	0	3	**75**	0	0	0	**0**
7:30 to 7:45		219	9	3	**231**	94	7	4	**105**	0	0	0	**0**	272	10	6	**288**	91	1	1	**93**	0	0	0	**0**
7:45 to 8:00		200	6	1	**207**	117	6	4	**127**	0	0	0	**0**	286	5	5	**296**	83	1	1	**85**	0	0	0	**0**
8:00 to 8:15		202	9	2	**213**	107	5	5	**117**	0	0	0	**0**	268	4	3	**275**	80	1	2	**83**	0	0	0	**0**
8:15 to 8:30		217	4	2	**223**	136	2	3	**141**	0	0	0	**0**	285	4	4	**293**	92	2	1	**95**	0	0	0	**0**
8:30 to 8:45		220	8	3	**231**	117	11	3	**131**	0	0	0	**0**	296	4	6	**306**	66	1	1	**68**	0	0	0	**0**
8:45 to 9:00		240	8	3	**251**	112	5	4	**121**	1	0	0	**1**	244	5	3	**252**	163	2	3	**168**	0	0	0	**0**
9:00 to 9:15		181	2	1	**184**	135	6	5	**146**	1	0	0	**1**	259	5	2	**266**	107	1	1	**109**	0	0	0	**0**
9:15 to 9:30		163	6	2	**171**	129	10	4	**143**	1	0	0	**1**	299	10	6	**315**	88	0	0	**88**	0	0	0	**0**
9:30 to 9:45		175	2	3	**180**	88	4	2	**94**	0	0	0	**0**	235	12	5	**252**	62	0	0	**62**	0	0	0	**0**
9:45 to 10:00		181	7	1	**189**	150	10	5	**165**	1	0	0	**1**	274	6	4	**284**	55	0	0	**55**	1	0	0	**1**
AM Totals		**2,304**	**71**	**24**	**2,399**	**1,370**	**77**	**46**	**1,493**	**4**	**0**	**0**	**4**	**3,263**	**79**	**49**	**3,391**	**1,017**	**10**	**15**	**1,042**	**2**	**0**	**0**	**2**
15:30 to 15:45		319	1	1	**321**	296	10	5	**311**	0	0	0	**0**	214	8	6	**228**	87	3	0	**90**	0	0	0	**0**
15:45 to 16:00		263	4	4	**271**	340	1	4	**345**	0	0	0	**0**	261	2	0	**263**	73	0	0	**73**	0	0	0	**0**
16:00 to 16:15		229	1	3	**233**	308	1	7	**316**	2	0	0	**2**	183	6	6	**195**	39	0	2	**41**	1	0	0	**1**
16:15 to 16:30		185	2	5	**192**	366	3	4	**373**	0	0	0	**0**	223	2	7	**232**	47	0	0	**47**	0	0	0	**0**
16:30 to 16:45		233	2	5	**240**	353	4	5	**362**	1	0	0	**1**	181	5	3	**189**	63	0	0	**63**	0	0	0	**0**
16:45 to 17:00		232	2	3	**237**	286	2	4	**292**	0	0	0	**0**	204	7	7	**218**	53	1	0	**54**	0	0	0	**0**
17:00 to 17:15		314	3	2	**319**	381	2	3	**386**	0	0	0	**0**	222	3	3	**228**	76	1	0	**77**	0	0	0	**0**
17:15 to 17:30		290	1	2	**293**	362	2	3	**367**	0	0	0	**0**	195	3	7	**205**	63	0	0	**63**	0	0	0	**0**
17:30 to 17:45		329	5	4	**338**	365	3	3	**371**	0	0	0	**0**	186	2	3	**191**	64	0	0	**64**	1	0	0	**1**
17:45 to 18:00		309	2	4	**315**	334	3	4	**341**	0	0	0	**0**	185	0	3	**188**	54	1	0	**55**	0	0	0	**0**
18:00 to 18:15		339	6	1	**346**	260	3	1	**264**	0	0	0	**0**	218	1	3	**222**	71	0	0	**71**	0	0	0	**0**
18:15 to 18:30		323	4	4	**331**	299	1	1	**301**	0	0	0	**0**	221	2	4	**227**	47	0	0	**47**	0	0	0	**0**
PM Totals		**3,365**	**33**	**38**	**3,436**	**3,950**	**35**	**44**	**4,029**	**3**	**0**	**0**	**3**	**2,493**	**41**	**52**	**2,586**	**737**	**6**	**2**	**745**	**2**	**0**	**0**	**2**

Approach	**Manningham Rd**																				**Crossing Pedestrians**						
Direction	**Direction 7 (Left Turn)**				**Direction 8 (Through)**				**Direction 9U (U Turn)**																	
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total									A	B	C	D	E	F	Total
7:00 to 7:15	6	0	0	**6**	138	6	3	**147**	0	0	0	**0**									0	0	2	0	0	0	**2**
7:15 to 7:30	12	1	0	**13**	178	2	1	**181**	0	0	0	**0**									0	0	0	0	0	0	**0**
7:30 to 7:45	11	0	0	**11**	244	6	5	**255**	0	0	0	**0**									0	2	0	1	0	0	**3**
7:45 to 8:00	10	2	1	**13**	250	6	1	**257**	0	0	0	**0**									0	0	0	1	0	0	**1**
8:00 to 8:15	5	0	0	**5**	256	10	4	**270**	0	0	0	**0**									1	0	0	1	0	0	**2**
8:15 to 8:30	8	0	0	**8**	255	5	3	**263**	0	0	0	**0**									3	0	2	0	0	0	**5**
8:30 to 8:45	7	0	0	**7**	252	0	3	**255**	0	0	0	**0**									2	2	2	1	0	0	**7**
8:45 to 9:00	14	0	0	**14**	292	6	6	**304**	0	0	0	**0**									0	0	0	0	0	0	**0**
9:00 to 9:15	10	0	1	**11**	241	5	1	**247**	0	0	0	**0**									1	1	1	1	0	0	**4**
9:15 to 9:30	15	1	0	**16**	234	2	2	**238**	0	0	0	**0**									0	0	0	1	0	0	**1**
9:30 to 9:45	11	1	0	**12**	268	7	2	**277**	0	0	0	**0**									0	0	0	0	0	0	**0**
9:45 to 10:00	14	0	0	**14**	202	9	2	**213**	0	0	0	**0**									1	1	1	0	0	0	**3**
AM Totals	**123**	**5**	**2**	**130**	**2,810**	**64**	**33**	**2,907**	**0**	**0**	**0**	**0**									**8**	**6**	**8**	**6**	**0**	**0**	**28**
15:30 to 15:45	13	1	0	**14**	276	4	2	**282**	0	0	0	**0**									6	25	0	4	0	0	**35**
15:45 to 16:00	11	0	0	**11**	338	4	2	**344**	0	0	0	**0**									0	2	0	2	0	0	**4**
16:00 to 16:15	8	0	0	**8**	319	4	4	**327**	0	0	0	**0**									0	1	0	3	0	0	**4**
16:15 to 16:30	15	0	0	**15**	303	4	4	**311**	0	0	0	**0**									0	0	1	4	0	0	**5**
16:30 to 16:45	17	0	1	**18**	314	2	3	**319**	0	0	0	**0**									1	1	0	6	0	0	**8**
16:45 to 17:00	15	1	0	**16**	343	2	3	**348**	0	0	0	**0**									2	3	2	1	0	0	**8**
17:00 to 17:15	30	0	0	**30**	302	4	3	**309**	0	0	0	**0**									0	0	2	0	0	0	**2**
17:15 to 17:30	19	0	0	**19**	330	3	4	**337**	0	0	0	**0**									0	5	0	5	0	0	**10**
17:30 to 17:45	13	1	0	**14**	315	1	2	**318**	0	0	0	**0**									0	2	0	0	0	0	**2**
17:45 to 18:00	22	0	0	**22**	327	1	4	**332**	0	0	0	**0**									0	0	2	1	0	0	**3**
18:00 to 18:15	15	0	0	**15**	285	0	1	**286**	0	0	0	**0**									0	0	0	0	0	0	**0**
18:15 to 18:30	12	0	0	**12**	298	1	2	**301**	0	0	0	**0**									0	0	0	1	0	0	**1**
PM Totals	**190**	**3**	**1**	**194**	**3,750**	**30**	**34**	**3,814**	**0**	**0**	**0**	**0**									**9**	**39**	**7**	**27**	**0**	**0**	**82**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 1. Williamsons Rd / Manningham Rd
Day/Date	: Sat, 6th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	**Class 1**	**Class 2**	**Class 3**
	Cars	Trucks	Buses

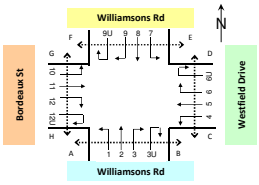


SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	**Williamsons Rd**												**Williamsons Rd**											
Direction		**Direction 2 (Through)**				**Direction 3 (Right Turn)**				**Direction 3U (U Turn)**				**Direction 4 (Left Turn)**					**Direction 6 (Right Turn)**				**Direction 6U (U Turn)**			
Time Period		**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**		**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**
11:00 to 11:15		225	3	2	**230**	191	0	1	**192**	1	0	0	**1**	260	3	2	**265**		69	1	0	**70**	0	0	0	**0**
11:15 to 11:30		224	2	1	**227**	175	1	3	**179**	1	0	0	**1**	263	2	3	**268**		74	0	0	**74**	0	0	0	**0**
11:30 to 11:45		225	0	0	**225**	259	1	2	**262**	0	0	0	**0**	337	0	1	**338**		72	0	0	**72**	0	0	0	**0**
11:45 to 12:00		253	1	2	**256**	274	2	2	**278**	0	0	0	**0**	279	2	2	**283**		56	1	0	**57**	1	0	0	**1**
12:00 to 12:15		209	3	0	**212**	241	0	0	**241**	0	0	0	**0**	236	2	1	**239**		65	0	0	**65**	0	0	0	**0**
12:15 to 12:30		209	3	1	**213**	222	2	3	**227**	2	0	0	**2**	249	3	3	**255**		82	0	0	**82**	0	0	0	**0**
12:30 to 12:45		241	1	0	**242**	270	4	2	**276**	0	0	0	**0**	273	3	0	**276**		65	0	0	**65**	0	0	0	**0**
12:45 to 13:00		256	1	2	**259**	297	3	2	**302**	0	0	0	**0**	267	1	3	**271**		69	0	0	**69**	0	0	0	**0**
13:00 to 13:15		251	3	0	**254**	257	1	1	**259**	0	0	0	**0**	266	4	2	**272**		65	0	0	**65**	0	0	0	**0**
13:15 to 13:30		258	3	1	**262**	248	1	3	**252**	0	0	0	**0**	265	3	3	**271**		88	0	0	**88**	0	0	0	**0**
13:30 to 13:45		232	0	0	**232**	270	2	1	**273**	1	0	0	**1**	213	3	1	**217**		63	1	0	**64**	0	0	0	**0**
13:45 to 14:00		231	0	0	**231**	268	1	3	**272**	1	0	0	**1**	243	3	2	**248**		88	0	0	**88**	1	0	0	**1**
Total		**2,814**	**20**	**9**	**2,843**	**2,972**	**18**	**23**	**3,013**	**6**	**0**	**0**	**6**	**3,151**	**29**	**23**	**3,203**		**856**	**3**	**0**	**859**	**2**	**0**	**0**	**2**

Approach	**Manningham Rd**													**Crossing Pedestrians**						
Direction	**Direction 7 (Left Turn)**				**Direction 8 (Through)**					**Direction 9U (U Turn)**										
Time Period	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**		**Cars**	**Trucks**	**Buses**	**Total**	**A**	**B**	**C**	**D**	**E**	**F**	**Total**
11:00 to 11:15	15	0	0	**15**	256	2	2	**260**		0	0	0	**0**	0	0	0	3	0	0	**3**
11:15 to 11:30	16	1	0	**17**	242	1	1	**244**		0	0	0	**0**	0	0	4	1	0	0	**5**
11:30 to 11:45	26	0	0	**26**	279	3	1	**283**		0	0	0	**0**	0	1	2	1	0	0	**4**
11:45 to 12:00	24	1	0	**25**	242	3	1	**246**		0	0	0	**0**	0	0	0	0	0	0	**0**
12:00 to 12:15	29	0	0	**29**	299	1	1	**301**		0	0	0	**0**	0	0	0	5	0	0	**5**
12:15 to 12:30	17	0	0	**17**	283	1	1	**285**		0	0	0	**0**	0	0	2	2	0	0	**4**
12:30 to 12:45	20	0	0	**20**	279	0	0	**279**		0	0	0	**0**	0	0	3	1	0	0	**4**
12:45 to 13:00	13	0	0	**13**	211	2	1	**214**		0	0	0	**0**	0	1	2	0	0	0	**3**
13:00 to 13:15	30	0	0	**30**	310	2	1	**313**		0	0	0	**0**	0	1	2	0	0	0	**3**
13:15 to 13:30	29	1	0	**30**	229	1	1	**231**		0	0	0	**0**	1	0	1	0	0	0	**2**
13:30 to 13:45	30	0	0	**30**	283	3	1	**287**		0	0	0	**0**	0	0	4	1	0	0	**5**
13:45 to 14:00	21	0	0	**21**	269	1	2	**272**		0	0	0	**0**	0	0	2	0	0	0	**2**
Total	**270**	**3**	**0**	**273**	**3,182**	**20**	**13**	**3,215**		**0**	**0**	**0**	**0**	**1**	**3**	**22**	**14**	**0**	**0**	**40**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 2. Williamsons Rd / Bordeaux St / Westfield Drive
Day/Date	: Fri, 19th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Classifications	**Class 1**	**Class 2**	**Class 3**
	Cars	Trucks	Buses

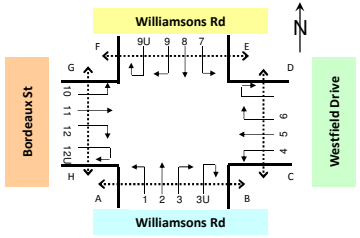
Approach	**Williamsons Rd**																**Westfield Drive**															
Direction	**Direction 1 (Left Turn)**				**Direction 2 (Through)**				**Direction 3 (Right Turn)**				**Direction 3U (U Turn)**				**Direction 4 (Left Turn)**				**Direction 5 (Through)**				**Direction 6 (Right Turn)**				**Direction 6U (U Turn)**			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15	0	0	0	**0**	214	5	5	**224**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
7:15 to 7:30	2	0	0	**2**	235	16	4	**255**	1	0	0	**1**	4	1	0	**5**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
7:30 to 7:45	3	0	0	**3**	262	11	9	**282**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
7:45 to 8:00	1	0	0	**1**	333	14	7	**354**	1	0	0	**1**	5	0	0	**5**	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
8:00 to 8:15	2	0	0	**2**	279	8	5	**292**	1	0	0	**1**	5	0	0	**5**	3	0	0	**3**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
8:15 to 8:30	5	0	0	**5**	283	9	5	**297**	1	0	0	**1**	4	0	0	**4**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
8:30 to 8:45	3	0	0	**3**	312	15	7	**334**	3	0	0	**3**	3	0	0	**3**	2	0	0	**2**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
8:45 to 9:00	3	0	0	**3**	301	10	7	**318**	2	1	0	**3**	4	0	0	**4**	5	0	0	**5**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
9:00 to 9:15	6	0	0	**6**	240	8	2	**250**	1	0	0	**1**	5	0	0	**5**	3	0	0	**3**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
9:15 to 9:30	5	1	0	**6**	300	10	6	**316**	1	0	0	**1**	3	0	0	**3**	2	0	0	**2**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
9:30 to 9:45	6	0	0	**6**	225	9	5	**239**	1	0	0	**1**	4	0	0	**4**	2	0	0	**2**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
9:45 to 10:00	4	0	0	**4**	292	16	8	**316**	4	0	0	**4**	2	1	0	**3**	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
AM Totals	**40**	**1**	**0**	**41**	**3,276**	**131**	**70**	**3,477**	**16**	**1**	**0**	**17**	**44**	**2**	**0**	**46**	**21**	**0**	**0**	**21**	**0**	**0**	**0**	**0**	**18**	**0**	**0**	**18**	**0**	**0**	**0**	**0**
15:30 to 15:45	6	0	0	**6**	523	11	7	**541**	5	0	0	**5**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
15:45 to 16:00	4	0	0	**4**	566	8	6	**580**	5	0	0	**5**	6	0	0	**6**	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
16:00 to 16:15	2	0	0	**2**	600	5	12	**617**	2	0	0	**2**	6	0	0	**6**	3	0	0	**3**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
16:15 to 16:30	5	0	0	**5**	602	4	6	**612**	4	0	0	**4**	2	0	0	**2**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
16:30 to 16:45	4	0	0	**4**	585	1	10	**596**	4	0	0	**4**	3	0	0	**3**	5	0	0	**5**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
16:45 to 17:00	2	0	0	**2**	609	6	11	**626**	4	0	0	**4**	2	1	0	**3**	2	0	0	**2**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
17:00 to 17:15	11	0	0	**11**	635	5	5	**645**	4	0	0	**4**	3	0	0	**3**	3	0	0	**3**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**
17:15 to 17:30	4	0	0	**4**	643	3	7	**653**	3	0	0	**3**	2	0	0	**2**	4	0	0	**4**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
17:30 to 17:45	3	0	0	**3**	619	2	7	**628**	3	0	0	**3**	3	0	0	**3**	5	0	0	**5**	0	0	0	**0**	7	0	0	**7**	0	0	0	**0**
17:45 to 18:00	8	0	0	**8**	661	2	4	**667**	1	0	0	**1**	1	0	0	**1**	4	0	0	**4**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
18:00 to 18:15	5	0	0	**5**	558	6	4	**568**	5	0	1	**6**	3	0	0	**3**	7	0	0	**7**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
18:15 to 18:30	5	0	0	**5**	498	2	7	**507**	2	0	0	**2**	4	0	0	**4**	3	0	0	**3**	0	0	0	**0**	2	0	1	**3**	0	0	0	**0**
PM Totals	**59**	**0**	**0**	**59**	**7,099**	**55**	**86**	**7,240**	**42**	**0**	**1**	**43**	**38**	**1**	**0**	**39**	**38**	**0**	**0**	**38**	**0**	**0**	**0**	**0**	**32**	**0**	**1**	**33**	**0**	**0**	**0**	**0**

Approach	**Williamsons Rd**																**Bordeaux St**																**Crossing Pedestrians**								
Direction	**Direction 7 (Left Turn)**				**Direction 8 (Through)**				**Direction 9 (Right Turn)**				**Direction 9U (U Turn)**				**Direction 10 (Left Turn)**				**Direction 11 (Through)**				**Direction 12 (Right Turn)**				**Direction 12U (U Turn)**												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
7:00 to 7:15	3	0	0	**3**	395	14	6	**415**	8	0	0	**8**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	2	1	0	0	0	0	**4**
7:15 to 7:30	2	0	0	**2**	408	5	4	**417**	4	0	0	**4**	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	0	0	3	1	0	0	0	0	**4**
7:30 to 7:45	1	0	0	**1**	542	7	7	**556**	10	0	0	**10**	3	0	0	**3**	7	0	0	**7**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**	0	0	2	0	0	0	0	0	**2**
7:45 to 8:00	4	0	0	**4**	524	21	6	**551**	8	0	0	**8**	7	0	0	**7**	4	0	0	**4**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	0	0	1	1	0	0	0	0	**2**
8:00 to 8:15	8	0	0	**8**	437	17	7	**461**	4	0	0	**4**	5	0	0	**5**	5	0	0	**5**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	0	0	0	0	0	0	0	**0**
8:15 to 8:30	11	0	0	**11**	527	9	4	**540**	4	0	0	**4**	15	0	0	**15**	6	0	0	**6**	1	0	0	**1**	9	0	0	**9**	0	0	0	**0**	0	0	6	1	0	0	0	0	**7**
8:30 to 8:45	11	0	0	**11**	512	12	8	**532**	3	0	0	**3**	58	0	0	**58**	31	0	0	**31**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**	0	0	3	2	0	0	0	0	**5**
8:45 to 9:00	19	0	0	**19**	515	6	6	**527**	2	0	0	**2**	52	0	0	**52**	22	0	0	**22**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	0	0	6	2	0	0	0	0	**8**
9:00 to 9:15	4	0	0	**4**	461	6	11	**478**	9	0	0	**9**	5	0	0	**5**	1	0	0	**1**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	0	0	6	3	0	0	0	0	**9**
9:15 to 9:30	3	0	1	**4**	492	12	6	**510**	7	1	0	**8**	3	0	0	**3**	6	0	0	**6**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	0	0	2	1	0	0	0	0	**3**
9:30 to 9:45	10	0	0	**10**	471	12	4	**487**	1	0	0	**1**	3	0	0	**3**	3	0	0	**3**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	0	0	1	1	0	0	0	0	**2**
9:45 to 10:00	5	0	0	**5**	435	9	7	**451**	2	0	0	**2**	1	0	0	**1**	3	0	0	**3**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	0	1	0	4	0	0	0	0	**5**
AM Totals	**81**	**0**	**1**	**82**	**5,719**	**130**	**76**	**5,925**	**62**	**1**	**0**	**63**	**157**	**0**	**0**	**157**	**88**	**0**	**0**	**88**	**3**	**0**	**0**	**3**	**32**	**0**	**0**	**32**	**0**	**0**	**0**	**0**	**1**	**1**	**32**	**17**	**0**	**0**	**0**	**0**	**51**
15:30 to 15:45	3	0	0	**3**	457	11	4	**472**	4	0	0	**4**	7	0	0	**7**	5	0	0	**5**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	0	0	0	3	0	0	0	0	**3**
15:45 to 16:00	8	0	0	**8**	508	9	5	**522**	0	0	0	**0**	1	0	0	**1**	5	1	0	**6**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	2	1	0	0	0	0	**3**
16:00 to 16:15	4	0	0	**4**	407	8	11	**426**	6	0	0	**6**	3	0	0	**3**	3	0	0	**3**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	1	2	0	0	0	0	**3**
16:15 to 16:30	5	0	0	**5**	496	15	9	**520**	5	0	0	**5**	6	0	0	**6**	3	0	0	**3**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	0	0	4	3	0	0	0	0	**7**
16:30 to 16:45	8	0	0	**8**	478	11	11	**500**	3	0	0	**3**	8	0	0	**8**	6	0	0	**6**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	0	0	1	2	0	0	0	0	**3**
16:45 to 17:00	8	0	0	**8**	525	8	5	**538**	2	0	0	**2**	21	0	0	**21**	7	0	0	**7**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	1	0	3	3	0	0	0	0	**7**
17:00 to 17:15	6	0	0	**6**	472	6	5	**483**	3	0	0	**3**	22	0	0	**22**	5	0	0	**5**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	0	0	0	2	0	0	0	0	**2**
17:15 to 17:30	5	0	0	**5**	537	4	8	**549**	5	0	0	**5**	4	0	0	**4**	6	0	0	**6**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	1	0	0	11	1	0	0	0	**13**
17:30 to 17:45	0	0	0	**0**	489	3	8	**500**	7	0	0	**7**	1	0	0	**1**	4	0	0	**4**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**	0	0	2	2	0	0	0	0	**4**
17:45 to 18:00	7	0	0	**7**	444	1	7	**452**	5	0	0	**5**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	0	0	3	3	0	0	0	0	**6**
18:00 to 18:15	3	0	0	**3**	524	1	3	**528**	6	0	0	**6**	2	0	0	**2**	4	0	0	**4**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	1	0	0	2	0	0	0	0	**3**
18:15 to 18:30	4	0	0	**4**	488	3	6	**497**	4	0	0	**4**	1	0	0	**1**	2	0	0	**2**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**	0	0	0	2	0	0	0	0	**2**
PM Totals	**61**	**0**	**0**	**61**	**5,825**	**80**	**82**	**5,987**	**50**	**0**	**0**	**50**	**76**	**0**	**0**	**76**	**52**	**1**	**0**	**53**	**2**	**0**	**0**	**2**	**36**	**0**	**0**	**36**	**0**	**0**	**0**	**0**	**3**	**0**	**16**	**36**	**1**	**0**	**0**	**0**	**56**

Job No. : V455
Client : GTA
Suburb : Doncaster
Location : 2. Williamsons Rd / Bordeaux St / Westfield Drive

Day/Date : Sat, 20th September 2014
Weather : Fine
Description : Classified Intersection Count
: 15 mins Data

Classifications	Class 1	Class 2	Class 3
	Cars	Trucks	Buses



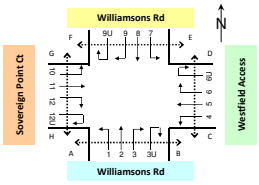
SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Williamsons Rd																Westfield Drive															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
11:00 to 11:15	4	0	0	4	382	2	1	385	8	0	0	8	6	0	0	6	3	0	0	3	0	0	0	0	0	1	0	1	0	0	0	0
11:15 to 11:30	5	0	0	5	402	4	4	410	5	0	0	5	3	0	0	3	1	0	0	1	0	0	0	0	3	0	0	3	0	0	0	0
11:30 to 11:45	5	0	0	5	433	5	2	440	5	0	0	5	9	0	0	9	9	0	0	9	0	0	0	0	1	0	0	1	0	0	0	0
11:45 to 12:00	2	0	0	2	465	2	4	471	9	0	0	9	1	0	0	1	6	0	0	6	0	0	0	0	1	0	0	1	0	0	0	0
12:00 to 12:15	6	0	0	6	448	5	2	455	3	0	0	3	6	1	0	7	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0
12:15 to 12:30	4	0	0	4	423	4	2	429	7	0	0	7	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
12:30 to 12:45	2	0	0	2	464	2	2	468	2	0	0	2	7	0	0	7	3	0	0	3	0	0	0	0	4	0	0	4	0	0	0	0
12:45 to 13:00	8	0	0	8	467	2	5	474	3	0	0	3	3	0	0	3	2	0	0	2	0	0	0	0	4	0	0	4	0	0	0	0
13:00 to 13:15	5	0	0	5	458	5	1	464	1	0	0	1	4	0	0	4	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
13:15 to 13:30	7	0	0	7	444	1	4	449	8	0	0	8	0	0	0	0	8	0	0	8	0	0	0	0	8	0	0	8	0	0	0	0
13:30 to 13:45	3	0	0	3	415	2	2	419	2	0	0	2	8	0	0	8	2	0	0	2	0	0	0	0	2	0	0	2	0	0	0	0
13:45 to 14:00	3	0	0	3	440	2	4	446	3	0	0	3	5	0	0	5	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
Total	54	0	0	54	5,241	36	33	5,310	56	0	0	56	52	1	0	53	45	0	0	45	0	0	0	0	24	1	0	25	0	0	0	0

Approach	Williamsons Rd																Bordeaux St																Crossing Pedestrians								
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
11:00 to 11:15	2	0	0	2	480	4	1	485	1	0	0	1	2	0	0	2	3	0	0	3	0	0	0	0	6	0	0	6	0	0	0	0	0	0	4	0	0	0	0	0	4
11:15 to 11:30	4	0	0	4	493	4	5	502	4	0	0	4	1	0	0	1	2	0	0	2	1	0	0	1	2	0	0	2	0	0	0	0	0	0	3	2	0	0	0	0	5
11:30 to 11:45	14	0	0	14	511	1	1	513	3	0	0	3	4	0	0	4	3	0	0	3	0	0	0	0	7	0	0	7	0	0	0	0	0	0	1	1	0	0	0	0	2
11:45 to 12:00	12	0	0	12	543	5	4	552	2	0	0	2	3	0	0	3	6	0	0	6	0	0	0	0	5	0	0	5	0	0	0	0	0	2	3	1	0	0	0	0	6
12:00 to 12:15	3	0	0	3	473	5	0	478	6	0	0	6	17	0	0	17	1	0	0	1	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	0	0	0	4
12:15 to 12:30	8	0	0	8	586	2	5	593	5	0	0	5	16	0	0	16	4	0	0	4	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	2
12:30 to 12:45	6	0	0	6	501	5	0	506	2	0	0	2	9	0	0	9	5	0	0	5	0	0	0	0	1	0	0	1	0	0	0	0	1	0	6	0	0	0	0	0	7
12:45 to 13:00	9	0	0	9	526	3	5	534	8	0	0	8	7	0	0	7	4	0	0	4	0	0	0	0	7	0	0	7	0	0	0	0	0	0	4	2	0	0	0	0	6
13:00 to 13:15	2	0	0	2	465	0	1	466	3	0	0	3	17	0	0	17	11	0	0	11	0	0	0	0	3	0	0	3	0	0	0	0	0	0	5	1	0	0	0	0	6
13:15 to 13:30	6	0	0	6	521	3	5	529	1	0	0	1	1	0	0	1	3	0	0	3	0	0	0	0	3	0	0	3	0	0	0	0	0	0	6	1	0	0	0	0	7
13:30 to 13:45	6	0	0	6	492	1	0	493	4	0	0	4	3	0	0	3	4	0	0	4	0	0	0	0	1	0	0	1	1	0	0	1	0	0	3	0	0	0	0	0	3
13:45 to 14:00	5	0	0	5	482	1	5	488	6	0	0	6	7	0	0	7	3	0	0	3	0	0	0	0	4	0	0	4	0	0	0	0	0	0	8	1	0	0	0	0	9
Total	77	0	0	77	6,073	34	32	6,139	45	0	0	45	87	0	0	87	49	0	0	49	1	0	0	1	42	0	0	42	1	0	0	1	1	2	49	9	0	0	0	0	61

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 3. Williamsons Rd / Westfield Access / Sovereign Point Ct
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	Class 1	Class 2	Class 3
	Cars	Trucks	Buses



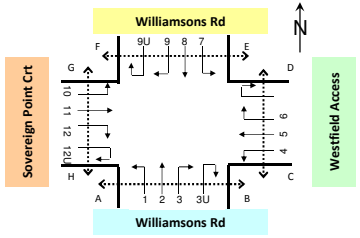
SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Williamsons Rd																Westfield Access															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15	0	0	0	**0**	239	11	1	**251**	2	0	0	**2**	0	0	0	**0**	1	0	8	**9**	0	0	0	**0**	1	0	2	**3**	0	0	0	**0**
7:15 to 7:30	2	0	0	**2**	255	9	0	**264**	1	0	0	**1**	0	0	0	**0**	3	0	9	**12**	0	0	0	**0**	9	0	7	**16**	0	0	0	**0**
7:30 to 7:45	2	0	0	**2**	330	15	1	**346**	3	0	0	**3**	0	0	0	**0**	9	0	11	**20**	0	0	0	**0**	15	0	6	**21**	0	0	0	**0**
7:45 to 8:00	0	0	0	**0**	291	13	0	**304**	3	1	0	**4**	0	0	0	**0**	6	0	9	**15**	0	0	0	**0**	7	0	6	**13**	0	0	0	**0**
8:00 to 8:15	1	0	0	**1**	298	12	0	**310**	10	0	0	**10**	0	0	0	**0**	5	0	12	**17**	0	0	0	**0**	6	2	7	**15**	2	0	0	**2**
8:15 to 8:30	1	0	0	**1**	288	8	0	**296**	12	0	0	**12**	0	0	0	**0**	4	1	5	**10**	0	0	0	**0**	4	0	4	**8**	0	0	0	**0**
8:30 to 8:45	1	0	0	**1**	300	18	2	**320**	14	0	0	**14**	0	0	0	**0**	7	1	10	**18**	0	0	0	**0**	8	0	6	**14**	0	0	0	**0**
8:45 to 9:00	2	0	0	**2**	299	14	1	**314**	27	0	0	**27**	0	0	0	**0**	6	0	12	**18**	0	0	0	**0**	5	0	5	**10**	0	0	0	**0**
9:00 to 9:15	0	0	0	**0**	290	8	0	**298**	32	0	0	**32**	0	0	0	**0**	5	0	9	**14**	0	0	0	**0**	8	0	5	**13**	0	0	0	**0**
9:15 to 9:30	2	0	0	**2**	250	14	1	**265**	38	0	0	**38**	0	0	0	**0**	16	0	9	**25**	0	0	0	**0**	16	2	5	**23**	0	0	0	**0**
9:30 to 9:45	1	0	0	**1**	217	8	0	**225**	28	0	0	**28**	0	0	0	**0**	22	0	8	**30**	0	0	0	**0**	22	0	5	**27**	0	0	0	**0**
9:45 to 10:00	4	0	0	**4**	286	16	0	**302**	35	0	0	**35**	0	0	0	**0**	26	1	8	**35**	0	0	0	**0**	29	0	6	**35**	0	0	0	**0**
AM Totals	**16**	**0**	**0**	**16**	**3,343**	**146**	**6**	**3,495**	**205**	**1**	**0**	**206**	**0**	**0**	**0**	**0**	**110**	**3**	**110**	**223**	**0**	**0**	**0**	**0**	**130**	**4**	**64**	**198**	**2**	**0**	**0**	**2**
15:30 to 15:45	3	0	0	**3**	438	9	2	**449**	41	0	0	**41**	0	0	0	**0**	77	0	7	**84**	0	0	0	**0**	122	0	4	**126**	2	0	0	**2**
15:45 to 16:00	4	0	0	**4**	457	5	0	**462**	47	1	0	**48**	0	0	0	**0**	57	0	11	**68**	0	0	0	**0**	104	1	7	**112**	0	0	0	**0**
16:00 to 16:15	1	0	0	**1**	452	2	1	**455**	47	0	0	**47**	0	0	0	**0**	49	0	9	**58**	0	0	0	**0**	115	0	9	**124**	1	0	0	**1**
16:15 to 16:30	2	0	0	**2**	452	5	0	**457**	55	0	0	**55**	1	0	0	**1**	64	0	7	**71**	0	0	0	**0**	121	0	11	**132**	1	0	0	**1**
16:30 to 16:45	1	0	1	**2**	466	7	0	**473**	41	0	0	**41**	0	0	0	**0**	54	0	10	**64**	0	0	0	**0**	128	0	8	**136**	0	0	0	**0**
16:45 to 17:00	3	0	0	**3**	482	4	1	**487**	53	0	0	**53**	0	0	0	**0**	54	0	9	**63**	0	0	0	**0**	124	0	7	**131**	0	0	0	**0**
17:00 to 17:15	2	0	0	**2**	540	6	0	**546**	58	0	0	**58**	1	0	0	**1**	62	0	9	**71**	0	0	0	**0**	121	0	5	**126**	1	0	0	**1**
17:15 to 17:30	4	0	0	**4**	547	4	0	**551**	52	0	0	**52**	0	0	0	**0**	50	0	10	**60**	1	0	0	**1**	117	0	10	**127**	0	0	0	**0**
17:30 to 17:45	1	0	0	**1**	521	10	0	**531**	59	0	0	**59**	1	0	0	**1**	56	0	7	**63**	0	0	0	**0**	100	0	3	**103**	0	0	0	**0**
17:45 to 18:00	2	0	0	**2**	511	4	1	**516**	36	0	0	**36**	0	0	0	**0**	54	0	9	**63**	1	0	0	**1**	110	1	7	**118**	0	0	0	**0**
18:00 to 18:15	3	0	0	**3**	485	5	0	**490**	58	0	0	**58**	2	0	0	**2**	52	0	10	**62**	0	0	0	**0**	104	0	3	**107**	0	0	0	**0**
18:15 to 18:30	4	0	0	**4**	496	5	0	**501**	39	0	0	**39**	2	0	0	**2**	49	0	9	**58**	0	0	0	**0**	106	0	3	**109**	0	0	0	**0**
PM Totals	**30**	**0**	**1**	**31**	**5,847**	**66**	**5**	**5,918**	**586**	**1**	**0**	**587**	**7**	**0**	**0**	**7**	**678**	**0**	**107**	**785**	**2**	**0**	**0**	**2**	**1,372**	**2**	**77**	**1,451**	**5**	**0**	**0**	**5**

Approach	Williamsons Rd																Sovereign Point Ct																Crossing Pedestrians								
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
7:00 to 7:15	3	1	0	**4**	368	10	5	**383**	1	0	0	**1**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	1	0	0	0	0	0	0	**1**
7:15 to 7:30	10	0	0	**10**	432	9	4	**445**	1	0	0	**1**	1	0	0	**1**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	3	0	0	0	1	0	0	**4**
7:30 to 7:45	11	0	0	**11**	463	14	11	**488**	1	0	0	**1**	1	0	0	**1**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	3	2	0	0	0	1	0	**6**
7:45 to 8:00	22	0	0	**22**	521	14	6	**541**	0	0	0	**0**	1	0	0	**1**	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	5	1	0	0	0	0	0	**7**
8:00 to 8:15	16	1	0	**17**	498	10	7	**515**	0	1	0	**1**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	3	1	0	0	0	0	0	**4**
8:15 to 8:30	23	0	0	**23**	508	12	7	**527**	1	0	0	**1**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	2	2	0	0	0	0	0	**4**
8:30 to 8:45	44	0	0	**44**	456	5	8	**469**	0	0	0	**0**	3	0	0	**3**	7	0	0	**7**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	4	5	0	0	0	0	1	**11**
8:45 to 9:00	80	1	0	**81**	438	9	9	**456**	1	0	0	**1**	0	0	0	**0**	2	1	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	5	2	4	0	2	3	1	**20**
9:00 to 9:15	95	0	0	**95**	416	10	5	**431**	1	0	0	**1**	1	0	0	**1**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	6	1	1	0	0	1	3	**13**
9:15 to 9:30	124	0	0	**124**	384	12	7	**403**	0	0	0	**0**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	8	2	1	0	0	3	4	**19**
9:30 to 9:45	126	1	0	**127**	388	15	8	**411**	5	0	0	**5**	1	0	0	**1**	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	12	4	2	1	0	0	2	3	**24**
9:45 to 10:00	104	1	0	**105**	375	13	6	**394**	1	0	0	**1**	1	0	0	**1**	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	5	3	0	0	0	2	3	**15**
AM Totals	**658**	**5**	**0**	**663**	**5,247**	**133**	**83**	**5,463**	**12**	**1**	**0**	**13**	**9**	**0**	**0**	**9**	**42**	**1**	**0**	**43**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**21**	**49**	**21**	**7**	**0**	**3**	**12**	**15**	**128**
15:30 to 15:45	86	0	0	**86**	395	9	7	**411**	0	0	0	**0**	2	0	0	**2**	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	5	4	3	0	0	0	3	6	**21**
15:45 to 16:00	112	0	0	**112**	463	7	4	**474**	2	0	0	**2**	2	0	0	**2**	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	11	4	0	1	0	4	6	**29**
16:00 to 16:15	96	0	0	**96**	366	7	10	**383**	1	0	0	**1**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	9	5	3	0	0	2	2	**25**
16:15 to 16:30	102	0	0	**102**	427	5	10	**442**	2	0	0	**2**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	3	3	4	0	1	6	5	**22**
16:30 to 16:45	90	0	0	**90**	425	9	7	**441**	3	0	0	**3**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	6	2	2	3	1	0	8	3	**25**
16:45 to 17:00	86	0	0	**86**	418	5	7	**430**	2	0	0	**2**	1	0	0	**1**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	3	2	3	0	0	5	4	**20**
17:00 to 17:15	100	0	0	**100**	380	6	10	**396**	3	0	0	**3**	9	0	0	**9**	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	5	0	5	2	0	2	6	2	**22**
17:15 to 17:30	87	0	0	**87**	416	4	10	**430**	0	0	0	**0**	2	0	0	**2**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	2	3	5	0	0	7	4	**21**
17:30 to 17:45	98	0	0	**98**	453	2	6	**461**	3	0	0	**3**	2	0	0	**2**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	1	4	4	0	0	0	3	**12**
17:45 to 18:00	95	0	0	**95**	398	1	7	**406**	5	0	0	**5**	0	0	0	**0**	7	0	0	**7**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	7	2	5	2	0	0	4	2	**22**
18:00 to 18:15	121	0	0	**121**	385	1	4	**390**	1	0	0	**1**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	2	3	1	1	0	5	1	**16**
18:15 to 18:30	122	0	0	**122**	432	2	6	**440**	1	0	0	**1**	1	0	0	**1**	6	0	0	**6**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	2	6	0	0	5	2	**17**
PM Totals	**1,195**	**0**	**0**	**1,195**	**4,958**	**58**	**88**	**5,104**	**23**	**0**	**0**	**23**	**20**	**0**	**0**	**20**	**46**	**0**	**0**	**46**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**38**	**39**	**41**	**33**	**3**	**3**	**55**	**40**	**252**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 3. Williamsons Rd / Westfield Access / Sovereign Point Ct
Day/Date	: Sat, 6th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses

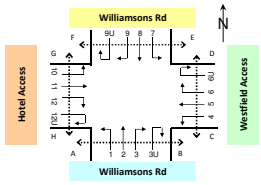


SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Williamsons Rd																Westfield Access															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
11:00 to 11:15	2	2	0	**4**	298	1	1	**300**	68	0	0	**68**	0	0	0	**0**	56	0	4	**60**	0	0	0	**0**	87	0	2	**89**	4	0	0	**4**
11:15 to 11:30	2	0	0	**2**	300	2	0	**302**	68	0	0	**68**	4	0	0	**4**	74	0	4	**78**	0	0	0	**0**	112	0	4	**116**	0	0	0	**0**
11:30 to 11:45	1	2	0	**3**	339	1	0	**340**	82	0	0	**82**	1	0	0	**1**	83	0	3	**86**	0	0	0	**0**	121	0	2	**123**	2	0	0	**2**
11:45 to 12:00	2	0	0	**2**	358	3	0	**361**	71	0	0	**71**	2	0	0	**2**	82	0	5	**87**	0	0	0	**0**	137	0	4	**141**	0	0	0	**0**
12:00 to 12:15	1	2	0	**3**	339	2	0	**341**	70	0	0	**70**	0	0	0	**0**	81	1	4	**86**	0	0	0	**0**	119	0	0	**119**	2	0	0	**2**
12:15 to 12:30	2	1	0	**3**	325	5	0	**330**	74	0	0	**74**	1	0	0	**1**	57	0	4	**61**	0	0	0	**0**	109	0	5	**114**	0	0	0	**0**
12:30 to 12:45	1	1	0	**2**	346	5	0	**351**	61	0	0	**61**	0	0	0	**0**	83	0	1	**84**	0	0	0	**0**	131	0	1	**132**	0	0	0	**0**
12:45 to 13:00	1	0	0	**1**	414	4	0	**418**	72	0	0	**72**	1	1	0	**2**	75	0	6	**81**	0	0	0	**0**	145	0	4	**149**	1	0	0	**1**
13:00 to 13:15	3	0	0	**3**	356	2	0	**358**	83	0	0	**83**	0	0	0	**0**	84	0	7	**91**	0	0	0	**0**	105	0	1	**106**	0	0	0	**0**
13:15 to 13:30	3	0	0	**3**	349	3	0	**352**	54	0	0	**54**	0	0	0	**0**	87	0	4	**91**	1	0	0	**1**	132	0	5	**137**	2	0	0	**2**
13:30 to 13:45	0	1	0	**1**	363	2	0	**365**	72	0	0	**72**	1	0	0	**1**	99	0	2	**101**	0	0	0	**0**	144	0	0	**144**	0	0	0	**0**
13:45 to 14:00	3	0	0	**3**	366	1	0	**367**	101	0	0	**101**	1	0	0	**1**	87	0	6	**93**	0	0	0	**0**	165	0	3	**168**	0	0	0	**0**
Total	**21**	**9**	**0**	**30**	**4,153**	**31**	**1**	**4,185**	**876**	**0**	**0**	**876**	**11**	**1**	**0**	**12**	**948**	**1**	**50**	**999**	**1**	**0**	**0**	**1**	**1,507**	**0**	**31**	**1,538**	**11**	**0**	**0**	**11**

Approach	Williamsons Rd																Sovereign Point Crt																Crossing Pedestrians								
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
11:00 to 11:15	139	0	0	**139**	346	8	3	**357**	1	0	0	**1**	0	0	0	**0**	1	2	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	6	10	4	1	0	0	3	5	**29**
11:15 to 11:30	170	0	0	**170**	406	5	4	**415**	1	0	0	**1**	0	0	0	**0**	5	1	0	**6**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	12	7	1	0	0	4	5	**32**
11:30 to 11:45	148	1	0	**149**	399	3	0	**402**	1	0	0	**1**	0	0	0	**0**	3	1	0	**4**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	10	13	5	1	0	0	7	7	**43**
11:45 to 12:00	153	0	0	**153**	423	7	5	**435**	0	0	0	**0**	0	0	0	**0**	1	2	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	9	2	6	0	1	1	4	**26**
12:00 to 12:15	141	0	0	**141**	386	3	2	**391**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	7	3	5	6	0	0	2	2	**25**
12:15 to 12:30	141	0	0	**141**	382	4	5	**391**	0	0	0	**0**	0	0	0	**0**	5	2	0	**7**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	16	3	5	7	0	0	2	3	**36**
12:30 to 12:45	166	0	0	**166**	396	3	0	**399**	0	0	0	**0**	0	0	0	**0**	6	1	0	**7**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	5	5	2	1	1	0	2	8	**24**
12:45 to 13:00	137	0	0	**137**	312	4	4	**320**	1	0	0	**1**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	9	9	3	0	0	4	3	**32**
13:00 to 13:15	129	0	0	**129**	389	5	2	**396**	3	0	0	**3**	1	0	0	**1**	1	1	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	2	4	0	0	0	0	4	**12**
13:15 to 13:30	136	0	0	**136**	376	3	5	**384**	1	0	0	**1**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	9	3	1	0	0	5	7	**28**
13:30 to 13:45	118	0	0	**118**	401	7	1	**409**	3	0	0	**3**	2	0	0	**2**	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	9	6	5	1	0	0	2	7	**30**
13:45 to 14:00	131	0	0	**131**	342	3	5	**350**	3	0	0	**3**	1	0	0	**1**	4	0	0	**4**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	4	6	3	2	0	0	3	6	**24**
Total	**1,709**	**1**	**0**	**1,710**	**4,558**	**55**	**36**	**4,649**	**14**	**0**	**0**	**14**	**4**	**0**	**0**	**4**	**45**	**10**	**0**	**55**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**72**	**87**	**54**	**30**	**1**	**1**	**35**	**61**	**341**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 4. Williamsons Rd / Westfield Access / Hotel Access
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data



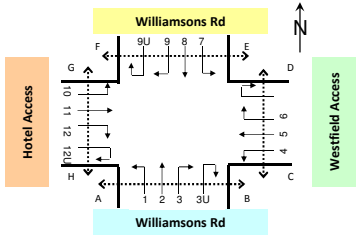
SKYHIGH - THE TRAFFIC SURVEY COMPANY

	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses

Approach	Williamsons Rd																Westfield Access															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15	3	1	0	4	239	11	1	251	9	1	7	17	0	0	0	0	2	0	0	2	0	0	0	0	2	0	0	2	0	0	0	0
7:15 to 7:30	3	0	0	3	262	8	0	270	14	0	8	22	1	0	0	1	10	0	0	10	0	0	0	0	2	1	0	3	0	0	0	0
7:30 to 7:45	2	1	0	3	332	15	1	348	11	0	13	24	0	0	0	0	8	0	0	8	1	0	0	1	3	0	0	3	0	0	0	0
7:45 to 8:00	3	0	0	3	300	15	0	315	22	1	13	36	1	0	0	1	10	0	0	10	0	0	0	0	11	1	0	12	0	0	0	0
8:00 to 8:15	7	0	0	7	282	11	0	293	16	1	2	19	1	0	0	1	9	1	0	10	1	0	0	1	7	0	0	7	1	0	0	1
8:15 to 8:30	10	0	0	10	298	7	0	305	26	2	9	37	2	0	0	2	16	2	0	18	0	0	0	0	1	0	0	1	0	0	0	0
8:30 to 8:45	1	0	0	1	315	18	2	335	21	4	8	33	3	0	0	3	13	0	0	13	2	0	0	2	11	1	0	12	1	0	0	1
8:45 to 9:00	13	0	0	13	301	11	1	313	42	2	11	55	0	0	0	0	16	1	0	17	0	0	0	0	13	2	0	15	0	0	0	0
9:00 to 9:15	6	0	0	6	315	6	0	321	52	1	6	59	2	1	0	3	15	7	0	22	0	0	0	0	13	2	0	15	1	0	0	1
9:15 to 9:30	3	1	0	4	265	11	0	276	46	3	9	58	0	0	0	0	27	1	0	28	0	0	0	0	16	1	0	17	2	0	0	2
9:30 to 9:45	7	0	0	7	236	8	0	244	30	2	5	37	1	0	0	1	36	3	0	39	0	0	0	0	16	0	0	16	0	0	0	0
9:45 to 10:00	1	0	0	1	298	17	0	315	32	3	10	45	0	0	0	0	33	5	0	38	0	0	0	0	24	1	0	25	0	0	0	0
AM Totals	59	3	0	62	3,443	138	5	3,586	321	20	101	442	11	1	0	12	195	20	0	215	4	0	0	4	119	9	0	128	5	0	0	5
15:30 to 15:45	10	0	0	10	428	7	2	437	43	2	6	51	3	0	0	3	55	2	0	57	1	0	0	1	31	1	0	32	1	0	0	1
15:45 to 16:00	14	0	0	14	472	4	0	476	69	3	11	83	0	1	0	1	42	1	0	43	1	0	0	1	25	1	0	26	1	0	0	1
16:00 to 16:15	14	0	0	14	471	2	1	474	47	2	11	60	3	0	0	3	32	3	0	35	0	0	0	0	31	0	0	31	1	0	0	1
16:15 to 16:30	10	0	0	10	464	4	0	468	67	0	9	76	4	0	0	4	43	1	0	44	2	0	0	2	26	0	0	26	0	0	0	0
16:30 to 16:45	12	0	0	12	493	7	0	500	60	1	8	69	1	0	0	1	46	0	0	46	3	0	0	3	18	0	0	18	0	0	0	0
16:45 to 17:00	14	0	0	14	487	4	1	492	49	0	7	56	3	0	0	3	38	1	0	39	0	0	0	0	48	0	0	48	0	0	0	0
17:00 to 17:15	20	0	0	20	549	4	0	553	46	0	7	53	1	0	0	1	42	0	0	42	1	0	0	1	42	0	0	42	0	0	0	0
17:15 to 17:30	32	0	0	32	551	3	0	554	50	0	10	60	1	0	0	1	39	2	0	41	0	0	0	0	25	0	0	25	0	0	0	0
17:30 to 17:45	12	0	0	12	524	10	0	534	43	0	8	51	3	0	0	3	47	1	0	48	0	0	0	0	34	0	0	34	0	0	0	0
17:45 to 18:00	14	0	0	14	526	4	1	531	45	0	7	52	0	0	0	0	35	0	0	35	2	0	0	2	22	0	0	22	0	0	0	0
18:00 to 18:15	21	0	0	21	513	6	0	519	48	0	7	55	0	0	0	0	44	0	0	44	0	0	0	0	26	0	0	26	1	0	0	1
18:15 to 18:30	16	0	0	16	488	4	0	492	34	0	8	42	2	0	0	2	30	0	0	30	0	0	0	0	17	0	0	17	2	0	0	2
PM Totals	189	0	0	189	5,966	59	5	6,030	601	8	99	708	21	1	0	22	493	11	0	504	10	0	0	10	345	2	0	347	6	0	0	6

Approach	Williamsons Rd																Hotel Access												Crossing Pedestrians								
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
7:00 to 7:15	9	0	4	13	346	11	7	364	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	1	0	0	0	0	1	3
7:15 to 7:30	12	0	5	17	414	11	8	433	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3	0	1	0	0	2	0	6
7:30 to 7:45	15	2	11	28	460	12	12	484	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	5	2	2	0	0	4	3	17
7:45 to 8:00	15	3	5	23	468	10	10	488	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	0	0	0	0	1	8
8:00 to 8:15	17	0	11	28	520	10	9	539	1	0	0	1	0	0	0	0	2	0	0	2	0	0	0	0	1	0	0	1	0	0	0	0	0	3	2	0	0	0	0	0	5
8:15 to 8:30	20	0	6	26	485	12	6	503	6	0	0	6	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	9	1	2	0	0	2	1	17
8:30 to 8:45	27	0	5	32	438	8	12	458	1	0	0	1	0	0	0	0	2	0	0	2	1	0	0	1	0	0	0	0	0	0	0	0	4	4	1	2	0	0	0	1	12
8:45 to 9:00	47	1	7	55	401	8	14	423	3	0	0	3	0	0	0	0	1	0	0	1	0	0	0	0	2	0	0	2	0	0	0	0	7	10	5	2	0	0	0	0	24
9:00 to 9:15	41	2	7	50	361	8	8	377	2	0	0	2	0	0	0	0	2	0	0	2	0	0	0	0	3	0	0	3	0	0	0	0	2	11	1	3	0	0	0	0	17
9:15 to 9:30	40	0	8	48	363	11	9	383	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	2	0	0	2	0	0	0	0	4	4	0	0	0	0	2	0	10
9:30 to 9:45	38	1	6	45	374	16	6	396	1	0	0	1	0	0	0	0	2	0	0	2	1	0	0	1	0	0	0	0	0	0	0	0	1	9	0	0	0	0	0	1	11
9:45 to 10:00	29	1	8	38	356	14	9	379	3	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	5	2	0	0	0	4	0	11
AM Totals	310	10	83	403	4,986	131	110	5,227	22	0	0	22	2	0	0	2	10	0	0	10	3	1	0	4	15	0	0	15	0	0	0	0	22	67	18	12	0	0	14	8	141
15:30 to 15:45	43	1	7	51	423	13	5	441	4	0	0	4	0	0	0	0	6	0	0	6	0	0	0	0	11	0	0	11	0	0	0	0	7	8	1	0	0	0	3	0	19
15:45 to 16:00	49	0	4	53	449	7	12	468	10	0	0	10	1	0	0	1	6	0	0	6	1	0	0	1	3	0	0	3	0	0	0	0	18	8	5	0	0	0	2	3	36
16:00 to 16:15	28	0	9	37	370	6	10	386	2	0	0	2	2	0	0	2	10	0	0	10	0	0	0	0	10	0	0	10	0	0	0	0	13	7	2	2	0	0	2	5	31
16:15 to 16:30	52	0	10	62	453	5	9	467	5	1	0	6	0	0	0	0	10	0	0	10	0	0	0	0	6	1	0	7	0	0	0	0	10	5	1	1	1	0	3	4	25
16:30 to 16:45	36	0	8	44	419	9	9	437	3	0	0	3	0	0	0	0	7	0	0	7	1	0	0	1	8	0	0	8	0	0	0	0	10	5	7	4	0	0	2	0	28
16:45 to 17:00	42	0	8	50	437	6	8	451	7	0	0	7	0	0	0	0	12	0	0	12	2	0	0	2	12	0	0	12	0	0	0	0	7	3	0	1	0	1	5	2	19
17:00 to 17:15	31	0	7	38	376	5	10	391	1	0	0	1	1	0	0	1	11	0	0	11	1	0	0	1	8	0	0	8	0	0	0	0	10	5	1	2	0	0	3	1	22
17:15 to 17:30	33	1	9	43	417	5	10	432	6	0	0	6	0	0	0	0	13	0	0	13	0	0	0	0	9	0	0	9	0	0	0	0	10	5	1	1	0	0	3	2	22
17:30 to 17:45	41	0	8	49	472	2	8	482	6	0	0	6	2	0	0	2	16	0	0	16	0	0	0	0	6	0	0	6	0	0	0	0	9	7	1	2	0	0	1	1	21
17:45 to 18:00	38	0	6	44	402	0	9	411	8	0	0	8	0	0	0	0	10	0	0	10	1	0	0	1	9	0	0	9	0	0	0	0	6	5	0	0	0	0	1	0	12
18:00 to 18:15	34	0	5	39	383	1	10	394	7	0	0	7	2	0	0	2	20	0	0	20	1	0	0	1	11	0	0	11	0	0	0	0	11	1	3	1	0	0	5	0	21
18:15 to 18:30	36	0	5	41	426	2	10	438	15	0	0	15	2	0	0	2	8	0	0	8	0	0	0	0	7	0	0	7	0	0	0	0	3	11	0	1	0	0	0	0	15
PM Totals	463	2	86	551	5,027	61	110	5,198	74	1	0	75	10	0	0	10	129	0	0	129	7	0	0	7	100	1	0	101	0	0	0	0	114	70	22	15	1	1	30	18	271

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 4. Williamsons Rd / Westfield Access / Hotel Access
Day/Date	: Sat, 6th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

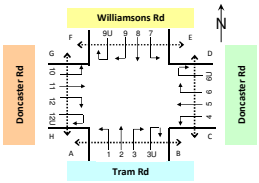
Classifications	**Class 1**	**Class 2**	**Class 3**
	Cars	Trucks	Buses

Approach	**Williamsons Rd**																**Westfield Access**															
Direction	**Direction 1 (Left Turn)**				**Direction 2 (Through)**				**Direction 3 (Right Turn)**				**Direction 3U (U Turn)**				**Direction 4 (Left Turn)**				**Direction 5 (Through)**				**Direction 6 (Right Turn)**				**Direction 6U (U Turn)**			
Time Period	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**
11:00 to 11:15	9	0	0	**9**	324	2	0	**326**	51	0	3	**54**	0	0	0	**0**	43	0	0	**43**	3	0	0	**3**	22	0	0	**22**	1	0	0	**1**
11:15 to 11:30	17	0	0	**17**	334	1	0	**335**	54	0	5	**59**	2	0	0	**2**	52	0	0	**52**	3	0	0	**3**	35	0	0	**35**	1	0	0	**1**
11:30 to 11:45	7	0	0	**7**	373	4	0	**377**	56	0	3	**59**	3	0	0	**3**	57	0	0	**57**	5	0	0	**5**	44	0	0	**44**	0	0	0	**0**
11:45 to 12:00	13	0	0	**13**	405	3	0	**408**	46	1	5	**52**	2	0	0	**2**	39	1	0	**40**	2	0	0	**2**	30	0	0	**30**	0	0	0	**0**
12:00 to 12:15	9	0	0	**9**	373	4	0	**377**	55	0	4	**59**	6	0	0	**6**	49	0	0	**49**	1	0	0	**1**	34	1	0	**35**	1	0	0	**1**
12:15 to 12:30	18	0	0	**18**	375	5	0	**380**	55	0	4	**59**	4	0	0	**4**	48	0	0	**48**	1	0	0	**1**	25	0	0	**25**	0	0	0	**0**
12:30 to 12:45	14	0	0	**14**	362	5	0	**367**	58	0	2	**60**	4	0	0	**4**	44	0	0	**44**	2	0	0	**2**	26	1	0	**27**	0	0	0	**0**
12:45 to 13:00	12	0	0	**12**	470	5	0	**475**	51	0	5	**56**	6	0	0	**6**	44	0	0	**44**	0	0	0	**0**	26	0	0	**26**	0	0	0	**0**
13:00 to 13:15	15	0	0	**15**	392	2	0	**394**	47	0	7	**54**	2	0	0	**2**	55	0	0	**55**	1	0	0	**1**	30	0	0	**30**	1	0	0	**1**
13:15 to 13:30	9	0	0	**9**	379	2	0	**381**	59	0	1	**60**	7	0	0	**7**	33	0	0	**33**	2	0	0	**2**	28	1	0	**29**	0	0	0	**0**
13:30 to 13:45	10	0	0	**10**	415	3	0	**418**	47	0	3	**50**	1	0	0	**1**	48	0	0	**48**	0	0	0	**0**	15	0	0	**15**	1	0	0	**1**
13:45 to 14:00	7	0	0	**7**	430	1	0	**431**	41	0	5	**46**	2	0	0	**2**	39	1	0	**40**	1	0	0	**1**	33	0	0	**33**	0	0	0	**0**
Total	**140**	**0**	**0**	**140**	**4,632**	**37**	**0**	**4,669**	**620**	**1**	**47**	**668**	**39**	**0**	**0**	**39**	**551**	**2**	**0**	**553**	**21**	**0**	**0**	**21**	**348**	**3**	**0**	**351**	**5**	**0**	**0**	**5**

Approach	**Williamsons Rd**																**Hotel Access**																**Crossing Pedestrians**								
Direction	**Direction 7 (Left Turn)**				**Direction 8 (Through)**				**Direction 9 (Right Turn)**				**Direction 9U (U Turn)**				**Direction 10 (Left Turn)**				**Direction 11 (Through)**				**Direction 12 (Right Turn)**				**Direction 12U (U Turn)**												
Time Period	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Total**
11:00 to 11:15	33	0	3	**36**	359	8	5	**372**	5	0	0	**5**	2	0	0	**2**	6	0	0	**6**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	5	16	2	2	0	0	3	2	**30**
11:15 to 11:30	47	1	3	**51**	379	3	5	**387**	11	0	0	**11**	2	0	0	**2**	3	0	0	**3**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	8	21	1	1	0	0	2	10	**43**
11:30 to 11:45	48	0	0	**48**	410	2	3	**415**	7	0	0	**7**	3	0	0	**3**	2	0	0	**2**	1	0	0	**1**	4	0	0	**4**	0	0	0	**0**	13	15	0	0	0	0	0	2	**30**
11:45 to 12:00	59	1	5	**65**	431	6	5	**442**	11	0	0	**11**	1	0	0	**1**	2	0	0	**2**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	10	9	0	2	0	0	4	2	**27**
12:00 to 12:15	41	0	0	**41**	401	4	4	**409**	7	0	0	**7**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	11	12	3	1	0	0	2	1	**30**
12:15 to 12:30	34	0	5	**39**	365	5	5	**375**	5	0	0	**5**	2	0	0	**2**	7	0	0	**7**	0	0	0	**0**	14	0	0	**14**	0	0	0	**0**	10	14	3	2	0	0	2	4	**35**
12:30 to 12:45	42	0	0	**42**	434	3	1	**438**	6	0	0	**6**	3	0	0	**3**	9	0	0	**9**	1	0	0	**1**	11	0	0	**11**	0	0	0	**0**	10	11	6	2	2	0	4	1	**36**
12:45 to 13:00	31	1	4	**36**	352	5	6	**363**	7	0	0	**7**	2	0	0	**2**	8	0	0	**8**	1	0	0	**1**	11	0	0	**11**	0	0	0	**0**	13	15	3	5	0	0	1	3	**40**
13:00 to 13:15	41	0	1	**42**	417	5	5	**427**	4	0	0	**4**	1	0	0	**1**	8	0	0	**8**	0	0	0	**0**	9	0	0	**9**	0	0	0	**0**	10	11	0	2	0	1	0	1	**25**
13:15 to 13:30	36	0	6	**42**	420	3	5	**428**	8	0	0	**8**	1	0	0	**1**	5	0	0	**5**	0	0	0	**0**	6	1	0	**7**	0	0	0	**0**	18	12	5	5	0	0	3	5	**48**
13:30 to 13:45	40	1	1	**42**	437	6	3	**446**	6	0	0	**6**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	7	0	0	**7**	0	0	0	**0**	2	22	4	3	0	0	0	1	**32**
13:45 to 14:00	45	0	5	**50**	390	3	7	**400**	8	0	0	**8**	1	0	0	**1**	6	0	0	**6**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	18	9	3	4	0	0	1	1	**36**
Total	**497**	**4**	**33**	**534**	**4,795**	**53**	**54**	**4,902**	**85**	**0**	**0**	**85**	**18**	**0**	**0**	**18**	**65**	**0**	**0**	**65**	**3**	**0**	**0**	**3**	**78**	**1**	**0**	**79**	**0**	**0**	**0**	**0**	**128**	**167**	**30**	**29**	**2**	**1**	**22**	**33**	**412**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 5. Doncaster Rd / Tram Rd / Williamsons Rd
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	Class 1	Class 2	Class 3
	Cars	Trucks	Buses



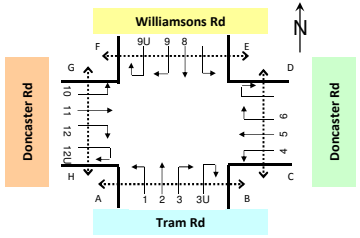
SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Tram Rd																Doncaster Rd															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15				0	122	10	1	133	20	0	0	20	0	0	0	0				0	152	2	2	156	82	2	5	89	2	0	0	2
7:15 to 7:30				0	153	3	2	158	14	1	0	15	0	0	0	0				0	209	1	3	213	91	1	10	102	0	0	0	0
7:30 to 7:45				0	193	11	2	206	11	0	0	11	0	0	0	0				0	224	3	3	230	82	2	5	89	1	0	0	1
7:45 to 8:00				0	175	12	3	190	27	0	0	27	0	0	0	0				0	247	2	2	251	92	1	5	98	0	0	0	0
8:00 to 8:15				0	173	10	1	184	47	0	0	47	2	0	0	2				0	246	5	3	254	92	1	1	94	0	0	0	0
8:15 to 8:30				0	160	4	2	166	49	0	0	49	1	0	0	1				0	259	4	2	265	87	2	2	91	0	0	0	0
8:30 to 8:45				0	152	13	2	167	100	1	0	101	0	0	0	0				0	221	3	1	225	98	1	3	102	1	0	0	1
8:45 to 9:00				0	156	6	3	165	85	3	0	88	2	0	0	2				0	209	4	1	214	95	2	2	99	3	0	0	3
9:00 to 9:15				0	166	5	1	172	60	3	0	63	2	0	0	2				0	191	2	3	196	107	1	2	110	3	0	0	3
9:15 to 9:30				0	118	9	0	127	71	0	1	72	1	0	0	1				0	143	4	2	149	76	1	3	80	2	0	0	2
9:30 to 9:45				0	125	3	3	131	63	1	0	64	0	0	0	0				0	133	3	1	137	81	4	2	87	3	0	0	3
9:45 to 10:00				0	139	10	1	150	63	1	0	64	1	0	0	1				0	157	7	1	165	91	4	6	101	2	0	0	2
AM Totals	0	0	0	0	1,832	96	21	1,949	610	10	1	621	9	0	0	9	0	0	0	0	2,391	40	24	2,455	1,074	22	46	1,142	17	0	0	17
15:30 to 15:45	34	0	1	35	205	5	2	212	78	0	0	78	3	0	0	3	53	1	0	54	197	2	2	201	152	2	3	157	1	0	0	1
15:45 to 16:00	35	0	0	35	228	1	2	231	74	0	0	74	2	0	0	2	53	1	0	54	205	1	2	208	152	2	3	157	1	0	0	1
16:00 to 16:15	35	0	0	35	228	3	4	235	63	0	0	63	3	0	0	3	58	1	0	59	213	1	0	214	170	1	3	174	0	0	0	0
16:15 to 16:30	37	0	0	37	234	1	2	237	68	0	0	68	3	0	0	3	35	0	0	35	166	2	2	170	118	1	3	122	1	0	0	1
16:30 to 16:45	41	0	0	41	241	5	2	248	64	0	0	64	1	0	0	1	45	0	0	45	213	3	0	216	137	1	2	140	2	0	0	2
16:45 to 17:00	24	2	0	26	218	3	3	224	59	0	0	59	7	0	0	7	39	0	0	39	226	1	2	229	151	1	2	154	0	0	0	0
17:00 to 17:15	41	0	0	41	259	1	0	260	67	0	0	67	3	0	0	3	43	0	0	43	220	0	1	221	175	2	3	180	0	0	0	0
17:15 to 17:30	44	1	0	45	286	1	4	291	79	0	0	79	3	0	0	3	57	0	0	57	227	0	1	228	182	0	4	186	1	0	0	1
17:30 to 17:45	42	0	0	42	267	9	2	278	65	0	0	65	1	0	0	1	54	0	0	54	231	0	1	232	136	0	0	136	2	0	0	2
17:45 to 18:00	65	0	0	65	260	3	2	265	70	0	0	70	1	0	0	1	72	1	0	73	229	1	0	230	148	1	3	152	0	0	0	0
18:00 to 18:15	71	0	0	71	292	3	1	296	79	0	0	79	3	0	0	3	42	0	0	42	215	0	2	217	156	2	3	161	2	0	0	2
18:15 to 18:30	67	0	0	67	267	1	3	271	77	0	0	77	4	0	0	4	70	0	0	70	193	0	1	194	169	2	2	173	1	0	0	1
PM Totals	536	3	1	540	2,985	36	27	3,048	843	0	0	843	34	0	0	34	621	4	0	625	2,535	11	14	2,560	1,846	15	31	1,892	11	0	0	11

Approach	Williamsons Rd																Doncaster Rd																Crossing Pedestrians								
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
7:00 to 7:15	48	4	1	53	174	3	2	179	123	2	4	129	0	0	0	0	56	1	2	59	37	3	3	43	3	0	0	3	0	0	0	0			0	2	1	0	0	0	3
7:15 to 7:30	42	0	1	43	212	6	2	220	128	1	3	132	0	0	0	0	47	3	1	51	47	1	1	49	7	0	0	7	0	0	0	0			1	5	3	0	0	1	10
7:30 to 7:45	56	4	2	62	263	5	3	271	170	3	9	182	0	0	0	0	62	3	2	67	72	2	1	75	18	0	0	18	0	0	0	0			1	1	3	2	0	0	7
7:45 to 8:00	77	4	2	83	292	3	3	298	160	0	4	164	0	0	0	0	73	2	5	80	78	4	1	83	22	0	0	22	0	0	0	0			4	0	3	3	0	0	10
8:00 to 8:15	79	0	3	82	285	9	2	296	158	3	3	164	1	0	0	1	93	2	1	96	124	3	1	128	19	0	0	19	0	0	0	0			2	1	2	3	1	1	10
8:15 to 8:30	79	1	3	83	296	7	2	305	123	3	2	128	1	0	0	1	89	6	4	99	174	2	2	178	22	1	0	23	0	0	0	0			3	6	8	2	0	1	20
8:30 to 8:45	83	1	3	87	300	5	2	307	136	2	7	145	0	0	0	0	107	5	6	118	231	2	2	235	27	1	0	28	0	0	0	0			2	8	7	1	0	0	18
8:45 to 9:00	94	1	6	101	200	6	3	209	108	0	1	109	1	0	0	1	134	4	5	143	286	3	4	293	26	0	0	26	0	0	0	0			2	6	5	3	4	0	20
9:00 to 9:15	104	2	3	109	233	5	5	243	102	4	4	110	2	1	0	3	108	0	3	111	220	5	7	232	24	2	0	26	0	0	0	0			3	4	6	2	1	0	16
9:15 to 9:30	95	2	4	101	210	6	1	217	130	3	5	138	4	0	0	4	136	7	7	150	187	6	5	198	17	1	0	18	0	0	0	0			3	5	4	2	1	0	15
9:30 to 9:45	85	6	3	94	194	9	3	206	115	5	0	120	3	0	0	3	94	2	1	97	156	4	1	161	18	0	0	18	0	0	0	0			4	11	7	3	2	0	27
9:45 to 10:00	89	7	5	101	162	5	1	168	100	5	4	109	0	0	0	0	100	4	3	107	206	2	2	210	14	1	0	15	0	0	0	0			4	6	5	3	1	2	21
AM Totals	931	32	36	999	2,821	69	29	2,919	1,553	31	46	1,630	12	1	0	13	1,099	39	40	1,178	1,818	37	30	1,885	217	6	0	223	0	0	0	0	0	0	29	55	54	24	10	5	177
15:30 to 15:45	140	0	1	141	267	10	3	280	106	0	0	106	2	0	0	2	193	5	3	201	240	1	1	242	35	2	0	37	0	0	0	0	5	2	20	3	2	17	0	2	51
15:45 to 16:00	123	2	4	129	273	3	3	279	92	1	7	100	3	0	0	3	182	2	6	190	288	2	1	291	26	2	0	28	0	0	0	0	15	2	19	19	4	11	0	1	71
16:00 to 16:15	122	2	0	124	238	5	2	245	71	2	5	78	3	0	0	3	196	2	6	204	259	2	2	263	36	0	0	36	0	0	0	0	7	1	7	5	2	3	0	0	25
16:15 to 16:30	112	0	0	112	295	0	4	299	91	0	3	94	1	0	0	1	212	0	4	216	312	2	5	319	32	0	0	32	0	0	0	0	2	3	6	7	6	9	4	4	41
16:30 to 16:45	101	0	4	105	243	4	3	250	90	1	6	97	0	0	0	0	197	1	2	200	266	1	1	268	32	0	0	32	1	0	0	1	3	2	20	5	1	4	1	3	39
16:45 to 17:00	114	0	3	117	295	1	2	298	93	0	3	96	3	0	0	3	193	0	3	196	257	2	1	260	34	0	0	34	1	0	0	1	2	4	7	5	5	5	1	3	32
17:00 to 17:15	111	1	2	114	224	7	3	234	76	1	5	82	2	0	0	2	224	2	4	230	247	0	2	249	40	0	0	40	2	0	0	2	9	1	10	6	0	5	1	3	35
17:15 to 17:30	107	3	3	113	257	4	3	264	87	0	2	89	3	0	0	3	214	2	3	219	286	1	1	288	35	1	0	36	3	0	0	3	6	2	13	5	5	2	0	0	33
17:30 to 17:45	123	1	2	126	283	1	2	286	108	1	4	113	0	0	0	0	197	1	3	201	283	0	2	285	29	0	0	29	7	0	0	7	0	1	6	9	7	7	0	4	34
17:45 to 18:00	88	1	6	95	255	0	3	258	95	0	2	97	1	0	0	1	205	0	4	209	307	1	3	311	27	2	0	29	5	0	0	5	0	2	7	8	10	3	8	2	40
18:00 to 18:15	106	0	5	111	298	0	1	299	106	0	3	109	0	0	0	0	159	1	2	162	298	1	1	300	27	0	0	27	4	0	0	4	5	2	14	7	4	7	2	3	44
18:15 to 18:30	111	0	8	119	238	2	1	241	91	1	0	92	1	0	0	1	144	1	5	150	251	0	4	255	30	0	0	30	2	0	0	2	0	1	10	9	2	1	1	0	24
PM Totals	1,358	10	38	1,406	3,166	37	30	3,233	1,106	7	40	1,153	19	0	0	19	2,316	17	45	2,378	3,294	13	24	3,331	383	7	0	390	25	0	0	25	54	23	139	88	48	74	18	25	469

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 5. Doncaster Rd / Tram Rd / Williamsons Rd
Day/Date	: Sat, 6th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses

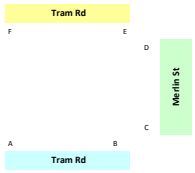


SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Tram Rd																Doncaster Rd															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
11:00 to 11:15	31	0	0	31	152	1	1	154	78	2	0	80	0	0	0	0	59	0	0	59	186	1	0	187	110	0	0	110	4	0	0	4
11:15 to 11:30	18	1	0	19	143	1	1	145	78	0	0	78	3	0	0	3	41	0	0	41	214	2	1	217	112	0	2	114	5	0	0	5
11:30 to 11:45	26	0	0	26	160	2	1	163	79	0	0	79	2	0	0	2	48	0	0	48	229	0	0	229	122	0	2	124	4	0	0	4
11:45 to 12:00	36	0	0	36	189	2	0	191	78	1	0	79	2	0	0	2	65	1	0	66	246	1	1	248	118	1	1	120	4	0	0	4
12:00 to 12:15	30	0	0	30	152	3	0	155	87	0	0	87	2	0	0	2	56	0	0	56	232	0	0	232	158	0	3	161	6	0	0	6
12:15 to 12:30	31	0	0	31	180	1	1	182	103	0	0	103	2	0	0	2	69	0	0	69	263	1	0	264	100	2	1	103	6	0	0	6
12:30 to 12:45	44	0	0	44	181	3	0	184	88	0	0	88	2	0	0	2	66	0	1	67	240	1	1	242	135	0	1	136	2	0	0	2
12:45 to 13:00	35	1	0	36	214	3	2	219	79	0	0	79	3	0	0	3	54	0	0	54	245	0	1	246	121	1	2	124	2	0	0	2
13:00 to 13:15	34	0	0	34	178	2	1	181	80	1	0	81	3	0	0	3	68	0	0	68	231	1	0	232	128	0	4	132	3	0	0	3
13:15 to 13:30	33	0	0	33	190	2	0	192	93	0	0	93	0	0	0	0	70	0	0	70	235	0	3	238	114	0	0	114	2	0	0	2
13:30 to 13:45	43	0	0	43	174	2	0	176	87	0	0	87	3	0	0	3	61	1	0	62	202	0	0	202	111	0	1	112	7	0	0	7
13:45 to 14:00	28	1	0	29	190	0	1	191	77	0	0	77	4	0	0	4	58	0	1	59	201	0	1	202	129	0	2	131	4	0	0	4
Total	389	3	0	392	2,103	22	8	2,133	1,007	4	0	1,011	26	0	0	26	715	2	2	719	2,724	7	8	2,739	1,458	4	19	1,481	49	0	0	49

Approach	Williamsons Rd																Doncaster Rd																Crossing Pedestrians								
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
11:00 to 11:15	109	2	1	112	207	6	1	214	135	0	3	138	1	0	0	1	151	0	1	152	207	1	0	208	23	1	0	24	0	0	0	0	2	7	11	21	8	4	2	2	57
11:15 to 11:30	99	0	1	100	208	3	1	212	116	0	2	118	3	0	0	3	123	0	2	125	248	2	1	251	19	0	0	19	0	0	0	0	2	2	7	15	3	4	2	1	36
11:30 to 11:45	113	0	1	114	239	1	1	241	130	0	2	132	2	0	0	2	182	2	1	185	263	0	1	264	23	1	0	24	1	0	0	1	7	6	8	17	1	7	0	3	49
11:45 to 12:00	116	2	4	122	202	6	1	209	140	2	1	143	3	0	0	3	157	1	3	161	232	1	1	234	17	0	0	17	0	0	0	0	7	9	9	18	5	4	1	0	53
12:00 to 12:15	138	1	1	140	209	2	0	211	124	0	2	126	2	0	0	2	153	1	1	155	243	0	0	243	31	0	0	31	0	0	0	0	5	0	9	16	13	3	7	0	53
12:15 to 12:30	120	1	1	122	260	2	1	263	129	3	3	135	1	0	0	1	165	2	2	169	221	3	0	224	27	0	0	27	2	0	0	2	2	3	10	14	2	2	2	0	35
12:30 to 12:45	124	0	1	125	241	1	0	242	122	1	1	124	1	0	0	1	143	2	1	146	243	2	1	246	32	0	0	32	1	0	0	1	6	5	14	9	7	7	0	3	51
12:45 to 13:00	103	1	4	108	203	5	0	208	122	0	2	124	3	0	0	3	180	1	2	183	228	1	1	230	42	0	0	42	0	0	0	0	5	6	13	29	9	7	2	3	74
13:00 to 13:15	116	0	2	118	248	4	1	253	88	0	2	90	0	0	0	0	153	0	2	155	246	1	0	247	25	0	0	25	0	0	0	0	3	7	10	8	0	4	1	0	33
13:15 to 13:30	126	0	2	128	266	6	1	273	134	0	2	136	1	0	0	1	165	0	1	166	229	0	0	229	32	1	0	33	1	0	0	1	4	12	17	18	8	1	5	2	67
13:30 to 13:45	138	1	0	139	264	4	0	268	128	1	1	130	1	0	0	1	186	1	2	189	245	1	2	248	38	1	0	39	0	0	0	0	6	5	20	9	7	3	5	4	59
13:45 to 14:00	104	1	3	108	212	1	1	214	110	1	2	113	2	0	0	2	166	1	2	169	234	0	0	234	22	0	0	22	1	0	0	1	2	10	16	11	2	11	2	0	54
Total	1,406	9	21	1,436	2,759	41	8	2,808	1,478	8	23	1,509	20	0	0	20	1,924	11	20	1,955	2,839	12	7	2,858	331	4	0	335	6	0	0	6	51	72	144	185	65	57	29	18	621

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 6. Tram Rd / Merlin St
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

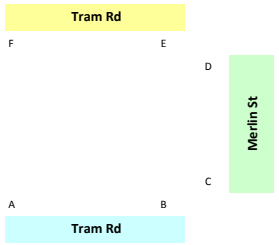


	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses

Approach	Tram Rd												Merlin St											
Direction		Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period		Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15		178	10	1	**189**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**
7:15 to 7:30		185	10	3	**198**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
7:30 to 7:45		220	13	2	**235**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
7:45 to 8:00		244	13	3	**260**	5	0	0	**5**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**
8:00 to 8:15		189	11	1	**201**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	1	0	0	**1**	0	0	0	**0**
8:15 to 8:30		279	5	3	**287**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**
8:30 to 8:45		263	15	3	**281**	3	0	0	**3**	0	0	0	**0**	2	0	0	**2**	3	0	0	**3**	0	0	0	**0**
8:45 to 9:00		279	10	2	**291**	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**
9:00 to 9:15		250	9	3	**262**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
9:15 to 9:30		200	8	1	**209**	2	0	0	**2**	0	0	0	**0**	1	0	0	**1**	4	0	0	**4**	0	0	0	**0**
9:30 to 9:45		194	8	2	**204**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**
9:45 to 10:00		235	13	1	**249**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
AM Totals		**2,716**	**125**	**25**	**2,866**	**12**	**0**	**0**	**12**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**11**	**15**	**0**	**0**	**15**	**0**	**0**	**0**	**0**
15:30 to 15:45		300	5	3	**308**	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**
15:45 to 16:00		331	1	2	**334**	4	0	0	**4**	0	0	0	**0**	1	0	0	**1**	2	0	0	**2**	0	0	0	**0**
16:00 to 16:15		335	4	4	**343**	2	0	0	**2**	0	0	0	**0**	1	0	0	**1**	3	0	0	**3**	0	0	0	**0**
16:15 to 16:30		311	2	2	**315**	3	0	0	**3**	0	0	0	**0**	1	0	0	**1**	4	0	0	**4**	0	0	0	**0**
16:30 to 16:45		303	3	2	**308**	2	0	0	**2**	0	0	0	**0**	1	0	0	**1**	4	0	0	**4**	0	0	0	**0**
16:45 to 17:00		329	6	3	**338**	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	2	0	0	**2**	0	0	0	**0**
17:00 to 17:15		365	0	0	**365**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
17:15 to 17:30		399	3	4	**406**	2	0	0	**2**	0	0	0	**0**	2	0	0	**2**	3	0	0	**3**	0	0	0	**0**
17:30 to 17:45		401	8	3	**412**	3	0	0	**3**	0	0	0	**0**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**
17:45 to 18:00		367	4	2	**373**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**
18:00 to 18:15		416	3	0	**419**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**
18:15 to 18:30		417	1	3	**421**	4	0	0	**4**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
PM Totals		**4,274**	**40**	**28**	**4,342**	**24**	**0**	**0**	**24**	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**10**	**26**	**0**	**0**	**26**	**0**	**0**	**0**	**0**

Approach	Tram Rd												Crossing Pedestrians						
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9U (U Turn)										
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	Total
7:00 to 7:15	3	0	0	**3**	208	4	2	**214**	0	0	0	**0**	0	0	0	1	0	0	**1**
7:15 to 7:30	2	0	0	**2**	271	9	2	**282**	0	0	0	**0**	0	0	0	0	0	0	**0**
7:30 to 7:45	2	0	0	**2**	337	5	3	**345**	0	0	0	**0**	0	0	0	3	0	0	**3**
7:45 to 8:00	3	0	0	**3**	395	7	3	**405**	0	0	0	**0**	0	0	0	0	0	0	**0**
8:00 to 8:15	3	0	0	**3**	315	10	2	**327**	0	0	0	**0**	0	0	1	1	0	0	**2**
8:15 to 8:30	4	0	0	**4**	331	9	2	**342**	0	0	0	**0**	0	0	1	2	0	0	**3**
8:30 to 8:45	5	0	0	**5**	346	7	2	**355**	0	0	0	**0**	0	0	0	0	0	0	**0**
8:45 to 9:00	5	0	0	**5**	259	8	3	**270**	0	0	0	**0**	0	0	0	1	0	0	**1**
9:00 to 9:15	5	0	0	**5**	282	9	5	**296**	0	0	0	**0**	0	0	0	0	0	0	**0**
9:15 to 9:30	9	0	0	**9**	233	10	1	**244**	0	0	0	**0**	0	0	0	1	0	0	**1**
9:30 to 9:45	2	0	0	**2**	249	5	3	**257**	0	0	0	**0**	0	0	0	0	0	0	**0**
9:45 to 10:00	7	0	0	**7**	254	9	1	**264**	0	0	0	**0**	0	0	0	0	0	0	**0**
AM Totals	**50**	**0**	**0**	**50**	**3,480**	**92**	**29**	**3,601**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**9**	**0**	**0**	**11**
15:30 to 15:45	8	0	0	**8**	364	17	3	**384**	0	0	0	**0**	0	0	2	1	0	0	**3**
15:45 to 16:00	7	0	0	**7**	350	9	2	**361**	0	0	0	**0**	0	0	2	0	0	0	**2**
16:00 to 16:15	18	0	0	**18**	344	10	1	**355**	0	0	0	**0**	0	0	1	1	0	0	**2**
16:15 to 16:30	9	0	0	**9**	389	6	5	**400**	0	0	0	**0**	0	0	0	0	0	0	**0**
16:30 to 16:45	9	0	0	**9**	383	5	4	**392**	0	0	0	**0**	0	0	0	0	0	0	**0**
16:45 to 17:00	10	0	0	**10**	401	7	2	**410**	0	0	0	**0**	0	0	1	3	0	0	**4**
17:00 to 17:15	14	0	0	**14**	369	7	3	**379**	0	0	0	**0**	0	0	0	0	0	0	**0**
17:15 to 17:30	15	0	0	**15**	406	4	2	**412**	0	0	0	**0**	0	0	2	1	0	0	**3**
17:30 to 17:45	10	0	0	**10**	423	1	3	**427**	0	0	0	**0**	0	0	5	3	0	0	**8**
17:45 to 18:00	18	0	0	**18**	323	2	3	**328**	0	0	0	**0**	0	0	0	1	0	0	**1**
18:00 to 18:15	9	0	0	**9**	349	0	1	**350**	0	0	0	**0**	0	0	5	0	0	0	**5**
18:15 to 18:30	5	0	0	**5**	324	2	1	**327**	0	0	0	**0**	0	0	3	0	0	0	**3**
PM Totals	**132**	**0**	**0**	**132**	**4,425**	**70**	**30**	**4,525**	**0**	**0**	**0**	**0**	**0**	**0**	**21**	**10**	**0**	**0**	**31**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 6. Tram Rd / Merlin St
Day/Date	: Sat, 6th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

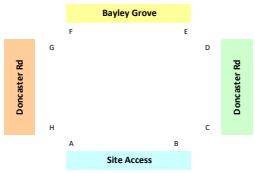


	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses

Approach	Tram Rd												Merlin St											
Direction		Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)					Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period		Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total		Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
11:00 to 11:15		276	4	1	**281**	2	0	0	**2**	0	0	0	**0**	1	0	0	**1**		2	0	0	**2**	0	0	0	**0**
11:15 to 11:30		226	2	1	**229**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**		2	0	0	**2**	0	0	0	**0**
11:30 to 11:45		262	4	1	**267**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**		3	0	0	**3**	0	0	0	**0**
11:45 to 12:00		277	5	0	**282**	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**		7	0	0	**7**	0	0	0	**0**
12:00 to 12:15		268	3	0	**271**	3	0	0	**3**	0	0	0	**0**	1	0	0	**1**		3	0	0	**3**	0	0	0	**0**
12:15 to 12:30		278	2	1	**281**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**		3	0	0	**3**	0	0	0	**0**
12:30 to 12:45		292	4	0	**296**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**		2	0	0	**2**	0	0	0	**0**
12:45 to 13:00		307	2	2	**311**	1	0	0	**1**	0	0	0	**0**	3	0	0	**3**		5	0	0	**5**	0	0	0	**0**
13:00 to 13:15		280	5	1	**286**	3	0	0	**3**	0	0	0	**0**	3	0	0	**3**		3	0	0	**3**	0	0	0	**0**
13:15 to 13:30		279	1	1	**281**	7	0	0	**7**	0	0	0	**0**	2	0	0	**2**		2	0	0	**2**	0	0	0	**0**
13:30 to 13:45		277	2	0	**279**	3	0	0	**3**	0	0	0	**0**	3	0	0	**3**		1	0	0	**1**	0	0	0	**0**
13:45 to 14:00		290	1	1	**292**	2	0	0	**2**	0	0	0	**0**	4	0	0	**4**		1	0	0	**1**	0	0	0	**0**
Total		**3,312**	**35**	**9**	**3,356**	**23**	**0**	**0**	**23**	**0**	**0**	**0**	**0**	**21**	**0**	**0**	**21**		**34**	**0**	**0**	**34**	**0**	**0**	**0**	**0**

Approach	Tram Rd												Crossing Pedestrians						
Direction	Direction 7 (Left Turn)				Direction 8 (Through)					Direction 9U (U Turn)									
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total		Cars	Trucks	Buses	Total	A	B	C	D	E	F	Total
11:00 to 11:15	11	0	0	**11**	272	8	1	**281**		0	0	0	**0**	0	0	1	2	0	0	**3**
11:15 to 11:30	10	0	0	**10**	292	3	1	**296**		0	0	0	**0**	0	0	0	2	0	0	**2**
11:30 to 11:45	9	0	0	**9**	282	2	1	**285**		0	0	0	**0**	0	0	1	2	0	0	**3**
11:45 to 12:00	9	0	0	**9**	293	7	1	**301**		0	0	0	**0**	0	0	4	4	0	0	**8**
12:00 to 12:15	8	0	0	**8**	296	3	0	**299**		0	0	0	**0**	0	0	0	0	0	0	**0**
12:15 to 12:30	9	0	0	**9**	310	2	1	**313**		0	0	0	**0**	0	0	1	1	0	0	**2**
12:30 to 12:45	9	0	0	**9**	340	2	1	**343**		0	0	0	**0**	0	0	2	4	0	0	**6**
12:45 to 13:00	12	0	0	**12**	318	4	0	**322**		0	0	0	**0**	0	0	0	5	0	0	**5**
13:00 to 13:15	9	0	0	**9**	349	5	1	**355**		0	0	0	**0**	0	0	0	0	0	0	**0**
13:15 to 13:30	15	0	0	**15**	347	6	1	**354**		0	0	0	**0**	0	0	4	0	0	0	**4**
13:30 to 13:45	5	0	0	**5**	357	6	1	**364**		0	0	0	**0**	0	0	1	2	0	0	**3**
13:45 to 14:00	10	0	0	**10**	309	2	2	**313**		0	0	0	**0**	0	0	1	0	0	0	**1**
Total	**116**	**0**	**0**	**116**	**3,765**	**50**	**11**	**3,826**		**0**	**0**	**0**	**0**	**0**	**0**	**15**	**22**	**0**	**0**	**37**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 7. Doncaster Rd / Bayley Grove
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

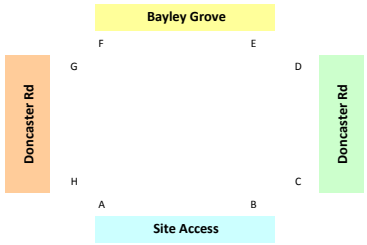


Classifications	**Class 1**	**Class 2**	**Class 3**
	Cars	Trucks	Buses

Approach	**Site Access**												**Doncaster Rd**															
Direction	**Direction 1 (Left Turn)**				**Direction 2 (Through)**				**Direction 3 (Right Turn)**				**Direction 3U (U Turn)**				**Direction 4 (Left Turn)**				**Direction 5 (Through)**				**Direction 6 (Right Turn)**				**Direction 6U (U Turn)**			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	167	1	4	**172**	0	0	0	**0**	0	0	0	**0**
7:15 to 7:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	202	1	6	**209**	0	0	0	**0**	0	0	0	**0**
7:30 to 7:45	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	245	2	6	**253**	0	0	0	**0**	0	0	0	**0**
7:45 to 8:00	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	230	1	4	**235**	0	0	0	**0**	0	0	0	**0**
8:00 to 8:15	1	3	0	**4**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	209	7	3	**219**	0	0	0	**0**	0	0	0	**0**
8:15 to 8:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	176	3	3	**182**	0	0	0	**0**	0	0	0	**0**
8:30 to 8:45	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	199	3	4	**206**	0	0	0	**0**	0	0	0	**0**
8:45 to 9:00	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	170	4	3	**177**	0	0	0	**0**	0	0	0	**0**
9:00 to 9:15	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	0	0	**4**	161	7	7	**175**	0	0	0	**0**	0	0	0	**0**
9:15 to 9:30	0	1	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	0	0	**4**	168	4	4	**176**	0	0	0	**0**	0	0	0	**0**
9:30 to 9:45	2	1	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	169	2	3	**174**	0	0	0	**0**	0	0	0	**0**
9:45 to 10:00	7	0	0	**7**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	0	0	**4**	176	14	1	**191**	0	0	0	**0**	0	0	0	**0**
AM Totals	**22**	**5**	**0**	**27**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**0**	**0**	**20**	**2,272**	**49**	**48**	**2,369**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
15:30 to 15:45	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	246	1	2	**249**	0	0	0	**0**	0	0	0	**0**
15:45 to 16:00	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	196	2	6	**204**	0	0	0	**0**	0	0	0	**0**
16:00 to 16:15	4	0	0	**4**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	216	2	3	**221**	0	0	0	**0**	0	0	0	**0**
16:15 to 16:30	7	0	0	**7**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	179	2	5	**186**	0	0	0	**0**	0	0	0	**0**
16:30 to 16:45	9	0	0	**9**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	0	0	**4**	222	2	1	**225**	0	0	0	**0**	0	0	0	**0**
16:45 to 17:00	11	0	0	**11**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	231	3	2	**236**	0	0	0	**0**	0	0	0	**0**
17:00 to 17:15	12	0	0	**12**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	205	0	3	**208**	0	0	0	**0**	0	0	0	**0**
17:15 to 17:30	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	251	0	3	**254**	0	0	0	**0**	0	0	0	**0**
17:30 to 17:45	7	0	0	**7**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	224	0	2	**226**	0	0	0	**0**	0	0	0	**0**
17:45 to 18:00	8	0	0	**8**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	5	0	0	**5**	294	0	2	**296**	0	0	0	**0**	0	0	0	**0**
18:00 to 18:15	9	0	0	**9**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	278	1	3	**282**	0	0	0	**0**	0	0	0	**0**
18:15 to 18:30	8	0	0	**8**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	251	0	1	**252**	0	0	0	**0**	0	0	0	**0**
PM Totals	**84**	**0**	**0**	**84**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**30**	**0**	**0**	**30**	**2,793**	**13**	**33**	**2,839**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Approach	**Bayley Grove**												**Doncaster Rd**												**Crossing Pedestrians**								
Direction	**Direction 7 (Left Turn)**				**Direction 8 (Through)**				**Direction 9 (Right Turn)**				**Direction 9U (U Turn)**				**Direction 10 (Left Turn)**				**Direction 11 (Through)**				**Direction 12 (Right Turn)**				**Direction 12U (U Turn)**												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
7:00 to 7:15	4	0	0	**4**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	60	5	2	**67**	0	0	0	**0**	0	0	0	**0**	0	1	0	0	0	0	0	0	**1**
7:15 to 7:30	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	79	5	4	**88**	0	0	0	**0**	0	0	0	**0**	0	1	0	0	0	0	0	0	**1**
7:30 to 7:45	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	103	2	1	**106**	0	0	0	**0**	0	0	0	**0**	0	0	0	0	2	0	0	0	**2**
7:45 to 8:00	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	0	0	**4**	102	6	4	**112**	0	0	0	**0**	0	0	0	**0**	1	1	0	0	0	0	0	0	**2**
8:00 to 8:15	6	0	0	**6**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	0	0	**4**	118	3	3	**124**	0	0	0	**0**	0	0	0	**0**	0	1	0	0	1	0	0	0	**2**
8:15 to 8:30	4	1	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	182	5	2	**189**	0	0	0	**0**	0	0	0	**0**	0	3	0	0	0	0	0	0	**3**
8:30 to 8:45	10	0	0	**10**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	216	5	7	**228**	0	0	0	**0**	0	0	0	**0**	0	1	0	0	1	0	0	0	**2**
8:45 to 9:00	6	0	0	**6**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	0	0	**4**	270	6	7	**283**	0	0	0	**0**	0	0	0	**0**	0	1	0	0	1	1	0	0	**3**
9:00 to 9:15	6	0	0	**6**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	8	1	0	**9**	221	6	4	**231**	0	0	0	**0**	0	0	0	**0**	0	0	0	0	2	1	0	0	**3**
9:15 to 9:30	8	1	0	**9**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	7	1	0	**8**	199	8	9	**216**	0	0	0	**0**	0	0	0	**0**	0	0	0	0	0	0	0	0	**0**
9:30 to 9:45	8	1	0	**9**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	1	0	**4**	186	6	2	**194**	0	0	0	**0**	0	0	0	**0**	0	0	0	0	1	0	0	0	**1**
9:45 to 10:00	4	0	0	**4**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	210	7	1	**218**	0	0	0	**0**	0	0	0	**0**	0	0	0	0	0	0	0	0	**0**
AM Totals	**69**	**3**	**0**	**72**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**44**	**3**	**0**	**47**	**1,946**	**64**	**46**	**2,056**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**9**	**0**	**0**	**8**	**2**	**0**	**0**	**20**
15:30 to 15:45	12	0	0	**12**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	244	3	2	**249**	0	0	0	**0**	0	0	0	**0**	2	2	0	1	0	0	0	0	**5**
15:45 to 16:00	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	7	0	0	**7**	289	3	2	**294**	0	0	0	**0**	0	0	0	**0**	1	3	0	0	0	0	0	2	**6**
16:00 to 16:15	8	0	0	**8**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	5	0	0	**5**	250	1	4	**255**	0	0	0	**0**	0	0	0	**0**	1	2	1	0	1	1	0	0	**6**
16:15 to 16:30	11	0	0	**11**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	7	0	0	**7**	316	2	4	**322**	0	0	0	**0**	0	0	0	**0**	3	0	0	0	0	0	0	0	**3**
16:30 to 16:45	7	0	0	**7**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	0	0	**4**	274	0	3	**277**	0	0	0	**0**	0	0	0	**0**	2	4	0	0	0	0	2	0	**8**
16:45 to 17:00	8	0	0	**8**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	8	0	0	**8**	320	2	2	**324**	0	0	0	**0**	0	0	0	**0**	5	0	0	0	0	0	0	0	**5**
17:00 to 17:15	12	0	0	**12**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	293	2	3	**298**	0	0	0	**0**	0	0	0	**0**	3	0	1	0	2	1	0	0	**7**
17:15 to 17:30	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	10	0	0	**10**	291	0	4	**295**	0	0	0	**0**	0	0	0	**0**	0	1	0	0	0	1	0	0	**2**
17:30 to 17:45	6	0	0	**6**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	312	1	2	**315**	0	0	0	**0**	0	0	0	**0**	2	2	0	0	2	2	0	0	**8**
17:45 to 18:00	8	0	0	**8**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	4	0	0	**4**	310	1	0	**311**	0	0	0	**0**	0	0	0	**0**	3	0	0	0	1	0	0	0	**4**
18:00 to 18:15	9	0	0	**9**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	10	0	0	**10**	313	1	3	**317**	0	0	0	**0**	0	0	0	**0**	2	0	0	0	0	0	0	0	**2**
18:15 to 18:30	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	7	0	0	**7**	258	0	6	**264**	0	0	0	**0**	0	0	0	**0**	0	0	0	0	0	1	0	0	**1**
PM Totals	**94**	**0**	**0**	**94**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**77**	**0**	**0**	**77**	**3,470**	**16**	**35**	**3,521**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**24**	**14**	**2**	**1**	**6**	**6**	**2**	**2**	**57**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 7. Doncaster Rd / Bayley Grove
Day/Date	: Sat, 6th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data



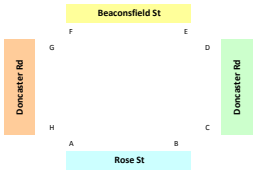
	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses

Approach	Site Access																Doncaster Rd															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
11:00 to 11:15	11	0	0	**11**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	16	0	0	**16**	226	1	2	**229**	0	0	0	**0**	0	0	0	**0**
11:15 to 11:30	11	0	0	**11**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	243	3	1	**247**	0	0	0	**0**	0	0	0	**0**
11:30 to 11:45	8	0	0	**8**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	7	0	0	**7**	236	0	2	**238**	0	0	0	**0**	0	0	0	**0**
11:45 to 12:00	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	14	0	0	**14**	279	3	1	**283**	0	0	0	**0**	0	0	0	**0**
12:00 to 12:15	16	0	0	**16**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	12	0	0	**12**	244	0	2	**246**	0	0	0	**0**	0	0	0	**0**
12:15 to 12:30	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	12	0	0	**12**	267	1	1	**269**	0	0	0	**0**	0	0	0	**0**
12:30 to 12:45	19	0	0	**19**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	10	0	0	**10**	281	2	2	**285**	0	0	0	**0**	0	0	0	**0**
12:45 to 13:00	19	0	0	**19**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	10	0	0	**10**	286	1	1	**288**	0	0	0	**0**	0	0	0	**0**
13:00 to 13:15	21	0	0	**21**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	18	0	0	**18**	236	1	2	**239**	0	0	0	**0**	0	0	0	**0**
13:15 to 13:30	20	0	0	**20**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	15	0	0	**15**	295	0	3	**298**	0	0	0	**0**	0	0	0	**0**
13:30 to 13:45	13	0	0	**13**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	5	0	0	**5**	241	1	1	**243**	0	0	0	**0**	0	0	0	**0**
13:45 to 14:00	20	0	0	**20**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	7	0	0	**7**	233	2	1	**236**	0	0	0	**0**	0	0	0	**0**
Total	**166**	**0**	**0**	**166**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**129**	**0**	**0**	**129**	**3,067**	**15**	**19**	**3,101**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Approach	Bayley Grove																Doncaster Rd																Crossing Pedestrians								
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
11:00 to 11:15	12	0	0	**12**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	243	1	0	**244**	0	0	0	**0**	0	0	0	**0**	4	0	0	0	5	3	0	0	**12**
11:15 to 11:30	4	0	0	**4**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	279	1	1	**281**	0	0	0	**0**	0	0	0	**0**	3	0	0	0	0	1	0	0	**4**
11:30 to 11:45	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	9	0	0	**9**	281	1	2	**284**	0	0	0	**0**	0	0	0	**0**	1	0	0	1	2	3	0	0	**7**
11:45 to 12:00	6	1	0	**7**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	252	3	2	**257**	0	0	0	**0**	0	0	0	**0**	2	2	0	0	1	2	0	0	**7**
12:00 to 12:15	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	7	0	0	**7**	293	2	1	**296**	0	0	0	**0**	0	0	0	**0**	3	4	0	0	1	1	0	0	**9**
12:15 to 12:30	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	9	1	0	**10**	262	0	0	**262**	0	0	0	**0**	0	0	0	**0**	2	3	0	0	0	0	0	1	**6**
12:30 to 12:45	10	1	0	**11**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	9	0	0	**9**	304	4	2	**310**	0	0	0	**0**	0	0	0	**0**	0	2	0	0	1	1	0	0	**4**
12:45 to 13:00	9	0	0	**9**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	315	1	2	**318**	0	0	0	**0**	0	0	0	**0**	6	2	2	0	0	1	0	0	**11**
13:00 to 13:15	4	0	0	**4**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	7	0	0	**7**	291	1	1	**293**	0	0	0	**0**	0	0	0	**0**	5	9	0	0	0	2	0	0	**16**
13:15 to 13:30	11	0	0	**11**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	9	0	0	**9**	281	0	1	**282**	0	0	0	**0**	0	0	0	**0**	1	2	1	0	2	0	0	0	**6**
13:30 to 13:45	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	6	0	0	**6**	301	1	2	**304**	0	0	0	**0**	0	0	0	**0**	0	5	0	0	0	0	0	0	**5**
13:45 to 14:00	7	0	0	**7**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	0	**3**	307	1	1	**309**	0	0	0	**0**	0	0	0	**0**	2	1	0	0	0	0	0	0	**3**
Total	**78**	**2**	**0**	**80**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**74**	**1**	**0**	**75**	**3,409**	**16**	**15**	**3,440**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**29**	**30**	**3**	**1**	**12**	**14**	**0**	**1**	**90**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 8. Doncaster Rd / Rose St / Beaconsfield St
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses



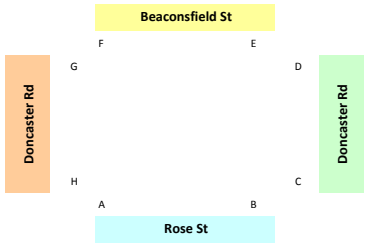
Approach	Rose St												Doncaster Rd											
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15	1	0	0	1	0	0	0	0	2	0	0	2	0	0	0	0	8	0	0	8	169	3	5	177
7:15 to 7:30	2	0	0	2	0	0	0	0	5	0	0	5	0	0	0	0	19	0	0	19	206	2	6	214
7:30 to 7:45	3	0	0	3	1	0	0	1	3	0	0	3	0	0	0	0	21	0	0	21	219	3	7	229
7:45 to 8:00	0	0	0	0	1	0	0	1	6	0	0	6	0	0	0	0	16	0	0	16	216	1	3	220
8:00 to 8:15	9	0	0	9	0	0	0	0	4	0	0	4	0	0	0	0	15	1	0	16	200	7	4	211
8:15 to 8:30	4	0	0	4	0	0	0	0	4	1	0	5	0	0	0	0	12	0	0	12	175	3	3	181
8:30 to 8:45	8	0	0	8	0	0	0	0	4	0	0	4	0	0	0	0	12	1	0	13	181	3	4	188
8:45 to 9:00	5	1	0	6	0	0	0	0	8	0	0	8	0	0	0	0	28	0	0	28	169	3	3	175
9:00 to 9:15	10	1	0	11	2	0	0	2	12	0	0	12	0	0	0	0	13	0	0	13	147	7	6	160
9:15 to 9:30	11	0	0	11	3	0	0	3	4	2	0	6	0	0	0	0	10	0	0	10	153	5	3	161
9:30 to 9:45	10	0	0	10	0	0	0	0	4	0	0	4	0	0	0	0	13	2	0	15	150	5	3	158
9:45 to 10:00	5	1	0	6	0	0	0	0	6	1	0	7	0	0	0	0	8	0	0	8	168	12	2	182
AM Totals	68	3	0	71	7	0	0	7	62	4	0	66	0	0	0	0	175	4	0	179	2,153	54	49	2,256
15:30 to 15:45	8	0	0	8	0	0	0	0	6	1	0	7	0	0	0	0	15	0	0	15	198	0	3	201
15:45 to 16:00	8	0	0	8	1	0	0	1	6	0	0	6	0	0	0	0	15	0	0	15	191	1	6	198
16:00 to 16:15	9	0	0	9	1	0	0	1	8	1	0	9	0	0	0	0	16	0	0	16	197	2	2	201
16:15 to 16:30	7	0	0	7	2	0	0	2	11	0	0	11	0	0	0	0	20	0	0	20	165	1	5	171
16:30 to 16:45	19	0	0	19	1	0	0	1	15	0	0	15	0	0	0	0	17	1	0	18	198	1	2	201
16:45 to 17:00	6	1	0	7	0	0	0	0	11	0	0	11	0	0	0	0	11	1	0	12	204	2	3	209
17:00 to 17:15	4	0	0	4	0	0	0	0	9	0	0	9	0	0	0	0	13	0	0	13	212	0	2	214
17:15 to 17:30	5	0	0	5	1	0	0	1	7	0	0	7	0	0	0	0	14	0	0	14	232	0	2	234
17:30 to 17:45	1	0	0	1	2	0	0	2	4	1	0	5	0	0	0	0	9	0	0	9	215	0	3	218
17:45 to 18:00	4	0	0	4	0	0	0	0	8	0	0	8	0	0	0	0	10	0	0	10	265	0	1	266
18:00 to 18:15	4	0	0	4	1	0	0	1	1	0	0	1	0	0	0	0	9	0	0	9	255	1	3	259
18:15 to 18:30	5	0	0	5	2	0	0	2	7	0	0	7	0	0	0	0	5	0	0	5	241	0	1	242
PM Totals	80	1	0	81	11	0	0	11	93	3	0	96	0	0	0	0	154	2	0	156	2,573	8	33	2,614

Approach	Doncaster Rd							
Direction	Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15	10	0	0	10	0	0	0	0
7:15 to 7:30	13	0	0	13	0	0	0	0
7:30 to 7:45	16	0	0	16	2	0	0	2
7:45 to 8:00	15	0	0	15	0	0	0	0
8:00 to 8:15	14	0	0	14	1	0	0	1
8:15 to 8:30	14	0	0	14	0	0	0	0
8:30 to 8:45	8	0	0	8	0	0	0	0
8:45 to 9:00	14	1	0	15	3	0	0	3
9:00 to 9:15	7	0	0	7	0	0	0	0
9:15 to 9:30	13	0	0	13	1	0	0	1
9:30 to 9:45	8	0	0	8	3	0	0	3
9:45 to 10:00	7	0	0	7	0	0	0	0
AM Totals	139	1	0	140	10	0	0	10
15:30 to 15:45	12	0	0	12	0	0	0	0
15:45 to 16:00	20	0	0	20	2	0	0	2
16:00 to 16:15	21	0	0	21	0	0	0	0
16:15 to 16:30	9	0	0	9	3	0	0	3
16:30 to 16:45	10	0	0	10	1	0	0	1
16:45 to 17:00	7	0	0	7	4	0	0	4
17:00 to 17:15	8	0	0	8	0	0	0	0
17:15 to 17:30	8	0	0	8	2	0	0	2
17:30 to 17:45	14	0	0	14	4	0	0	4
17:45 to 18:00	11	0	0	11	1	0	0	1
18:00 to 18:15	12	0	0	12	0	0	0	0
18:15 to 18:30	7	0	0	7	1	0	0	1
PM Totals	139	0	0	139	18	0	0	18

Approach	Beaconsfield St												Doncaster Rd											
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15	5	0	0	5	1	0	0	1	6	0	0	6	0	0	0	0	3	0	0	3	49	5	2	56
7:15 to 7:30	6	0	0	6	0	0	0	0	3	0	0	3	0	0	0	0	8	0	0	8	66	4	3	73
7:30 to 7:45	14	1	0	15	0	0	0	0	5	0	0	5	0	0	0	0	4	0	0	4	91	3	1	95
7:45 to 8:00	10	0	0	10	1	0	0	1	4	0	0	4	0	0	0	0	2	1	0	3	93	5	4	102
8:00 to 8:15	8	0	0	8	0	0	0	0	2	0	0	2	0	0	0	0	4	0	0	4	105	3	3	111
8:15 to 8:30	15	0	0	15	0	0	0	0	2	0	0	2	0	0	0	0	9	0	0	9	175	7	2	184
8:30 to 8:45	19	0	0	19	0	0	0	0	5	0	0	5	0	0	0	0	9	0	0	9	201	4	7	212
8:45 to 9:00	16	0	0	16	0	0	0	0	5	0	0	5	0	0	0	0	9	0	0	9	257	6	6	269
9:00 to 9:15	13	0	0	13	0	0	0	0	4	0	1	5	0	0	0	0	10	0	0	10	204	3	5	212
9:15 to 9:30	13	0	0	13	1	1	0	2	6	0	0	6	0	0	0	0	7	0	0	7	200	10	9	219
9:30 to 9:45	14	0	0	14	0	0	0	0	3	1	0	4	0	0	0	0	3	1	0	4	163	6	3	172
9:45 to 10:00	8	0	0	8	0	0	0	0	6	0	0	6	0	0	0	0	5	1	0	6	195	4	2	201
AM Totals	141	1	0	142	3	1	0	4	51	1	1	53	0	0	0	0	73	3	0	76	1,799	60	47	1,906
15:30 to 15:45	13	1	0	14	0	0	0	0	1	0	0	1	0	0	0	0	11	0	0	11	238	3	1	242
15:45 to 16:00	10	0	0	10	1	0	0	1	3	0	0	3	0	0	0	0	7	0	0	7	273	3	3	279
16:00 to 16:15	19	0	0	19	1	0	0	1	5	0	0	5	0	0	0	0	7	0	0	7	259	1	4	264
16:15 to 16:30	16	0	0	16	2	0	0	2	6	0	0	6	0	0	0	0	15	1	0	16	274	1	4	279
16:30 to 16:45	17	1	0	18	0	0	0	0	2	0	0	2	0	0	0	0	7	0	0	7	254	0	3	257
16:45 to 17:00	15	0	0	15	1	0	0	1	8	0	0	8	0	0	0	0	7	0	0	7	292	1	2	295
17:00 to 17:15	32	0	0	32	0	0	0	0	3	0	0	3	0	0	0	0	10	0	0	10	311	1	3	315
17:15 to 17:30	24	0	0	24	1	0	0	1	6	0	0	6	0	0	0	0	11	0	0	11	281	1	4	286
17:30 to 17:45	20	0	0	20	0	0	0	0	6	0	0	6	0	0	0	0	9	0	0	9	292	0	2	294
17:45 to 18:00	13	0	0	13	0	0	0	0	4	0	0	4	0	0	0	0	9	0	0	9	295	1	3	299
18:00 to 18:15	19	0	0	19	0	0	0	0	3	0	0	3	0	0	0	0	8	0	0	8	290	0	3	293
18:15 to 18:30	11	0	0	11	2	0	0	2	4	0	0	4	0	0	0	0	5	0	0	5	248	1	7	256
PM Totals	209	2	0	211	8	0	0	8	51	0	0	51	0	0	0	0	106	1	0	107	3,307	13	39	3,359

Approach	Doncaster Rd								Crossing Pedestrians								
Direction	Direction 12 (Right Turn)				Direction 12U (U Turn)												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
7:00 to 7:15	5	0	0	5	2	0	0	2	3	1	0	0	0	0	0	1	5
7:15 to 7:30	4	0	0	4	3	0	0	3	3	2	0	0	2	0	0	3	10
7:30 to 7:45	6	0	0	6	1	0	0	1	1	1	0	0	3	0	0	1	6
7:45 to 8:00	8	0	0	8	5	0	0	5	2	0	0	0	1	3	0	1	7
8:00 to 8:15	9	0	0	9	6	0	0	6	6	0	0	0	1	0	0	3	10
8:15 to 8:30	6	0	0	6	6	0	0	6	3	3	0	0	3	3	0	3	15
8:30 to 8:45	5	0	0	5	2	0	0	2	2	1	3	1	0	0	1	1	10
8:45 to 9:00	4	0	0	4	2	0	0	2	2	1	2	0	0	0	0	0	5
9:00 to 9:15	4	0	0	4	4	0	0	4	2	4	2	0	0	0	1	6	15
9:15 to 9:30	4	0	0	4	5	3	5	0	0	0	0	0	0	3	16		
9:30 to 9:45	5	0	0	5	5	0	0	5	2	1	2	1	0	0	1	0	7
9:45 to 10:00	9	0	0	9	10	1	0	11	1	3	1	0	0	0	0	3	8
AM Totals	71	0	0	71	50	1	0	51	31	22	15	2	10	6	3	25	114
15:30 to 15:45	3	0	0	3	4	0	0	4	2	5	1	0	0	0	1	1	10
15:45 to 16:00	7	0	0	7	3	0	0	3	7	2	0	0	0	0	0	0	9
16:00 to 16:15	11	0	0	11	7	0	0	7	3	3	0	0	0	2	0	0	8
16:15 to 16:30	9	0	0	9	6	0	0	6	5	6	6	1	0	0	0	0	18
16:30 to 16:45	8	0	0	8	6	0	0	6	9	1	0	1	0	0	0	0	11
16:45 to 17:00	8	0	0	8	6	0	0	6	9	1	0	1	0	0	0	0	11
17:00 to 17:15	6	0	0	6	1	0	0	1	0	3	2	2	0	0	0	1	8
17:15 to 17:30	4	0	0	4	5	0	0	5	6	0	3	1	0	0	0	0	10
17:30 to 17:45	8	0	0	8	4	0	0	4	2	5	3	2	0	0	0	2	14
17:45 to 18:00	7	0	0	7	2	5	0	0	0	0	0	0	0	0	0	7	
18:00 to 18:15	6	0	0	6	5	0	0	5	4	0	1	0	0	0	0	0	5
18:15 to 18:30	3	0	0	3	3	0	0	3	2	0	2	0	0	0	0	1	5
PM Totals	73	0	0	73	60	0	0	60	43	31	19	7	0	2	2	6	110

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 8. Doncaster Rd / Rose St / Beaconsfield St
Day/Date	: Sat, 6th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

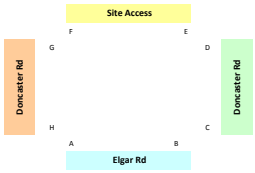


	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses

Approach	Rose St																Doncaster Rd															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
11:00 to 11:15	8	0	0	**8**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	13	0	0	**13**	208	1	2	**211**	5	0	0	**5**	1	0	0	**1**
11:15 to 11:30	11	0	0	**11**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	7	0	0	**7**	215	3	2	**220**	3	0	0	**3**	1	0	0	**1**
11:30 to 11:45	11	0	0	**11**	2	0	0	**2**	9	0	0	**9**	0	0	0	**0**	14	0	0	**14**	235	0	1	**236**	12	0	0	**12**	1	0	0	**1**
11:45 to 12:00	13	0	0	**13**	0	0	0	**0**	8	0	0	**8**	0	0	0	**0**	11	0	0	**11**	278	3	1	**282**	6	0	0	**6**	0	0	0	**0**
12:00 to 12:15	12	0	0	**12**	0	0	0	**0**	11	0	0	**11**	0	0	0	**0**	10	0	0	**10**	250	0	2	**252**	8	0	0	**8**	0	0	0	**0**
12:15 to 12:30	6	0	0	**6**	0	0	0	**0**	6	1	0	**7**	0	0	0	**0**	11	0	0	**11**	267	1	1	**269**	2	0	0	**2**	2	0	0	**2**
12:30 to 12:45	5	0	0	**5**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	20	0	0	**20**	266	2	2	**270**	8	0	0	**8**	0	0	0	**0**
12:45 to 13:00	16	0	0	**16**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**	5	0	0	**5**	262	1	1	**264**	7	0	0	**7**	0	0	0	**0**
13:00 to 13:15	13	0	0	**13**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	11	0	0	**11**	226	1	2	**229**	7	0	0	**7**	3	0	0	**3**
13:15 to 13:30	10	0	0	**10**	3	0	0	**3**	3	0	0	**3**	0	0	0	**0**	4	0	0	**4**	267	0	3	**270**	10	0	0	**10**	0	0	0	**0**
13:30 to 13:45	8	0	0	**8**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	7	0	0	**7**	226	1	1	**228**	6	0	0	**6**	0	0	0	**0**
13:45 to 14:00	9	0	0	**9**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	9	0	0	**9**	218	1	1	**220**	5	0	0	**5**	1	0	0	**1**
Total	**122**	**0**	**0**	**122**	**6**	**0**	**0**	**6**	**60**	**1**	**0**	**61**	**0**	**0**	**0**	**0**	**122**	**0**	**0**	**122**	**2,918**	**14**	**19**	**2,951**	**79**	**0**	**0**	**79**	**9**	**0**	**0**	**9**

Approach	Beaconsfield St																Doncaster Rd																Crossing Pedestrians								
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
11:00 to 11:15	13	0	0	**13**	2	0	0	**2**	5	0	0	**5**	0	0	0	**0**	8	0	0	**8**	427	1	1	**429**	5	0	0	**5**	6	0	0	**6**	0	1	4	1	0	0	0	0	**6**
11:15 to 11:30	12	0	0	**12**	1	0	0	**1**	3	0	0	**3**	0	0	0	**0**	6	0	0	**6**	241	1	1	**243**	5	0	0	**5**	9	0	0	**9**	5	4	0	1	0	0	0	0	**10**
11:30 to 11:45	16	0	0	**16**	1	0	0	**1**	3	0	0	**3**	0	0	0	**0**	5	0	0	**5**	243	2	2	**247**	7	0	0	**7**	6	0	0	**6**	5	5	1	4	0	0	0	1	**16**
11:45 to 12:00	11	0	0	**11**	1	0	0	**1**	4	0	0	**4**	0	0	0	**0**	12	0	0	**12**	240	2	2	**244**	6	0	0	**6**	5	0	0	**5**	2	2	2	2	0	0	0	1	**9**
12:00 to 12:15	10	0	0	**10**	1	0	0	**1**	4	0	0	**4**	0	0	0	**0**	11	0	0	**11**	253	2	1	**256**	6	0	0	**6**	4	0	0	**4**	8	3	2	1	0	0	0	0	**14**
12:15 to 12:30	6	0	0	**6**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	6	0	0	**6**	255	1	0	**256**	3	0	0	**3**	9	0	0	**9**	6	5	1	0	0	0	0	1	**13**
12:30 to 12:45	12	1	0	**13**	1	0	0	**1**	4	0	0	**4**	0	0	0	**0**	18	0	0	**18**	272	3	2	**277**	7	0	0	**7**	7	0	0	**7**	0	2	4	0	0	0	1	0	**7**
12:45 to 13:00	14	0	0	**14**	1	0	0	**1**	2	0	0	**2**	0	0	0	**0**	11	0	0	**11**	274	1	2	**277**	10	0	0	**10**	17	0	0	**17**	2	8	0	1	0	0	0	0	**11**
13:00 to 13:15	15	0	0	**15**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	8	0	0	**8**	262	0	1	**263**	10	0	0	**10**	8	0	0	**8**	6	3	3	4	0	0	0	0	**16**
13:15 to 13:30	13	0	0	**13**	1	0	0	**1**	3	0	0	**3**	0	0	0	**0**	12	0	0	**12**	241	0	1	**242**	9	0	0	**9**	11	0	0	**11**	11	3	3	3	0	0	0	1	**21**
13:30 to 13:45	4	0	0	**4**	1	0	0	**1**	3	0	0	**3**	0	0	0	**0**	13	0	0	**13**	270	1	3	**274**	4	0	0	**4**	11	0	0	**11**	1	13	0	0	0	0	0	0	**14**
13:45 to 14:00	4	0	0	**4**	1	0	0	**1**	5	0	0	**5**	0	0	0	**0**	12	0	0	**12**	294	1	1	**296**	7	0	0	**7**	12	0	0	**12**	7	4	0	1	0	0	0	0	**12**
Total	**130**	**1**	**0**	**131**	**11**	**0**	**0**	**11**	**40**	**0**	**0**	**40**	**0**	**0**	**0**	**0**	**122**	**0**	**0**	**122**	**3,272**	**15**	**17**	**3,304**	**79**	**0**	**0**	**79**	**105**	**0**	**0**	**105**	**53**	**53**	**20**	**18**	**0**	**0**	**1**	**4**	**149**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 9. Doncaster Rd / Elgar Rd
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

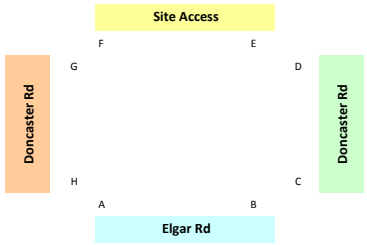


	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses

Approach	Elgar Rd												Doncaster Rd											
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15	6	0	0	**6**	0	0	0	**0**	52	1	1	**54**	0	0	0	**0**	135	1	2	**138**	173	3	5	**181**	1	0	0	**1**	1	0	0	**1**
7:15 to 7:30	7	0	0	**7**	0	0	0	**0**	45	1	0	**46**	0	0	0	**0**	136	2	3	**141**	235	2	6	**243**	4	0	0	**4**	4	0	0	**4**
7:30 to 7:45	6	1	0	**7**	1	0	0	**1**	70	2	1	**73**	0	0	0	**0**	185	7	7	**199**	254	2	7	**263**	1	0	0	**1**	1	0	0	**1**
7:45 to 8:00	14	0	0	**14**	0	0	0	**0**	82	1	2	**85**	0	0	0	**0**	187	2	5	**194**	242	1	3	**246**	4	0	0	**4**	4	0	0	**4**
8:00 to 8:15	12	0	0	**12**	1	0	0	**1**	105	3	0	**108**	0	0	0	**0**	212	3	2	**217**	211	7	4	**222**	4	0	0	**4**	4	0	0	**4**
8:15 to 8:30	11	0	0	**11**	0	0	0	**0**	144	1	4	**149**	0	0	0	**0**	200	2	1	**203**	193	3	3	**199**	6	1	0	**7**	6	1	0	**7**
8:30 to 8:45	10	1	0	**11**	2	0	0	**2**	193	3	2	**198**	0	0	0	**0**	172	3	4	**179**	186	3	5	**194**	10	0	0	**10**	10	0	0	**10**
8:45 to 9:00	13	0	1	**14**	4	0	0	**4**	205	2	4	**211**	0	0	0	**0**	150	2	1	**153**	195	4	1	**200**	2	0	0	**2**	2	0	0	**2**
9:00 to 9:15	17	1	0	**18**	4	0	0	**4**	156	4	4	**164**	0	0	0	**0**	137	3	2	**142**	159	6	6	**171**	3	0	0	**3**	3	0	0	**3**
9:15 to 9:30	10	0	1	**11**	0	0	0	**0**	130	3	3	**136**	0	0	0	**0**	124	2	4	**130**	156	6	2	**164**	5	0	0	**5**	5	0	0	**5**
9:30 to 9:45	10	0	0	**10**	0	0	0	**0**	130	0	1	**131**	0	0	0	**0**	101	1	0	**102**	152	6	3	**161**	8	0	0	**8**	8	0	0	**8**
9:45 to 10:00	14	0	0	**14**	1	0	0	**1**	105	3	3	**111**	0	0	0	**0**	100	2	3	**105**	180	13	2	**195**	2	0	0	**2**	2	0	0	**2**
AM Totals	**130**	**3**	**2**	**135**	**13**	**0**	**0**	**13**	**1,417**	**24**	**25**	**1,466**	**0**	**0**	**0**	**0**	**1,839**	**30**	**34**	**1,903**	**2,336**	**56**	**47**	**2,439**	**50**	**1**	**0**	**51**	**50**	**1**	**0**	**51**
15:30 to 15:45	27	0	0	**27**	0	0	0	**0**	229	3	3	**235**	0	0	0	**0**	131	1	0	**132**	204	0	3	**207**	0	0	0	**0**	8	0	0	**8**
15:45 to 16:00	21	0	0	**21**	0	0	0	**0**	263	1	4	**268**	0	0	0	**0**	129	0	2	**131**	201	2	6	**209**	0	0	0	**0**	3	0	0	**3**
16:00 to 16:15	16	0	0	**16**	0	0	0	**0**	236	2	5	**243**	0	0	0	**0**	100	0	3	**103**	218	2	2	**222**	0	0	0	**0**	3	0	0	**3**
16:15 to 16:30	11	0	0	**11**	0	0	0	**0**	270	1	4	**275**	0	0	0	**0**	105	0	1	**106**	188	1	4	**193**	0	0	0	**0**	2	0	0	**2**
16:30 to 16:45	7	0	0	**7**	0	0	0	**0**	209	1	1	**211**	0	0	0	**0**	124	1	4	**129**	219	3	2	**224**	3	0	0	**3**	5	0	0	**5**
16:45 to 17:00	13	0	0	**13**	0	0	0	**0**	212	0	2	**214**	0	0	0	**0**	126	0	2	**128**	224	3	3	**230**	0	0	0	**0**	0	0	0	**0**
17:00 to 17:15	14	0	0	**14**	0	0	0	**0**	225	1	3	**229**	0	0	0	**0**	118	0	5	**123**	210	0	2	**212**	3	0	0	**3**	5	0	0	**5**
17:15 to 17:30	20	0	0	**20**	0	0	0	**0**	233	2	1	**236**	0	0	0	**0**	132	0	1	**133**	230	1	2	**233**	0	0	0	**0**	8	0	0	**8**
17:30 to 17:45	12	0	0	**12**	0	0	0	**0**	223	2	2	**227**	0	0	0	**0**	136	2	2	**140**	225	0	3	**228**	0	0	0	**0**	5	0	0	**5**
17:45 to 18:00	14	0	0	**14**	0	0	0	**0**	241	1	4	**246**	0	0	0	**0**	107	0	1	**108**	282	1	1	**284**	0	0	0	**0**	8	0	0	**8**
18:00 to 18:15	18	0	0	**18**	0	0	0	**0**	187	2	1	**190**	0	0	0	**0**	126	0	2	**128**	257	0	3	**260**	0	0	0	**0**	7	0	0	**7**
18:15 to 18:30	11	0	0	**11**	0	0	0	**0**	187	0	2	**189**	0	0	0	**0**	113	1	0	**114**	238	0	1	**239**	0	0	0	**0**	4	0	0	**4**
PM Totals	**184**	**0**	**0**	**184**	**0**	**0**	**0**	**0**	**2,715**	**16**	**32**	**2,763**	**0**	**0**	**0**	**0**	**1,447**	**5**	**23**	**1,475**	**2,696**	**13**	**32**	**2,741**	**6**	**0**	**0**	**6**	**58**	**0**	**0**	**58**

Approach	Site Access												Doncaster Rd												Crossing Pedestrians								
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
7:00 to 7:15	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	51	4	2	**57**	3	1	0	**4**	0	0	0	**0**	0	0	0	0	0	0	0	0	**0**
7:15 to 7:30	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	69	4	2	**75**	7	0	0	**7**	0	0	0	**0**	0	1	0	0	0	0	0	0	**1**
7:30 to 7:45	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	94	4	2	**100**	6	0	0	**6**	5	0	0	**5**	0	1	0	0	2	0	1	0	**4**
7:45 to 8:00	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	90	5	4	**99**	11	0	0	**11**	0	0	0	**0**	2	2	0	0	1	1	2	0	**8**
8:00 to 8:15	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	93	3	2	**98**	13	0	1	**14**	2	0	0	**2**	1	0	0	0	1	0	0	0	**2**
8:15 to 8:30	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	165	6	2	**173**	17	0	0	**17**	2	0	0	**2**	0	0	0	0	2	0	5	2	**9**
8:30 to 8:45	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	182	5	6	**193**	27	0	0	**27**	2	0	0	**2**	1	2	0	0	1	0	1	0	**5**
8:45 to 9:00	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	249	6	6	**261**	19	0	0	**19**	1	0	0	**1**	1	3	0	0	0	0	2	1	**7**
9:00 to 9:15	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	203	3	7	**213**	16	0	0	**16**	1	0	0	**1**	1	2	0	0	1	0	2	0	**6**
9:15 to 9:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	210	12	10	**232**	10	0	0	**10**	0	0	0	**0**	0	0	0	0	2	2	0	1	**5**
9:30 to 9:45	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	165	6	2	**173**	8	1	0	**9**	0	0	0	**0**	0	0	0	0	5	1	0	0	**6**
9:45 to 10:00	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	188	5	1	**194**	19	0	0	**19**	0	0	0	**0**	1	0	0	0	2	0	2	0	**5**
AM Totals	**9**	**0**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**1,759**	**63**	**46**	**1,868**	**156**	**2**	**1**	**159**	**13**	**0**	**0**	**13**	**7**	**11**	**0**	**0**	**17**	**4**	**15**	**4**	**58**
15:30 to 15:45	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	235	5	1	**241**	11	0	0	**11**	0	0	0	**0**	1	3	0	0	0	1	0	4	**9**
15:45 to 16:00	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	247	3	3	**253**	13	0	0	**13**	0	0	0	**0**	1	0	0	0	3	8	3	8	**23**
16:00 to 16:15	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	268	2	4	**274**	12	0	0	**12**	2	0	0	**2**	1	1	0	0	2	4	2	2	**12**
16:15 to 16:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	284	1	5	**290**	20	0	0	**20**	0	0	0	**0**	0	2	0	0	1	2	0	1	**6**
16:30 to 16:45	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	287	1	2	**290**	13	0	0	**13**	0	0	0	**0**	2	0	0	0	4	2	2	6	**16**
16:45 to 17:00	4	0	0	**4**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	285	1	3	**289**	13	0	0	**13**	1	0	0	**1**	7	5	0	0	1	2	2	2	**19**
17:00 to 17:15	11	0	0	**11**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	294	1	3	**298**	21	0	0	**21**	2	0	0	**2**	1	0	0	0	0	4	0	1	**6**
17:15 to 17:30	7	0	0	**7**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	296	1	3	**300**	13	0	0	**13**	3	0	0	**3**	0	1	0	0	3	3	0	3	**10**
17:30 to 17:45	13	0	0	**13**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	293	1	3	**297**	13	0	0	**13**	0	0	0	**0**	0	0	0	0	2	4	1	2	**9**
17:45 to 18:00	10	0	0	**10**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	295	1	3	**299**	17	0	0	**17**	0	0	0	**0**	0	2	0	0	1	0	0	1	**4**
18:00 to 18:15	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	291	0	3	**294**	15	0	0	**15**	1	0	0	**1**	0	0	0	0	0	1	0	0	**1**
18:15 to 18:30	5	0	0	**5**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	241	1	7	**249**	18	0	0	**18**	0	0	0	**0**	0	0	0	0	2	1	2	2	**7**
PM Totals	**66**	**0**	**0**	**66**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,316**	**18**	**40**	**3,374**	**179**	**0**	**0**	**179**	**9**	**0**	**0**	**9**	**13**	**14**	**0**	**0**	**19**	**32**	**12**	**32**	**122**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 9. Doncaster Rd / Elgar Rd
Day/Date	: Sat, 6th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

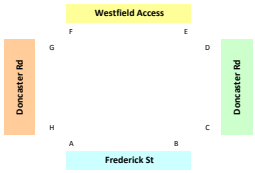


	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses

Approach	Elgar Rd																Doncaster Rd															
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
11:00 to 11:15	10	0	0	**10**	0	0	0	**0**	140	1	0	**141**	0	0	0	**0**	122	1	1	**124**	225	1	2	**228**	0	0	0	**0**	4	0	0	**4**
11:15 to 11:30	15	0	0	**15**	0	0	0	**0**	145	1	2	**148**	0	0	0	**0**	125	1	1	**127**	221	3	2	**226**	1	0	0	**1**	1	0	0	**1**
11:30 to 11:45	30	0	0	**30**	0	0	0	**0**	211	3	0	**214**	0	0	0	**0**	148	0	1	**149**	237	0	1	**238**	0	0	0	**0**	1	0	0	**1**
11:45 to 12:00	23	1	0	**24**	0	0	0	**0**	168	0	2	**170**	0	0	0	**0**	144	1	1	**146**	274	2	1	**277**	0	0	0	**0**	2	0	0	**2**
12:00 to 12:15	24	0	0	**24**	0	0	0	**0**	162	0	0	**162**	0	0	0	**0**	145	0	0	**145**	238	0	2	**240**	2	0	0	**2**	0	0	0	**0**
12:15 to 12:30	19	0	0	**19**	0	0	0	**0**	200	2	2	**204**	0	0	0	**0**	147	3	2	**152**	272	1	1	**274**	1	0	0	**1**	2	0	0	**2**
12:30 to 12:45	19	0	0	**19**	0	0	0	**0**	151	0	0	**151**	0	0	0	**0**	135	1	0	**136**	267	2	2	**271**	0	0	0	**0**	2	0	0	**2**
12:45 to 13:00	14	0	0	**14**	0	0	0	**0**	177	2	1	**180**	0	0	0	**0**	134	0	2	**136**	261	1	1	**263**	0	0	0	**0**	4	0	0	**4**
13:00 to 13:15	20	0	0	**20**	0	0	0	**0**	171	1	1	**173**	0	0	0	**0**	127	0	0	**127**	224	1	2	**227**	0	0	0	**0**	3	0	0	**3**
13:15 to 13:30	25	0	0	**25**	0	0	0	**0**	206	1	1	**208**	0	0	0	**0**	133	0	2	**135**	266	0	3	**269**	1	0	0	**1**	5	0	0	**5**
13:30 to 13:45	14	0	0	**14**	0	0	0	**0**	213	2	1	**216**	0	0	0	**0**	145	0	0	**145**	222	1	1	**224**	0	0	0	**0**	4	0	0	**4**
13:45 to 14:00	11	0	0	**11**	0	0	0	**0**	147	0	1	**148**	0	0	0	**0**	124	1	2	**127**	215	1	1	**217**	0	0	0	**0**	1	0	0	**1**
Total	**224**	**1**	**0**	**225**	**0**	**0**	**0**	**0**	**2,091**	**13**	**11**	**2,115**	**0**	**0**	**0**	**0**	**1,629**	**8**	**12**	**1,649**	**2,922**	**13**	**19**	**2,954**	**5**	**0**	**0**	**5**	**29**	**0**	**0**	**29**

Approach	Site Access																Doncaster Rd																Crossing Pedestrians								
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
11:00 to 11:15	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	231	1	1	**233**	13	0	0	**13**	0	0	0	**0**	1	0	0	0	3	3	0	1	**8**
11:15 to 11:30	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	248	1	1	**250**	17	0	0	**17**	0	0	0	**0**	1	4	0	0	1	2	0	3	**11**
11:30 to 11:45	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	255	0	2	**257**	13	0	0	**13**	0	0	0	**0**	5	6	0	0	0	1	1	1	**14**
11:45 to 12:00	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	240	2	2	**244**	11	1	0	**12**	0	0	0	**0**	0	4	0	0	1	3	0	0	**8**
12:00 to 12:15	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	269	1	1	**271**	11	0	0	**11**	0	0	0	**0**	1	0	0	0	4	2	3	5	**15**
12:15 to 12:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	236	3	0	**239**	11	0	0	**11**	0	0	0	**0**	5	0	0	0	1	0	0	0	**6**
12:30 to 12:45	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	266	4	2	**272**	17	1	0	**18**	0	0	0	**0**	1	0	0	0	3	2	3	3	**12**
12:45 to 13:00	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	258	1	2	**261**	31	0	0	**31**	0	0	0	**0**	1	7	0	0	6	3	4	1	**22**
13:00 to 13:15	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	256	1	1	**258**	22	0	0	**22**	0	0	0	**0**	1	2	0	0	2	1	4	0	**10**
13:15 to 13:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	233	0	0	**233**	20	0	0	**20**	0	0	0	**0**	2	0	0	0	3	1	1	0	**7**
13:30 to 13:45	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	260	1	3	**264**	17	0	0	**17**	0	0	0	**0**	3	6	0	0	2	1	1	0	**13**
13:45 to 14:00	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	281	1	1	**283**	15	0	0	**15**	0	0	0	**0**	0	2	0	0	0	8	0	7	**17**
Total	**4**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3,033**	**16**	**16**	**3,065**	**198**	**2**	**0**	**200**	**0**	**0**	**0**	**0**	**21**	**31**	**0**	**0**	**26**	**27**	**17**	**21**	**143**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 10. Doncaster Rd / Frederick St / Westfield Access
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

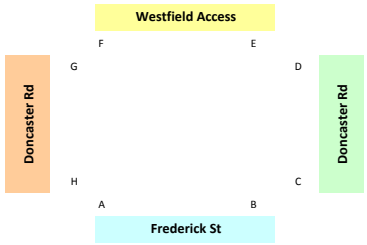


Classifications	**Class 1**	**Class 2**	**Class 3**
	Cars	Trucks	Buses

Approach	**Frederick St**												**Doncaster Rd**											
Direction	**Direction 1 (Left Turn)**				**Direction 2 (Through)**				**Direction 3 (Right Turn)**				**Direction 3U (U Turn)**				**Direction 4 (Left Turn)**				**Direction 5 (Through)**			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15	2	0	0	**2**	4	0	0	**4**	0	0	0	**0**	0	0	0	**0**	4	0	0	**4**	240	1	6	**247**
7:15 to 7:30	8	0	0	**8**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	296	3	17	**316**
7:30 to 7:45	8	0	0	**8**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	2	0	0	**2**	362	8	7	**377**
7:45 to 8:00	5	0	0	**5**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	5	0	0	**5**	351	7	8	**366**
8:00 to 8:15	8	0	0	**8**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	5	0	0	**5**	362	8	3	**373**
8:15 to 8:30	2	0	0	**2**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	7	0	0	**7**	320	5	4	**329**
8:30 to 8:45	8	0	0	**8**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	10	0	0	**10**	342	3	4	**349**
8:45 to 9:00	4	1	0	**5**	0	0	0	**0**	7	0	0	**7**	0	0	0	**0**	9	1	0	**10**	308	6	4	**318**
9:00 to 9:15	8	0	0	**8**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	9	0	0	**9**	284	3	4	**291**
9:15 to 9:30	2	0	0	**2**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	4	0	0	**4**	224	7	6	**237**
9:30 to 9:45	4	1	0	**5**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	1	1	0	**2**	257	6	4	**267**
9:45 to 10:00	8	1	0	**9**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	239	10	6	**255**
AM Totals	**67**	**3**	**0**	**70**	**4**	**0**	**0**	**4**	**31**	**0**	**0**	**31**	**0**	**0**	**0**	**0**	**57**	**2**	**0**	**59**	**3,585**	**67**	**73**	**3,725**
15:30 to 15:45	6	0	0	**6**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	10	0	0	**10**	415	3	8	**426**
15:45 to 16:00	6	0	0	**6**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	3	0	0	**3**	377	3	2	**382**
16:00 to 16:15	7	0	0	**7**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	6	0	0	**6**	397	2	3	**402**
16:15 to 16:30	6	0	0	**6**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	1	0	0	**1**	299	5	5	**309**
16:30 to 16:45	13	0	0	**13**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	6	0	0	**6**	384	4	3	**391**
16:45 to 17:00	16	1	0	**17**	0	0	0	**0**	7	0	0	**7**	0	0	0	**0**	11	0	0	**11**	385	4	4	**393**
17:00 to 17:15	24	0	0	**24**	0	0	0	**0**	11	0	0	**11**	0	0	0	**0**	8	0	0	**8**	392	2	4	**398**
17:15 to 17:30	19	0	0	**19**	0	0	0	**0**	11	0	0	**11**	0	0	0	**0**	8	0	0	**8**	429	0	4	**433**
17:30 to 17:45	9	0	0	**9**	0	0	0	**0**	10	0	0	**10**	0	0	0	**0**	7	0	0	**7**	409	0	2	**411**
17:45 to 18:00	16	0	0	**16**	0	0	0	**0**	10	0	0	**10**	0	0	0	**0**	9	0	0	**9**	431	2	5	**438**
18:00 to 18:15	7	0	0	**7**	0	0	0	**0**	8	0	0	**8**	0	0	0	**0**	10	0	0	**10**	411	3	3	**417**
18:15 to 18:30	13	0	0	**13**	0	0	0	**0**	7	0	0	**7**	0	0	0	**0**	8	0	0	**8**	377	1	2	**380**
PM Totals	**142**	**1**	**0**	**143**	**0**	**0**	**0**	**0**	**87**	**0**	**0**	**87**	**0**	**0**	**0**	**0**	**87**	**0**	**0**	**87**	**4,706**	**29**	**45**	**4,780**

Approach	**Doncaster Rd**								**Westfield Access**																**Crossing Pedestrians**								
Direction	**Direction 6 (Right Turn)**				**Direction 6U (U Turn)**				**Direction 7 (Left Turn)**				**Direction 8 (Through)**				**Direction 9 (Right Turn)**				**Direction 9U (U Turn)**												
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
7:00 to 7:15	1	0	0	**1**	0	0	0	**0**	2	1	0	**3**	1	0	0	**1**	12	1	0	**13**	85	8	2	**95**	7	0	0	**7**	3	0	0	**3**	3	3	2	7	0	7	1	0	**23**
7:15 to 7:30	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	4	0	0	**4**	97	2	0	**99**	4	0	0	**4**	0	0	0	**0**	0	0	2	9	1	11	0	0	**23**
7:30 to 7:45	2	0	0	**2**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	5	0	0	**5**	117	7	3	**127**	7	0	0	**7**	1	0	0	**1**	2	0	3	5	3	6	0	0	**19**
7:45 to 8:00	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	7	2	0	**9**	163	7	3	**173**	10	0	0	**10**	2	0	0	**2**	2	4	1	8	4	6	0	0	**25**
8:00 to 8:15	0	0	0	**0**	0	0	0	**0**	0	2	0	**2**	0	0	0	**0**	11	0	0	**11**	193	7	3	**203**	9	0	0	**9**	1	0	0	**1**	3	4	2	15	5	17	0	1	**47**
8:15 to 8:30	0	1	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	19	1	0	**20**	281	2	5	**288**	14	0	0	**14**	2	0	0	**2**	5	2	1	13	7	11	0	0	**39**
8:30 to 8:45	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	29	0	0	**29**	370	4	5	**379**	20	0	0	**20**	0	0	0	**0**	2	3	7	27	11	28	0	0	**78**
8:45 to 9:00	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	0	0	0	**0**	41	0	0	**41**	379	5	10	**394**	24	1	0	**25**	3	0	0	**3**	7	1	8	23	14	31	0	0	**84**
9:00 to 9:15	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	43	0	0	**43**	314	10	11	**335**	11	0	0	**11**	6	0	0	**6**	2	3	3	14	4	11	0	0	**37**
9:15 to 9:30	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	63	0	0	**63**	278	8	10	**296**	6	0	0	**6**	3	0	0	**3**	4	5	0	13	0	11	0	0	**33**
9:30 to 9:45	3	1	0	**4**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	37	1	0	**38**	260	8	4	**272**	8	0	0	**8**	5	0	0	**5**	2	2	1	5	1	12	0	0	**23**
9:45 to 10:00	1	0	0	**1**	0	0	0	**0**	0	1	0	**1**	0	0	0	**0**	38	1	0	**39**	311	10	7	**328**	6	0	0	**6**	2	0	0	**2**	1	0	2	8	7	14	0	0	**32**
AM Totals	**9**	**3**	**0**	**12**	**0**	**0**	**0**	**0**	**10**	**5**	**0**	**15**	**1**	**0**	**0**	**1**	**309**	**6**	**0**	**315**	**2,848**	**78**	**63**	**2,989**	**126**	**1**	**0**	**127**	**28**	**0**	**0**	**28**	**33**	**27**	**32**	**147**	**57**	**165**	**1**	**1**	**463**
15:30 to 15:45	1	0	0	**1**	0	0	0	**0**	0	1	0	**1**	0	0	0	**0**	50	0	0	**50**	371	5	3	**379**	5	0	0	**5**	1	0	0	**1**	11	3	17	7	18	32	0	1	**89**
15:45 to 16:00	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	54	1	0	**55**	453	1	5	**459**	10	0	0	**10**	8	0	0	**8**	4	2	10	14	6	19	0	1	**56**
16:00 to 16:15	1	1	0	**2**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	66	0	0	**66**	384	3	4	**391**	11	0	0	**11**	6	1	0	**7**	1	4	7	10	13	11	0	0	**46**
16:15 to 16:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	65	0	0	**65**	440	3	6	**449**	6	0	0	**6**	11	0	0	**11**	1	3	14	14	24	22	0	0	**78**
16:30 to 16:45	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	61	0	0	**61**	378	1	5	**384**	8	0	0	**8**	5	0	0	**5**	4	0	17	8	19	11	0	0	**59**
16:45 to 17:00	3	1	0	**4**	0	0	0	**0**	2	0	0	**2**	1	0	0	**1**	52	2	0	**54**	405	2	4	**411**	9	0	0	**9**	6	0	0	**6**	3	6	19	13	17	17	0	0	**75**
17:00 to 17:15	1	0	0	**1**	0	0	0	**0**	1	1	0	**2**	0	0	0	**0**	74	0	0	**74**	360	1	3	**364**	5	0	0	**5**	4	0	0	**4**	0	2	21	3	14	10	0	0	**50**
17:15 to 17:30	0	0	0	**0**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	58	0	0	**58**	439	3	4	**446**	11	0	0	**11**	2	0	0	**2**	2	2	15	8	7	14	0	0	**48**
17:30 to 17:45	2	0	0	**2**	1	0	0	**1**	1	0	0	**1**	0	0	0	**0**	62	0	0	**62**	425	2	5	**432**	3	0	0	**3**	4	0	0	**4**	2	3	16	3	17	14	0	0	**55**
17:45 to 18:00	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	53	0	0	**53**	415	2	9	**426**	8	0	0	**8**	2	0	0	**2**	5	3	19	9	17	19	0	2	**74**
18:00 to 18:15	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	51	0	0	**51**	412	1	6	**419**	2	0	0	**2**	6	0	0	**6**	9	3	12	6	10	8	0	0	**48**
18:15 to 18:30	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	77	0	0	**77**	400	0	12	**412**	6	0	0	**6**	6	0	0	**6**	3	2	22	6	18	8	0	0	**59**
PM Totals	**14**	**2**	**0**	**16**	**1**	**0**	**0**	**1**	**9**	**2**	**0**	**11**	**1**	**0**	**0**	**1**	**723**	**3**	**0**	**726**	**4,882**	**24**	**66**	**4,972**	**84**	**0**	**0**	**84**	**61**	**1**	**0**	**62**	**45**	**33**	**189**	**101**	**180**	**185**	**0**	**4**	**737**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 10. Doncaster Rd / Frederick St / Westfield Access
Day/Date	: Sat, 6th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

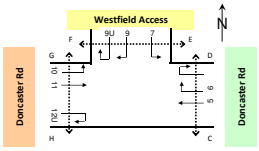


Classifications	**Class 1**	**Class 2**	**Class 3**
	Cars	Trucks	Buses

Approach	**Frederick St**																**Doncaster Rd**															
Direction	**Direction 1 (Left Turn)**				**Direction 2 (Through)**				**Direction 3 (Right Turn)**				**Direction 3U (U Turn)**				**Direction 4 (Left Turn)**				**Direction 5 (Through)**				**Direction 6 (Right Turn)**				**Direction 6U (U Turn)**			
Time Period	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**
11:00 to 11:15	3	0	0	**3**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	4	0	0	**4**	401	4	1	**406**	0	0	0	**0**	0	0	0	**0**
11:15 to 11:30	8	0	0	**8**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	7	0	0	**7**	365	2	3	**370**	0	0	0	**0**	0	0	0	**0**
11:30 to 11:45	7	0	0	**7**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	9	0	0	**9**	365	0	2	**367**	0	0	0	**0**	0	0	0	**0**
11:45 to 12:00	9	1	0	**10**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	5	0	0	**5**	427	3	1	**431**	0	0	0	**0**	0	0	0	**0**
12:00 to 12:15	4	0	0	**4**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	4	0	0	**4**	424	0	3	**427**	0	0	0	**0**	0	0	0	**0**
12:15 to 12:30	4	0	0	**4**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	5	0	0	**5**	429	3	2	**434**	0	0	0	**0**	0	0	0	**0**
12:30 to 12:45	11	0	0	**11**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	7	0	0	**7**	422	1	2	**425**	0	0	0	**0**	0	0	0	**0**
12:45 to 13:00	10	0	0	**10**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	3	0	0	**3**	440	0	5	**445**	0	0	0	**0**	0	0	0	**0**
13:00 to 13:15	1	0	0	**1**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	3	0	0	**3**	426	0	2	**428**	0	0	0	**0**	0	0	0	**0**
13:15 to 13:30	8	0	0	**8**	0	0	0	**0**	5	0	0	**5**	0	0	0	**0**	7	0	0	**7**	413	0	3	**416**	0	0	0	**0**	0	0	0	**0**
13:30 to 13:45	7	0	0	**7**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	5	0	0	**5**	372	s	1	**373**	0	0	0	**0**	0	0	0	**0**
13:45 to 14:00	5	0	0	**5**	0	0	0	**0**	6	0	0	**6**	0	0	0	**0**	3	0	0	**3**	408	0	5	**413**	0	0	0	**0**	0	0	0	**0**
Total	**77**	**1**	**0**	**78**	**0**	**0**	**0**	**0**	**49**	**0**	**0**	**49**	**0**	**0**	**0**	**0**	**62**	**0**	**0**	**62**	**4,892**	**13**	**30**	**4,935**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Approach	**Westfield Access**																**Doncaster Rd**																**Crossing Pedestrians**								
Direction	**Direction 7 (Left Turn)**				**Direction 8 (Through)**				**Direction 9 (Right Turn)**				**Direction 9U (U Turn)**				**Direction 10 (Left Turn)**				**Direction 11 (Through)**				**Direction 12 (Right Turn)**				**Direction 12U (U Turn)**												
Time Period	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Total**
11:00 to 11:15	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	64	0	0	**64**	354	4	3	**361**	4	0	0	**4**	6	0	0	**6**	2	5	13	14	13	16	0	0	**63**
11:15 to 11:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	62	1	0	**63**	361	1	2	**364**	2	1	0	**3**	6	0	0	**6**	7	1	6	9	7	14	0	0	**44**
11:30 to 11:45	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	53	0	0	**53**	412	0	1	**413**	9	0	0	**9**	9	0	0	**9**	2	1	12	18	9	21	0	0	**63**
11:45 to 12:00	3	0	0	**3**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	64	1	0	**65**	371	3	2	**376**	3	0	0	**3**	5	0	0	**5**	5	8	9	16	13	16	0	0	**67**
12:00 to 12:15	3	0	0	**3**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	67	0	0	**67**	410	1	3	**414**	6	0	0	**6**	5	0	0	**5**	3	2	7	2	11	5	0	0	**30**
12:15 to 12:30	4	0	0	**4**	0	0	0	**0**	4	0	0	**4**	0	0	0	**0**	65	0	0	**65**	364	4	1	**369**	6	0	0	**6**	10	0	0	**10**	5	2	5	17	13	19	0	0	**61**
12:30 to 12:45	1	0	0	**1**	0	0	0	**0**	3	0	0	**3**	0	0	0	**0**	65	1	0	**66**	398	1	2	**401**	4	0	0	**4**	6	0	0	**6**	2	9	12	22	15	31	0	0	**91**
12:45 to 13:00	1	0	0	**1**	0	0	0	**0**	1	1	0	**2**	0	0	0	**0**	64	0	0	**64**	336	0	4	**340**	2	0	0	**2**	11	0	0	**11**	2	3	5	15	10	26	1	0	**62**
13:00 to 13:15	2	1	0	**3**	0	0	0	**0**	0	1	0	**1**	0	0	0	**0**	67	1	0	**68**	375	1	3	**379**	4	0	0	**4**	5	0	0	**5**	0	1	8	7	12	17	0	0	**45**
13:15 to 13:30	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	59	0	0	**59**	387	0	2	**389**	2	0	0	**2**	4	0	0	**4**	3	8	18	14	21	25	0	0	**89**
13:30 to 13:45	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	57	0	0	**57**	408	2	2	**412**	2	0	0	**2**	8	0	0	**8**	5	3	8	12	12	13	0	0	**53**
13:45 to 14:00	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	46	0	0	**46**	345	1	2	**348**	4	0	0	**4**	10	0	0	**10**	5	10	15	18	18	24	0	0	**90**
Total	**19**	**1**	**0**	**20**	**0**	**0**	**0**	**0**	**9**	**2**	**0**	**11**	**1**	**0**	**0**	**1**	**733**	**4**	**0**	**737**	**4,521**	**18**	**27**	**4,566**	**48**	**1**	**0**	**49**	**85**	**0**	**0**	**85**	**41**	**53**	**118**	**164**	**154**	**227**	**1**	**0**	**758**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 11. Doncaster Rd / Westfield Access
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

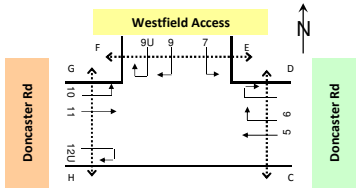
Classifications	**Class 1**	**Class 2**	**Class 3**
	Cars	Trucks	Buses

Approach	Doncaster Rd											
Direction	Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15	226	2	7	235	9	0	0	9	0	0	0	0
7:15 to 7:30	283	3	16	302	11	0	0	11	0	0	0	0
7:30 to 7:45	352	7	1	360	16	0	0	16	0	0	0	0
7:45 to 8:00	346	7	8	361	23	0	0	23	0	0	0	0
8:00 to 8:15	351	5	3	359	22	0	0	22	0	0	0	0
8:15 to 8:30	314	5	4	323	34	0	0	34	0	0	0	0
8:30 to 8:45	336	4	4	344	56	0	0	56	0	0	0	0
8:45 to 9:00	309	6	4	319	67	0	0	67	0	0	0	0
9:00 to 9:15	273	3	4	280	132	1	0	133	0	0	0	0
9:15 to 9:30	200	7	6	213	110	0	0	110	0	0	0	0
9:30 to 9:45	208	7	4	219	94	0	0	94	0	0	0	0
9:45 to 10:00	179	7	6	192	95	1	0	96	0	0	0	0
AM Totals	3,377	63	67	3,507	669	2	0	671	0	0	0	0
15:30 to 15:45	287	2	8	297	79	0	0	79	0	0	0	0
15:45 to 16:00	252	3	2	257	88	0	0	88	0	0	0	0
16:00 to 16:15	220	2	3	225	92	0	0	92	0	0	0	0
16:15 to 16:30	168	6	5	179	85	0	0	85	0	0	0	0
16:30 to 16:45	230	5	3	238	72	0	0	72	0	0	0	0
16:45 to 17:00	229	4	4	237	76	0	0	76	0	0	0	0
17:00 to 17:15	236	2	4	242	66	0	0	66	0	0	0	0
17:15 to 17:30	256	0	4	260	65	0	0	65	0	0	0	0
17:30 to 17:45	245	0	2	247	90	0	0	90	0	0	0	0
17:45 to 18:00	284	2	5	291	111	0	0	111	0	0	0	0
18:00 to 18:15	280	4	3	287	101	0	0	101	0	0	0	0
18:15 to 18:30	237	0	2	239	101	0	0	101	0	0	0	0
PM Totals	2,924	30	45	2,999	1,026	0	0	1,026	0	0	0	0

Approach	Westfield Access												Doncaster Rd												Crossing Pedestrians						
Direction	Direction 7 (Left Turn)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12U (U Turn)										
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	C	D	E	F	G	H	Total
7:00 to 7:15	8	0	0	8	18	0	0	18	0	0	0	0	20	2	0	22	65	6	2	73	0	0	0	0	1	0	0	0	0	0	1
7:15 to 7:30	10	0	0	10	10	0	0	10	0	0	0	0	14	2	0	16	85	0	2	87	0	0	0	0	0	0	1	0	0	0	1
7:30 to 7:45	6	0	0	6	13	0	0	13	1	0	0	1	23	1	0	24	97	6	3	106	0	0	0	0	0	0	2	2	0	0	4
7:45 to 8:00	4	0	0	4	9	2	0	11	0	0	0	0	31	0	0	31	135	7	3	145	0	0	0	0	0	0	0	1	0	0	1
8:00 to 8:15	10	1	0	11	15	0	0	15	1	0	0	1	52	1	0	53	143	6	4	153	0	0	0	0	0	0	0	2	0	0	2
8:15 to 8:30	10	0	0	10	11	0	0	11	0	0	0	0	64	0	0	64	217	3	5	225	0	0	0	0	0	0	3	1	0	0	4
8:30 to 8:45	9	0	0	9	16	0	0	16	3	0	0	3	120	0	0	120	253	4	5	262	0	0	0	0	0	2	10	3	0	0	15
8:45 to 9:00	16	0	0	16	7	0	0	7	2	0	0	2	117	1	0	118	271	4	10	285	0	0	0	0	1	1	6	8	0	0	16
9:00 to 9:15	19	1	0	20	19	0	0	19	1	0	0	1	130	0	0	130	192	11	1	204	0	0	0	0	0	1	1	1	0	0	3
9:15 to 9:30	22	0	0	22	27	0	0	27	1	0	0	1	123	1	0	124	162	7	10	179	0	0	0	0	1	4	1	7	0	0	13
9:30 to 9:45	27	0	0	27	48	1	0	49	1	0	0	1	105	2	0	107	159	7	4	170	0	0	0	0	1	1	1	5	0	0	8
9:45 to 10:00	40	1	0	41	60	3	0	63	1	0	0	1	134	3	0	137	176	7	7	190	0	0	0	0	0	3	2	6	0	0	11
AM Totals	181	3	0	184	253	6	0	259	11	0	0	11	933	13	0	946	1,955	68	56	2,079	0	0	0	0	4	12	27	36	0	0	79
15:30 to 15:45	123	0	0	123	123	1	0	124	1	0	0	1	110	0	0	110	291	5	3	299	0	0	0	0	2	0	11	27	0	0	40
15:45 to 16:00	128	0	0	128	133	0	0	133	2	0	0	2	126	0	0	126	328	1	5	334	0	0	0	0	2	1	4	5	0	0	12
16:00 to 16:15	124	1	0	125	151	0	0	151	2	0	0	2	113	0	0	113	284	4	4	292	0	0	0	0	1	1	9	5	0	0	16
16:15 to 16:30	125	0	0	125	133	0	0	133	3	0	0	3	130	0	0	130	337	2	6	345	0	0	0	0	1	0	10	6	0	0	17
16:30 to 16:45	131	0	0	131	160	0	0	160	1	0	0	1	95	0	0	95	291	2	5	298	0	0	0	0	2	0	10	2	0	0	14
16:45 to 17:00	120	0	0	120	160	1	0	161	0	0	0	0	106	0	0	106	321	2	4	327	0	0	0	0	0	1	2	7	0	0	10
17:00 to 17:15	125	0	0	125	156	0	0	156	2	0	0	2	112	0	0	112	280	2	3	285	0	0	0	0	0	1	1	7	0	0	9
17:15 to 17:30	121	0	0	121	174	0	0	174	1	0	0	1	112	0	0	112	348	3	4	355	0	0	0	0	0	0	3	7	0	0	10
17:30 to 17:45	112	0	0	112	156	0	0	156	0	0	0	0	121	0	0	121	339	1	5	345	0	0	0	0	0	0	5	5	0	0	10
17:45 to 18:00	128	0	0	128	155	0	0	155	2	0	0	2	108	0	0	108	328	1	9	338	1	0	0	1	0	0	4	7	0	0	11
18:00 to 18:15	119	0	0	119	140	0	0	140	5	0	0	5	135	0	0	135	287	1	6	294	0	0	0	0	0	0	3	2	0	0	5
18:15 to 18:30	102	0	0	102	139	0	0	139	3	0	0	3	144	0	0	144	261	0	12	273	0	0	0	0	0	0	6	6	0	0	12
PM Totals	1,458	1	0	1,459	1,780	2	0	1,782	22	0	0	22	1,412	0	0	1,412	3,695	24	66	3,785	1	0	0	1	8	4	68	86	0	0	166

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 11. Doncaster Rd / Westfield Access
Day/Date	: Sat, 6th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses



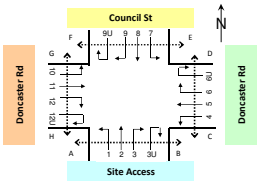
SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Doncaster Rd											
Direction	Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
11:00 to 11:15	256	4	1	**261**	130	0	0	**130**	0	0	0	**0**
11:15 to 11:30	225	2	3	**230**	115	0	0	**115**	0	0	0	**0**
11:30 to 11:45	225	0	2	**227**	105	0	0	**105**	0	0	0	**0**
11:45 to 12:00	253	3	1	**257**	111	0	0	**111**	0	0	0	**0**
12:00 to 12:15	262	0	3	**265**	101	0	0	**101**	0	0	0	**0**
12:15 to 12:30	259	1	2	**262**	102	0	0	**102**	0	0	0	**0**
12:30 to 12:45	252	1	2	**255**	86	0	0	**86**	0	0	0	**0**
12:45 to 13:00	264	0	5	**269**	90	0	0	**90**	0	0	0	**0**
13:00 to 13:15	249	0	2	**251**	105	0	0	**105**	0	0	0	**0**
13:15 to 13:30	236	0	3	**239**	100	0	0	**100**	0	0	0	**0**
13:30 to 13:45	197	1	2	**200**	123	1	0	**124**	0	0	0	**0**
13:45 to 14:00	232	0	5	**237**	88	0	0	**88**	0	0	0	**0**
Total	**2,910**	**12**	**31**	**2,953**	**1,256**	**1**	**0**	**1,257**	**0**	**0**	**0**	**0**

Approach	Westfield Access												Doncaster Rd												Crossing Pedestrians						
Direction	Direction 7 (Left Turn)					Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12U (U Turn)									
Time Period	Cars	Trucks	Buses	Total		Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total		C	D	E	F	G	H	Total
11:00 to 11:15	106	0	0	**106**		152	0	0	**152**	1	0	0	**1**	151	0	0	**151**	206	4	3	**213**	0	0	0	**0**		0	3	6	6	0	0	**15**
11:15 to 11:30	98	0	0	**98**		131	0	0	**131**	2	0	0	**2**	154	0	0	**154**	210	1	2	**213**	0	0	0	**0**		0	1	3	6	0	0	**10**
11:30 to 11:45	119	0	0	**119**		148	0	0	**148**	1	0	0	**1**	178	0	0	**178**	240	1	2	**243**	0	0	0	**0**		0	1	3	10	1	1	**16**
11:45 to 12:00	135	0	0	**135**		172	0	0	**172**	3	0	0	**3**	131	1	0	**132**	243	2	3	**248**	0	0	0	**0**		2	0	7	4	0	0	**13**
12:00 to 12:15	143	0	0	**143**		166	0	0	**166**	4	0	0	**4**	134	1	0	**135**	282	0	2	**284**	0	0	0	**0**		1	0	7	3	0	0	**11**
12:15 to 12:30	143	0	0	**143**		175	0	0	**175**	3	0	0	**3**	137	0	0	**137**	235	4	1	**240**	0	0	0	**0**		0	0	4	10	0	0	**14**
12:30 to 12:45	119	0	0	**119**		182	0	0	**182**	2	0	0	**2**	142	0	0	**142**	256	1	2	**259**	0	0	0	**0**		0	0	9	8	0	0	**17**
12:45 to 13:00	139	0	0	**139**		182	0	0	**182**	1	0	0	**1**	135	0	0	**135**	209	1	4	**214**	0	0	0	**0**		1	1	5	8	0	0	**15**
13:00 to 13:15	131	0	0	**131**		180	0	0	**180**	0	0	0	**0**	130	0	0	**130**	249	2	3	**254**	0	0	0	**0**		0	0	5	9	0	0	**14**
13:15 to 13:30	123	0	0	**123**		183	0	0	**183**	0	0	0	**0**	152	0	0	**152**	239	0	2	**241**	0	0	0	**0**		0	6	8	18	0	0	**32**
13:30 to 13:45	142	1	0	**143**		179	0	0	**179**	1	0	0	**1**	141	1	0	**142**	272	1	2	**275**	0	0	0	**0**		1	0	6	1	0	0	**8**
13:45 to 14:00	122	0	0	**122**		182	0	0	**182**	1	0	0	**1**	113	0	0	**113**	238	1	3	**242**	0	0	0	**0**		0	2	3	4	0	0	**9**
Total	**1,520**	**1**	**0**	**1,521**		**2,032**	**0**	**0**	**2,032**	**19**	**0**	**0**	**19**	**1,698**	**3**	**0**	**1,701**	**2,879**	**18**	**29**	**2,926**	**0**	**0**	**0**	**0**		**5**	**14**	**66**	**87**	**1**	**1**	**174**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 12. Doncaster Rd / Council St
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses



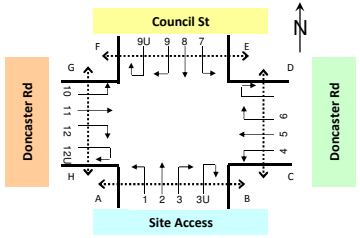
SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Site Access												Doncaster Rd											
Direction	Direction 1 (Left Turn)				Direction 2 (Through)				Direction 3 (Right Turn)				Direction 3U (U Turn)				Direction 4 (Left Turn)				Direction 5 (Through)				Direction 6 (Right Turn)				Direction 6U (U Turn)			
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total
7:00 to 7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	214	1	8	223	6	0	0	6	1	0	0	1
7:15 to 7:30	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	285	3	15	303	4	0	0	4	2	0	0	2
7:30 to 7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	353	6	7	366	5	0	0	5	0	0	0	0
7:45 to 8:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	347	8	8	363	15	0	0	15	1	0	0	1
8:00 to 8:15	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	9	346	6	4	356	9	0	0	9	0	0	0	0
8:15 to 8:30	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	9	314	5	3	322	16	0	0	16	3	0	0	3
8:30 to 8:45	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	329	4	4	337	26	0	0	26	1	0	0	1
8:45 to 9:00	2	0	0	2	0	0	0	0	1	0	0	1	0	0	0	0	19	0	0	19	339	6	3	348	28	0	1	29	1	0	0	1
9:00 to 9:15	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	10	352	4	4	360	17	0	0	17	5	0	0	5
9:15 to 9:30	2	0	0	2	0	0	0	0	1	0	0	1	0	0	0	0	3	0	0	3	285	7	6	298	14	0	0	14	1	0	0	1
9:30 to 9:45	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	271	6	4	281	8	0	0	8	4	0	0	4
9:45 to 10:00	2	0	0	2	0	0	0	0	2	0	0	2	0	0	0	0	1	0	0	1	263	9	6	278	7	0	0	7	1	0	0	1
AM Totals	18	0	0	18	0	0	0	0	4	0	0	4	0	0	0	0	67	0	0	67	3,698	65	72	3,835	155	0	1	156	20	0	0	20
15:30 to 15:45	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	322	3	8	333	28	0	0	28	4	0	0	4
15:45 to 16:00	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	326	3	2	331	24	0	0	24	1	0	0	1
16:00 to 16:15	3	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	279	2	3	284	18	0	0	18	3	0	0	3
16:15 to 16:30	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	233	5	6	244	7	0	0	7	7	0	0	7
16:30 to 16:45	5	0	0	5	1	0	0	1	5	0	0	5	0	0	0	0	1	0	0	1	265	2	3	270	21	0	0	21	4	0	0	4
16:45 to 17:00	2	0	0	2	0	0	0	0	3	0	0	3	0	0	0	0	1	0	0	1	270	5	3	278	11	0	0	11	1	0	0	1
17:00 to 17:15	24	0	0	24	1	0	0	1	5	0	0	5	0	0	0	0	0	0	0	0	248	2	4	254	16	0	0	16	2	0	0	2
17:15 to 17:30	19	0	0	19	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	277	0	4	281	16	0	0	16	1	0	0	1
17:30 to 17:45	13	0	0	13	0	0	0	0	4	0	0	4	0	0	0	0	4	0	0	4	280	0	2	282	16	0	0	16	1	0	0	1
17:45 to 18:00	6	0	0	6	0	0	0	0	1	0	0	1	0	0	0	0	2	0	0	2	333	2	5	340	18	0	0	18	6	0	0	6
18:00 to 18:15	10	0	0	10	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	335	5	3	343	20	0	0	20	5	0	0	5
18:15 to 18:30	5	0	0	5	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	282	0	2	284	12	0	0	12	1	0	0	1
PM Totals	91	0	0	91	3	0	0	3	28	0	0	28	0	0	0	0	12	0	0	12	3,450	29	45	3,524	207	0	0	207	36	0	0	36

Approach	Council St												Doncaster Rd												Crossing Pedestrians								
Direction	Direction 7 (Left Turn)				Direction 8 (Through)				Direction 9 (Right Turn)				Direction 9U (U Turn)				Direction 10 (Left Turn)				Direction 11 (Through)				Direction 12 (Right Turn)				Direction 12U (U Turn)													
Time Period	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	Cars	Trucks	Buses	Total	A	B	C	D	E	F	G	H	Total
7:00 to 7:15	5	0	0	5	0	0	0	0	18	0	0	18	0	0	0	0	6	0	0	6	65	4	2	71	1	0	0	1	1	0	0	1	4	1	3	0	1	0	0	0	9
7:15 to 7:30	10	0	0	10	0	0	0	0	36	0	0	36	0	0	0	0	5	0	0	5	86	2	2	90	3	0	0	3	1	0	0	1	1	0	3	2	1	1	0	0	8
7:30 to 7:45	9	0	0	9	1	0	0	1	31	0	0	31	0	0	0	0	9	1	0	10	90	5	4	99	5	0	0	5	2	0	0	2	2	0	2	0	1	0	0	0	5
7:45 to 8:00	8	0	0	8	0	0	0	0	35	0	0	35	0	0	0	0	9	0	0	9	131	7	3	141	7	0	0	7	1	0	0	1	3	2	0	1	2	2	0	1	11
8:00 to 8:15	8	0	0	8	0	0	0	0	49	0	0	49	0	0	0	0	11	0	0	11	129	6	4	139	6	0	0	6	2	0	0	2	5	1	4	0	0	2	0	2	14
8:15 to 8:30	9	0	0	9	1	0	0	1	35	0	0	35	0	0	0	0	15	0	0	15	196	3	4	203	8	0	0	8	4	0	0	4	3	0	2	2	6	1	0	0	14
8:30 to 8:45	17	0	0	17	1	0	0	1	56	0	0	56	0	0	0	0	25	1	0	26	197	3	6	206	13	0	0	13	3	0	0	3	5	6	0	10	3	3	0	0	27
8:45 to 9:00	29	0	0	29	0	0	0	0	52	1	0	53	0	0	0	0	29	0	0	29	252	4	10	266	14	0	0	14	2	0	0	2	4	7	2	18	4	3	0	0	38
9:00 to 9:15	18	0	0	18	0	0	0	0	56	1	0	57	0	0	0	0	22	0	0	22	183	11	11	205	9	0	0	9	4	0	0	4	3	0	9	0	2	0	0	1	15
9:15 to 9:30	12	0	0	12	0	0	0	0	20	0	0	20	0	0	0	0	9	0	0	9	165	6	9	180	7	0	0	7	4	0	0	4	6	1	3	1	1	6	0	0	18
9:30 to 9:45	11	0	0	11	0	0	0	0	22	0	0	22	0	0	0	0	11	0	0	11	175	8	5	188	2	0	0	2	1	0	0	1	1	2	0	0	0	5	0	0	8
9:45 to 10:00	8	0	0	8	0	0	0	0	13	1	0	14	0	0	0	0	11	0	0	11	203	8	7	218	0	0	0	0	4	0	0	4	2	0	1	2	2	4	0	0	11
AM Totals	144	0	0	144	3	0	0	3	423	3	0	426	0	0	0	0	162	2	0	164	1,872	67	67	2,006	75	0	0	75	29	0	0	29	39	20	29	36	23	27	0	4	178
15:30 to 15:45	27	0	0	27	0	0	0	0	46	0	0	46	0	0	0	0	20	0	0	20	359	3	3	365	1	0	0	1	7	0	0	7	10	2	31	2	4	12	0	0	61
15:45 to 16:00	20	0	1	21	0	0	0	0	40	0	0	40	0	0	0	0	37	0	0	37	410	2	5	417	1	0	0	1	6	0	0	6	4	1	10	0	11	9	0	0	35
16:00 to 16:15	15	1	0	16	0	0	0	0	34	0	0	34	0	0	0	0	27	1	0	28	357	4	4	365	3	0	0	3	8	0	0	8	3	3	0	1	5	8	0	0	20
16:15 to 16:30	11	0	0	11	0	0	0	0	13	0	0	13	0	0	0	0	28	0	0	28	414	2	6	422	2	0	0	2	2	0	0	2	1	4	3	0	9	7	0	0	24
16:30 to 16:45	17	0	0	17	0	0	0	0	19	0	0	19	0	0	0	0	38	0	0	38	377	1	5	383	1	0	0	1	7	1	0	8	1	2	1	0	11	4	0	0	19
16:45 to 17:00	15	0	0	15	1	0	0	1	23	0	0	23	0	0	0	0	37	0	0	37	383	2	4	389	0	0	0	0	3	0	0	3	0	3	2	3	1	5	0	0	14
17:00 to 17:15	8	0	0	8	0	0	0	0	28	0	0	28	0	0	0	0	36	0	0	36	348	2	4	354	0	0	0	0	5	0	0	5	1	2	0	0	2	6	0	0	11
17:15 to 17:30	17	0	0	17	0	0	0	0	22	0	0	22	0	0	0	0	31	0	0	31	428	4	4	436	2	0	0	2	4	0	0	4	1	2	2	2	2	5	0	0	14
17:30 to 17:45	8	0	0	8	0	0	0	0	20	0	0	20	0	0	0	0	30	0	0	30	415	2	5	422	3	0	0	3	5	0	0	5	0	1	1	0	3	3	0	0	8
17:45 to 18:00	14	0	0	14	0	0	0	0	22	0	0	22	0	0	0	0	28	0	0	28	412	3	9	424	0	0	0	0	7	0	0	7	0	0	1	0	6	6	0	0	13
18:00 to 18:15	10	1	0	11	0	0	0	0	19	0	0	19	0	0	0	0	30	0	0	30	418	2	5	425	2	0	0	2	4	0	0	4	3	1	3	0	3	2	0	0	12
18:15 to 18:30	20	0	0	20	1	0	0	1	28	0	0	28	0	0	0	0	28	0	0	28	414	2	9	425	0	0	0	0	6	0	0	6	3	5	1	0	7	2	0	0	18
PM Totals	182	2	1	185	2	0	0	2	314	0	0	314	0	0	0	0	370	1	0	371	4,735	29	63	4,827	15	0	0	15	64	1	0	65	27	26	55	8	64	69	0	0	249

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 12. Doncaster Rd / Council St
Day/Date	: Sat, 6th September 2014
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

	Class 1	Class 2	Class 3
Classifications	Cars	Trucks	Buses

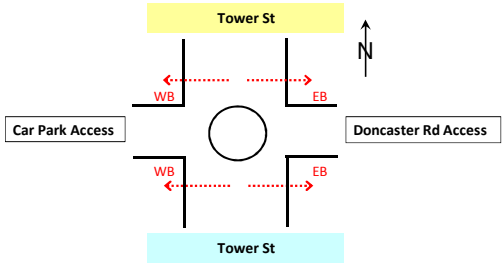


SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Site Access																Doncaster Rd															
Direction	**Direction 1 (Left Turn)**				**Direction 2 (Through)**				**Direction 3 (Right Turn)**				**Direction 3U (U Turn)**				**Direction 4 (Left Turn)**				**Direction 5 (Through)**				**Direction 6 (Right Turn)**				**Direction 6U (U Turn)**			
Time Period	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**
11:00 to 11:15	3	0	0	**3**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	348	4	1	**353**	16	0	0	**16**	2	0	0	**2**
11:15 to 11:30	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	328	2	4	**334**	18	0	0	**18**	4	0	0	**4**
11:30 to 11:45	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	292	0	1	**293**	16	0	0	**16**	0	0	0	**0**
11:45 to 12:00	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	340	3	1	**344**	20	0	0	**20**	5	0	0	**5**
12:00 to 12:15	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	351	0	3	**354**	14	0	0	**14**	4	0	0	**4**
12:15 to 12:30	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	343	1	2	**346**	16	0	0	**16**	4	0	0	**4**
12:30 to 12:45	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	291	1	2	**294**	16	0	0	**16**	10	0	0	**10**
12:45 to 13:00	1	0	0	**1**	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	339	0	5	**344**	13	0	0	**13**	5	0	0	**5**
13:00 to 13:15	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	292	0	2	**294**	16	0	0	**16**	3	0	0	**3**
13:15 to 13:30	1	0	0	**1**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	0	**1**	299	0	4	**303**	9	0	0	**9**	7	0	0	**7**
13:30 to 13:45	1	0	0	**1**	0	0	0	**0**	2	0	0	**2**	0	0	0	**0**	0	0	0	**0**	285	0	2	**287**	13	0	0	**13**	3	0	0	**3**
13:45 to 14:00	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	299	1	5	**305**	16	0	0	**16**	7	0	0	**7**
Total	**9**	**0**	**0**	**9**	**2**	**0**	**0**	**2**	**6**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**7**	**3,807**	**12**	**32**	**3,851**	**183**	**0**	**0**	**183**	**54**	**0**	**0**	**54**

Approach	Council St																Doncaster Rd																Crossing Pedestrians								
Direction	**Direction 7 (Left Turn)**				**Direction 8 (Through)**				**Direction 9 (Right Turn)**				**Direction 9U (U Turn)**				**Direction 10 (Left Turn)**				**Direction 11 (Through)**				**Direction 12 (Right Turn)**				**Direction 12U (U Turn)**												
Time Period	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**Cars**	**Trucks**	**Buses**	**Total**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**Total**
11:00 to 11:15	10	0	0	**10**	0	0	0	**0**	21	0	0	**21**	0	0	0	**0**	22	0	0	**22**	260	4	3	**267**	3	0	0	**3**	3	0	0	**3**	7	1	0	0	2	3	0	0	**13**
11:15 to 11:30	14	0	0	**14**	0	0	0	**0**	15	0	0	**15**	0	0	0	**0**	28	0	0	**28**	279	1	2	**282**	1	0	0	**1**	9	0	0	**9**	2	0	0	0	3	7	0	0	**12**
11:30 to 11:45	17	0	0	**17**	0	0	0	**0**	16	0	0	**16**	0	0	0	**0**	22	0	0	**22**	326	1	5	**332**	1	0	0	**1**	2	0	0	**2**	7	0	1	0	1	3	0	0	**12**
11:45 to 12:00	9	0	0	**9**	0	0	0	**0**	28	0	0	**28**	0	0	0	**0**	20	0	0	**20**	378	2	3	**383**	0	0	0	**0**	2	0	0	**2**	4	5	3	1	6	2	0	0	**21**
12:00 to 12:15	10	0	0	**10**	0	0	0	**0**	14	0	0	**14**	0	0	0	**0**	25	0	0	**25**	391	0	3	**394**	0	0	0	**0**	3	0	0	**3**	2	2	1	0	6	10	0	0	**21**
12:15 to 12:30	14	0	0	**14**	0	0	0	**0**	23	0	0	**23**	0	0	0	**0**	22	0	0	**22**	338	4	1	**343**	1	0	0	**1**	4	0	0	**4**	1	0	4	1	7	5	0	0	**18**
12:30 to 12:45	7	0	0	**7**	0	0	0	**0**	22	0	0	**22**	0	0	0	**0**	30	0	0	**30**	347	1	2	**350**	0	0	0	**0**	8	0	0	**8**	2	3	2	1	5	4	0	0	**17**
12:45 to 13:00	13	0	0	**13**	0	0	0	**0**	19	0	0	**19**	0	0	0	**0**	24	0	0	**24**	304	1	4	**309**	0	0	0	**0**	8	0	0	**8**	2	2	0	3	6	9	0	0	**22**
13:00 to 13:15	11	0	0	**11**	0	0	0	**0**	26	0	0	**26**	0	0	0	**0**	24	1	0	**25**	349	1	3	**353**	0	0	0	**0**	11	0	0	**11**	3	2	2	5	5	12	0	0	**29**
13:15 to 13:30	10	0	0	**10**	0	0	0	**0**	21	0	0	**21**	0	0	0	**0**	19	0	0	**19**	325	0	2	**327**	2	0	0	**2**	10	0	0	**10**	4	1	0	1	10	7	0	0	**23**
13:30 to 13:45	15	0	0	**15**	0	0	0	**0**	19	1	0	**20**	0	0	0	**0**	16	0	0	**16**	393	0	4	**397**	0	0	0	**0**	4	1	0	**5**	3	2	0	2	7	0	0	0	**14**
13:45 to 14:00	16	0	0	**16**	0	0	0	**0**	17	0	0	**17**	0	0	0	**0**	18	0	0	**18**	361	2	3	**366**	0	0	0	**0**	4	0	0	**4**	5	4	2	0	5	5	0	0	**21**
Total	**146**	**0**	**0**	**146**	**0**	**0**	**0**	**0**	**241**	**1**	**0**	**242**	**0**	**0**	**0**	**0**	**270**	**1**	**0**	**271**	**4,051**	**17**	**35**	**4,103**	**8**	**0**	**0**	**8**	**68**	**1**	**0**	**69**	**42**	**22**	**15**	**14**	**63**	**67**	**0**	**0**	**223**

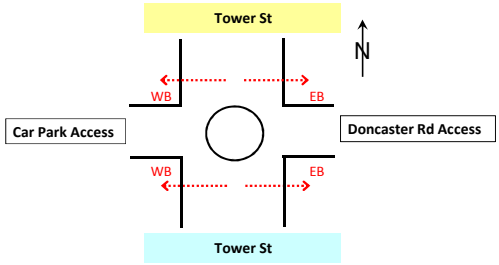
Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 13. Tower St Roundabout
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Pedestrians Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach			Pedestrians			
Direction			WB		EB	
Time Period			Peds	Total	Peds	Total
7:00	to	7:15	1	**1**	0	**0**
7:15	to	7:30	2	**2**	0	**0**
7:30	to	7:45	4	**4**	1	**1**
7:45	to	8:00	6	**6**	0	**0**
8:00	to	8:15	2	**2**	0	**0**
8:15	to	8:30	2	**2**	3	**3**
8:30	to	8:45	4	**4**	1	**1**
8:45	to	9:00	12	**12**	2	**2**
9:00	to	9:15	9	**9**	6	**6**
9:15	to	9:30	11	**11**	1	**1**
9:30	to	9:45	6	**6**	2	**2**
9:45	to	10:00	4	**4**	6	**6**
AM Totals			**63**	**63**	**22**	**22**
15:30	to	15:45	13	**13**	8	**8**
15:45	to	16:00	6	**6**	13	**13**
16:00	to	16:15	12	**12**	10	**10**
16:15	to	16:30	2	**2**	11	**11**
16:30	to	16:45	7	**7**	11	**11**
16:45	to	17:00	7	**7**	6	**6**
17:00	to	17:15	4	**4**	11	**11**
17:15	to	17:30	9	**9**	4	**4**
17:30	to	17:45	7	**7**	7	**7**
17:45	to	18:00	10	**10**	11	**11**
18:00	to	18:15	2	**2**	8	**8**
18:15	to	18:30	4	**4**	8	**8**
PM Totals			**83**	**83**	**108**	**108**

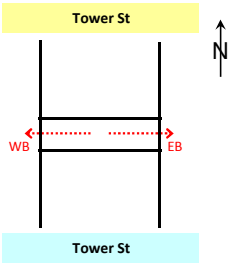
Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 13. Tower St Roundabout
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Pedestrians Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach		Pedestrians			
Direction		WB		EB	
Time Period		Peds	Total	Peds	Total
11:00	to 11:15	9	**9**	9	**9**
11:15	to 11:30	7	**7**	2	**2**
11:30	to 11:45	15	**15**	6	**6**
11:45	to 12:00	7	**7**	9	**9**
12:00	to 12:15	4	**4**	14	**14**
12:15	to 12:30	6	**6**	11	**11**
12:30	to 12:45	7	**7**	4	**4**
12:45	to 13:00	8	**8**	9	**9**
13:00	to 13:15	10	**10**	9	**9**
13:15	to 13:30	19	**19**	6	**6**
13:30	to 13:45	4	**4**	12	**12**
13:45	to 14:00	8	**8**	5	**5**
Total		**104**	**104**	**96**	**96**

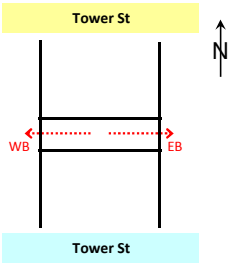
Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 14. Tower St (crossing north of site 13 roundabout)
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Pedestrians Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach			Pedestrians			
Direction			WB		EB	
Time Period			Peds	Total	Peds	Total
7:00	to	7:15	7	**7**	0	**0**
7:15	to	7:30	8	**8**	0	**0**
7:30	to	7:45	6	**6**	0	**0**
7:45	to	8:00	17	**17**	1	**1**
8:00	to	8:15	14	**14**	1	**1**
8:15	to	8:30	31	**31**	2	**2**
8:30	to	8:45	49	**49**	3	**3**
8:45	to	9:00	70	**70**	4	**4**
9:00	to	9:15	35	**35**	1	**1**
9:15	to	9:30	31	**31**	4	**4**
9:30	to	9:45	23	**23**	2	**2**
9:45	to	10:00	37	**37**	6	**6**
AM Totals			**328**	**328**	**24**	**24**
15:30	to	15:45	56	**56**	21	**21**
15:45	to	16:00	31	**31**	13	**13**
16:00	to	16:15	15	**15**	31	**31**
16:15	to	16:30	14	**14**	28	**28**
16:30	to	16:45	19	**19**	26	**26**
16:45	to	17:00	31	**31**	17	**17**
17:00	to	17:15	8	**8**	52	**52**
17:15	to	17:30	9	**9**	41	**41**
17:30	to	17:45	7	**7**	44	**44**
17:45	to	18:00	5	**5**	15	**15**
18:00	to	18:15	4	**4**	20	**20**
18:15	to	18:30	1	**1**	22	**22**
PM Totals			**200**	**200**	**330**	**330**

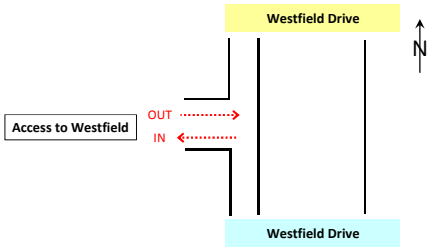
Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 14. Tower St (crossing north of Site 13 roundabout)
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Pedestrians Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach			Pedestrians			
Direction			WB		EB	
Time Period			Peds	Total	Peds	Total
11:00	to	11:15	17	**17**	4	**4**
11:15	to	11:30	24	**24**	5	**5**
11:30	to	11:45	14	**14**	8	**8**
11:45	to	12:00	25	**25**	6	**6**
12:00	to	12:15	19	**19**	6	**6**
12:15	to	12:30	7	**7**	4	**4**
12:30	to	12:45	21	**21**	3	**3**
12:45	to	13:00	11	**11**	10	**10**
13:00	to	13:15	14	**14**	10	**10**
13:15	to	13:30	22	**22**	8	**8**
13:30	to	13:45	15	**15**	7	**7**
13:45	to	14:00	18	**18**	4	**4**
Total			**207**	**207**	**75**	**75**

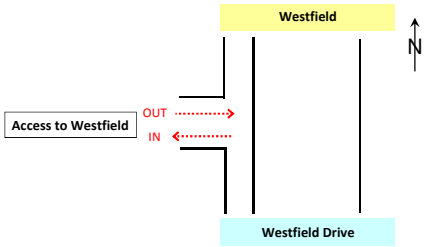
Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 15. Westfield Drive Access
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Pedestrians Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Pedestrians			
Direction	**IN**		**OUT**	
Time Period	**peds**	**Total**	**peds**	**Total**
7:00 to 7:15	2	**2**	0	**0**
7:15 to 7:30	7	**7**	0	**0**
7:30 to 7:45	12	**12**	0	**0**
7:45 to 8:00	9	**9**	0	**0**
8:00 to 8:15	9	**9**	1	**1**
8:15 to 8:30	11	**11**	2	**2**
8:30 to 8:45	8	**8**	0	**0**
8:45 to 9:00	8	**8**	1	**1**
9:00 to 9:15	3	**3**	0	**0**
9:15 to 9:30	1	**1**	1	**1**
9:30 to 9:45	3	**3**	1	**1**
9:45 to 10:00	9	**9**	1	**1**
AM Totals	**82**	**82**	**7**	**7**
15:30 to 15:45	10	**10**	9	**9**
15:45 to 16:00	5	**5**	6	**6**
16:00 to 16:15	1	**1**	9	**9**
16:15 to 16:30	1	**1**	9	**9**
16:30 to 16:45	1	**1**	8	**8**
16:45 to 17:00	0	**0**	2	**2**
17:00 to 17:15	0	**0**	6	**6**
17:15 to 17:30	0	**0**	5	**5**
17:30 to 17:45	0	**0**	2	**2**
17:45 to 18:00	1	**1**	3	**3**
18:00 to 18:15	0	**0**	0	**0**
18:15 to 18:30	0	**0**	0	**0**
PM Totals	**19**	**19**	**59**	**59**

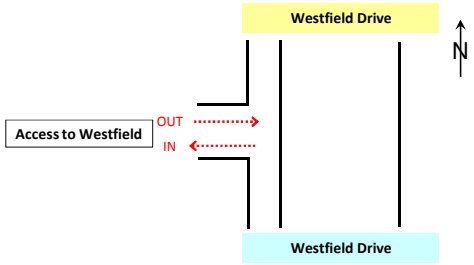
Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 15. Westfield Drive Access
Day/Date	: Fri, 19th September 2014
Weather	: Fine
Description	: Pedestrians Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach	Pedestrians			
Direction	**IN**		**OUT**	
Time Period	**peds**	**Total**	**peds**	**Total**
7:00 to 7:15	1	**1**	0	**0**
7:15 to 7:30	1	**1**	0	**0**
7:30 to 7:45	2	**2**	0	**0**
7:45 to 8:00	4	**4**	0	**0**
8:00 to 8:15	3	**3**	0	**0**
8:15 to 8:30	5	**5**	0	**0**
8:30 to 8:45	8	**8**	0	**0**
8:45 to 9:00	13	**13**	0	**0**
9:00 to 9:15	4	**4**	0	**0**
9:15 to 9:30	7	**7**	3	**3**
9:30 to 9:45	6	**6**	0	**0**
9:45 to 10:00	6	**6**	0	**0**
AM Totals	**60**	**60**	**3**	**3**
15:30 to 15:45	5	**5**	7	**7**
15:45 to 16:00	11	**11**	4	**4**
16:00 to 16:15	5	**5**	9	**9**
16:15 to 16:30	6	**6**	10	**10**
16:30 to 16:45	4	**4**	9	**9**
16:45 to 17:00	3	**3**	4	**4**
17:00 to 17:15	1	**1**	9	**9**
17:15 to 17:30	3	**3**	10	**10**
17:30 to 17:45	2	**2**	7	**7**
17:45 to 18:00	2	**2**	10	**10**
18:00 to 18:15	0	**0**	6	**6**
18:15 to 18:30	4	**4**	4	**4**
PM Totals	**46**	**46**	**89**	**89**

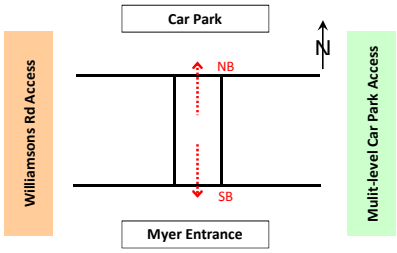
Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 15. Westfield Drive Access
Day/Date	: Sat, 20th September 2014
Weather	: Fine
Description	: Pedestrians Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach			Pedestrians			
Direction			IN		OUT	
Time Period			peds	Total	peds	Total
11:00	to	11:15	5	**5**	0	**0**
11:15	to	11:30	8	**8**	0	**0**
11:30	to	11:45	12	**12**	2	**2**
11:45	to	12:00	17	**17**	2	**2**
12:00	to	12:15	12	**12**	1	**1**
12:15	to	12:30	4	**4**	2	**2**
12:30	to	12:45	12	**12**	1	**1**
12:45	to	13:00	12	**12**	2	**2**
13:00	to	13:15	2	**2**	2	**2**
13:15	to	13:30	0	**0**	4	**4**
13:30	to	13:45	2	**2**	4	**4**
13:45	to	14:00	4	**4**	0	**0**
Total			**90**	**90**	**20**	**20**

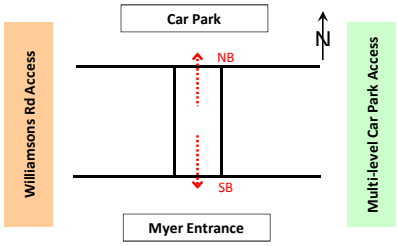
Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 16. Westfield Myer Access
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Pedestrians Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach			Pedestrians			
Direction			NB		NB	
Time Period			Peds	Total	Peds	Total
7:00	to	7:15	1	**1**	2	**2**
7:15	to	7:30	1	**1**	3	**3**
7:30	to	7:45	0	**0**	1	**1**
7:45	to	8:00	0	**0**	4	**4**
8:00	to	8:15	0	**0**	6	**6**
8:15	to	8:30	3	**3**	7	**7**
8:30	to	8:45	3	**3**	7	**7**
8:45	to	9:00	1	**1**	12	**12**
9:00	to	9:15	3	**3**	21	**21**
9:15	to	9:30	6	**6**	18	**18**
9:30	to	9:45	10	**10**	32	**32**
9:45	to	10:00	10	**10**	34	**34**
AM Totals			**38**	**38**	**147**	**147**
15:30	to	15:45	34	**34**	41	**41**
15:45	to	16:00	50	**50**	40	**40**
16:00	to	16:15	40	**40**	66	**66**
16:15	to	16:30	49	**49**	53	**53**
16:30	to	16:45	54	**54**	60	**60**
16:45	to	17:00	34	**34**	37	**37**
17:00	to	17:15	46	**46**	49	**49**
17:15	to	17:30	42	**42**	31	**31**
17:30	to	17:45	49	**49**	43	**43**
17:45	to	18:00	43	**43**	50	**50**
18:00	to	18:15	33	**33**	60	**60**
18:15	to	18:30	44	**44**	42	**42**
PM Totals			**518**	**518**	**572**	**572**

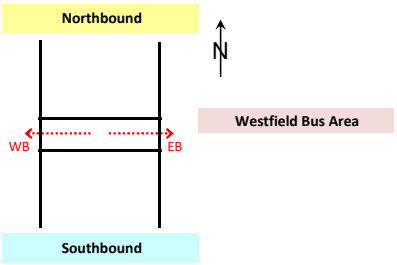
Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 16. Westfield Myer Access
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Pedestrians Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach			Pedestrians			
Direction			NB		NB	
Time Period			Peds	Total	Peds	Total
11:00	to	11:15	55	**55**	104	**104**
11:15	to	11:30	63	**63**	91	**91**
11:30	to	11:45	58	**58**	113	**113**
11:45	to	12:00	89	**89**	108	**108**
12:00	to	12:15	47	**47**	101	**101**
12:15	to	12:30	92	**92**	99	**99**
12:30	to	12:45	82	**82**	80	**80**
12:45	to	13:00	97	**97**	96	**96**
13:00	to	13:15	80	**80**	110	**110**
13:15	to	13:30	82	**82**	89	**89**
13:30	to	13:45	96	**96**	77	**77**
13:45	to	14:00	72	**72**	107	**107**
Total			**913**	**913**	**1,175**	**1,175**

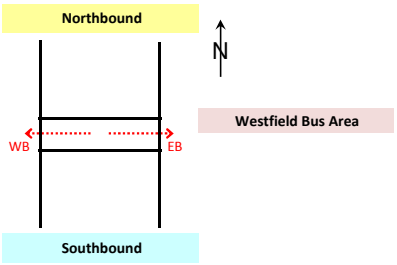
Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 17. Westfield Bus Area
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Pedestrians Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach			Pedestrians			
Direction			WB		EB	
Time Period			Peds	Total	Peds	Total
7:00	to	7:15		0		0
7:15	to	7:30		0		0
7:30	to	7:45		0		0
7:45	to	8:00		0		0
8:00	to	8:15		0		0
8:15	to	8:30		0		0
8:30	to	8:45		0		0
8:45	to	9:00		0		0
9:00	to	9:15		0		0
9:15	to	9:30		0		0
9:30	to	9:45		0		0
9:45	to	10:00		0		0
AM Totals			0	0	0	0
15:30	to	15:45	83	83	117	117
15:45	to	16:00	79	79	128	128
16:00	to	16:15	87	87	136	136
16:15	to	16:30	63	63	64	64
16:30	to	16:45	69	69	59	59
16:45	to	17:00	68	68	59	59
17:00	to	17:15	90	90	66	66
17:15	to	17:30	95	95	75	75
17:30	to	17:45	79	79	55	55
17:45	to	18:00	60	60	32	32
18:00	to	18:15	73	73	54	54
18:15	to	18:30	46	46	52	52
PM Totals			892	892	897	897

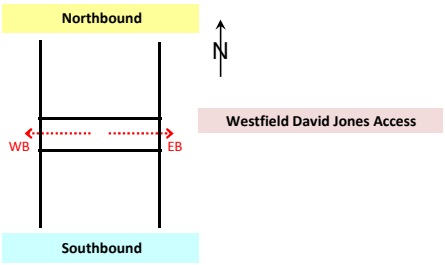
Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 17. Westfield Bus Area
Day/Date	: Sat, 6th September 2014
Weather	: Fine
Description	: Pedestrians Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach		Pedestrians			
Direction		WB		EB	
Time Period		Peds	Total	Peds	Total
11:00	to 11:15	49	**49**	64	**64**
11:15	to 11:30	54	**54**	61	**61**
11:30	to 11:45	59	**59**	63	**63**
11:45	to 12:00	54	**54**	60	**60**
12:00	to 12:15	64	**64**	49	**49**
12:15	to 12:30	58	**58**	71	**71**
12:30	to 12:45	61	**61**	59	**59**
12:45	to 13:00	59	**59**	91	**91**
13:00	to 13:15	78	**78**	71	**71**
13:15	to 13:30	51	**51**	74	**74**
13:30	to 13:45	73	**73**	60	**60**
13:45	to 14:00	70	**70**	96	**96**
Total		**730**	**730**	**819**	**819**

Job No.	: V455
Client	: GTA
Suburb	: Doncaster
Location	: 18. Westfield David Jones Access
Day/Date	: Fri, 5th September 2014
Weather	: Fine
Description	: Pedestrians Count
	: 15 mins Data



SKYHIGH - THE TRAFFIC SURVEY COMPANY

Approach			Pedestrians			
Direction			WB		EB	
Time Period			Peds	Total	Peds	Total
7:00	to	7:15	0	**0**	0	**0**
7:15	to	7:30	2	**2**	6	**6**
7:30	to	7:45	3	**3**	3	**3**
7:45	to	8:00	4	**4**	3	**3**
8:00	to	8:15	9	**9**	3	**3**
8:15	to	8:30	7	**7**	8	**8**
8:30	to	8:45	5	**5**	9	**9**
8:45	to	9:00	9	**9**	16	**16**
9:00	to	9:15	9	**9**	8	**8**
9:15	to	9:30	10	**10**	8	**8**
9:30	to	9:45	4	**4**	8	**8**
9:45	to	10:00	5	**5**	7	**7**
AM Totals			**67**	**67**	**79**	**79**
15:30	to	15:45	5	**5**	13	**13**
15:45	to	16:00	12	**12**	8	**8**
16:00	to	16:15	12	**12**	11	**11**
16:15	to	16:30	16	**16**	17	**17**
16:30	to	16:45	14	**14**	6	**6**
16:45	to	17:00	6	**6**	9	**9**
17:00	to	17:15	13	**13**	12	**12**
17:15	to	17:30	19	**19**	7	**7**
17:30	to	17:45	13	**13**	11	**11**
17:45	to	18:00	18	**18**	7	**7**
18:00	to	18:15	22	**22**	4	**4**
18:15	to	18:30	7	**7**	11	**11**
PM Totals			**157**	**157**	**116**	**116**

TRAVEL TIME SURVEY RAW DATA

DATE	TIME PERIOD	RUN ID	DONCASTER ROAD EASTBOUND							RUN ID	DONCASTER ROAD WESTBOUND						
		FROM	Bayley Street	Rose Street	Elgar Road	Tram Road	Frederick Street (Entrance)	South East Site Entrance	Bayley Street	FROM	Council Street	South East Site Entrance	Frederick Street (Entrance)	Tram Road	Elgar Road	Rose Street	Council Street
		TO	Rose Street	Elgar Road	Tram Road	Frederick Street (Entrance)	South East Site Entrance	Council Street	Council Street	TO	South East Site Entrance	Frederick Street (Entrance)	Tram Road	Elgar Road	Rose Street	Bayley Street	Bayley Street
FRIDAY 5/09/2014	7:15am to 8:15am	1	14	11	8	12	5	9	**59**	1	10	5	63	8	10	14	**110**
		2	14	17	10	13	5	10	**69**	2	27	6	12	8	9	14	**76**
		3	15	11	9	16	5	10	**66**	3	38	7	19	8	9	14	**95**
		4	14	12	8	15	6	10	**65**	4	38	7	14	7	10	14	**90**
		5	14	106	11	18	5	10	**164**	5	17	6	20	9	11	14	**77**
		6	14	72	15	23	6	10	**140**	6	11	6	16	7	10	14	**64**
	8:15am to 9:15am	1	14	27	11	26	7	10	**95**	1	17	5	13	9	10	14	**68**
		2	15	93	11	16	6	10	**151**	2	11	8	15	9	11	15	**69**
		3	14	19	11	15	6	10	**75**	3	16	5	13	9	10	14	**67**
		4	15	78	11	19	6	11	**140**	4	11	6	12	9	10	13	**61**
		5	15	76	10	15	8	11	**135**	5	68	7	25	9	11	14	**134**
		6	19	107	11	14	6	12	**169**	6	11	5	11	7	10	14	**58**
		7	16	74	9	15	7	11	**132**								
		8	27	97	14	15	7	10	**170**								
	3:45pm to 4:45pm	1	76	101	11	18	9	38	**253**	1	73	6	20	9	10	14	**132**
		2	14	41	9	13	5	10	**92**	2	36	6	49	9	11	14	**125**
		3	15	43	10	15	7	11	**101**	3	85	6	18	9	13	15	**146**
		4	15	49	101	20	7	10	**202**	4	62	11	31	9	10	14	**137**
		5	14	52	11	16	6	11	**110**	5	55	9	35	8	11	14	**132**
										6	76	7	24	9	11	15	**142**
	4:45pm to 5:45pm	1	15	39	9	14	5	11	**93**	1	63	6	31	8	10	14	**132**
		2	14	51	10	12	5	10	**102**	2	73	7	20	9	11	14	**134**
		3	18	40	8	13	6	10	**95**	3	75	7	17	8	10	13	**130**
		4	14	75	10	14	6	51	**170**	4	54	9	28	9	15	16	**131**
		5	14	27	11	15	7	10	**84**	5	63	10	37	9	12	13	**144**
		6	16	59	11	13	5	11	**115**	6	11	5	87	8	16	15	**142**
		7	17	73	11	91	7	15	**214**	7	40	10	39	8	11	17	**125**
SATURDAY 6/09/2014	11:30am to 12:30pm	1	49	108	14	16	7	11	**205**	1	15	7	35	8	11	16	**92**
		2	44	96	12	13	6	11	**182**	2	68	9	27	8	10	15	**137**
		3	25	133	19	13	6	9	**205**	3	21	8	37	10	16	21	**113**
		4	16	19	8	12	5	9	**69**	4	35	7	22	10	12	16	**102**
		5	14	102	16	15	5	9	**161**	5	44	6	15	9	13	16	**103**
										6	75	7	26	8	10	14	**140**
	12:30pm to 1:30pm	1	18	103	10	13	7	13	**164**	1	58	6	22	11	11	14	**122**
		2	137	102	10	14	6	10	**279**	2	63	5	26	8	11	15	**128**
		3	17	77	9	14	5	12	**134**	3	16	10	22	10	10	12	**80**
		4	30	102	10	15	7	10	**174**	4	28	6	21	8	11	17	**91**
		5	20	104	15	16	7	10	**172**	5	62	10	40	8	9	13	**142**
		6	18	120	10	21	6	10	**185**	6	68	7	25	8	11	16	**135**

TRAVEL TIME SURVEY RAW DATA

DATE	TIME PERIOD	RUN ID	TRAM ROAD AND WILLIAMSONS ROAD NORTHBOUND							RUN ID	TRAM ROAD AND WILLIAMSONS ROAD SOUTHBOUND						
		FROM	Merlin Street	Doncaster Road	Hotel/Shopping Centre Entrance	North West Site Entrance	Bordeaux Street	Williamsons Road	Merlin Street	FROM	George Street	Williamsons Road	Bordeaux Street	North West Site Entrance	Hotel/Shopping Centre Entrance	Doncaster Road	George Street
		TO	Doncaster Road	Hotel/Shopping Centre Entrance	North West Site Entrance	Bordeaux Street	Williamsons Road	George Street	George Street	TO	Williamsons Road	Bordeaux Street	North West Site Entrance	Hotel/Shopping Centre Entrance	Doncaster Road	Merlin Street	Merlin Street
FRIDAY 5/09/2014	7:15am to 8:15am	1	86	18	10	8	38	15	**175**	1	15	18	24	15	38	27	**137**
		2	81	21	56	9	15	12	**194**	2	20	20	39	22	51	23	**175**
		3	83	63	18	11	17	13	**205**	3	77	18	36	13	58	49	**251**
		4	97	21	13	10	18	14	**173**	4	32	19	32	35	61	20	**199**
		5	91	21	47	11	22	17	**209**								
	8:15am to 9:15am	1	184	20	15	12	22	16	**269**	1	42	38	23	15	102	25	**245**
		2	60	23	14	11	48	17	**173**	2	65	23	65	12	101	27	**293**
		3	47	24	24	13	24	17	**149**	3	92	37	15	15	59	40	**258**
		4	81	70	13	11	20	16	**211**	4	17	26	32	19	126	30	**250**
	3:45pm to 4:45pm	1	138	22	48	11	33	17	**269**	1	68	25	15	14	161	27	**310**
		2	98	78	13	9	18	15	**231**	2	112	18	32	14	183	17	**376**
		3	120	58	12	10	17	15	**232**	3	52	20	26	23	109	19	**249**
		4	97	76	12	9	18	13	**225**	4	76	20	29	32	132	20	**309**
	4:45pm to 5:45pm	1	195	46	15	9	27	14	**306**	1	28	21	28	16	164	20	**277**
		2	61	25	48	10	28	16	**188**	2	172	22	40	14	95	28	**371**
		3	96	81	12	11	19	14	**233**	3	71	24	13	18	202	22	**350**
SATURDAY 6/09/2014	11:30am to 12:30pm	1	76	35	12	11	22	15	**171**	1	19	46	75	18	57	26	**241**
		2	89	26	13	10	25	18	**181**	2	19	91	71	29	24	22	**256**
		3	89	60	14	11	19	18	**211**	3	35	31	39	15	79	25	**224**
		4	90	25	12	10	18	13	**168**	4	58	35	34	66	48	21	**262**
		5	95	23	12	11	19	16	**176**	5	59	21	20	14	45	23	**182**
		6	68	48	14	9	16	14	**169**	6	74	25	42	12	104	22	**279**
	12:30pm to 1:30pm	1	75	40	14	12	18	14	**173**	1	73	25	37	21	70	23	**249**
		2	67	22	10	11	18	13	**141**	2	28	21	38	29	25	19	**160**
		3	101	23	12	10	18	14	**178**	3	29	30	13	19	29	21	**141**
		4	82	26	12	10	18	14	**162**	4	91	22	22	21	71	27	**254**
		5	79	22	12	10	19	14	**156**	5	38	22	51	26	117	24	**278**
		6	72	62	14	9	19	13	**189**	6	56	21	36	27	102	24	**266**

TRAVEL TIME SURVEY RAW DATA

DATE	TIME PERIOD	RUN ID	ELGAR ROAD AND WILLIAMSONS ROAD NORTHBOUND								RUN ID	ELGAR ROAD AND WILLIAMSONS ROAD SOUTHBOUND							
		From	Hanke Road	Doncaster Road	Tram Road	Hotel/Shopping Centre Entrance	North West Site Entrance	Bordeaux Street	Manningham Road	Hanke Road	From	George Street	Manningham Road	Bordeaux Street	North West Site Entrance	Hotel/Shopping Centre Entrance	Tram Road	Doncaster Road	George Street
		To	Doncaster Road	Tram Road	Hotel/Shopping Centre Entrance	North West Site Entrance	Bordeaux Street	Manningham Road	George Street	George Street	To	Manningham Road	Bordeaux Street	North West Site Entrance	Hotel/Shopping Centre Entrance	Tram Road	Doncaster Road	Hanke Road	Hanke Road
FRIDAY 5/09/2014	7:15am to 8:15am	1	58	11	23	10	9	55	50	**216**	1	19	18	9	69	95	9	25	**244**
		2	113	13	27	33	10	23	55	**274**	2	18	19	50	24	311	11	28	**461**
		3	50	26	64	16	11	75	64	**306**	3	75	19	10	20	137	10	26	**297**
		4	102	17	24	13	10	73	66	**305**	4	19	20	9	80	94	16	31	**269**
		5	93	11	27	40	12	22	61	**266**	5	21	24	29	33	41	11	26	**185**
		6	90	10	90	11	8	99	16	**324**									
	8:15am to 9:15am	1	89	11	59	16	12	106	61	**354**	1	16	19	8	53	125	10	26	**257**
		2	80	12	40	21	13	99	16	**281**	2	80	27	13	13	126	14	33	**306**
		3	112	15	77	41	12	106	16	**379**	3	64	34	13	76	130	14	27	**358**
		4	108	12	27	20	14	90	20	**291**									
	3:45pm to 4:45pm	1	184	12	41	56	11	68	18	**390**	1	18	19	37	26	169	20	31	**320**
		2	98	21	43	11	11	57	42	**283**	2	18	38	71	17	247	14	29	**434**
		3	96	13	59	11	13	44	17	**253**	3	18	18	62	30	397	11	28	**564**
		4	94	11	63	26	11	124	18	**347**	4	17	17	58	14	202	10	27	**345**
											5	59	21	9	10	239	11	27	**376**
	4:45pm to 5:45pm	1	118	14	35	17	54	148	16	**402**	1	56	19	9	10	156	30	30	**310**
		2	196	11	48	12	12	88	17	**384**	2	41	22	13	14	243	17	30	**380**
		3	96	23	52	14	12	85	16	**298**	3	66	22	13	13	359	10	27	**510**
		4	108	15	70	15	14	80	17	**319**	4	17	18	9	70	123	19	30	**286**
SATURDAY 6/09/2014	11:30am to 12:30pm	1	102	18	21	49	11	39	18	**258**	1	53	35	87	27	188	10	28	**428**
		2	87	14	81	12	8	98	16	**316**	2	62	19	9	10	86	13	27	**226**
		3	78	14	24	10	9	99	15	**249**	3	19	21	72	18	262	15	37	**444**
		4	80	13	22	10	8	72	16	**221**	4	60	22	10	10	185	12	27	**326**
		5	81	13	19	49	10	46	16	**234**	5	65	18	10	19	296	10	28	**446**
	12:30pm to 1:30pm	1	98	14	29	11	9	91	17	**269**	1	19	18	55	30	164	11	26	**323**
		2	91	18	79	11	11	86	16	**312**	2	17	18	48	14	131	12	38	**278**
		3	78	12	39	13	11	86	16	**255**	3	20	69	15	122	278	11	27	**542**
		4	115	11	51	13	9	89	15	**303**	4	16	18	58	19	36	13	41	**201**

Appendix C

Turn Flow Calibration Results

WESTFIELD DONCASTER TURN FLOW CALIBRATION
WEEKDAY AM PEAK

SUMMARY STATISTICS	
7:15am to 8:15am	
TOTAL	119
GEH<5	93%
GEH<10	100%

SUMMARY STATISTICS	
8:15am to 9:15am	
TOTAL	119
GEH<5	93%
GEH<10	100%

				1					2				
				7:15 to 8:15					8:15 to 9:15				
Intersection	Approach	Turn	Turn ID	Observed	Modelled	Absolute Difference	Relative Difference (%)	GEH	Observed	Modelled	Absolute Difference	Relative Difference (%)	GEH
Manningham Road / Williamsons Road	North	Left	82890	42	105	63	150%	7.35	40	71	31	78%	4.16
		Through	82931	963	975	12	1%	0.39	1,069	1036	-33	-3%	1.02
	East	Left	82887	1,175	1171	-4	0%	0.12	1,117	1309	192	17%	5.51
		Right	82933	336	381	45	13%	2.38	440	454	14	3%	0.66
	South	Through	82934	823	916	93	11%	3.15	889	900	11	1%	0.37
		Right	82935	461	676	215	47%	9.02	539	752	213	40%	8.38
Williamsons Road / Bordeaux Street / Westfield Drive	North	Left	83375	15	38	23	153%	4.47	45	43	-2	-4%	0.30
		Through	83378	2,084	2077	-7	0%	0.16	2,035	2134	99	5%	2.16
		Right	83379	26	18	-8	-31%	1.71	18	41	23	128%	4.23
		U-Turn	84884	17	17	0	0%	0.00	130	116	-14	-11%	1.26
	East	Left	83383	5	5	0	0%	0.00	10	4	-6	-60%	2.27
		Through	83384	0	0	0	0%	0.00	0	0	0	0%	0.00
		Right	83385	6	4	-2	-33%	0.89	6	11	5	83%	1.71
	South	Left	83393	8	14	6	75%	1.81	17	21	4	24%	0.92
		Through	83394	1,230	1603	373	30%	9.90	1,235	1515	280	23%	7.55
		Right	83746	3	4	1	33%	0.53	8	12	4	50%	1.26
		U-Turn	84885	20	20	0	0%	0.00	16	22	6	38%	1.38
	West	Left	83386	16	2	-14	-88%	4.67	60	97	37	62%	4.18
		Through	83388	1	0	-1	-100%	1.41	2	3	1	50%	0.63
		Right	83389	8	14	6	75%	1.81	18	26	8	44%	1.71
Williamsons Road / Westfield Access / Sovereign Point Crescent	North	Left	83745	60	72	12	20%	1.48	243	257	14	6%	0.89
		Through	81979	1,989	2046	57	3%	1.27	1,883	1887	4	0%	0.09
		Right	84886	3	7	4	133%	1.79	3	22	19	633%	5.37
	East	Left	81975	64	41	-23	-36%	3.17	60	48	-12	-20%	1.63
		Through	84888	0	0	0	0%	0.00	0	0	0	0%	0.00
		Right	81977	65	64	-1	-2%	0.12	45	38	-7	-16%	1.09
	South	Left	81985	5	1	-4	-80%	2.31	4	1	-3	-75%	1.90
		Through	81986	1,224	1565	341	28%	9.13	1,228	1509	281	23%	7.60
		Right	81987	18	30	12	67%	2.45	85	109	24	28%	2.44
	West	Left	81982	11	22	11	100%	2.71	16	15	-1	-6%	0.25
Williamsons Road / Westfield Access / Hotel Access	North	Left	83738	96	110	14	15%	1.38	163	155	-8	-5%	0.63
		Through	81346	1,944	1952	8	0%	0.18	1,761	1755	-6	0%	0.14
		Right	83739	5	11	6	120%	2.12	12	19	7	58%	1.78
	East	Left	81339	38	42	4	11%	0.63	70	61	-9	-13%	1.11
		Through	81340	2	2	0	0%	0.00	2	1	-1	-50%	0.82
		Right	81341	25	29	4	16%	0.77	43	39	-4	-9%	0.62
	South	Left	83736	16	24	8	50%	1.79	30	53	23	77%	3.57
		Through	81358	1,226	1573	347	28%	9.28	1,274	1575	301	24%	7.98
		Right	83737	101	131	30	30%	2.79	184	181	-3	-2%	0.22
	West	Left	81335	2	1	-1	-50%	0.82	6	7	1	17%	0.39
		Through	81337	1	2	1	100%	0.82	1	0	-1	-100%	1.41
		Right	81338	2	1	-1	-50%	0.82	5	1	-4	-80%	2.31
Doncaster Road / Tram Road / Williamsons Road	North	Left	84651	270	295	25	9%	1.49	380	413	33	9%	1.66
		Through	80650	1,085	1131	46	4%	1.38	1,064	980	-84	-8%	2.63
		Right	83992	642	507	-135	-21%	5.63	492	475	-17	-3%	0.77
	East	Left	84659	86	114	28	33%	2.82	147	156	9	6%	0.73
		Through	80636	948	1054	106	11%	3.35	900	829	-71	-8%	2.41
		Right	83664	383	374	-9	-2%	0.46	402	374	-28	-7%	1.42
	South	Left	84655	175	154	-21	-12%	1.64	157	137	-20	-13%	1.65
		Through	80641	738	825	87	12%	3.11	670	755	85	13%	3.18
		Right	83993	100	106	6	6%	0.59	301	279	-22	-7%	1.29
	West	Left	80586	294	473	179	61%	9.14	471	654	183	39%	7.72
		Through	80672	335	340	5	1%	0.27	938	927	-11	-1%	0.36
		Right	80673	66	78	12	18%	1.41	103	133	30	29%	2.76
Tram Road / Merlin Street	North	Left	82738	10	9	-1	-10%	0.32	19	26	7	37%	1.48
		Through	82740	1,264	1300	36	3%	1.01	1,263	1211	-52	-4%	1.48
	East	Left	82736	4	0	-4	-100%	2.83	4	0	-4	-100%	2.83
		Right	82737	3	10	7	233%	2.75	6	18	12	200%	3.46
	South	Through	82732	983	1106	123	12%	3.79	1,121	1115	-6	-1%	0.18
		Right	82735	5	0	-5	-100%	3.16	4	0	-4	-100%	2.83
Doncaster Road / Bayley Grove	North	Left	81429	19	26	7	37%	1.48	27	31	4	15%	0.74
	East	Left	83711	3	10	7	233%	2.75	6	21	15	250%	4.08
		Through	81421	916	818	-98	-11%	3.33	740	759	19	3%	0.69
	South	Left	83712	6	8	2	33%	0.76	8	5	-3	-38%	1.18
	West	Left	81426	13	17	4	31%	1.03	18	9	-9	-50%	2.45
		Through	81427	430	477	47	11%	2.21	931	895	-36	-4%	1.19
Doncaster Road / Rose Street / Beaonsfield Street	North	Left	80562	39	55	16	41%	2.33	63	71	8	13%	0.98
		Through	80566	1	0	-1	-100%	1.41	0	0	0	0%	0.00
		Right	80567	14	26	12	86%	2.68	17	25	8	47%	1.75
	East	Left	80568	72	98	26	36%	2.82	66	97	31	47%	3.43
		Through	80570	874	791	-83	-9%	2.88	704	710	6	1%	0.23
		Right	80571	58	94	36	62%	4.13	44	68	24	55%	3.21
	South	Left	80573	14	6	-8	-57%	2.53	29	28	-1	-3%	0.19
		Through	80574	2	0	-2	-100%	2.00	2	1	-1	-50%	0.82
		Right	80575	18	27	9	50%	1.90	29	33	4	14%	0.72
	West	Left	80576	19	25	6	32%	1.28	37	30	-7	-19%	1.21
		Through	80577	381	453	72	19%	3.53	877	872	-5	-1%	0.17
		Right	80578	27	19	-8	-30%	1.67	19	14	-5	-26%	1.23
		U-Turn	84890	15	6	-9	-60%	2.78	14	4	-10	-71%	3.33
Doncaster Road / Elgar Road / Site Access	North	Left	83690	2	6	4	200%	2.00	2	7	5	250%	2.36
	East	Left	83859	751	724	-27	-4%	0.99	677	651	-26	-4%	1.01
		Through	83693	974	963	-11	-1%	0.35	764	783	19	2%	0.68
		Right	83694	13	23	10	77%	2.36	22	15	-7	-32%	1.63
	South	Left	81664	40	45	5	13%	0.77	54	105	51	94%	5.72
		Through	83695	2	5	3	150%	1.60	10	6	-4	-40%	1.41
		Right	83697	312	419	107	34%	5.60	722	848	126	17%	4.50
	West	Left	83698	1	6	5	500%	2.67	0	7	7	#DIV/0!	3.74
		Through	83699	372	466	94	25%	4.59	840	880	40	5%	1.36
		Right	83700	38	51	13	34%	1.95	79	81	2	3%	0.22
Doncaster Road / Frederick Street / Westfield Access	North	Left	82714	3	0	-3	-100%	2.45	3	0	-3	-100%	2.45
		Through	82716	0	0	0	0%	0.00	0	0	0	0%	0.00
		Right	82717	7	6	-1	-14%	0.39	2	16	14	700%	4.67
	East	Left	82724	12	14	2	17%	0.55	36	20	-16	-44%	3.02
		Through	82725	1,432	1556	124	9%	3.21	1,287	1332	45	3%	1.24
	South	Left	82721	29	15	-14	-48%	2.98	23	15	-8	-35%	1.84
		Right	82723	7	3	-4	-57%	1.79	17	5	-12	-71%	3.62
	West	Left	83599	29	37	8	28%	1.39	133	140	7	5%	0.60
		Through	82718	602	670	68	11%	2.70	1,396	1392	-4	0%	0.11
		Right	82719	34	34	0	0%	0.00	81	81	0	0%	0.00
Doncaster Road / Westfield Access	North	Left	85880	31	37	6	19%	1.03	55	80	25	45%	3.04
		Right	82195	49	75	26	53%	3.30	53	52	-1	-2%	0.14
	East	Through	82185	1,382	1497	115	8%	3.03	1,266	1301	35	3%	0.98
		Right	83661	72	102	30	42%	3.22	290	324	34	12%	1.94
	West	Left	82196	124	108	-16	-13%	1.49	432	423	-9	-2%	0.44
		Through	82198	491	565	74	15%	3.22	976	974	-2	0%	0.06
Doncaster Road / Council Street	North	Left	83647	35	38	3	9%	0.50	73	63	-10	-14%	1.21
		Through	83648	1	0	-1	-100%	1.41	2	0	-2	-100%	2.00
		Right	83649	151	151	0	0%	0.00	201	163	-38	-19%	2.82
	East	Left	83650	16	17	1	6%	0.25	46	53	7	15%	0.99
		Through	83651	1,388	1419	31	2%	0.83	1,367	1462	95	7%	2.53
		Right	83652	33	22	-11	-33%	2.10	88	92	4	5%	0.42
		U-Turn	84895	3	10	7	233%	2.75	10	14	4	40%	1.15
	South	Left	83653	4	19	15	375%	4.42	6	12	6	100%	2.00
		Through	83654	0	0	0	0%	0.00	0	0	0	0%	0.00
		Right	83655	0	5	5	#DIV/0!	3.16	1	2	1	100%	0.82
	West	Left	83656	35	41	6	17%	0.97	92	115	23	25%	2.26
		Through	83657	469	528	59	13%	2.64	880	893	13	1%	0.44
		Right	83658	21	25	4	19%	0.83	44	43	-1	-2%	0.15
		U-Turn	84896	6	5	-1	-17%	0.43	13	6	-7	-54%	2.27

WESTFIELD DONCASTER TURN FLOW CALIBRATION
WEEKDAY PM PEAK

SUMMARY STATISTICS	
3:45pm to 4:45pm	
TOTAL	119
GEH<5	90%
GEH<10	100%

SUMMARY STATISTICS	
4:45pm to 5:45pm	
TOTAL	119
GEH<5	97%
GEH<10	100%

				1					2				
				3:45pm to 4:45pm					4:45pm to 5:45pm				
Intersection	Approach	Turn	Turn ID	Observed	Modelled	Absolute Difference	Relative Difference (%)	GEH	Observed	Modelled	Absolute Difference	Relative Difference (%)	GEH
Manningham Road / Williamsons Road	North	Left	82890	52	45	-7	-13%	1.01	79	67	-12	-15%	1.40
		Through	82931	1,301	1414	113	9%	3.07	1,312	1390	78	6%	2.12
	East	Left	82887	879	859	-20	-2%	0.68	842	778	-64	-8%	2.25
		Right	82933	224	225	1	0%	0.07	258	235	-23	-9%	1.46
	South	Through	82934	936	1037	101	11%	3.22	1,187	1216	29	2%	0.84
		Right	82935	1,396	1455	59	4%	1.56	1,416	1346	-70	-5%	1.88
Williamsons Road / Bordeaux Street / Westfield Drive	North	Left	83375	25	23	-2	-8%	0.41	19	15	-4	-21%	0.97
		Through	83378	2,066	2244	178	9%	3.83	2,111	2101	-10	0%	0.23
		Right	83379	14	14	0	0%	0.00	17	20	3	18%	0.70
		U-Turn	84884	18	5	-13	-72%	3.83	48	41	-7	-15%	1.05
	East	Left	83383	10	11	1	10%	0.31	14	22	8	57%	1.89
		Through	83384	0	0	0	0%	0.00	0	0	0	0%	0.00
		Right	83385	7	5	-2	-29%	0.82	16	4	-12	-75%	3.79
	South	Left	83393	15	8	-7	-47%	2.06	20	21	1	5%	0.22
		Through	83394	2,381	2516	135	6%	2.73	2,603	2575	-28	-1%	0.55
		Right	83746	15	12	-3	-20%	0.82	14	24	10	71%	2.29
		U-Turn	84885	17	29	12	71%	2.50	11	12	1	9%	0.29
	West	Left	83386	18	5	-13	-72%	3.83	22	12	-10	-45%	2.43
		Through	83388	0	0	0	0%	0.00	1	0	-1	-100%	1.41
		Right	83389	11	6	-5	-45%	1.71	10	3	-7	-70%	2.75
Williamsons Road / Westfield Access / Sovereign Point Crescent	North	Left	83745	400	380	-20	-5%	1.01	371	399	28	8%	1.43
		Through	81979	1,740	1893	153	9%	3.59	1,717	1716	-1	0%	0.02
		Right	84886	8	5	-3	-38%	1.18	8	17	9	113%	2.55
	East	Left	81975	261	283	22	8%	1.33	257	240	-17	-7%	1.08
		Through	84888	0	2	2	#DIV/0!	2.00	1	0	-1	-100%	1.41
		Right	81977	504	493	-11	-2%	0.49	487	539	52	11%	2.30
	South	Left	81985	9	11	2	22%	0.63	10	6	-4	-40%	1.41
		Through	81986	1,847	2053	206	11%	4.66	2,115	2086	-29	-1%	0.63
		Right	81987	191	219	28	15%	1.96	222	291	69	31%	4.31
	West	Left	81982	8	21	13	163%	3.41	14	8	-6	-43%	1.81
Williamsons Road / Westfield Access / Hotel Access	North	Left	83738	196	187	-9	-5%	0.65	180	190	10	6%	0.74
		Through	81346	1,758	1928	170	10%	3.96	1,756	1757	1	0%	0.02
		Right	83739	21	24	3	14%	0.63	20	20	0	0%	0.00
	East	Left	81339	168	191	23	14%	1.72	170	149	-21	-12%	1.66
		Through	81340	6	8	2	33%	0.76	1	1	0	0%	0.00
		Right	81341	101	127	26	26%	2.44	149	144	-5	-3%	0.41
	South	Left	83736	50	72	22	44%	2.82	78	67	-11	-14%	1.29
		Through	81358	1,918	2121	203	11%	4.52	2,133	2199	66	3%	1.42
		Right	83737	288	283	-5	-2%	0.30	220	215	-5	-2%	0.34
	West	Left	81335	33	37	4	12%	0.68	52	30	-22	-42%	3.44
		Through	81337	2	0	-2	-100%	2.00	3	0	-3	-100%	2.45
		Right	81338	28	24	-4	-14%	0.78	35	30	-5	-14%	0.88
Doncaster Road / Tram Road / Williamsons Road	North	Left	84651	470	524	54	11%	2.42	470	499	29	6%	1.32
		Through	80650	1,073	1190	117	11%	3.48	1,082	1013	-69	-6%	2.13
		Right	83992	369	441	72	20%	3.58	380	344	-36	-9%	1.89
	East	Left	84659	194	248	55	28%	3.67	234	306	72	31%	4.36
		Through	80636	808	976	168	21%	5.63	910	912	2	0%	0.07
		Right	83664	593	511	-82	-14%	3.49	656	526	-130	-20%	5.35
	South	Left	84655	138	136	-2	-1%	0.17	166	164	-2	-1%	0.16
		Through	80641	951	1044	93	10%	2.94	1,053	994	-59	-6%	1.84
		Right	83993	269	321	52	19%	3.03	270	310	40	15%	2.35
	West	Left	80586	810	849	39	5%	1.35	846	899	53	6%	1.79
		Through	80672	1,141	1166	25	2%	0.74	1,082	1150	68	6%	2.04
		Right	80673	128	138	10	8%	0.87	139	164	25	18%	2.03
Tram Road / Merlin Street	North	Left	82738	43	36	-7	-16%	1.11	49	24	-25	-51%	4.14
		Through	82740	1,357	1565	208	15%	5.44	1,449	1462	13	1%	0.34
	East	Left	82736	4	0	-4	-100%	2.83	4	0	-4	-100%	2.83
		Right	82737	13	7	-6	-46%	1.90	7	7	0	0%	0.00
	South	Through	82732	1,365	1483	118	9%	3.13	1,521	1476	-45	-3%	1.16
		Right	82735	11	0	-11	-100%	4.69	7	0	-7	-100%	3.74
Doncaster Road / Bayley Grove	North	Left	81429	29	46	17	59%	2.78	31	12	-19	-61%	4.10
	East	Left	83711	8	31	23	288%	5.21	7	9	2	29%	0.71
		Through	81421	836	994	158	19%	5.22	924	895	-29	-3%	0.96
	South	Left	83712	22	35	13	59%	2.44	32	30	-2	-6%	0.36
	West	Left	81426	23	15	-8	-35%	1.84	30	23	-7	-23%	1.36
		Through	81427	1,148	1075	-73	-6%	2.19	1,232	1236	4	0%	0.11
Doncaster Road / Rose Street / Beaonsfield Street	North	Left	80562	63	57	-6	-10%	0.77	91	98	7	8%	0.72
		Through	80566	4	0	-4	-100%	2.83	2	1	-1	-50%	0.82
		Right	80567	16	27	11	69%	2.37	23	38	15	65%	2.72
	East	Left	80568	69	39	-30	-43%	4.08	48	35	-13	-27%	2.02
		Through	80570	771	898	127	16%	4.40	875	830	-45	-5%	1.54
		Right	80571	60	110	50	83%	5.42	37	83	46	124%	5.94
	South	Left	80573	43	101	58	135%	6.84	17	32	15	88%	3.03
		Through	80574	5	11	6	120%	2.12	3	3	0	0%	0.00
		Right	80575	41	85	44	107%	5.54	32	42	10	31%	1.64
	West	Left	80576	37	16	-21	-57%	4.08	37	18	-19	-51%	3.62
		Through	80577	1,079	1078	-1	0%	0.03	1,190	1181	-9	-1%	0.26
		Right	80578	31	22	-9	-29%	1.75	26	40	14	54%	2.44
		U-Turn	84890	25	8	-17	-68%	4.19	16	5	-11	-69%	3.39
Doncaster Road / Elgar Road / Site Access	North	Left	83690	10	39	29	290%	5.86	35	61	26	74%	3.75
	East	Left	83859	469	588	119	25%	5.18	524	544	20	4%	0.87
		Through	83693	848	956	108	13%	3.60	903	860	-43	-5%	1.45
		Right	83694	3	9	6	200%	2.45	3	10	7	233%	2.75
	South	Left	81664	55	95	40	73%	4.62	59	101	42	71%	4.70
		Through	83695	0	5	5	#DIV/0!	3.16	0	7	7	#DIV/0!	3.74
		Right	83697	997	968	-29	-3%	0.93	906	917	11	1%	0.36
	West	Left	83698	0	8	8	#DIV/0!	4.00	0	9	9	#DIV/0!	4.24
		Through	83699	1,107	1147	40	4%	1.19	1,184	1261	77	7%	2.20
		Right	83700	58	71	13	22%	1.62	60	72	12	20%	1.48
Doncaster Road / Frederick Street / Westfield Access	North	Left	82714	5	0	-5	-100%	3.16	7	0	-7	-100%	3.74
		Through	82716	0	0	0	0%	0.00	1	0	-1	-100%	1.41
		Right	82717	2	4	2	100%	1.15	7	13	6	86%	1.90
	East	Left	82724	16	23	7	44%	1.59	34	26	-8	-24%	1.46
		Through	82725	1,484	1697	213	14%	5.34	1,635	1731	96	6%	2.34
	South	Left	82721	32	28	-4	-13%	0.73	69	36	-33	-48%	4.55
		Right	82723	17	13	-4	-24%	1.03	39	33	-6	-15%	1.00
	West	Left	83599	247	245	-2	-1%	0.13	248	245	-3	-1%	0.19
		Through	82718	1,683	1739	56	3%	1.35	1,653	1679	26	2%	0.64
		Right	82719	66	47	-19	-29%	2.53	44	15	-29	-66%	5.34
Doncaster Road / Westfield Access	North	Left	85880	509	633	124	24%	5.19	478	514	36	8%	1.62
		Right	82195	577	642	65	11%	2.63	647	648	1	0%	0.04
	East	Through	82185	899	1069	170	19%	5.42	986	1110	124	13%	3.83
		Right	83661	337	360	23	7%	1.23	297	330	33	11%	1.86
	West	Left	82196	464	518	54	12%	2.44	451	408	-43	-10%	2.07
		Through	82198	1,269	1233	-36	-3%	1.02	1,312	1298	-14	-1%	0.39
Doncaster Road / Council Street	North	Left	83647	65	64	-1	-2%	0.12	48	51	3	6%	0.43
		Through	83648	0	0	0	0%	0.00	1	0	-1	-100%	1.41
		Right	83649	106	101	-5	-5%	0.49	93	92	-1	-1%	0.10
	East	Left	83650	4	6	2	50%	0.89	5	4	-1	-20%	0.47
		Through	83651	1,129	1259	130	12%	3.76	1,095	1232	137	13%	4.02
		Right	83652	70	69	-1	-1%	0.12	59	38	-21	-36%	3.02
		U-Turn	84895	15	13	-2	-13%	0.53	5	1	-4	-80%	2.31
	South	Left	83653	12	20	8	67%	2.00	58	61	3	5%	0.39
		Through	83654	2	0	-2	-100%	2.00	1	0	-1	-100%	1.41
		Right	83655	5	6	1	20%	0.43	16	21	5	31%	1.16
	West	Left	83656	131	101	-30	-23%	2.79	134	109	-25	-19%	2.27
		Through	83657	1,587	1740	153	10%	3.75	1,601	1673	72	4%	1.78
		Right	83658	7	19	12	171%	3.33	5	16	11	220%	3.39
		U-Turn	84896	24	8	-16	-67%	4.00	17	10	-7	-41%	1.91

WESTFIELD DONCASTER TURN FLOW CALIBRATION
SATURDAY MIDDAY PEAK

SUMMARY STATISTICS	
11:30am to 12:30pm	
TOTAL	119
GEH<5	96%
GEH<10	100%

SUMMARY STATISTICS	
12:30pm to 1:30pm	
TOTAL	119
GEH<5	96%
GEH<10	100%

				1					2				
				11:30 to 12:30					12:30 to 13:30				
Intersection	Approach	Turn	Turn ID	Observed	Modelled	Absolute Difference	Relative Difference (%)	GEH	Observed	Modelled	Absolute Difference	Relative Difference (%)	GEH
Manningham Road / Williamsons Road	North	Left	82890	97	43	-54	-56%	6.45	93	37	-56	-60%	6.95
		Through	82931	1,115	1,164	49	4%	1.45	1,037	1,110	73	7%	2.23
	East	Left	82887	1,115	1,023	-92	-8%	2.81	1,090	961	-129	-12%	4.03
		Right	82933	276	233	-43	-16%	2.70	287	255	-32	-11%	1.94
	South	Through	82934	906	972	66	7%	2.15	1,017	1,087	70	7%	2.16
		Right	82935	1,008	958	-50	-5%	1.59	1,089	876	-213	-20%	6.80
Williamsons Road / Bordeaux Street / Westfield Drive	North	Left	83375	37	36	-1	-3%	0.17	23	22	-1	-4%	0.21
		Through	83378	2,179	2,113	-66	-3%	1.42	2,096	1,999	-97	-5%	2.14
		Right	83379	16	18	2	13%	0.49	14	21	7	50%	1.67
		U-Turn	84884	40	33	-7	-18%	1.16	34	29	-5	-15%	0.89
	East	Left	83383	20	26	6	30%	1.25	14	26	12	86%	2.68
		Through	83384	0	0	0	0%	0.00	0	0	0	0%	0.00
		Right	83385	3	3	0	0%	0.00	16	5	-11	-69%	3.39
	South	Left	83393	17	53	36	212%	6.09	22	41	19	86%	3.39
		Through	83394	1,795	1,906	111	6%	2.58	1,929	1,957	28	1%	0.63
		Right	83746	24	39	15	63%	2.67	14	15	1	7%	0.26
		U-Turn	84885	17	31	14	82%	2.86	14	23	9	64%	2.09
	West	Left	83386	14	13	-1	-7%	0.27	23	17	-6	-26%	1.34
		Through	83388	0	0	0	0%	0.00	0	0	0	0%	0.00
		Right	83389	15	17	2	13%	0.50	14	11	-3	-21%	0.85
Williamsons Road / Westfield Access / Sovereign Point Crescent	North	Left	83745	584	606	22	4%	0.90	568	525	-43	-8%	1.84
		Through	81979	1,619	1,558	-61	-4%	1.53	1,499	1,549	50	3%	1.28
		Right	84886	1	0	-1	-100%	1.41	5	8	3	60%	1.18
	East	Left	81975	320	364	44	14%	2.38	347	339	-8	-2%	0.43
		Through	84888	0	1	1	#DIV/0!	1.41	1	5	4	400%	2.31
		Right	81977	497	535	38	8%	1.67	524	546	22	4%	0.95
	South	Left	81985	11	18	7	64%	1.84	9	16	7	78%	1.98
		Through	81986	1,372	1,445	73	5%	1.95	1,479	1,470	-9	-1%	0.23
		Right	81987	297	385	88	30%	4.77	270	307	37	14%	2.18
	West	Left	81982	20	41	21	105%	3.80	17	27	10	59%	2.13
Williamsons Road / Westfield Access / Hotel Access	North	Left	83738	193	207	14	7%	0.99	162	169	7	4%	0.54
		Through	81346	1,641	1,712	71	4%	1.73	1,656	1,679	23	1%	0.56
		Right	83739	30	30	0	0%	0.00	25	19	-6	-24%	1.28
	East	Left	81339	194	204	10	5%	0.71	176	191	15	9%	1.11
		Through	81340	9	10	1	11%	0.32	5	7	2	40%	0.82
		Right	81341	134	147	13	10%	1.10	112	119	7	6%	0.65
	South	Left	83736	47	57	10	21%	1.39	50	53	3	6%	0.42
		Through	81358	1,542	1,670	128	8%	3.19	1,617	1,651	34	2%	0.84
		Right	83737	229	249	20	9%	1.29	230	215	-15	-7%	1.01
	West	Left	81335	15	18	3	20%	0.74	30	23	-7	-23%	1.36
		Through	81337	1	1	0	0%	0.00	2	0	-2	-100%	2.00
		Right	81338	24	14	-10	-42%	2.29	38	22	-16	-42%	2.92
Doncaster Road / Tram Road / Williamsons Road	North	Left	84651	498	501	3	1%	0.13	479	441	-38	-8%	1.77
		Through	80650	924	894	-30	-3%	1.00	976	938	-38	-4%	1.23
		Right	83992	536	517	-19	-4%	0.83	474	498	24	5%	1.09
	East	Left	84659	251	242	-9	-4%	0.57	272	265	-7	-3%	0.42
		Through	80636	973	956	-17	-2%	0.55	958	960	2	0%	0.06
		Right	83664	508	531	23	5%	1.01	506	492	-14	-3%	0.63
	South	Left	84655	123	158	35	28%	2.95	147	146	-1	-1%	0.08
		Through	80641	691	754	63	9%	2.34	776	729	-47	-6%	1.71
		Right	83993	348	347	-1	0%	0.05	341	331	-10	-3%	0.55
	West	Left	80586	670	686	16	2%	0.61	650	649	-1	0%	0.04
		Through	80672	965	1,056	91	9%	2.86	952	1,026	74	8%	2.35
		Right	80673	99	109	10	10%	0.98	132	133	1	1%	0.09
Tram Road / Merlin Street	North	Left	82738	35	30	-5	-14%	0.88	45	44	-1	-2%	0.15
		Through	82740	1,198	1,217	19	2%	0.55	1,374	1,294	-80	-6%	2.19
	East	Left	82736	3	0	-3	-100%	2.45	8	0	-8	-100%	4.00
		Right	82737	16	20	4	25%	0.94	12	16	4	33%	1.07
	South	Through	82732	1,123	1,209	86	8%	2.52	1,221	1,189	-32	-3%	0.92
		Right	82735	5	0	-5	-100%	3.16	11	0	-11	-100%	4.69
Doncaster Road / Bayley Grove	North	Left	81429	20	16	-4	-20%	0.94	35	13	-22	-63%	4.49
	East	Left	83711	45	68	23	51%	3.06	53	69	16	30%	2.05
		Through	81421	1,036	1,035	-1	0%	0.03	1,110	1,044	-66	-6%	2.01
	South	Left	83712	32	28	-4	-13%	0.73	79	76	-3	-4%	0.34
	West	Left	81426	27	63	36	133%	5.37	31	52	21	68%	3.26
		Through	81427	1,099	1,087	-12	-1%	0.36	1,203	1,165	-38	-3%	1.10
Doncaster Road / Rose Street / Beaonsfield Street	North	Left	80562	43	44	1	2%	0.15	55	45	-10	-18%	1.41
		Through	80566	3	0	-3	-100%	2.45	3	3	0	0%	0.00
		Right	80567	13	14	1	8%	0.27	11	37	26	236%	5.31
	East	Left	80568	46	40	-6	-13%	0.91	40	29	-11	-28%	1.87
		Through	80570	1,039	1,023	-16	-2%	0.50	1,033	1,039	6	1%	0.19
		Right	80571	28	84	56	200%	7.48	32	73	41	128%	5.66
	South	Left	80573	42	38	-4	-10%	0.63	44	20	-24	-55%	4.24
		Through	80574	2	3	1	50%	0.63	4	0	-4	-100%	2.83
		Right	80575	35	56	21	60%	3.11	8	70	62	775%	9.93
	West	Left	80576	34	20	-14	-41%	2.69	49	32	-17	-35%	2.67
		Through	80577	1,003	1,039	36	4%	1.13	1,059	1,082	23	2%	0.70
		Right	80578	22	21	-1	-5%	0.22	36	29	-7	-19%	1.23
		U-Turn	84890	24	28	4	17%	0.78	43	32	-11	-26%	1.80
Doncaster Road / Elgar Road / Site Access	North	Left	83690	2	2	0	0%	0.00	2	8	6	300%	2.68
	East	Left	83859	592	610	18	3%	0.73	534	558	24	4%	1.03
		Through	83693	1,029	1,025	-4	0%	0.12	1,030	1,039	9	1%	0.28
		Right	83694	3	7	4	133%	1.79	1	7	6	600%	3.00
	South	Left	81664	97	120	23	24%	2.21	78	110	32	41%	3.30
		Through	83695	0	3	3	#DIV/0!	2.45	0	8	8	#DIV/0!	4.00
		Right	83697	750	773	23	3%	0.83	712	682	-30	-4%	1.14
	West	Left	83698	0	0	0	0%	0.00	0	0	0	0%	0.00
		Through	83699	1,011	1,102	91	9%	2.80	1,024	1,128	104	10%	3.17
		Right	83700	47	61	14	30%	1.91	91	91	0	0%	0.00
Doncaster Road / Frederick Street / Westfield Access	North	Left	82714	13	12	-1	-8%	0.28	5	11	6	120%	2.12
		Through	82716	0	0	0	0%	0.00	0	0	0	0%	0.00
		Right	82717	5	11	6	120%	2.12	6	6	0	0%	0.00
	East	Left	82724	23	4	-19	-83%	5.17	20	8	-12	-60%	3.21
		Through	82725	1,659	1,669	10	1%	0.25	1,714	1,699	-15	-1%	0.36
	South	Left	82721	25	33	8	32%	1.49	30	33	3	10%	0.53
		Right	82723	17	9	-8	-47%	2.22	13	8	-5	-38%	1.54
	West	Left	83599	250	244	-6	-2%	0.38	257	231	-26	-10%	1.66
		Through	82718	1,572	1,621	49	3%	1.23	1,509	1,549	40	3%	1.02
		Right	82719	53	39	-14	-26%	2.06	38	21	-17	-45%	3.13
Doncaster Road / Westfield Access	North	Left	85880	540	527	-13	-2%	0.56	512	492	-20	-4%	0.89
		Right	82195	661	608	-53	-8%	2.10	727	654	-73	-10%	2.78
	East	Through	82185	1,011	1,060	49	5%	1.52	1,014	1,054	40	4%	1.24
		Right	83661	419	368	-51	-12%	2.57	381	374	-7	-2%	0.36
	West	Left	82196	582	640	58	10%	2.35	559	666	107	19%	4.32
		Through	82198	1,015	1,001	-14	-1%	0.44	968	892	-76	-8%	2.49
Doncaster Road / Council Street	North	Left	83647	50	47	-3	-6%	0.43	41	23	-18	-44%	3.18
		Through	83648	0	0	0	0%	0.00	0	0	0	0%	0.00
		Right	83649	81	86	5	6%	0.55	88	122	34	39%	3.32
	East	Left	83650	2	0	-2	-100%	2.00	4	0	-4	-100%	2.83
		Through	83651	1,337	1,316	-21	-2%	0.58	1,235	1,275	40	3%	1.13
		Right	83652	66	80	14	21%	1.64	54	46	-8	-15%	1.13
		U-Turn	84895	13	13	0	0%	0.00	25	23	-2	-8%	0.41
	South	Left	83653	1	2	1	100%	0.82	3	2	-1	-33%	0.63
		Through	83654	2	0	-2	-100%	2.00	0	2	2	#DIV/0!	2.00
		Right	83655	1	1	0	0%	0.00	1	0	-1	-100%	1.41
	West	Left	83656	89	83	-6	-7%	0.65	98	100	2	2%	0.20
		Through	83657	1,452	1,421	-31	-2%	0.82	1,339	1,233	-106	-8%	2.96
		Right	83658	2	0	-2	-100%	2.00	2	9	7	350%	2.98
		U-Turn	84896	11	22	11	100%	2.71	37	35	-2	-5%	0.33

WESTFIELD DONCASTER AIMSUN MODELLING
CORE AREA CALIBRATION RESULTS
EXISTING CONDITIONS (2014) - AM PEAK

			1								2							
			7:15am to 8:15am								8:15am to 9:15am							
Intersection	Approach	Turn	Observed	Modelled	Absolute Difference	Relative Difference (%)	Flows < 99, within 10 vehicles of observed	Flows 100 to 999, within 10% of observed	Flows 1,000 to 1,999 within 100 vehicles of observed	Flows > 2,000, within 5% of observed	Observed	Modelled	Absolute Difference	Relative Difference (%)	Flows < 99, within 10 vehicles of observed	Flows 100 to 999, within 10% of observed	Flows 1,000 to 1,999 within 100 vehicles of observed	Flows > 2,000, within 5% of observed
Manningham Road / Williamsons Road	North	Left	42	105	63	150%	N/A	150%	N/A	N/A	40	71	31	78%	31	N/A	N/A	N/A
		Through	963	975	12	1%	N/A	0	N/A	N/A	1,069	1036	-33	-3%	N/A	N/A	-33	N/A
	East	Left	1,175	1171	-4	0%	N/A	N/A	-4	N/A	1,117	1309	192	17%	N/A	N/A	192	N/A
		Right	336	381	45	13%	N/A	0	N/A	N/A	440	454	14	3%	N/A	0	N/A	N/A
	South	Through	823	916	93	11%	N/A	0	N/A	N/A	889	900	11	1%	N/A	0	N/A	N/A
		Right	461	676	215	47%	N/A	0	N/A	N/A	539	752	213	40%	N/A	0	N/A	N/A
Williamsons Road / Bordeaux Street / Westfield Drive	North	Left	15	38	23	153%	23	N/A	N/A	N/A	45	43	-2	-4%	-2	N/A	N/A	N/A
		Through	2,084	2077	-7	0%	N/A	N/A	N/A	0%	2,035	2134	99	5%	N/A	N/A	N/A	5%
		Right	26	18	-8	-31%	-8	N/A	N/A	N/A	18	41	23	128%	23	N/A	N/A	N/A
		U-Turn	17	17	0	0%	0	N/A	N/A	N/A	130	116	-14	-11%	N/A	0	N/A	N/A
	East	Left	5	5	0	0%	0	N/A	N/A	N/A	10	4	-6	-60%	-6	N/A	N/A	N/A
		Through	0	0	0	0%	0	N/A	N/A	N/A	0	0	0	0%	0	N/A	N/A	N/A
		Right	6	4	-2	-33%	-2	N/A	N/A	N/A	6	11	5	83%	5	N/A	N/A	N/A
	South	Left	8	14	6	75%	6	N/A	N/A	N/A	17	21	4	24%	4	N/A	N/A	N/A
		Through	1,230	1603	373	30%	N/A	N/A	373	N/A	1,235	1515	280	23%	N/A	N/A	280	N/A
		Right	3	4	1	33%	1	N/A	N/A	N/A	8	12	4	50%	4	N/A	N/A	N/A
		U-Turn	20	20	0	0%	0	N/A	N/A	N/A	16	22	6	38%	6	N/A	N/A	N/A
	West	Left	16	2	-14	-88%	-14	N/A	N/A	N/A	60	97	37	62%	37	N/A	N/A	N/A
		Through	1	0	-1	-100%	-1	N/A	N/A	N/A	2	3	1	50%	1	N/A	N/A	N/A
		Right	8	14	6	75%	6	N/A	N/A	N/A	18	26	8	44%	8	N/A	N/A	N/A
Williamsons Road / Westfield Access / Sovereign Point Crescent	North	Left	60	72	12	20%	12	N/A	N/A	N/A	243	257	14	6%	N/A	0	N/A	N/A
		Through	1,989	2046	57	3%	N/A	N/A	N/A	3%	1,883	1887	4	0%	N/A	N/A	4	N/A
		Right	3	7	4	133%	4	N/A	N/A	N/A	3	22	19	633%	19	N/A	N/A	N/A
	East	Left	64	41	-23	-36%	-23	N/A	N/A	N/A	60	48	-12	-20%	-12	N/A	N/A	N/A
		Through	0	0	0	0%	0	N/A	N/A	N/A	0	0	0	0%	0	N/A	N/A	N/A
		Right	65	64	-1	-2%	-1	N/A	N/A	N/A	45	38	-7	-16%	-7	N/A	N/A	N/A
	South	Left	5	1	-4	-80%	-4	N/A	N/A	N/A	4	1	-3	-75%	-3	N/A	N/A	N/A
		Through	1,224	1565	341	28%	N/A	N/A	341	N/A	1,228	1509	281	23%	N/A	N/A	281	N/A
		Right	18	30	12	67%	12	N/A	N/A	N/A	85	109	24	28%	N/A	0	N/A	N/A
	West	Left	11	22	11	100%	11	N/A	N/A	N/A	16	15	-1	-6%	-1	N/A	N/A	N/A
Williamsons Road / Westfield Access / Hotel Access	North	Left	96	110	14	15%	N/A	0	N/A	N/A	163	155	-8	-5%	N/A	0	N/A	N/A
		Through	1,944	1952	8	0%	N/A	N/A	8	N/A	1,761	1755	-6	0%	N/A	N/A	-6	N/A
		Right	5	11	6	120%	6	N/A	N/A	N/A	12	19	7	58%	7	N/A	N/A	N/A
	East	Left	38	42	4	11%	4	N/A	N/A	N/A	70	61	-9	-13%	-9	N/A	N/A	N/A
		Through	2	2	0	0%	0	N/A	N/A	N/A	2	1	-1	-50%	-1	N/A	N/A	N/A
		Right	25	29	4	16%	4	N/A	N/A	N/A	43	39	-4	-9%	-4	N/A	N/A	N/A
	South	Left	16	24	8	50%	8	N/A	N/A	N/A	30	53	23	77%	23	N/A	N/A	N/A
		Through	1,226	1573	347	28%	N/A	N/A	347	N/A	1,274	1575	301	24%	N/A	N/A	301	N/A
		Right	101	131	30	30%	N/A	0	N/A	N/A	184	181	-3	-2%	N/A	0	N/A	N/A
	West	Left	2	1	-1	-50%	-1	N/A	N/A	N/A	6	7	1	17%	1	N/A	N/A	N/A
		Through	1	2	1	100%	1	N/A	N/A	N/A	1	0	-1	-100%	-1	N/A	N/A	N/A
		Right	2	1	-1	-50%	-1	N/A	N/A	N/A	5	1	-4	-80%	-4	N/A	N/A	N/A
Doncaster Road / Tram Road / Williamsons Road	North	Left	270	295	25	9%	N/A	0	N/A	N/A	380	413	33	9%	N/A	0	N/A	N/A
		Through	1,085	1131	46	4%	N/A	N/A	46	N/A	1,064	980	-84	-8%	N/A	0	N/A	N/A
		Right	642	507	-135	-21%	N/A	0	N/A	N/A	492	475	-17	-3%	N/A	0	N/A	N/A
	East	Left	86	114	28	33%	N/A	0	N/A	N/A	147	156	9	6%	N/A	0	N/A	N/A
		Through	948	1054	106	11%	N/A	N/A	106	N/A	900	829	-71	-8%	N/A	0	N/A	N/A
		Right	383	374	-9	-2%	N/A	0	N/A	N/A	402	374	-28	-7%	N/A	0	N/A	N/A
	South	Left	175	154	-21	-12%	N/A	0	N/A	N/A	157	137	-20	-13%	N/A	0	N/A	N/A
		Through	738	825	87	12%	N/A	0	N/A	N/A	670	755	85	13%	N/A	0	N/A	N/A
		Right	100	106	6	6%	N/A	0	N/A	N/A	301	279	-22	-7%	N/A	0	N/A	N/A
	West	Left	294	473	179	61%	N/A	1	N/A	N/A	471	654	183	39%	N/A	0	N/A	N/A
		Through	335	340	5	1%	N/A	0	N/A	N/A	938	927	-11	-1%	N/A	0	N/A	N/A
		Right	66	78	12	18%	12	N/A	N/A	N/A	103	133	30	29%	N/A	0	N/A	N/A
Tram Road / Merlin Street	North	Left	10	9	-1	-10%	-1	N/A	N/A	N/A	19	26	7	37%	7	N/A	N/A	N/A
		Through	1,264	1300	36	3%	N/A	N/A	36	N/A	1,263	1211	-52	-4%	N/A	N/A	-52	N/A
	East	Left	4	0	-4	-100%	-4	N/A	N/A	N/A	4	0	-4	-100%	-4	N/A	N/A	N/A
		Right	3	10	7	233%	7	N/A	N/A	N/A	6	18	12	200%	12	N/A	N/A	N/A
	South	Through	983	1106	123	12%	N/A	N/A	123	N/A	1,121	1115	-6	-1%	N/A	N/A	-6	N/A
		Right	5	0	-5	-100%	-5	N/A	N/A	N/A	4	0	-4	-100%	-4	N/A	N/A	N/A
Doncaster Road / Bayley Grove	North	Left	19	26	7	37%	7	N/A	N/A	N/A	27	31	4	15%	4	N/A	N/A	N/A
	East	Left	3	10	7	233%	7	N/A	N/A	N/A	6	21	15	250%	15	N/A	N/A	N/A
		Through	916	818	-98	-11%	N/A	0	N/A	N/A	740	759	19	3%	N/A	0	N/A	N/A
	South	Left	6	8	2	33%	2	N/A	N/A	N/A	8	5	-3	-38%	-3	N/A	N/A	N/A
	West	Left	13	17	4	31%	4	N/A	N/A	N/A	18	9	-9	-50%	-9	N/A	N/A	N/A
		Through	430	477	47	11%	N/A	0	N/A	N/A	931	895	-36	-4%	N/A	0	N/A	N/A
Doncaster Road / Rose Street / Beaonsfield Street	North	Left	39	55	16	41%	16	N/A	N/A	N/A	63	71	8	13%	8	N/A	N/A	N/A
		Through	1	0	-1	-100%	-1	N/A	N/A	N/A	0	0	0	0%	0	N/A	N/A	N/A
		Right	14	26	12	86%	12	N/A	N/A	N/A	17	25	8	47%	8	N/A	N/A	N/A
	East	Left	72	98	26	36%	26	N/A	N/A	N/A	66	97	31	47%	31	N/A	N/A	N/A
		Through	874	791	-83	-9%	N/A	0	N/A	N/A	704	710	6	1%	N/A	0	N/A	N/A
		Right	58	94	36	62%	36	N/A	N/A	N/A	44	68	24	55%	24	N/A	N/A	N/A
	South	Left	14	6	-8	-57%	-8	N/A	N/A	N/A	29	28	-1	-3%	-1	N/A	N/A	N/A
		Through	2	0	-2	-100%	-2	N/A	N/A	N/A	2	1	-1	-50%	-1	N/A	N/A	N/A
		Right	18	27	9	50%	9	N/A	N/A	N/A	29	33	4	14%	4	N/A	N/A	N/A
	West	Left	19	25	6	32%	6	N/A	N/A	N/A	37	30	-7	-19%	-7	N/A	N/A	N/A
		Through	381	453	72	19%	N/A	0	N/A	N/A	877	872	-5	-1%	N/A	0	N/A	N/A
		Right	27	19	-8	-30%	-8	N/A	N/A	N/A	19	14	-5	-26%	-5	N/A	N/A	N/A
		U-Turn	15	6	-9	-60%	-9	N/A	N/A	N/A	14	4	-10	-71%	-10	N/A	N/A	N/A
Doncaster Road / Elgar Road / Site Access	North	Left	2	6	4	200%	4	N/A	N/A	N/A	2	7	5	250%	5	N/A	N/A	N/A
	East	Left	751	724	-27	-4%	N/A	0	N/A	N/A	677	651	-26	-4%	N/A	0	N/A	N/A
		Through	974	963	-11	-1%	N/A	0	N/A	N/A	764	783	19	2%	N/A	0	N/A	N/A
		Right	13	23	10	77%	10	N/A	N/A	N/A	22	15	-7	-32%	-7	N/A	N/A	N/A
	South	Left	40	45	5	13%	5	N/A	N/A	N/A	54	105	51	94%	N/A	1	N/A	N/A
		Through	2	5	3	150%	3	N/A	N/A	N/A	10	6	-4	-40%	-4	N/A	N/A	N/A
		Right	312	419	107	34%	N/A	0	N/A	N/A	722	848	126	17%	N/A	0	N/A	N/A
	West	Left	1	6	5	500%	5	N/A	N/A	N/A	0	7	7	#DIV/0!	7	N/A	N/A	N/A
		Through	372	466	94	25%	N/A	0	N/A	N/A	840	880	40	5%	N/A	0	N/A	N/A
		Right	38	51	13	34%	13	N/A	N/A	N/A	79	81	2	3%	2	N/A	N/A	N/A
Doncaster Road / Frederick Street / Westfield Access	North	Left	3	0	-3	-100%	-3	N/A	N/A	N/A	3	0	-3	-100%	-3	N/A	N/A	N/A
		Through	0	0	0	0%	0	N/A	N/A	N/A	0	0	0	0%	0	N/A	N/A	N/A
		Right	7	6	-1	-14%	-1	N/A	N/A	N/A	2	16	14	700%	14	N/A	N/A	N/A
	East	Left	12	14	2	17%	2	N/A	N/A	N/A	36	20	-16	-44%	-16	N/A	N/A	N/A
		Through	1,432	1556	124	9%	N/A	N/A	124	N/A	1,287	1332	45	3%	N/A	N/A	45	N/A
	South	Left	29	15	-14	-48%	-14	N/A	N/A	N/A	23	15	-8	-35%	-8	N/A	N/A	N/A
		Right	7	3	-4	-57%	-4	N/A	N/A	N/A	17	5	-12	-71%	-12	N/A	N/A	N/A
	West	Left	29	37	8	28%	8	N/A	N/A	N/A	133	140	7	5%	N/A	0	N/A	N/A
		Through	602	670	68	11%	N/A	0	N/A	N/A	1,396	1392	-4	0%	N/A	N/A	-4	N/A
		Right	34	34	0	0%	0	N/A	N/A	N/A	81	81	0	0%	0	N/A	N/A	N/A
Doncaster Road / Westfield Access	North	Left	31	37	6	19%	6	N/A	N/A	N/A	55	80	25	45%	25	N/A	N/A	N/A
		Right	49	75	26	53%	26	N/A	N/A	N/A	53	52	-1	-2%	-1	N/A	N/A	N/A
	East	Through	1,382	1497	115	8%	N/A	N/A	115	N/A	1,266	1301	35	3%	N/A	N/A	35	N/A
		Right	72	102	30	42%	N/A	0	N/A	N/A	290	324	34	12%	N/A	0	N/A	N/A
	West	Left	124	108	-16	-13%	N/A	0	N/A	N/A	432	423	-9	-2%	N/A	0	N/A	N/A
		Through	491	565	74	15%	N/A	0	N/A	N/A	976	974	-2	0%	N/A	0	N/A	N/A
Doncaster Road / Council Street	North	Left	35	38	3	9%	3	N/A	N/A	N/A	73	63	-10	-14%	-10	N/A	N/A	N/A
		Through	1	0	-1	-100%	-1	N/A	N/A	N/A	2	0	-2	-100%	-2	N/A	N/A	N/A
		Right	151	151	0	0%	N/A	0	N/A	N/A	201	163	-38	-19%	N/A	0	N/A	N/A
	East	Left	16	17	1	6%	1	N/A	N/A	N/A	46	53	7	15%	7	N/A	N/A	N/A
		Through	1,388	1419	31	2%	N/A	N/A	31	N/A	1,367	1462	95	7%	N/A	N/A	95	N/A
		Right	33	22	-11	-33%	-11	N/A	N/A	N/A	88	92	4	5%	4	N/A	N/A	N/A
		U-Turn	3	10	7	233%	7	N/A	N/A	N/A	10	14	4	40%	4	N/A	N/A	N/A
	South	Left	4	19	15	375%	15	N/A	N/A	N/A	6	12	6	100%	6	N/A	N/A	N/A
		Through	0	0	0	0%	0	N/A	N/A	N/A	0	0	0	0%	0	N/A	N/A	N/A
		Right	0	5	5	#DIV/0!	5	N/A	N/A	N/A	1	2	1	100%	1	N/A	N/A	N/A
	West	Left	35	41	6	17%	6	N/A	N/A	N/A	92	115	23	25%	N/A	0	N/A	N/A
		Through	469	528	59	13%	N/A	0	N/A	N/A	880	893	13	1%	N/A	0	N/A	N/A
		Right	21	25	4	19%	4	N/A	N/A	N/A	44	43	-1	-2%	-1	N/A	N/A	N/A
		U-Turn	6	5	-1	-17%	-1	N/A	N/A	N/A	13	6	-7	-54%	-7	N/A	N/A	N/A

		Total	75	30	12	2					Total	69	36	13	1			
			12	*17*	*7*	*0*						*11*	*9*	*4*	*0*			
			4	*4*	*0*	*0*						*3*	*3*	*0*	*0*			
		Does not meet criteria	16	21	7	0					Does not meet criteria	14	12	4	0			
		Meets criteria	59	9	5	2					Meets criteria	55	24	9	1			
			79%	30%	42%	100%						80%	67%	69%	100%			

WESTFIELD DONCASTER AIMSUN MODELLING
CORE AREA CALIBRATION RESULTS
EXISTING CONDITIONS (2014) - PM PEAK

			1								2							
			3:45pm to 4:45pm								4:45pm to 5:45pm							
Intersection	Approach	Turn	Observed	Modelled	Absolute Difference	Relative Difference (%)	Flows < 99, within 10 vehicles of observed	Flows 100 to 999, within 10% of observed	Flows 1,000 to 1,999 within 100 vehicles of observed	Flows > 2,000, within 5% of observed	Observed	Modelled	Absolute Difference	Relative Difference (%)	Flows < 99, within 10 vehicles of observed	Flows 100 to 999, within 10% of observed	Flows 1,000 to 1,999 within 100 vehicles of observed	Flows > 2,000, within 5% of observed
Manningham Road / Williamsons Road	North	Left	52	45	-7	-13%	-7	N/A	N/A	N/A	79	67	-12	-15%	-12	N/A	N/A	N/A
		Through	1,301	1414	113	9%	N/A	N/A	113	N/A	1,312	1390	78	6%	N/A	N/A	78	N/A
	East	Left	879	859	-20	-2%	N/A	0	N/A	N/A	842	778	-64	-8%	N/A	0	N/A	N/A
		Right	224	225	1	0%	N/A	0	N/A	N/A	258	235	-23	-9%	N/A	0	N/A	N/A
	South	Through	936	1037	101	11%	N/A	N/A	101	N/A	1,187	1216	29	2%	N/A	N/A	29	N/A
		Right	1,396	1455	59	4%	N/A	N/A	59	N/A	1,416	1346	-70	-5%	N/A	N/A	-70	N/A
Williamsons Road / Bordeaux Street / Westfield Drive	North	Left	25	23	-2	-8%	-2	N/A	N/A	N/A	19	15	-4	-21%	-4	N/A	N/A	N/A
		Through	2,066	2244	178	9%	N/A	N/A	N/A	9%	2,111	2101	-10	0%	N/A	N/A	N/A	0%
		Right	14	14	0	0%	0	N/A	N/A	N/A	17	20	3	18%	3	N/A	N/A	N/A
		U-Turn	18	5	-13	-72%	-13	N/A	N/A	N/A	48	41	-7	-15%	-7	N/A	N/A	N/A
	East	Left	10	11	1	10%	1	N/A	N/A	N/A	14	22	8	57%	8	N/A	N/A	N/A
		Through	0	0	0	0%	0	N/A	N/A	N/A	0	0	0	0%	0	N/A	N/A	N/A
		Right	7	5	-2	-29%	-2	N/A	N/A	N/A	16	4	-12	-75%	-12	N/A	N/A	N/A
	South	Left	15	8	-7	-47%	-7	N/A	N/A	N/A	20	21	1	5%	1	N/A	N/A	N/A
		Through	2,381	2516	135	6%	N/A	N/A	N/A	6%	2,603	2575	-28	-1%	N/A	N/A	N/A	-1%
		Right	15	12	-3	-20%	-3	N/A	N/A	N/A	14	24	10	71%	10	N/A	N/A	N/A
		U-Turn	17	29	12	71%	12	N/A	N/A	N/A	11	12	1	9%	1	N/A	N/A	N/A
	West	Left	18	5	-13	-72%	-13	N/A	N/A	N/A	22	12	-10	-45%	-10	N/A	N/A	N/A
		Through	0	0	0	0%	0	N/A	N/A	N/A	1	0	-1	-100%	-1	N/A	N/A	N/A
		Right	11	6	-5	-45%	-5	N/A	N/A	N/A	10	3	-7	-70%	-7	N/A	N/A	N/A
Williamsons Road / Westfield Access / Sovereign Point Crescent	North	Left	400	380	-20	-5%	N/A	0	N/A	N/A	371	399	28	8%	N/A	0	N/A	N/A
		Through	1,740	1893	153	9%	N/A	N/A	153	N/A	1,717	1716	-1	0%	N/A	N/A	-1	N/A
		Right	8	5	-3	-38%	-3	N/A	N/A	N/A	8	17	9	113%	9	N/A	N/A	N/A
	East	Left	261	283	22	8%	N/A	0	N/A	N/A	257	240	-17	-7%	N/A	0	N/A	N/A
		Through	0	2	2	#DIV/0!	2	N/A	N/A	N/A	1	0	-1	-100%	-1	N/A	N/A	N/A
		Right	504	493	-11	-2%	N/A	0	N/A	N/A	487	539	52	11%	N/A	0	N/A	N/A
	South	Left	9	11	2	22%	2	N/A	N/A	N/A	10	6	-4	-40%	-4	N/A	N/A	N/A
		Through	1,847	2053	206	11%	N/A	N/A	N/A	11%	2,115	2086	-29	-1%	N/A	N/A	N/A	-1%
		Right	191	219	28	15%	N/A	0	N/A	N/A	222	291	69	31%	N/A	0	N/A	N/A
	West	Left	8	21	13	163%	13	N/A	N/A	N/A	14	8	-6	-43%	-6	N/A	N/A	N/A
Williamsons Road / Westfield Access / Hotel Access	North	Left	196	187	-9	-5%	N/A	0	N/A	N/A	180	190	10	6%	N/A	0	N/A	N/A
		Through	1,758	1928	170	10%	N/A	N/A	170	N/A	1,756	1757	1	0%	N/A	N/A	1	N/A
		Right	21	24	3	14%	3	N/A	N/A	N/A	20	20	0	0%	0	N/A	N/A	N/A
	East	Left	168	191	23	14%	N/A	0	N/A	N/A	170	149	-21	-12%	N/A	0	N/A	N/A
		Through	6	8	2	33%	2	N/A	N/A	N/A	1	1	0	0%	0	N/A	N/A	N/A
		Right	101	127	26	26%	N/A	0	N/A	N/A	149	144	-5	-3%	N/A	0	N/A	N/A
	South	Left	50	72	22	44%	22	N/A	N/A	N/A	78	67	-11	-14%	-11	N/A	N/A	N/A
		Through	1,918	2121	203	11%	N/A	N/A	N/A	11%	2,133	2199	66	3%	N/A	N/A	N/A	3%
		Right	288	283	-5	-2%	N/A	0	N/A	N/A	220	215	-5	-2%	N/A	0	N/A	N/A
	West	Left	33	37	4	12%	4	N/A	N/A	N/A	52	30	-22	-42%	-22	N/A	N/A	N/A
		Through	2	0	-2	-100%	-2	N/A	N/A	N/A	3	0	-3	-100%	-3	N/A	N/A	N/A
		Right	28	24	-4	-14%	-4	N/A	N/A	N/A	35	30	-5	-14%	-5	N/A	N/A	N/A
Doncaster Road / Tram Road / Williamsons Road	North	Left	470	524	54	11%	N/A	0	N/A	N/A	470	499	29	6%	N/A	0	N/A	N/A
		Through	1,073	1190	117	11%	N/A	N/A	117	N/A	1,082	1013	-69	-6%	N/A	N/A	-69	N/A
		Right	369	441	72	20%	N/A	0	N/A	N/A	380	344	-36	-9%	N/A	0	N/A	N/A
	East	Left	194	248	55	28%	N/A	0	N/A	N/A	234	306	72	31%	N/A	0	N/A	N/A
		Through	808	976	168	21%	N/A	0	N/A	N/A	910	912	2	0%	N/A	0	N/A	N/A
		Right	593	511	-82	-14%	N/A	0	N/A	N/A	656	526	-130	-20%	N/A	0	N/A	N/A
	South	Left	138	136	-2	-1%	N/A	0	N/A	N/A	166	164	-2	-1%	N/A	0	N/A	N/A
		Through	951	1044	93	10%	N/A	N/A	93	N/A	1,053	994	-59	-6%	N/A	0	N/A	N/A
		Right	269	321	52	19%	N/A	0	N/A	N/A	270	310	40	15%	N/A	0	N/A	N/A
	West	Left	810	849	39	5%	N/A	0	N/A	N/A	846	899	53	6%	N/A	0	N/A	N/A
		Through	1,141	1166	25	2%	N/A	N/A	25	N/A	1,082	1150	68	6%	N/A	N/A	68	N/A
		Right	128	138	10	8%	N/A	0	N/A	N/A	139	164	25	18%	N/A	0	N/A	N/A
Tram Road / Merlin Street	North	Left	43	36	-7	-16%	-7	N/A	N/A	N/A	49	24	-25	-51%	-25	N/A	N/A	N/A
		Through	1,357	1565	208	15%	N/A	N/A	208	N/A	1,449	1462	13	1%	N/A	N/A	13	N/A
	East	Left	4	0	-4	-100%	-4	N/A	N/A	N/A	4	0	-4	-100%	-4	N/A	N/A	N/A
		Right	13	7	-6	-46%	-6	N/A	N/A	N/A	7	7	0	0%	0	N/A	N/A	N/A
	South	Through	1,365	1483	118	9%	N/A	N/A	118	N/A	1,521	1476	-45	-3%	N/A	N/A	-45	N/A
		Right	11	0	-11	-100%	-11	N/A	N/A	N/A	7	0	-7	-100%	-7	N/A	N/A	N/A
Doncaster Road / Bayley Grove	North	Left	29	46	17	59%	17	N/A	N/A	N/A	31	12	-19	-61%	-19	N/A	N/A	N/A
	East	Left	8	31	23	288%	23	N/A	N/A	N/A	7	9	2	29%	2	N/A	N/A	N/A
		Through	836	994	158	19%	N/A	0	N/A	N/A	924	895	-29	-3%	N/A	0	N/A	N/A
	South	Left	22	35	13	59%	13	N/A	N/A	N/A	32	30	-2	-6%	-2	N/A	N/A	N/A
	West	Left	23	15	-8	-35%	-8	N/A	N/A	N/A	30	23	-7	-23%	-7	N/A	N/A	N/A
		Through	1,148	1075	-73	-6%	N/A	N/A	-73	N/A	1,232	1236	4	0%	N/A	N/A	4	N/A
Doncaster Road / Rose Street / Beaonsfield Street	North	Left	63	57	-6	-10%	-6	N/A	N/A	N/A	91	98	7	8%	7	N/A	N/A	N/A
		Through	4	0	-4	-100%	-4	N/A	N/A	N/A	2	1	-1	-50%	-1	N/A	N/A	N/A
		Right	16	27	11	69%	11	N/A	N/A	N/A	23	38	15	65%	15	N/A	N/A	N/A
	East	Left	69	39	-30	-43%	-30	N/A	N/A	N/A	48	35	-13	-27%	-13	N/A	N/A	N/A
		Through	771	898	127	16%	N/A	0	N/A	N/A	875	830	-45	-5%	N/A	0	N/A	N/A
		Right	60	110	50	83%	N/A	1	N/A	N/A	37	83	46	124%	46	N/A	N/A	N/A
	South	Left	43	101	58	135%	N/A	1	N/A	N/A	17	32	15	88%	15	N/A	N/A	N/A
		Through	5	11	6	120%	6	N/A	N/A	N/A	3	3	0	0%	0	N/A	N/A	N/A
		Right	41	85	44	107%	44	N/A	N/A	N/A	32	42	10	31%	10	N/A	N/A	N/A
	West	Left	37	16	-21	-57%	-21	N/A	N/A	N/A	37	18	-19	-51%	-19	N/A	N/A	N/A
		Through	1,079	1078	-1	0%	N/A	N/A	-1	N/A	1,190	1181	-9	-1%	N/A	N/A	-9	N/A
		Right	31	22	-9	-29%	-9	N/A	N/A	N/A	26	40	14	54%	14	N/A	N/A	N/A
		U-Turn	25	8	-17	-68%	-17	N/A	N/A	N/A	16	5	-11	-69%	-11	N/A	N/A	N/A
Doncaster Road / Elgar Road / Site Access	North	Left	10	39	29	290%	29	N/A	N/A	N/A	35	61	26	74%	26	N/A	N/A	N/A
	East	Left	469	588	119	25%	N/A	0	N/A	N/A	524	544	20	4%	N/A	0	N/A	N/A
		Through	848	956	108	13%	N/A	0	N/A	N/A	903	860	-43	-5%	N/A	0	N/A	N/A
		Right	3	9	6	200%	6	N/A	N/A	N/A	3	10	7	233%	7	N/A	N/A	N/A
	South	Left	55	95	40	73%	40	N/A	N/A	N/A	59	101	42	71%	N/A	1	N/A	N/A
		Through	0	5	5	#DIV/0!	5	N/A	N/A	N/A	0	7	7	#DIV/0!	7	N/A	N/A	N/A
		Right	997	968	-29	-3%	N/A	0	N/A	N/A	906	917	11	1%	N/A	0	N/A	N/A
	West	Left	0	8	8	#DIV/0!	8	N/A	N/A	N/A	0	9	9	#DIV/0!	9	N/A	N/A	N/A
		Through	1,107	1147	40	4%	N/A	N/A	40	N/A	1,184	1261	77	7%	N/A	N/A	77	N/A
		Right	58	71	13	22%	13	N/A	N/A	N/A	60	72	12	20%	12	N/A	N/A	N/A
Doncaster Road / Frederick Street / Westfield Access	North	Left	5	0	-5	-100%	-5	N/A	N/A	N/A	7	0	-7	-100%	-7	N/A	N/A	N/A
		Through	0	0	0	0%	0	N/A	N/A	N/A	1	0	-1	-100%	-1	N/A	N/A	N/A
		Right	2	4	2	100%	2	N/A	N/A	N/A	7	13	6	86%	6	N/A	N/A	N/A
	East	Left	16	23	7	44%	7	N/A	N/A	N/A	34	26	-8	-24%	-8	N/A	N/A	N/A
		Through	1,484	1697	213	14%	N/A	N/A	213	N/A	1,635	1731	96	6%	N/A	N/A	96	N/A
	South	Left	32	28	-4	-13%	-4	N/A	N/A	N/A	69	36	-33	-48%	-33	N/A	N/A	N/A
		Right	17	13	-4	-24%	-4	N/A	N/A	N/A	39	33	-6	-15%	-6	N/A	N/A	N/A
	West	Left	247	245	-2	-1%	N/A	0	N/A	N/A	248	245	-3	-1%	N/A	0	N/A	N/A
		Through	1,683	1739	56	3%	N/A	N/A	56	N/A	1,653	1679	26	2%	N/A	N/A	26	N/A
		Right	66	47	-19	-29%	-19	N/A	N/A	N/A	44	15	-29	-66%	-29	N/A	N/A	N/A
Doncaster Road / Westfield Access	North	Left	509	633	124	24%	N/A	0	N/A	N/A	478	514	36	8%	N/A	0	N/A	N/A
		Right	577	642	65	11%	N/A	0	N/A	N/A	647	648	1	0%	N/A	0	N/A	N/A
	East	Through	899	1069	170	19%	N/A	N/A	170	N/A	986	1110	124	13%	N/A	N/A	124	N/A
		Right	337	360	23	7%	N/A	0	N/A	N/A	297	330	33	11%	N/A	0	N/A	N/A
	West	Left	464	518	54	12%	N/A	0	N/A	N/A	451	408	-43	-10%	N/A	0	N/A	N/A
		Through	1,269	1233	-36	-3%	N/A	N/A	-36	N/A	1,312	1298	-14	-1%	N/A	N/A	-14	N/A
Doncaster Road / Council Street	North	Left	65	64	-1	-2%	-1	N/A	N/A	N/A	48	51	3	6%	3	N/A	N/A	N/A
		Through	0	0	0	0%	0	N/A	N/A	N/A	1	0	-1	-100%	-1	N/A	N/A	N/A
		Right	106	101	-5	-5%	N/A	0	N/A	N/A	93	92	-1	-1%	-1	N/A	N/A	N/A
	East	Left	4	6	2	50%	2	N/A	N/A	N/A	5	4	-1	-20%	-1	N/A	N/A	N/A
		Through	1,129	1259	130	12%	N/A	N/A	130	N/A	1,095	1232	137	13%	N/A	N/A	137	N/A
		Right	70	69	-1	-1%	-1	N/A	N/A	N/A	59	38	-21	-36%	-21	N/A	N/A	N/A
		U-Turn	15	13	-2	-13%	-2	N/A	N/A	N/A	5	1	-4	-80%	-4	N/A	N/A	N/A
	South	Left	12	20	8	67%	8	N/A	N/A	N/A	58	61	3	5%	3	N/A	N/A	N/A
		Through	2	0	-2	-100%	-2	N/A	N/A	N/A	1	0	-1	-100%	-1	N/A	N/A	N/A
		Right	5	6	1	20%	1	N/A	N/A	N/A	16	21	5	31%	5	N/A	N/A	N/A
	West	Left	131	101	-30	-23%	N/A	0	N/A	N/A	134	109	-25	-19%	N/A	0	N/A	N/A
		Through	1,587	1740	153	10%	N/A	N/A	153	N/A	1,601	1673	72	4%	N/A	N/A	72	N/A
		Right	7	19	12	171%	12	N/A	N/A	N/A	5	16	11	220%	11	N/A	N/A	N/A
		U-Turn	24	8	-16	-67%	-16	N/A	N/A	N/A	17	10	-7	-41%	-7	N/A	N/A	N/A

		Total	63	33	19	4					Total	65	32	18	4			
			12	*17*	*11*	*4*						*7*	*7*	*2*	*0*			
			8	*2*	*0*	*0*						*12*	*3*	*0*	*0*			
		Does not meet criteria	20	19	11	4					Does not meet criteria	19	10	2	0			
		Meets criteria	43	14	8	0					Meets criteria	46	22	16	4			
			68%	42%	42%	0%						71%	69%	89%	100%			

WESTFIELD DONCASTER AIMSUN MODELLING
CORE AREA CALIBRATION RESULTS
EXISTING CONDITIONS (2014) - SAT PEAK

			1								2							
			11:30am to 12:30pm								12:30pm to 1:30pm							
Intersection	Approach	Turn	Observed	Modelled	Absolute Difference	Relative Difference (%)	Flows < 99, within 10 vehicles of observed	Flows 100 to 999, within 10% of observed	Flows 1,000 to 1,999 within 100 vehicles of observed	Flows > 2,000, within 5% of observed	Observed	Modelled	Absolute Difference	Relative Difference (%)	Flows < 99, within 10 vehicles of observed	Flows 100 to 999, within 10% of observed	Flows 1,000 to 1,999 within 100 vehicles of observed	Flows > 2,000, within 5% of observed
Manningham Road / Williamsons Road	North	Left	97	43	-54	-56%	-54	N/A	N/A	N/A	93	37	-56	-60%	-56	N/A	N/A	N/A
		Through	1,115	1164	49	4%	N/A	N/A	49	N/A	1,037	1110	73	7%	N/A	N/A	73	N/A
	East	Left	1,115	1023	-92	-8%	N/A	N/A	-92	N/A	1,090	961	-129	-12%	N/A	0	N/A	N/A
		Right	276	233	-43	-16%	N/A	0	N/A	N/A	287	255	-32	-11%	N/A	0	N/A	N/A
	South	Through	906	972	66	7%	N/A	0	N/A	N/A	1,017	1087	70	7%	N/A	N/A	70	N/A
		Right	1,008	958	-50	-5%	N/A	0	N/A	N/A	1,089	876	-213	-20%	N/A	0	N/A	N/A
Williamsons Road / Bordeaux Street / Westfield Drive	North	Left	37	36	-1	-3%	-1	N/A	N/A	N/A	23	22	-1	-4%	-1	N/A	N/A	N/A
		Through	2,179	2113	-66	-3%	N/A	N/A	N/A	-3%	2,096	1999	-97	-5%	N/A	N/A	-97	N/A
		Right	16	18	2	13%	2	N/A	N/A	N/A	14	21	7	50%	7	N/A	N/A	N/A
		U-Turn	40	33	-7	-18%	-7	N/A	N/A	N/A	34	29	-5	-15%	-5	N/A	N/A	N/A
	East	Left	20	26	6	30%	6	N/A	N/A	N/A	14	26	12	86%	12	N/A	N/A	N/A
		Through	0	0	0	0%	0	N/A	N/A	N/A	0	0	0	0%	0	N/A	N/A	N/A
		Right	3	3	0	0%	0	N/A	N/A	N/A	16	5	-11	-69%	-11	N/A	N/A	N/A
	South	Left	17	53	36	212%	36	N/A	N/A	N/A	22	41	19	86%	19	N/A	N/A	N/A
		Through	1,795	1906	111	6%	N/A	N/A	111	N/A	1,929	1957	28	1%	N/A	N/A	28	N/A
		Right	24	39	15	63%	15	N/A	N/A	N/A	14	15	1	7%	1	N/A	N/A	N/A
		U-Turn	17	31	14	82%	14	N/A	N/A	N/A	14	23	9	64%	9	N/A	N/A	N/A
	West	Left	14	13	-1	-7%	-1	N/A	N/A	N/A	23	17	-6	-26%	-6	N/A	N/A	N/A
		Through	0	0	0	0%	0	N/A	N/A	N/A	0	0	0	0%	0	N/A	N/A	N/A
		Right	15	17	2	13%	2	N/A	N/A	N/A	14	11	-3	-21%	-3	N/A	N/A	N/A
Williamsons Road / Westfield Access / Sovereign Point Crescent	North	Left	584	606	22	4%	N/A	0	N/A	N/A	568	525	-43	-8%	N/A	0	N/A	N/A
		Through	1,619	1558	-61	-4%	N/A	N/A	-61	N/A	1,499	1549	50	3%	N/A	N/A	50	N/A
		Right	1	0	-1	-100%	-1	N/A	N/A	N/A	5	8	3	60%	3	N/A	N/A	N/A
	East	Left	320	364	44	14%	N/A	0	N/A	N/A	347	339	-8	-2%	N/A	0	N/A	N/A
		Through	0	1	1	#DIV/0!	1	N/A	N/A	N/A	1	5	4	400%	4	N/A	N/A	N/A
		Right	497	535	38	8%	N/A	0	N/A	N/A	524	546	22	4%	N/A	0	N/A	N/A
	South	Left	11	18	7	64%	7	N/A	N/A	N/A	9	16	7	78%	7	N/A	N/A	N/A
		Through	1,372	1445	73	5%	N/A	N/A	73	N/A	1,479	1470	-9	-1%	N/A	N/A	-9	N/A
		Right	297	385	88	30%	N/A	0	N/A	N/A	270	307	37	14%	N/A	0	N/A	N/A
	West	Left	20	41	21	105%	21	N/A	N/A	N/A	17	27	10	59%	10	N/A	N/A	N/A
Williamsons Road / Westfield Access / Hotel Access	North	Left	193	207	14	7%	N/A	0	N/A	N/A	162	169	7	4%	N/A	0	N/A	N/A
		Through	1,641	1712	71	4%	N/A	N/A	71	N/A	1,656	1679	23	1%	N/A	N/A	23	N/A
		Right	30	30	0	0%	0	N/A	N/A	N/A	25	19	-6	-24%	-6	N/A	N/A	N/A
	East	Left	194	204	10	5%	N/A	0	N/A	N/A	176	191	15	9%	N/A	0	N/A	N/A
		Through	9	10	1	11%	1	N/A	N/A	N/A	5	7	2	40%	2	N/A	N/A	N/A
		Right	134	147	13	10%	N/A	0	N/A	N/A	112	119	7	6%	N/A	0	N/A	N/A
	South	Left	47	57	10	21%	10	N/A	N/A	N/A	50	53	3	6%	3	N/A	N/A	N/A
		Through	1,542	1670	128	8%	N/A	N/A	128	N/A	1,617	1651	34	2%	N/A	N/A	34	N/A
		Right	229	249	20	9%	N/A	0	N/A	N/A	230	215	-15	-7%	N/A	0	N/A	N/A
	West	Left	15	18	3	20%	3	N/A	N/A	N/A	30	23	-7	-23%	-7	N/A	N/A	N/A
		Through	1	1	0	0%	0	N/A	N/A	N/A	2	0	-2	-100%	-2	N/A	N/A	N/A
		Right	24	14	-10	-42%	-10	N/A	N/A	N/A	38	22	-16	-42%	-16	N/A	N/A	N/A
Doncaster Road / Tram Road / Williamsons Road	North	Left	498	501	3	1%	N/A	0	N/A	N/A	479	441	-38	-8%	N/A	0	N/A	N/A
		Through	924	894	-30	-3%	N/A	0	N/A	N/A	976	938	-38	-4%	N/A	0	N/A	N/A
		Right	536	517	-19	-4%	N/A	0	N/A	N/A	474	498	24	5%	N/A	0	N/A	N/A
	East	Left	251	242	-9	-4%	N/A	0	N/A	N/A	272	265	-7	-3%	N/A	0	N/A	N/A
		Through	973	956	-17	-2%	N/A	0	N/A	N/A	958	960	2	0%	N/A	0	N/A	N/A
		Right	508	531	23	5%	N/A	0	N/A	N/A	506	492	-14	-3%	N/A	0	N/A	N/A
	South	Left	123	158	35	28%	N/A	0	N/A	N/A	147	146	-1	-1%	N/A	0	N/A	N/A
		Through	691	754	63	9%	N/A	0	N/A	N/A	776	729	-47	-6%	N/A	0	N/A	N/A
		Right	348	347	-1	0%	N/A	0	N/A	N/A	341	331	-10	-3%	N/A	0	N/A	N/A
	West	Left	670	686	16	2%	N/A	0	N/A	N/A	650	649	-1	0%	N/A	0	N/A	N/A
		Through	965	1056	91	9%	N/A	N/A	91	N/A	952	1026	74	8%	N/A	N/A	74	N/A
		Right	99	109	10	10%	N/A	0	N/A	N/A	132	133	1	1%	N/A	0	N/A	N/A
Tram Road / Merlin Street	North	Left	35	30	-5	-14%	-5	N/A	N/A	N/A	45	44	-1	-2%	-1	N/A	N/A	N/A
		Through	1,198	1217	19	2%	N/A	N/A	19	N/A	1,374	1294	-80	-6%	N/A	N/A	-80	N/A
	East	Left	3	0	-3	-100%	-3	N/A	N/A	N/A	8	0	-8	-100%	-8	N/A	N/A	N/A
		Right	16	20	4	25%	4	N/A	N/A	N/A	12	16	4	33%	4	N/A	N/A	N/A
	South	Through	1,123	1209	86	8%	N/A	N/A	86	N/A	1,221	1189	-32	-3%	N/A	N/A	-32	N/A
		Right	5	0	-5	-100%	-5	N/A	N/A	N/A	11	0	-11	-100%	-11	N/A	N/A	N/A
Doncaster Road / Bayley Grove	North	Left	20	16	-4	-20%	-4	N/A	N/A	N/A	35	13	-22	-63%	-22	N/A	N/A	N/A
	East	Left	45	68	23	51%	23	N/A	N/A	N/A	53	69	16	30%	16	N/A	N/A	N/A
		Through	1,036	1035	-1	0%	N/A	N/A	-1	N/A	1,110	1044	-66	-6%	N/A	N/A	-66	N/A
	South	Left	32	28	-4	-13%	-4	N/A	N/A	N/A	79	76	-3	-4%	-3	N/A	N/A	N/A
	West	Left	27	63	36	133%	36	N/A	N/A	N/A	31	52	21	68%	21	N/A	N/A	N/A
		Through	1,099	1087	-12	-1%	N/A	N/A	-12	N/A	1,203	1165	-38	-3%	N/A	N/A	-38	N/A
Doncaster Road / Rose Street / Beaonsfield Street	North	Left	43	44	1	2%	1	N/A	N/A	N/A	55	45	-10	-18%	-10	N/A	N/A	N/A
		Through	3	0	-3	-100%	-3	N/A	N/A	N/A	3	3	0	0%	0	N/A	N/A	N/A
		Right	13	14	1	8%	1	N/A	N/A	N/A	11	37	26	236%	26	N/A	N/A	N/A
	East	Left	46	40	-6	-13%	-6	N/A	N/A	N/A	40	29	-11	-28%	-11	N/A	N/A	N/A
		Through	1,039	1023	-16	-2%	N/A	N/A	-16	N/A	1,033	1039	6	1%	N/A	N/A	6	N/A
		Right	28	84	56	200%	56	N/A	N/A	N/A	32	73	41	128%	41	N/A	N/A	N/A
	South	Left	42	38	-4	-10%	-4	N/A	N/A	N/A	44	20	-24	-55%	-24	N/A	N/A	N/A
		Through	2	3	1	50%	1	N/A	N/A	N/A	4	0	-4	-100%	-4	N/A	N/A	N/A
		Right	35	56	21	60%	21	N/A	N/A	N/A	8	70	62	775%	62	N/A	N/A	N/A
	West	Left	34	20	-14	-41%	-14	N/A	N/A	N/A	49	32	-17	-35%	-17	N/A	N/A	N/A
		Through	1,003	1039	36	4%	N/A	N/A	36	N/A	1,059	1082	23	2%	N/A	N/A	23	N/A
		Right	22	21	-1	-5%	-1	N/A	N/A	N/A	36	29	-7	-19%	-7	N/A	N/A	N/A
		U-Turn	24	28	4	17%	4	N/A	N/A	N/A	43	32	-11	-26%	-11	N/A	N/A	N/A
Doncaster Road / Elgar Road / Site Access	North	Left	2	2	0	0%	0	N/A	N/A	N/A	2	8	6	300%	6	N/A	N/A	N/A
	East	Left	592	610	18	3%	N/A	0	N/A	N/A	534	558	24	4%	N/A	0	N/A	N/A
		Through	1,029	1025	-4	0%	N/A	N/A	-4	N/A	1,030	1039	9	1%	N/A	N/A	9	N/A
		Right	3	7	4	133%	4	N/A	N/A	N/A	1	7	6	600%	6	N/A	N/A	N/A
	South	Left	97	120	23	24%	N/A	0	N/A	N/A	78	110	32	41%	N/A	0	N/A	N/A
		Through	0	3	3	#DIV/0!	3	N/A	N/A	N/A	0	8	8	#DIV/0!	8	N/A	N/A	N/A
		Right	750	773	23	3%	N/A	0	N/A	N/A	712	682	-30	-4%	N/A	0	N/A	N/A
	West	Left	0	0	0	0%	0	N/A	N/A	N/A	0	0	0	0%	0	N/A	N/A	N/A
		Through	1,011	1102	91	9%	N/A	N/A	91	N/A	1,024	1128	104	10%	N/A	N/A	104	N/A
		Right	47	61	14	30%	14	N/A	N/A	N/A	91	91	0	0%	0	N/A	N/A	N/A
Doncaster Road / Frederick Street / Westfield Access	North	Left	13	12	-1	-8%	-1	N/A	N/A	N/A	5	11	6	120%	6	N/A	N/A	N/A
		Through	0	0	0	0%	0	N/A	N/A	N/A	0	0	0	0%	0	N/A	N/A	N/A
		Right	5	11	6	120%	6	N/A	N/A	N/A	6	6	0	0%	0	N/A	N/A	N/A
	East	Left	23	4	-19	-83%	-19	N/A	N/A	N/A	20	8	-12	-60%	-12	N/A	N/A	N/A
		Through	1,659	1669	10	1%	N/A	N/A	10	N/A	1,714	1699	-15	-1%	N/A	N/A	-15	N/A
	South	Left	25	33	8	32%	8	N/A	N/A	N/A	30	33	3	10%	3	N/A	N/A	N/A
		Right	17	9	-8	-47%	-8	N/A	N/A	N/A	13	8	-5	-38%	-5	N/A	N/A	N/A
	West	Left	250	244	-6	-2%	N/A	0	N/A	N/A	257	231	-26	-10%	N/A	0	N/A	N/A
		Through	1,572	1621	49	3%	N/A	N/A	49	N/A	1,509	1549	40	3%	N/A	N/A	40	N/A
		Right	53	39	-14	-26%	-14	N/A	N/A	N/A	38	21	-17	-45%	-17	N/A	N/A	N/A
Doncaster Road / Westfield Access	North	Left	540	527	-13	-2%	N/A	0	N/A	N/A	512	492	-20	-4%	N/A	0	N/A	N/A
		Right	661	608	-53	-8%	N/A	0	N/A	N/A	727	654	-73	-10%	N/A	0	N/A	N/A
	East	Through	1,011	1060	49	5%	N/A	N/A	49	N/A	1,014	1054	40	4%	N/A	N/A	40	N/A
		Right	419	368	-51	-12%	N/A	0	N/A	N/A	381	374	-7	-2%	N/A	0	N/A	N/A
	West	Left	582	640	58	10%	N/A	0	N/A	N/A	559	666	107	19%	N/A	0	N/A	N/A
		Through	1,015	1001	-14	-1%	N/A	N/A	-14	N/A	968	892	-76	-8%	N/A	0	N/A	N/A
Doncaster Road / Council Street	North	Left	50	47	-3	-6%	-3	N/A	N/A	N/A	41	23	-18	-44%	-18	N/A	N/A	N/A
		Through	0	0	0	0%	0	N/A	N/A	N/A	0	0	0	0%	0	N/A	N/A	N/A
		Right	81	86	5	6%	5	N/A	N/A	N/A	88	122	34	39%	N/A	0	N/A	N/A
	East	Left	2	0	-2	-100%	-2	N/A	N/A	N/A	4	0	-4	-100%	-4	N/A	N/A	N/A
		Through	1,337	1316	-21	-2%	N/A	N/A	-21	N/A	1,235	1275	40	3%	N/A	N/A	40	N/A
		Right	66	80	14	21%	14	N/A	N/A	N/A	54	46	-8	-15%	-8	N/A	N/A	N/A
		U-Turn	13	13	0	0%	0	N/A	N/A	N/A	25	23	-2	-8%	-2	N/A	N/A	N/A
	South	Left	1	2	1	100%	1	N/A	N/A	N/A	3	2	-1	-33%	-1	N/A	N/A	N/A
		Through	2	0	-2	-100%	-2	N/A	N/A	N/A	0	2	2	#DIV/0!	2	N/A	N/A	N/A
		Right	1	1	0	0%	0	N/A	N/A	N/A	1	0	-1	-100%	-1	N/A	N/A	N/A
	West	Left	89	83	-6	-7%	-6	N/A	N/A	N/A	98	100	2	2%	N/A	0	N/A	N/A
		Through	1,452	1421	-31	-2%	N/A	N/A	-31	N/A	1,339	1233	-106	-8%	N/A	N/A	-106	N/A
		Right	2	0	-2	-100%	-2	N/A	N/A	N/A	2	9	7	350%	7	N/A	N/A	N/A
		U-Turn	11	22	11	100%	11	N/A	N/A	N/A	37	35	-2	-5%	-2	N/A	N/A	N/A

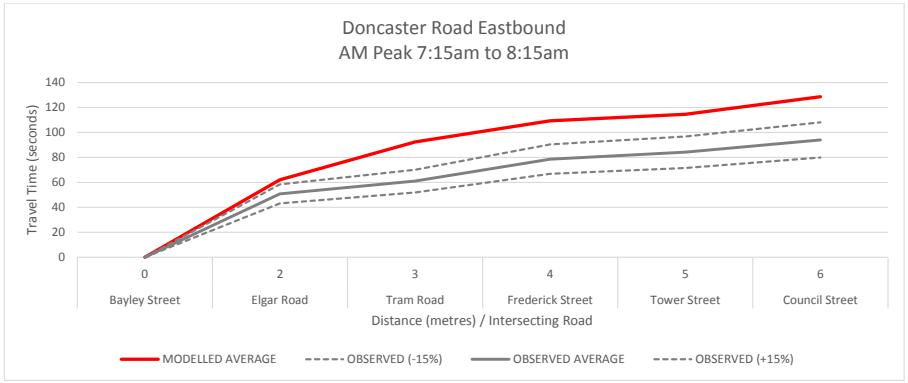
		Total	66	30	22	1					Total	64	33	22	0			
			11	*5*	*2*	*0*						*7*	*4*	*1*	*0*			
			4	*2*	*0*	*0*						*12*	*5*	*1*	*0*			
		Does not meet criteria	15	7	2	0					Does not meet criteria	19	9	2	0			
		Meets criteria	51	23	20	1					Meets criteria	45	24	20	0			
			77%	77%	91%	100%						70%	73%	91%	#DIV/0!			

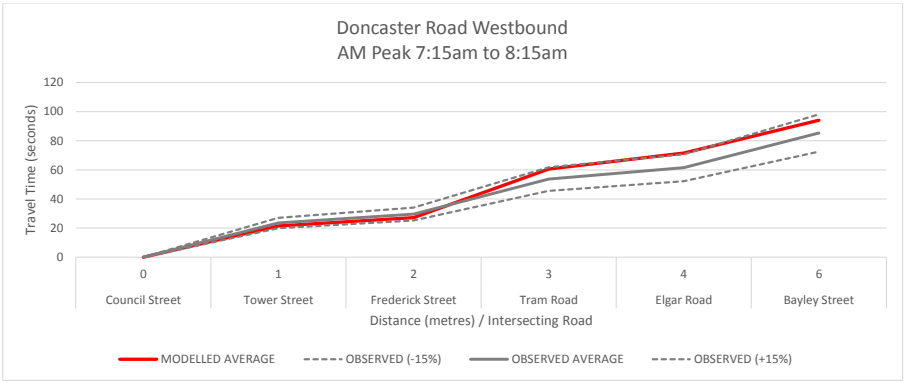
Appendix D

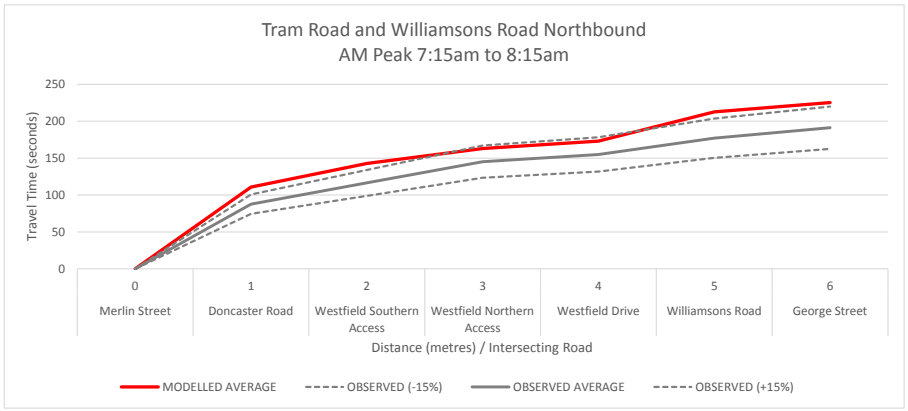
Travel Time Validation Results

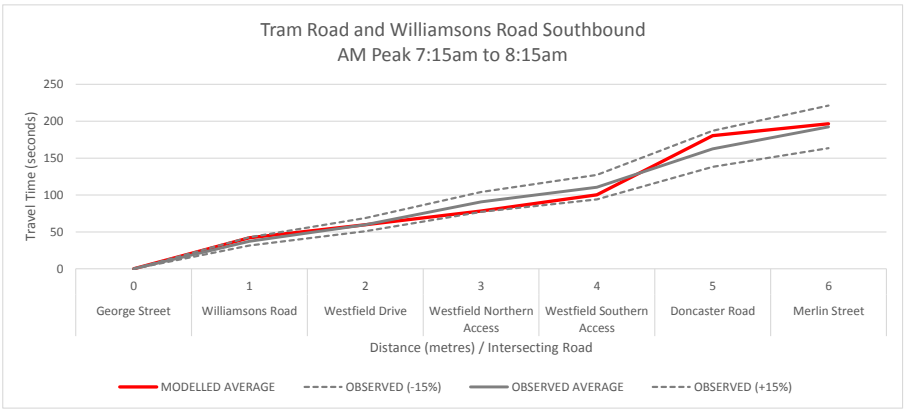
TRAVEL TIME VALIDATION (BY SECTION)
EXISTING CONDITIONS - AM PEAK (7:15am to 8:15am)

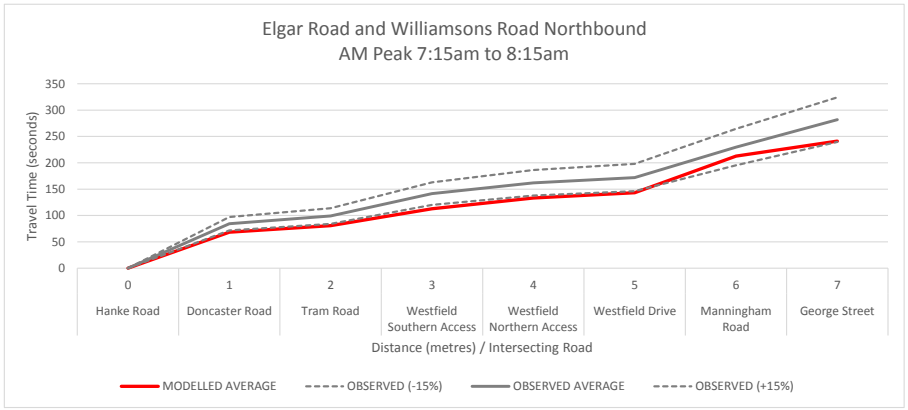
REF	ROUTE DESCRIPTION	MODELLED		OBSERVED			RELATIVE DIFFERENCE	% DIFFERENCE
		TRAVEL TIME	TRAFFIC FLOW	AVERAGE TRAVEL TIME	MINIMUM TRAVEL TIME	MAXIMUM TRAVEL TIME		
1 EB	86068: 1 Doncaster Road Eastbound: Section 1 (Bayley Street to Elgar Road)	62	442	51	25	121	11	22%
	86070: 3 Doncaster Road Eastbound: Section 2 (Elgar Road to Tram Road)	30	418	10	8	15	20	195%
	86071: 4 Doncaster Road Eastbound: Section 3 (Tram Road to Frederick Street)	17	440	18	12	26	-1	-4%
	86072: 5 Doncaster Road Eastbound: Section 4 (Frederick Street to Tower Street)	5	673	6	5	7	0	-6%
	86073: 6 Doncaster Road Eastbound: Section 5 (Tower Street to Council Street)	14	562	10	9	10	4	42%
	86074: 7 Doncaster Road Eastbound: Section Full (Bayley Street to Council Street)	**129**	**117**	**94**	**59**	**164**	**35**	**37%**
1 WB	86075: 8 Doncaster Road Westbound: Section 1 Council Street to Tower Street)	22	1564	24	10	38	-2	-8%
	86076: 9 Doncaster Road Westbound: Section 2 (Tower Street to Frederick Street)	6	1570	6	5	7	-1	-8%
	86077: 10 Doncaster Road Westbound: Section 3 (Frederick Street to Tram Road)	33	1054	24	12	63	9	39%
	86078: 11 Doncaster Road Westbound: Section 4 (Tram Road to Elgar Road)	11	986	8	7	9	3	40%
	86079: 12 Doncaster Road Westbound: Section 5 (Elgar Road to Bayley Street)	23	752	24	23	25	-1	-5%
	86081: 14 Doncaster Road Westbound: Full Section (Council Street to Bayley Street)	**94**	**506**	**85**	**64**	**110**	**9**	**10%**
2 NB	86082: 15 Tram Road and Williamsons Road Northbound: Section 1 (Merlin Street to Doncaster Road)	111	822	88	81	97	23	26%
	86083: 16 Tram Road and Williamsons Road Northbound: Section 2 (Doncaster Road to Westfield Southern Access)	32	1680	29	18	63	3	11%
	86084: 17 Tram Road and Williamsons Road Northbound: Section 3 (Westfield Southern Access to Westfield Northern Access)	20	1596	29	10	56	-9	-30%
	86085: 18 Tram Road and Williamsons Road Northbound: Section 4 (Westfield Northern Access to Westfield Drive)	10	1641	10	8	11	0	2%
	86086: 19 Tram Road and Williamsons Road Northbound: Section 5 (Westfield Drive to Williamsons Road)	40	1592	22	15	38	18	81%
	86087: 20 Tram Road and Williamsons Road Northbound: Section 6 (Williamsons Road to George Street)	13	1295	14	12	17	-2	-11%
	86088: 21 Tram Road and Williamsons Road Northbound: Full Section (Merlin Street to George Street)	**225**	**453**	**191**	**173**	**209**	**34**	**18%**
2 SB	86089: 22 Tram Road and Williamsons Road Southbound: Section 1 (George Street to Williamsons Road)	42	975	37	15	77	5	13%
	86090: 23 Tram Road and Williamsons Road Southbound: Section 2 (Williamsons Road to Westfield Drive)	18	984	23	18	38	-5	-22%
	86091: 24 Tram Road and Williamsons Road Southbound: Section 3 (Westfield Drive to Westfield Northern Access)	19	2053	31	23	39	-12	-39%
	86092: 25 Tram Road and Williamsons Road Southbound: Section 4 (Westfield Northern Access to Westfield Southern Access)	22	2073	20	13	35	2	9%
	86093: 26 Tram Road and Williamsons Road Southbound: Section 5 (Westfield Southern Access to Doncaster Road)	80	1131	52	38	61	28	54%
	86094: 27 Tram Road and Williamsons Road Southbound: Section 6 (Doncaster Road to Merlin Street)	16	1303	30	20	49	-14	-46%
	86095: 28 Tram Road and Williamsons Road Southbound: Section Full Section (George Street to Doncaster Road)	**197**	**528**	**191**	**137**	**251**	**6**	**3%**
3 NB	86096: 29 Elgar Road and Williamsons Road Northbound: Section 1 (Hanke Road to Doncaster Road)	68	385	84	50	113	-16	-19%
	86097: 30 Elgar Road and Williamsons Road Northbound: Section 2 (Doncaster Road to Tram Road)	13	473	15	10	26	-2	-14%
	86098: 31 Elgar Road and Williamsons Road Northbound: Section 3 (Tram Road to Westfield Southern Access)	32	1680	43	23	90	-10	-25%
	86099: 32 Elgar Road and Williamsons Road Northbound: Section 4 (Westfield Southern Access to Westfield Northern Access)	20	1596	21	10	40	0	-1%
	86100: 33 Elgar Road and Williamsons Road Northbound: Section 5 (Westfield Northern Access to Westfield Drive)	10	1641	10	8	12	0	0%
	86101: 34 Elgar Road and Williamsons Road Northbound: Section 6 (Westfield Drive to Manningham Road)	70	676	58	22	99	12	20%
	86102: 35 Elgar Road and Williamsons Road Northbound: Section 7 (Manningham Road to George Street)	28	787	52	16	66	-24	-45%
	86103: 36 Elgar Road and Williamsons Road Northbound: Section Full Section (Hanke Road to George Street)	**241**	**177**	**282**	**216**	**324**	**-41**	**-14%**
3 SB	86104: 37 Elgar Road and Williamsons Road Southbound: Section 1 (George Street to Manningham Road)	45	1082	33	18	75	11	35%
	86105: 38 Elgar Road and Williamsons Road Southbound: Section 2 (Manningham Road to Westfield Drive)	18	1166	21	19	24	-2	-11%
	86106: 39 Elgar Road and Williamsons Road Southbound: Section 3 (Westfield Drive to Westfield Northern Access)	19	2053	25	9	50	-6	-23%
	86107: 40 Elgar Road and Williamsons Road Southbound: Section 4 (Westfield Northern Access to Westfield Southern Access)	22	2073	45	20	80	-23	-52%
	86108: 41 Elgar Road and Williamsons Road Southbound: Section 5 (Westfield Southern Access to Tram Road)	169	507	136	41	311	34	25%
	86109: 42 Elgar Road and Williamsons Road Southbound: Section 6 (Tram Road to Elgar Road)	7	725	11	9	16	-4	-39%
	86110: 43 Elgar Road and Williamsons Road Southbound: Section 7 (Doncaster Road to Hanke Road)	26	270	27	25	31	-2	-6%
	86111: 44 Elgar Road and Williamsons Road Southbound: Full Section (George Street to Hanke Road)	**305**	**41**	**291**	**185**	**461**	**14**	**5%**

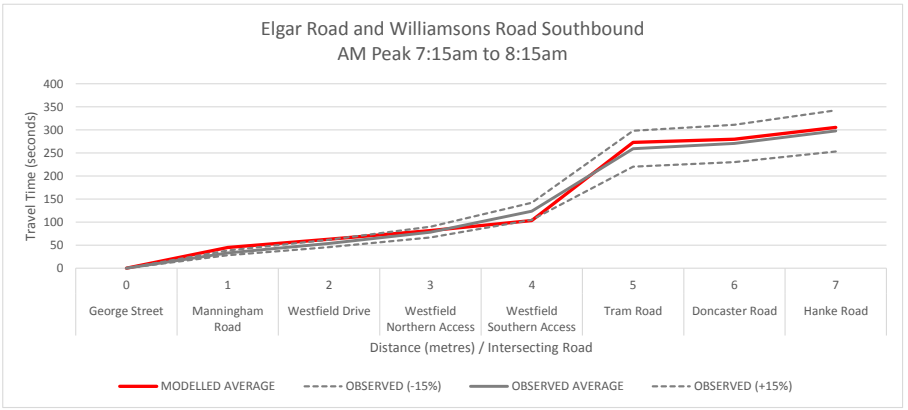

Doncaster Road Eastbound
AM Peak 7:15am to 8:15am
Travel Time (seconds)
0
20
40
60
80
100
120
140
0
Bayley Street
2
Elgar Road
3
Tram Road
4
Frederick Street
5
Tower Street
6
Council Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)


Doncaster Road Westbound
AM Peak 7:15am to 8:15am
Travel Time (seconds)
0
20
40
60
80
100
120
0
Council Street
1
Tower Street
2
Frederick Street
3
Tram Road
4
Elgar Road
6
Bayley Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)


Tram Road and Williamsons Road Northbound
AM Peak 7:15am to 8:15am
Travel Time (seconds)
0
50
100
150
200
250
0
Merlin Street
1
Doncaster Road
2
Westfield Southern Access
3
Westfield Northern Access
4
Westfield Drive
5
Williamsons Road
6
George Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

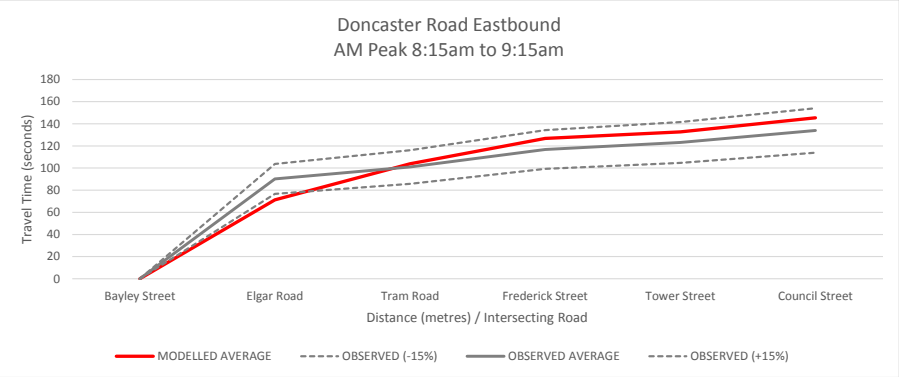

Tram Road and Williamsons Road Southbound
AM Peak 7:15am to 8:15am
Travel Time (seconds)
0
50
100
150
200
250
0
George Street
1
Williamsons Road
2
Westfield Drive
3
Westfield Northern Access
4
Westfield Southern Access
5
Doncaster Road
6
Merlin Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

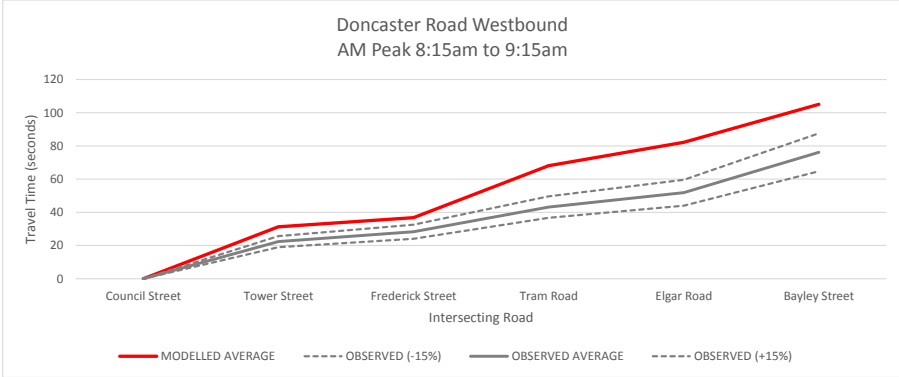

Elgar Road and Williamsons Road Northbound
AM Peak 7:15am to 8:15am
Travel Time (seconds)
0
50
100
150
200
250
300
350
0
Hanke Road
1
Doncaster Road
2
Tram Road
3
Westfield Southern Access
4
Westfield Northern Access
5
Westfield Drive
6
Manningham Road
7
George Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

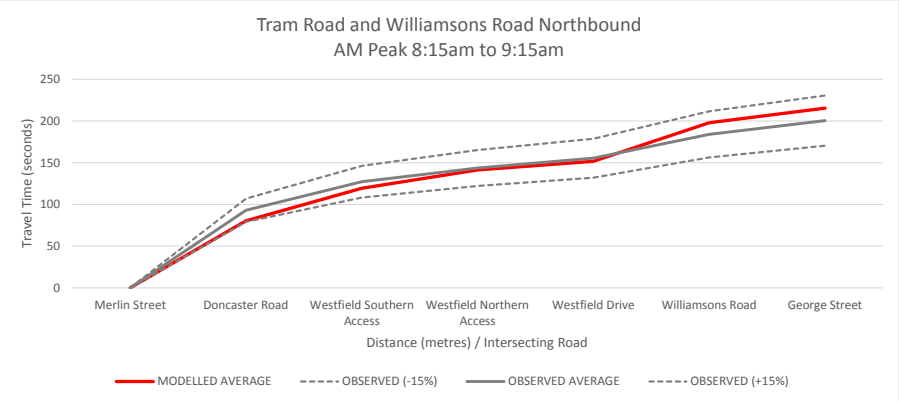

Elgar Road and Williamsons Road Southbound
AM Peak 7:15am to 8:15am
Travel Time (seconds)
0
50
100
150
200
250
300
350
400
0
George Street
1
Manningham Road
2
Westfield Drive
3
Westfield Northern Access
4
Westfield Southern Access
5
Tram Road
6
Doncaster Road
7
Hanke Road
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

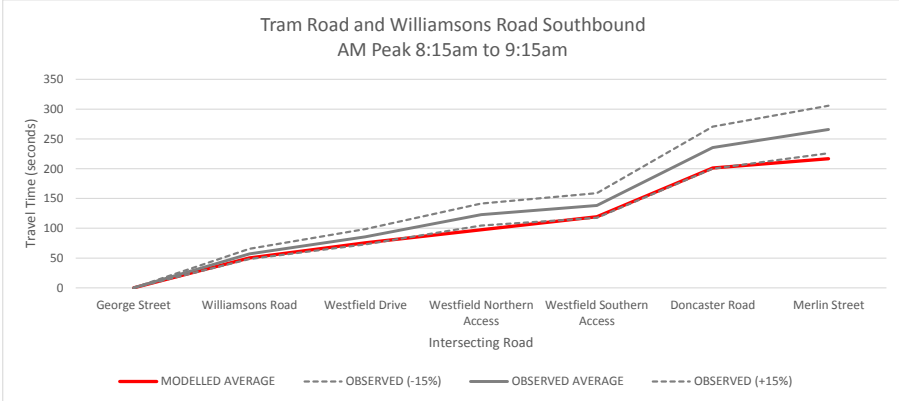
TRAVEL TIME VALIDATION
EXISTING CONDITIONS - AM PEAK (8:15am to 9:15am)

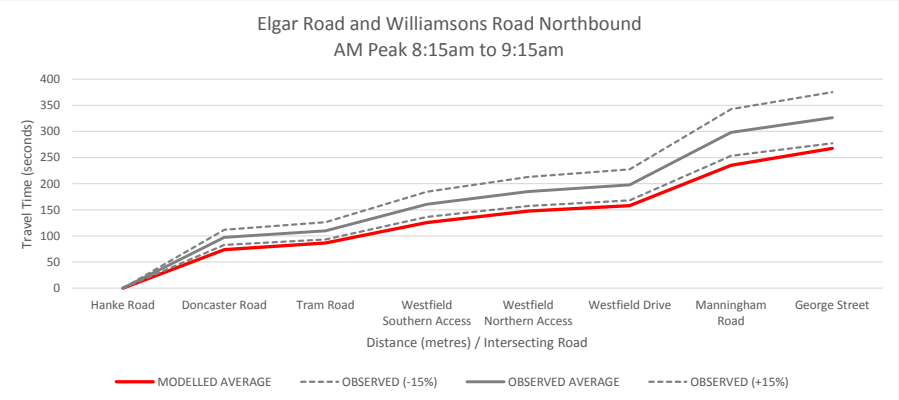
REF	ROUTE DESCRIPTION	MODELLED		OBSERVED			RELATIVE DIFFERENCE	% DIFFERENCE
		TRAVEL TIME	TRAFFIC FLOW	AVERAGE TRAVEL TIME	MINIMUM TRAVEL TIME	MAXIMUM TRAVEL TIME		
1 EB	86068: 1 Doncaster Road Eastbound: Section 1 (Bayley Street to Elgar Road)	71	868	90	33	126	-19	-21%
	86070: 3 Doncaster Road Eastbound: Section 2 (Elgar Road to Tram Road)	33	1060	11	10	11	22	201%
	86071: 4 Doncaster Road Eastbound: Section 3 (Tram Road to Frederick Street)	23	1098	16	14	19	7	45%
	86072: 5 Doncaster Road Eastbound: Section 4 (Frederick Street to Tower Street)	6	1397	6	6	8	0	-7%
	86073: 6 Doncaster Road Eastbound: Section 5 (Tower Street to Council Street)	13	978	11	10	12	2	18%
	86074: 7 Doncaster Road Eastbound: Section Full (Bayley Street to Council Street)	**145**	**190**	**134**	**75**	**169**	**11**	**9%**
1 WB	86075: 8 Doncaster Road Westbound: Section 1 Council Street to Tower Street)	31	1601	22	11	68	9	40%
	86076: 9 Doncaster Road Westbound: Section 2 (Tower Street to Frederick Street)	6	1352	6	5	8	0	-8%
	86077: 10 Doncaster Road Westbound: Section 3 (Frederick Street to Tram Road)	31	829	15	11	25	16	111%
	86078: 11 Doncaster Road Westbound: Section 4 (Tram Road to Elgar Road)	14	798	9	7	9	5	63%
	86079: 12 Doncaster Road Westbound: Section 5 (Elgar Road to Bayley Street)	23	639	24	23	26	-2	-6%
	86081: 14 Doncaster Road Westbound: Full Section (Council Street to Bayley Street)	**105**	**414**	**76**	**58**	**134**	**29**	**38%**
2 NB	86082: 15 Tram Road and Williamsons Road Northbound: Section 1 (Merlin Street to Doncaster Road)	80	748	93	47	184	-13	-14%
	86083: 16 Tram Road and Williamsons Road Northbound: Section 2 (Doncaster Road to Westfield Southern Access)	39	1766	34	20	70	5	14%
	86084: 17 Tram Road and Williamsons Road Northbound: Section 3 (Westfield Southern Access to Westfield Northern Access)	22	1619	17	13	24	5	33%
	86085: 18 Tram Road and Williamsons Road Northbound: Section 4 (Westfield Northern Access to Westfield Drive)	10	1570	12	11	13	-2	-13%
	86086: 19 Tram Road and Williamsons Road Northbound: Section 5 (Westfield Drive to Williamsons Road)	46	1652	29	20	48	18	62%
	86087: 20 Tram Road and Williamsons Road Northbound: Section 6 (Williamsons Road to George Street)	18	1353	17	16	17	1	7%
	86088: 21 Tram Road and Williamsons Road Northbound: Full Section (Merlin Street to George Street)	**215**	**467**	**201**	**149**	**269**	**15**	**7%**
2 SB	86089: 22 Tram Road and Williamsons Road Southbound: Section 1 (George Street to Williamsons Road)	50	1036	57	17	92	-7	-12%
	86090: 23 Tram Road and Williamsons Road Southbound: Section 2 (Williamsons Road to Westfield Drive)	25	1049	29	23	37	-4	-12%
	86091: 24 Tram Road and Williamsons Road Southbound: Section 3 (Westfield Drive to Westfield Northern Access)	22	1909	37	15	65	-15	-41%
	86092: 25 Tram Road and Williamsons Road Southbound: Section 4 (Westfield Northern Access to Westfield Southern Access)	22	1929	15	12	19	7	43%
	86093: 26 Tram Road and Williamsons Road Southbound: Section 5 (Westfield Southern Access to Doncaster Road)	82	979	97	59	126	-15	-16%
	86094: 27 Tram Road and Williamsons Road Southbound: Section 6 (Doncaster Road to Merlin Street)	16	1229	31	25	40	-15	-49%
	86095: 28 Tram Road and Williamsons Road Southbound: Section Full Section (George Street to Doncaster Road)	**217**	**466**	**262**	**245**	**293**	**-45**	**-17%**
3 NB	86096: 29 Elgar Road and Williamsons Road Northbound: Section 1 (Hanke Road to Doncaster Road)	74	790	97	80	112	-24	-24%
	86097: 30 Elgar Road and Williamsons Road Northbound: Section 2 (Doncaster Road to Tram Road)	13	649	13	11	15	0	2%
	86098: 31 Elgar Road and Williamsons Road Northbound: Section 3 (Tram Road to Westfield Southern Access)	39	1766	51	27	77	-12	-23%
	86099: 32 Elgar Road and Williamsons Road Northbound: Section 4 (Westfield Southern Access to Westfield Northern Access)	22	1619	25	16	41	-3	-10%
	86100: 33 Elgar Road and Williamsons Road Northbound: Section 5 (Westfield Northern Access to Westfield Drive)	10	1570	13	12	14	-3	-20%
	86101: 34 Elgar Road and Williamsons Road Northbound: Section 6 (Westfield Drive to Manningham Road)	77	751	100	90	106	-23	-23%
	86102: 35 Elgar Road and Williamsons Road Northbound: Section 7 (Manningham Road to George Street)	33	821	28	16	61	4	15%
	86103: 36 Elgar Road and Williamsons Road Northbound: Section Full Section (Hanke Road to George Street)	**268**	**283**	**326**	**281**	**379**	**-59**	**-18%**
3 SB	86104: 37 Elgar Road and Williamsons Road Southbound: Section 1 (George Street to Manningham Road)	48	1209	45	16	80	3	7%
	86105: 38 Elgar Road and Williamsons Road Southbound: Section 2 (Manningham Road to Westfield Drive)	28	1285	26	19	34	2	8%
	86106: 39 Elgar Road and Williamsons Road Southbound: Section 3 (Westfield Drive to Westfield Northern Access)	22	1909	24	8	60	-1	-6%
	86107: 40 Elgar Road and Williamsons Road Southbound: Section 4 (Westfield Northern Access to Westfield Southern Access)	22	1929	39	13	76	-17	-44%
	86108: 41 Elgar Road and Williamsons Road Southbound: Section 5 (Westfield Southern Access to Tram Road)	180	475	138	125	172	42	30%
	86109: 42 Elgar Road and Williamsons Road Southbound: Section 6 (Tram Road to Elgar Road)	7	651	12	10	14	-5	-40%
	86110: 43 Elgar Road and Williamsons Road Southbound: Section 7 (Doncaster Road to Hanke Road)	26	258	29	26	33	-3	-9%
	86111: 44 Elgar Road and Williamsons Road Southbound: Full Section (George Street to Hanke Road)	**333**	**32**	**307**	**257**	**358**	**26**	**8%**

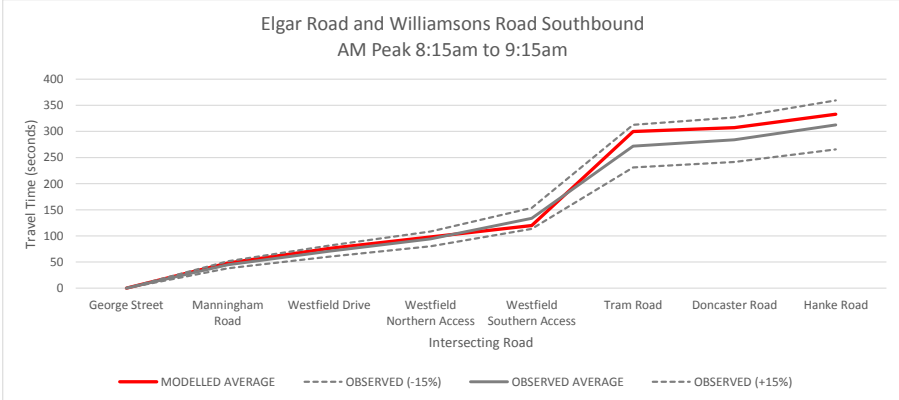

Doncaster Road Eastbound
AM Peak 8:15am to 9:15am
Travel Time (seconds)
0
20
40
60
80
100
120
140
160
180
Bayley Street
Elgar Road
Tram Road
Frederick Street
Tower Street
Council Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)


Doncaster Road Westbound
AM Peak 8:15am to 9:15am
Travel Time (seconds)
0
20
40
60
80
100
120
Council Street
Tower Street
Frederick Street
Tram Road
Elgar Road
Bayley Street
Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)


Tram Road and Williamsons Road Northbound
AM Peak 8:15am to 9:15am
Travel Time (seconds)
0
50
100
150
200
250
Merlin Street
Doncaster Road
Westfield Southern Access
Westfield Northern Access
Westfield Drive
Williamsons Road
George Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

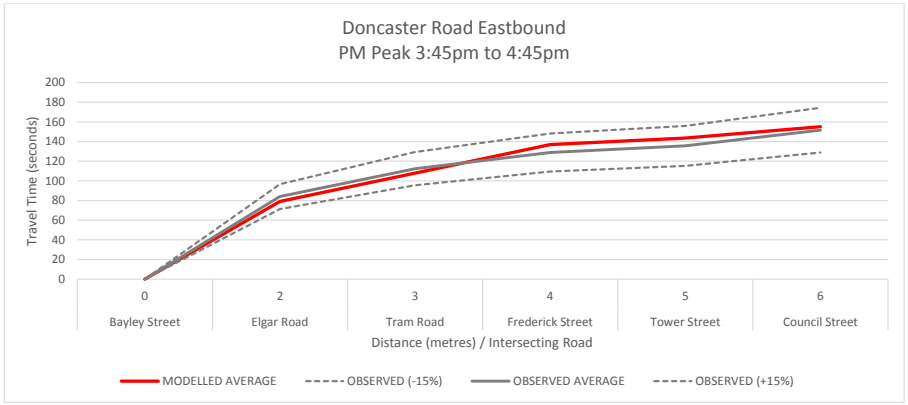

Tram Road and Williamsons Road Southbound
AM Peak 8:15am to 9:15am
Travel Time (seconds)
0
50
100
150
200
250
300
350
George Street
Williamsons Road
Westfield Drive
Westfield Northern Access
Westfield Southern Access
Doncaster Road
Merlin Street
Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

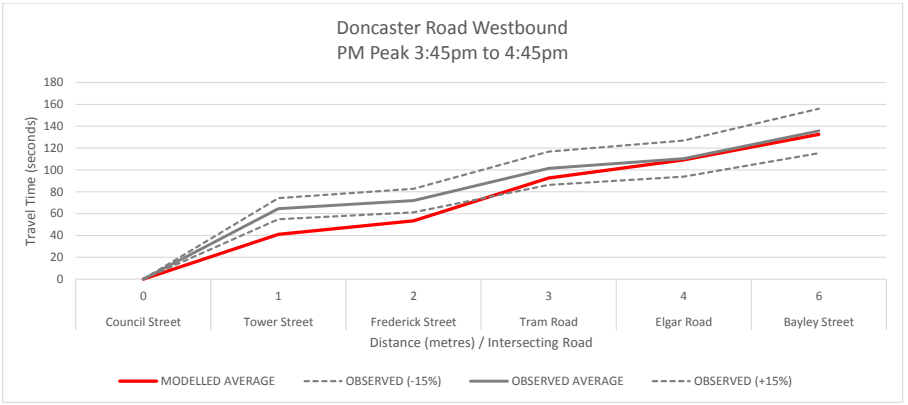

Elgar Road and Williamsons Road Northbound
AM Peak 8:15am to 9:15am
Travel Time (seconds)
0
50
100
150
200
250
300
350
400
Hanke Road
Doncaster Road
Tram Road
Westfield Southern Access
Westfield Northern Access
Westfield Drive
Manningham Road
George Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

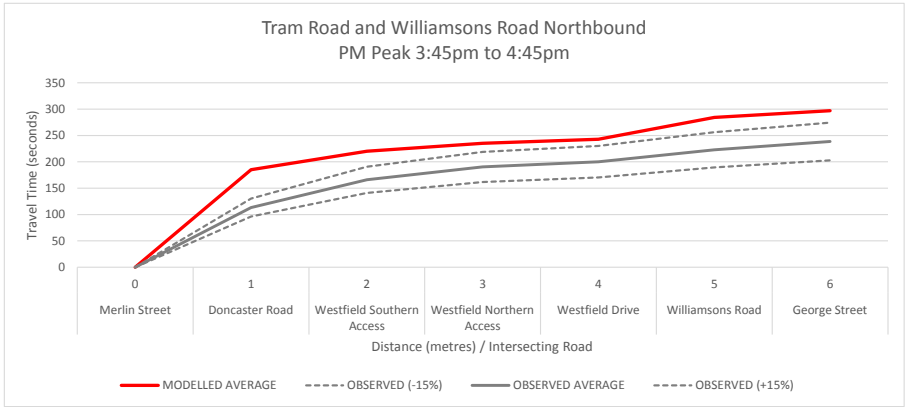

Elgar Road and Williamsons Road Southbound
AM Peak 8:15am to 9:15am
Travel Time (seconds)
0
50
100
150
200
250
300
350
400
George Street
Manningham Road
Westfield Drive
Westfield Northern Access
Westfield Southern Access
Tram Road
Doncaster Road
Hanke Road
Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

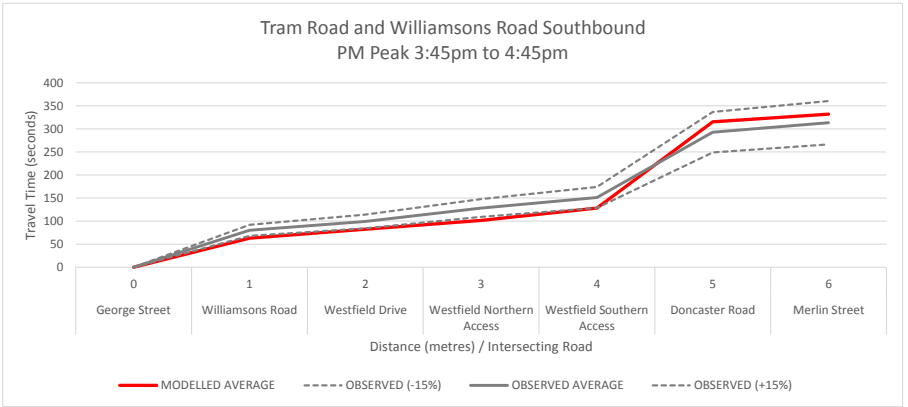
TRAVEL TIME VALIDATION
EXISTING CONDITIONS - PM PEAK (3:45pm to 4:45pm)

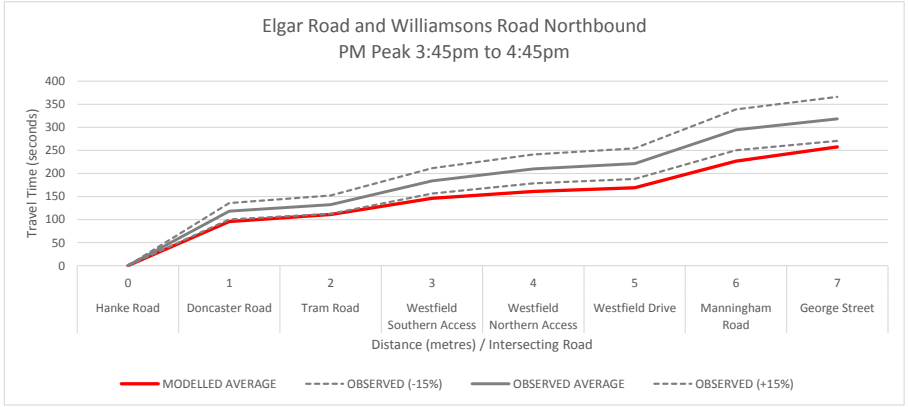
REF	ROUTE DESCRIPTION	MODELLED		OBSERVED			RELATIVE DIFFERENCE	% DIFFERENCE
		TRAVEL TIME	TRAFFIC FLOW	AVERAGE TRAVEL TIME	MINIMUM TRAVEL TIME	MAXIMUM TRAVEL TIME		
1 EB	86068: 1 Doncaster Road Eastbound: Section 1 (Bayley Street to Elgar Road)	79	1084	84	55	177	-5	-6%
	86070: 3 Doncaster Road Eastbound: Section 2 (Elgar Road to Tram Road)	29	1304	28	9	101	1	2%
	86071: 4 Doncaster Road Eastbound: Section 3 (Tram Road to Frederick Street)	29	1333	16	13	20	13	77%
	86072: 5 Doncaster Road Eastbound: Section 4 (Frederick Street to Tower Street)	7	1751	7	5	9	0	-2%
	86073: 6 Doncaster Road Eastbound: Section 5 (Tower Street to Council Street)	12	1232	16	10	38	-4	-28%
	86074: 7 Doncaster Road Eastbound: Section Full (Bayley Street to Council Street)	**155**	**496**	**152**	**92**	**253**	**3**	**2%**
1 WB	86075: 8 Doncaster Road Westbound: Section 1 Council Street to Tower Street)	41	1373	65	36	85	-24	-37%
	86076: 9 Doncaster Road Westbound: Section 2 (Tower Street to Frederick Street)	12	1720	8	6	11	5	67%
	86077: 10 Doncaster Road Westbound: Section 3 (Frederick Street to Tram Road)	39	976	30	18	49	10	33%
	86078: 11 Doncaster Road Westbound: Section 4 (Tram Road to Elgar Road)	17	965	9	8	9	8	88%
	86079: 12 Doncaster Road Westbound: Section 5 (Elgar Road to Bayley Street)	23	818	25	24	28	-2	-8%
	86081: 14 Doncaster Road Westbound: Full Section (Council Street to Bayley Street)	**133**	**275**	**136**	**125**	**146**	**-3**	**-2%**
2 NB	86082: 15 Tram Road and Williamsons Road Northbound: Section 1 (Merlin Street to Doncaster Road)	185	1024	113	97	138	72	63%
	86083: 16 Tram Road and Williamsons Road Northbound: Section 2 (Doncaster Road to Westfield Southern Access)	35	2407	53	22	78	-17	-33%
	86084: 17 Tram Road and Williamsons Road Northbound: Section 3 (Westfield Southern Access to Westfield Northern Access)	15	2283	24	12	48	-10	-39%
	86085: 18 Tram Road and Williamsons Road Northbound: Section 4 (Westfield Northern Access to Westfield Drive)	8	2565	10	9	11	-2	-21%
	86086: 19 Tram Road and Williamsons Road Northbound: Section 5 (Westfield Drive to Williamsons Road)	41	2492	23	17	33	19	82%
	86087: 20 Tram Road and Williamsons Road Northbound: Section 6 (Williamsons Road to George Street)	13	1260	16	15	17	-3	-19%
	86088: 21 Tram Road and Williamsons Road Northbound: Full Section (Merlin Street to George Street)	**297**	**396**	**244**	**231**	**269**	**53**	**22%**
2 SB	86089: 22 Tram Road and Williamsons Road Southbound: Section 1 (George Street to Williamsons Road)	63	1414	80	52	112	-17	-21%
	86090: 23 Tram Road and Williamsons Road Southbound: Section 2 (Williamsons Road to Westfield Drive)	19	1426	19	18	20	0	0%
	86091: 24 Tram Road and Williamsons Road Southbound: Section 3 (Westfield Drive to Westfield Northern Access)	19	1898	29	26	32	-10	-33%
	86092: 25 Tram Road and Williamsons Road Southbound: Section 4 (Westfield Northern Access to Westfield Southern Access)	27	2139	23	14	32	4	16%
	86093: 26 Tram Road and Williamsons Road Southbound: Section 5 (Westfield Southern Access to Doncaster Road)	187	1192	141	109	183	46	32%
	86094: 27 Tram Road and Williamsons Road Southbound: Section 6 (Doncaster Road to Merlin Street)	17	1588	21	17	27	-4	-20%
	86095: 28 Tram Road and Williamsons Road Southbound: Section Full Section (George Street to Doncaster Road)	**332**	**810**	**311**	**249**	**376**	**21**	**7%**
3 NB	86096: 29 Elgar Road and Williamsons Road Northbound: Section 1 (Hanke Road to Doncaster Road)	96	935	118	94	184	-22	-19%
	86097: 30 Elgar Road and Williamsons Road Northbound: Section 2 (Doncaster Road to Tram Road)	15	855	14	11	21	1	7%
	86098: 31 Elgar Road and Williamsons Road Northbound: Section 3 (Tram Road to Westfield Southern Access)	35	2407	52	41	63	-16	-32%
	86099: 32 Elgar Road and Williamsons Road Northbound: Section 4 (Westfield Southern Access to Westfield Northern Access)	15	2283	26	11	56	-11	-43%
	86100: 33 Elgar Road and Williamsons Road Northbound: Section 5 (Westfield Northern Access to Westfield Drive)	8	2565	12	11	13	-4	-31%
	86101: 34 Elgar Road and Williamsons Road Northbound: Section 6 (Westfield Drive to Manningham Road)	57	1457	73	44	124	-16	-22%
	86102: 35 Elgar Road and Williamsons Road Northbound: Section 7 (Manningham Road to George Street)	31	1519	24	17	42	7	31%
	86103: 36 Elgar Road and Williamsons Road Northbound: Section Full Section (Hanke Road to George Street)	**258**	**256**	**318**	**253**	**390**	**-61**	**-19%**
3 SB	86104: 37 Elgar Road and Williamsons Road Southbound: Section 1 (George Street to Manningham Road)	34	837	26	17	59	8	31%
	86105: 38 Elgar Road and Williamsons Road Southbound: Section 2 (Manningham Road to Westfield Drive)	21	860	23	17	38	-2	-8%
	86106: 39 Elgar Road and Williamsons Road Southbound: Section 3 (Westfield Drive to Westfield Northern Access)	19	1898	47	9	71	-28	-59%
	86107: 40 Elgar Road and Williamsons Road Southbound: Section 4 (Westfield Northern Access to Westfield Southern Access)	27	2139	19	10	30	7	38%
	86108: 41 Elgar Road and Williamsons Road Southbound: Section 5 (Westfield Southern Access to Tram Road)	223	441	251	169	397	-28	-11%
	86109: 42 Elgar Road and Williamsons Road Southbound: Section 6 (Tram Road to Elgar Road)	7	588	13	10	20	-6	-49%
	86110: 43 Elgar Road and Williamsons Road Southbound: Section 7 (Doncaster Road to Hanke Road)	26	260	28	27	31	-3	-10%
	86111: 44 Elgar Road and Williamsons Road Southbound: Full Section (George Street to Hanke Road)	**356**	**14**	**408**	**320**	**564**	**-52**	**-13%**

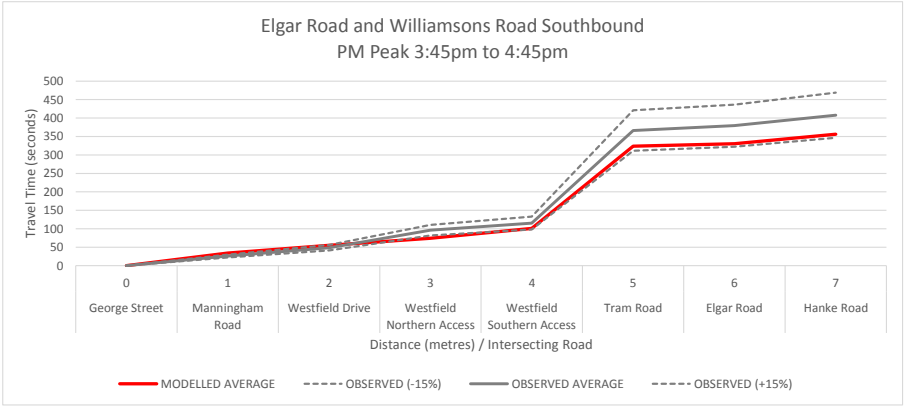

Doncaster Road Eastbound
PM Peak 3:45pm to 4:45pm
Travel Time (seconds)
0 20 40 60 80 100 120 140 160 180 200
0 Bayley Street
2 Elgar Road
3 Tram Road
4 Frederick Street
5 Tower Street
6 Council Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)


Doncaster Road Westbound
PM Peak 3:45pm to 4:45pm
Travel Time (seconds)
0 20 40 60 80 100 120 140 160 180
0 Council Street
1 Tower Street
2 Frederick Street
3 Tram Road
4 Elgar Road
6 Bayley Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)


Tram Road and Williamsons Road Northbound
PM Peak 3:45pm to 4:45pm
Travel Time (seconds)
0 50 100 150 200 250 300 350
0 Merlin Street
1 Doncaster Road
2 Westfield Southern Access
3 Westfield Northern Access
4 Westfield Drive
5 Williamsons Road
6 George Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

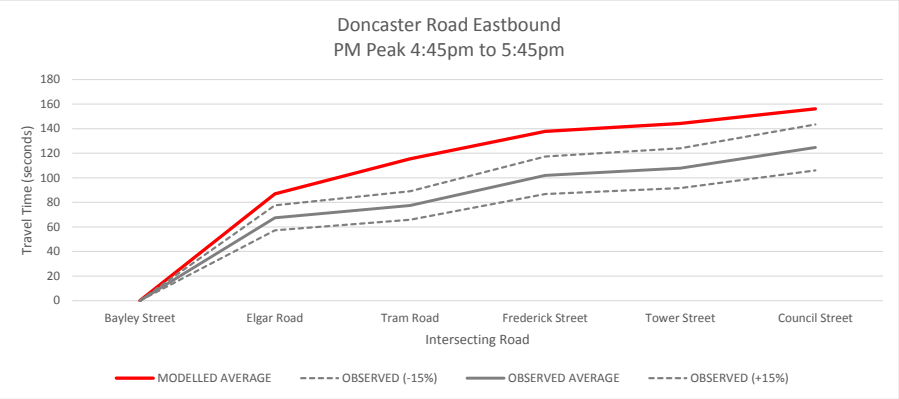

Tram Road and Williamsons Road Southbound
PM Peak 3:45pm to 4:45pm
Travel Time (seconds)
0 50 100 150 200 250 300 350 400
0 George Street
1 Williamsons Road
2 Westfield Drive
3 Westfield Northern Access
4 Westfield Southern Access
5 Doncaster Road
6 Merlin Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

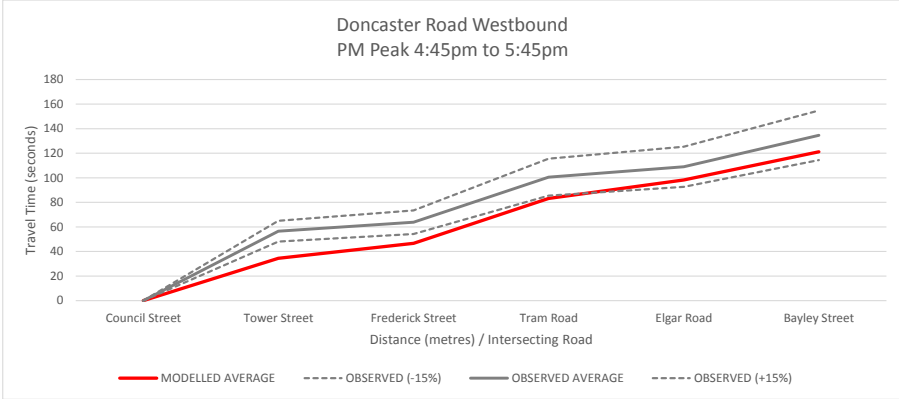

Elgar Road and Williamsons Road Northbound
PM Peak 3:45pm to 4:45pm
Travel Time (seconds)
0 50 100 150 200 250 300 350 400
0 Hanke Road
1 Doncaster Road
2 Tram Road
3 Westfield Southern Access
4 Westfield Northern Access
5 Westfield Drive
6 Manningham Road
7 George Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

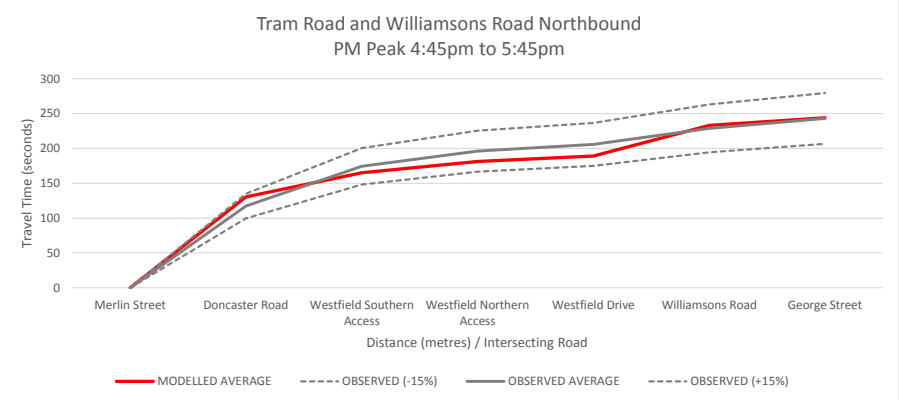

Elgar Road and Williamsons Road Southbound
PM Peak 3:45pm to 4:45pm
Travel Time (seconds)
0 50 100 150 200 250 300 350 400 450 500
0 George Street
1 Manningham Road
2 Westfield Drive
3 Westfield Northern Access
4 Westfield Southern Access
5 Tram Road
6 Elgar Road
7 Hanke Road
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

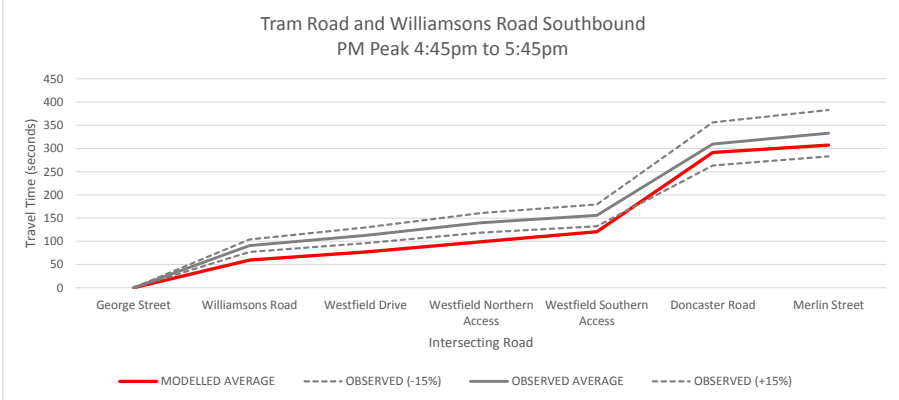
TRAVEL TIME VALIDATION
EXISTING CONDITIONS - PM PEAK (4:45pm to 5:45pm)

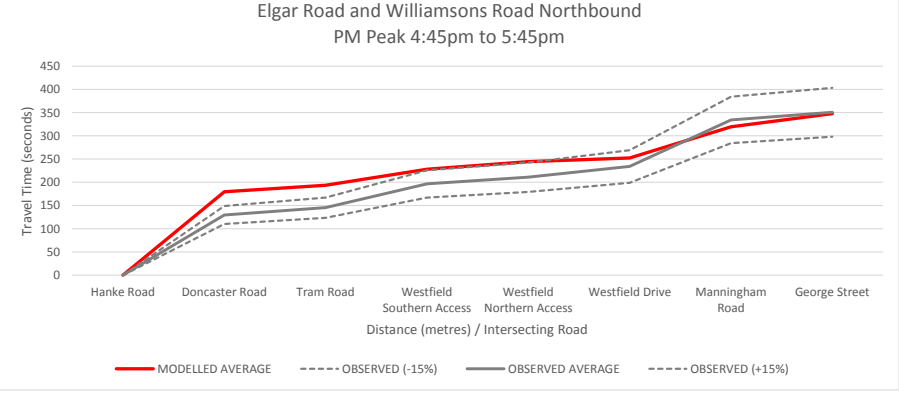
REF	ROUTE DESCRIPTION	MODELLED		OBSERVED			RELATIVE DIFFERENCE	% DIFFERENCE
		TRAVEL TIME	TRAFFIC FLOW	AVERAGE TRAVEL TIME	MINIMUM TRAVEL TIME	MAXIMUM TRAVEL TIME		
1 EB	86068: 1 Doncaster Road Eastbound: Section 1 (Bayley Street to Elgar Road)	87	1200	67	41	93	20	29%
	86070: 3 Doncaster Road Eastbound: Section 2 (Elgar Road to Tram Road)	29	1314	10	8	11	19	185%
	86071: 4 Doncaster Road Eastbound: Section 3 (Tram Road to Frederick Street)	22	1276	25	12	91	-2	-9%
	86072: 5 Doncaster Road Eastbound: Section 4 (Frederick Street to Tower Street)	7	1706	6	5	7	1	11%
	86073: 6 Doncaster Road Eastbound: Section 5 (Tower Street to Council Street)	12	1294	17	10	51	-5	-30%
	86074: 7 Doncaster Road Eastbound: Section Full (Bayley Street to Council Street)	**156**	**579**	**125**	**84**	**214**	**31**	**25%**
1 WB	86075: 8 Doncaster Road Westbound: Section 1 Council Street to Tower Street)	34	1397	57	11	75	-22	-39%
	86076: 9 Doncaster Road Westbound: Section 2 (Tower Street to Frederick Street)	12	1757	7	5	10	5	66%
	86077: 10 Doncaster Road Westbound: Section 3 (Frederick Street to Tram Road)	37	912	37	17	87	0	0%
	86078: 11 Doncaster Road Westbound: Section 4 (Tram Road to Elgar Road)	15	870	9	8	9	7	77%
	86079: 12 Doncaster Road Westbound: Section 5 (Elgar Road to Bayley Street)	23	741	26	23	31	-3	-11%
	86081: 14 Doncaster Road Westbound: Full Section (Council Street to Bayley Street)	**121**	**272**	**134**	**130**	**144**	**-13**	**-10%**
2 NB	86082: 15 Tram Road and Williamsons Road Northbound: Section 1 (Merlin Street to Doncaster Road)	130	980	117	61	195	13	11%
	86083: 16 Tram Road and Williamsons Road Northbound: Section 2 (Doncaster Road to Westfield Southern Access)	35	2431	57	25	81	-22	-39%
	86084: 17 Tram Road and Williamsons Road Northbound: Section 3 (Westfield Southern Access to Westfield Northern Access)	16	2383	22	12	48	-6	-26%
	86085: 18 Tram Road and Williamsons Road Northbound: Section 4 (Westfield Northern Access to Westfield Drive)	8	2632	10	9	11	-2	-19%
	86086: 19 Tram Road and Williamsons Road Northbound: Section 5 (Westfield Drive to Williamsons Road)	44	2562	23	18	28	21	91%
	86087: 20 Tram Road and Williamsons Road Northbound: Section 6 (Williamsons Road to George Street)	11	1448	14	13	16	-3	-23%
	86088: 21 Tram Road and Williamsons Road Northbound: Full Section (Merlin Street to George Street)	**244**	**381**	**238**	**188**	**306**	**6**	**3%**
2 SB	86089: 22 Tram Road and Williamsons Road Southbound: Section 1 (George Street to Williamsons Road)	59	1390	91	28	172	-31	-34%
	86090: 23 Tram Road and Williamsons Road Southbound: Section 2 (Williamsons Road to Westfield Drive)	18	1401	22	21	24	-5	-21%
	86091: 24 Tram Road and Williamsons Road Southbound: Section 3 (Westfield Drive to Westfield Northern Access)	22	1733	27	13	40	-5	-18%
	86092: 25 Tram Road and Williamsons Road Southbound: Section 4 (Westfield Northern Access to Westfield Southern Access)	22	1967	16	14	18	6	36%
	86093: 26 Tram Road and Williamsons Road Southbound: Section 5 (Westfield Southern Access to Doncaster Road)	170	1013	154	95	202	17	11%
	86094: 27 Tram Road and Williamsons Road Southbound: Section 6 (Doncaster Road to Merlin Street)	16	1470	23	20	28	-7	-31%
	86095: 28 Tram Road and Williamsons Road Southbound: Section Full Section (George Street to Doncaster Road)	**307**	**724**	**333**	**277**	**371**	**-25**	**-8%**
3 NB	86096: 29 Elgar Road and Williamsons Road Northbound: Section 1 (Hanke Road to Doncaster Road)	180	907	130	96	196	50	39%
	86097: 30 Elgar Road and Williamsons Road Northbound: Section 2 (Doncaster Road to Tram Road)	14	897	16	11	23	-2	-11%
	86098: 31 Elgar Road and Williamsons Road Northbound: Section 3 (Tram Road to Westfield Southern Access)	35	2431	51	35	70	-17	-32%
	86099: 32 Elgar Road and Williamsons Road Northbound: Section 4 (Westfield Southern Access to Westfield Northern Access)	16	2383	15	12	17	2	11%
	86100: 33 Elgar Road and Williamsons Road Northbound: Section 5 (Westfield Northern Access to Westfield Drive)	8	2632	23	12	54	-15	-66%
	86101: 34 Elgar Road and Williamsons Road Northbound: Section 6 (Westfield Drive to Manningham Road)	67	1344	100	80	148	-33	-33%
	86102: 35 Elgar Road and Williamsons Road Northbound: Section 7 (Manningham Road to George Street)	29	1400	17	16	17	12	73%
	86103: 36 Elgar Road and Williamsons Road Northbound: Section Full Section (Hanke Road to George Street)	**348**	**241**	**351**	**298**	**402**	**-3**	**-1%**
3 SB	86104: 37 Elgar Road and Williamsons Road Southbound: Section 1 (George Street to Manningham Road)	39	757	45	17	66	-6	-14%
	86105: 38 Elgar Road and Williamsons Road Southbound: Section 2 (Manningham Road to Westfield Drive)	21	776	20	18	22	1	6%
	86106: 39 Elgar Road and Williamsons Road Southbound: Section 3 (Westfield Drive to Westfield Northern Access)	22	1733	11	9	13	11	100%
	86107: 40 Elgar Road and Williamsons Road Southbound: Section 4 (Westfield Northern Access to Westfield Southern Access)	22	1967	27	10	70	-5	-19%
	86108: 41 Elgar Road and Williamsons Road Southbound: Section 5 (Westfield Southern Access to Tram Road)	191	344	220	123	359	-29	-13%
	86109: 42 Elgar Road and Williamsons Road Southbound: Section 6 (Tram Road to Elgar Road)	7	544	19	10	30	-12	-66%
	86110: 43 Elgar Road and Williamsons Road Southbound: Section 7 (Doncaster Road to Hanke Road)	25	253	29	27	30	-4	-13%
	86111: 44 Elgar Road and Williamsons Road Southbound: Full Section (George Street to Hanke Road)	**327**	**11**	**372**	**286**	**510**	**-44**	**-12%**

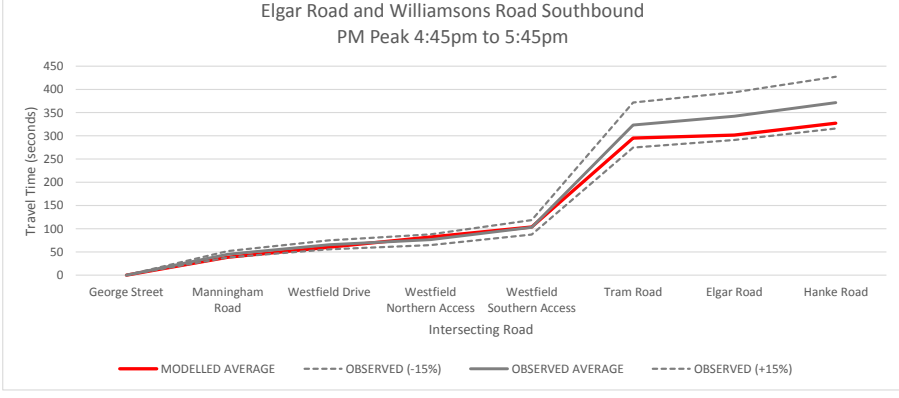

Doncaster Road Eastbound
PM Peak 4:45pm to 5:45pm
Travel Time (seconds)
0
20
40
60
80
100
120
140
160
180
Bayley Street
Elgar Road
Tram Road
Frederick Street
Tower Street
Council Street
Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)


Doncaster Road Westbound
PM Peak 4:45pm to 5:45pm
Travel Time (seconds)
0
20
40
60
80
100
120
140
160
180
Council Street
Tower Street
Frederick Street
Tram Road
Elgar Road
Bayley Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)


Tram Road and Williamsons Road Northbound
PM Peak 4:45pm to 5:45pm
Travel Time (seconds)
0
50
100
150
200
250
300
Merlin Street
Doncaster Road
Westfield Southern Access
Westfield Northern Access
Westfield Drive
Williamsons Road
George Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

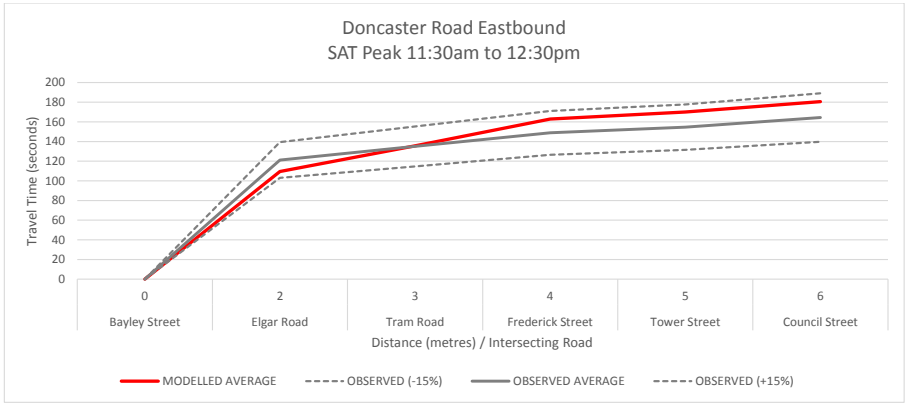

Tram Road and Williamsons Road Southbound
PM Peak 4:45pm to 5:45pm
Travel Time (seconds)
0
50
100
150
200
250
300
350
400
450
George Street
Williamsons Road
Westfield Drive
Westfield Northern Access
Westfield Southern Access
Doncaster Road
Merlin Street
Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

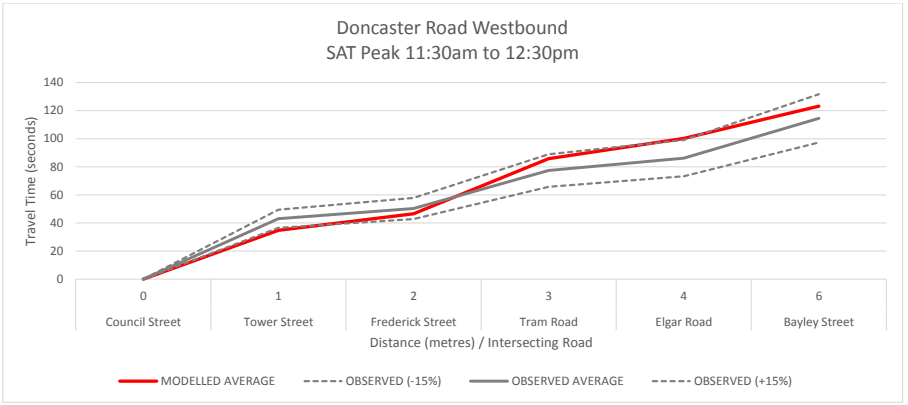

Elgar Road and Williamsons Road Northbound
PM Peak 4:45pm to 5:45pm
Travel Time (seconds)
0
50
100
150
200
250
300
350
400
450
Hanke Road
Doncaster Road
Tram Road
Westfield Southern Access
Westfield Northern Access
Westfield Drive
Manningham Road
George Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

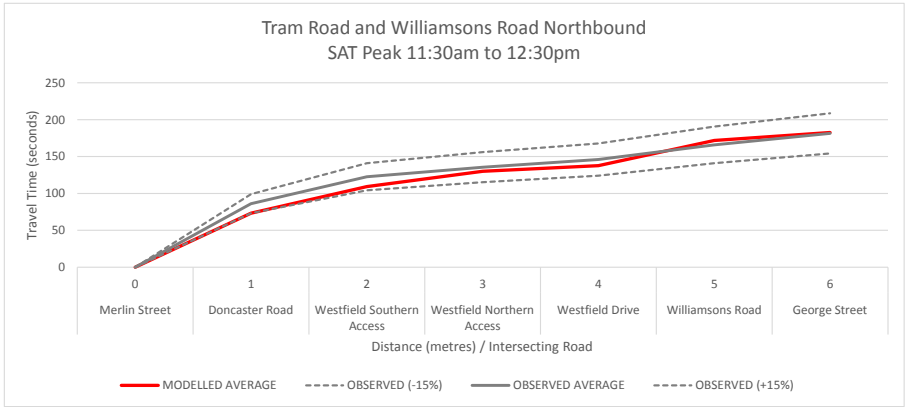

Elgar Road and Williamsons Road Southbound
PM Peak 4:45pm to 5:45pm
Travel Time (seconds)
0
50
100
150
200
250
300
350
400
450
George Street
Manningham Road
Westfield Drive
Westfield Northern Access
Westfield Southern Access
Tram Road
Elgar Road
Hanke Road
Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

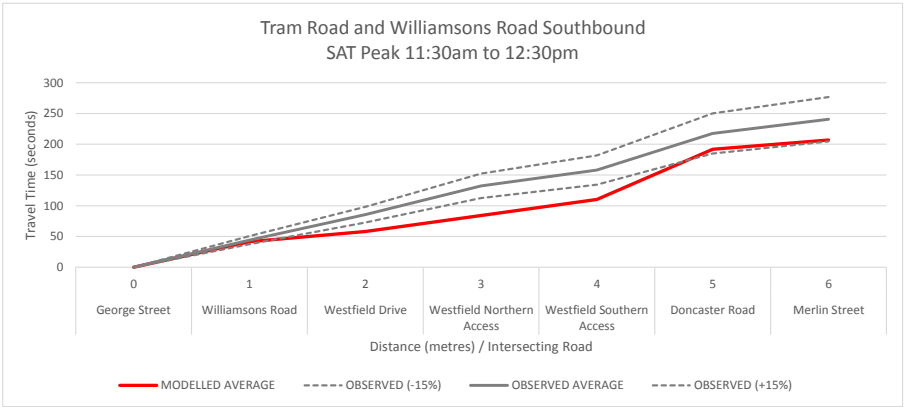
TRAVEL TIME VALIDATION
EXISTING CONDITIONS - SAT PEAK (11:30am to 12:30pm)

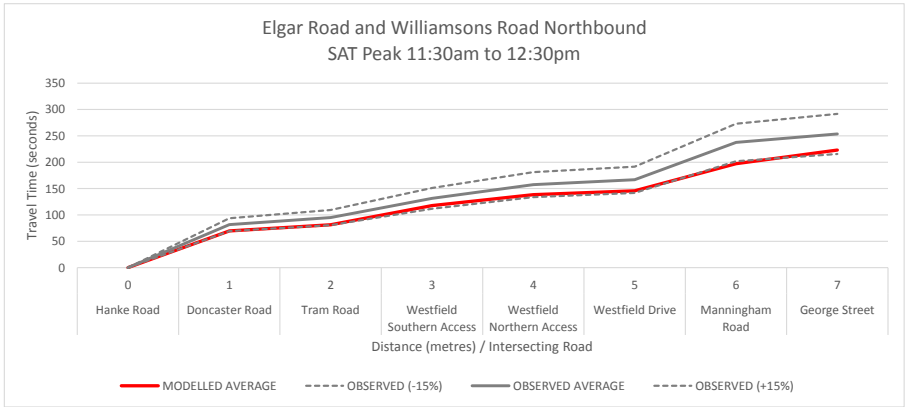
REF	ROUTE DESCRIPTION	MODELLED		OBSERVED			RELATIVE DIFFERENCE	% DIFFERENCE
		TRAVEL TIME	TRAFFIC FLOW	AVERAGE TRAVEL TIME	MINIMUM TRAVEL TIME	MAXIMUM TRAVEL TIME		
1 EB	86068: 1 Doncaster Road Eastbound: Section 1 (Bayley Street to Elgar Road)	109	1060	121	33	182	-12	-10%
	86070: 3 Doncaster Road Eastbound: Section 2 (Elgar Road to Tram Road)	26	1165	14	8	19	12	90%
	86071: 4 Doncaster Road Eastbound: Section 3 (Tram Road to Frederick Street)	27	1239	14	12	16	13	97%
	86072: 5 Doncaster Road Eastbound: Section 4 (Frederick Street to Tower Street)	7	1641	6	5	7	1	25%
	86073: 6 Doncaster Road Eastbound: Section 5 (Tower Street to Council Street)	11	998	10	9	11	1	8%
	86074: 7 Doncaster Road Eastbound: Section Full (Bayley Street to Council Street)	**181**	**405**	**164**	**69**	**205**	**16**	**10%**
1 WB	86075: 8 Doncaster Road Westbound: Section 1 Council Street to Tower Street)	35	1415	43	15	75	-8	-19%
	86076: 9 Doncaster Road Westbound: Section 2 (Tower Street to Frederick Street)	12	1673	7	6	9	4	61%
	86077: 10 Doncaster Road Westbound: Section 3 (Frederick Street to Tram Road)	39	956	27	15	37	12	45%
	86078: 11 Doncaster Road Westbound: Section 4 (Tram Road to Elgar Road)	14	1032	9	8	10	6	64%
	86079: 12 Doncaster Road Westbound: Section 5 (Elgar Road to Bayley Street)	23	920	28	24	37	-5	-19%
	86081: 14 Doncaster Road Westbound: Full Section (Council Street to Bayley Street)	**123**	**283**	**115**	**92**	**140**	**9**	**8%**
2 NB	86082: 15 Tram Road and Williamsons Road Northbound: Section 1 (Merlin Street to Doncaster Road)	73	736	86	68	95	-13	-15%
	86083: 16 Tram Road and Williamsons Road Northbound: Section 2 (Doncaster Road to Westfield Southern Access)	36	1930	36	23	60	0	-1%
	86084: 17 Tram Road and Williamsons Road Northbound: Section 3 (Westfield Southern Access to Westfield Northern Access)	21	1848	13	12	14	8	60%
	86085: 18 Tram Road and Williamsons Road Northbound: Section 4 (Westfield Northern Access to Westfield Drive)	8	2029	10	9	11	-3	-27%
	86086: 19 Tram Road and Williamsons Road Northbound: Section 5 (Westfield Drive to Williamsons Road)	34	1930	20	16	25	14	72%
	86087: 20 Tram Road and Williamsons Road Northbound: Section 6 (Williamsons Road to George Street)	11	1208	16	13	18	-5	-31%
	86088: 21 Tram Road and Williamsons Road Northbound: Full Section (Merlin Street to George Street)	**183**	**289**	**179**	**168**	**211**	**3**	**2%**
2 SB	86089: 22 Tram Road and Williamsons Road Southbound: Section 1 (George Street to Williamsons Road)	41	1164	44	19	74	-3	-6%
	86090: 23 Tram Road and Williamsons Road Southbound: Section 2 (Williamsons Road to Westfield Drive)	17	1163	42	21	91	-25	-60%
	86091: 24 Tram Road and Williamsons Road Southbound: Section 3 (Westfield Drive to Westfield Northern Access)	26	1558	47	20	75	-21	-44%
	86092: 25 Tram Road and Williamsons Road Southbound: Section 4 (Westfield Northern Access to Westfield Southern Access)	26	1949	26	12	66	0	1%
	86093: 26 Tram Road and Williamsons Road Southbound: Section 5 (Westfield Southern Access to Doncaster Road)	82	894	60	24	104	22	37%
	86094: 27 Tram Road and Williamsons Road Southbound: Section 6 (Doncaster Road to Merlin Street)	15	1240	23	21	26	-8	-35%
	86095: 28 Tram Road and Williamsons Road Southbound: Section Full Section (George Street to Doncaster Road)	**207**	**516**	**241**	**182**	**279**	**-34**	**-14%**
3 NB	86096: 29 Elgar Road and Williamsons Road Northbound: Section 1 (Hanke Road to Doncaster Road)	70	749	82	78	87	-12	-15%
	86097: 30 Elgar Road and Williamsons Road Northbound: Section 2 (Doncaster Road to Tram Road)	12	684	14	13	14	-2	-12%
	86098: 31 Elgar Road and Williamsons Road Northbound: Section 3 (Tram Road to Westfield Southern Access)	36	1930	37	19	81	0	-1%
	86099: 32 Elgar Road and Williamsons Road Northbound: Section 4 (Westfield Southern Access to Westfield Northern Access)	21	1848	26	10	49	-5	-20%
	86100: 33 Elgar Road and Williamsons Road Northbound: Section 5 (Westfield Northern Access to Westfield Drive)	8	2029	9	8	11	-2	-18%
	86101: 34 Elgar Road and Williamsons Road Northbound: Section 6 (Westfield Drive to Manningham Road)	51	958	71	39	99	-20	-28%
	86102: 35 Elgar Road and Williamsons Road Northbound: Section 7 (Manningham Road to George Street)	26	1001	16	15	18	10	60%
	86103: 36 Elgar Road and Williamsons Road Northbound: Section Full Section (Hanke Road to George Street)	**223**	**140**	**256**	**221**	**316**	**-33**	**-13%**
3 SB	86104: 37 Elgar Road and Williamsons Road Southbound: Section 1 (George Street to Manningham Road)	45	986	52	19	65	-7	-14%
	86105: 38 Elgar Road and Williamsons Road Southbound: Section 2 (Manningham Road to Westfield Drive)	19	1037	23	18	35	-4	-17%
	86106: 39 Elgar Road and Williamsons Road Southbound: Section 3 (Westfield Drive to Westfield Northern Access)	26	1558	38	9	87	-11	-30%
	86107: 40 Elgar Road and Williamsons Road Southbound: Section 4 (Westfield Northern Access to Westfield Southern Access)	26	1949	17	10	27	9	54%
	86108: 41 Elgar Road and Williamsons Road Southbound: Section 5 (Westfield Southern Access to Tram Road)	262	518	203	86	296	59	29%
	86109: 42 Elgar Road and Williamsons Road Southbound: Section 6 (Tram Road to Elgar Road)	7	610	12	10	15	-5	-40%
	86110: 43 Elgar Road and Williamsons Road Southbound: Section 7 (Doncaster Road to Hanke Road)	25	293	29	27	37	-5	-16%
	86111: 44 Elgar Road and Williamsons Road Southbound: Full Section (George Street to Hanke Road)	**410**	**34**	**374**	**226**	**446**	**36**	**10%**

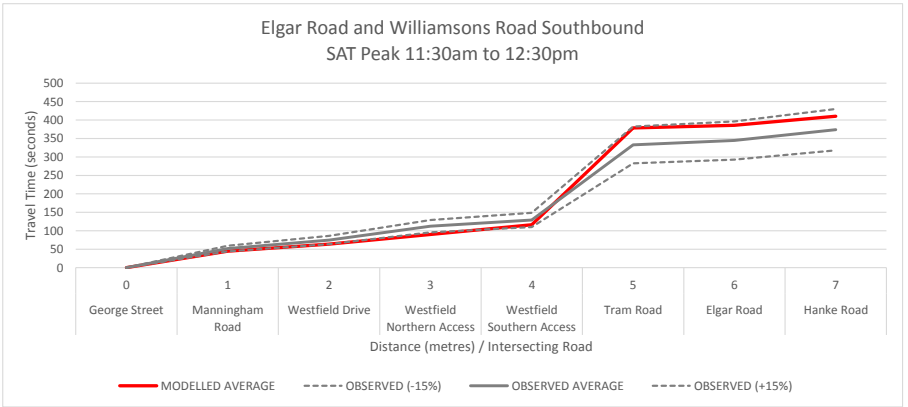

Doncaster Road Eastbound
SAT Peak 11:30am to 12:30pm
Travel Time (seconds)
0
20
40
60
80
100
120
140
160
180
200
0
Bayley Street
2
Elgar Road
3
Tram Road
4
Frederick Street
5
Tower Street
6
Council Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)


Doncaster Road Westbound
SAT Peak 11:30am to 12:30pm
Travel Time (seconds)
0
20
40
60
80
100
120
140
0
Council Street
1
Tower Street
2
Frederick Street
3
Tram Road
4
Elgar Road
6
Bayley Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)


Tram Road and Williamsons Road Northbound
SAT Peak 11:30am to 12:30pm
Travel Time (seconds)
0
50
100
150
200
250
0
Merlin Street
1
Doncaster Road
2
Westfield Southern Access
3
Westfield Northern Access
4
Westfield Drive
5
Williamsons Road
6
George Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

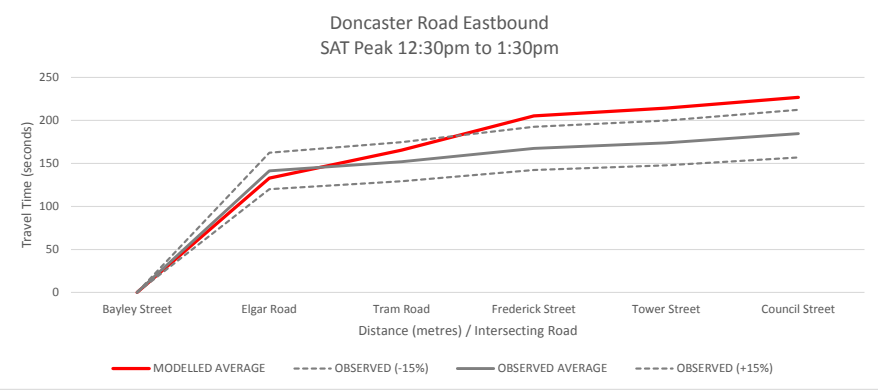

Tram Road and Williamsons Road Southbound
SAT Peak 11:30am to 12:30pm
Travel Time (seconds)
0
50
100
150
200
250
300
0
George Street
1
Williamsons Road
2
Westfield Drive
3
Westfield Northern Access
4
Westfield Southern Access
5
Doncaster Road
6
Merlin Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

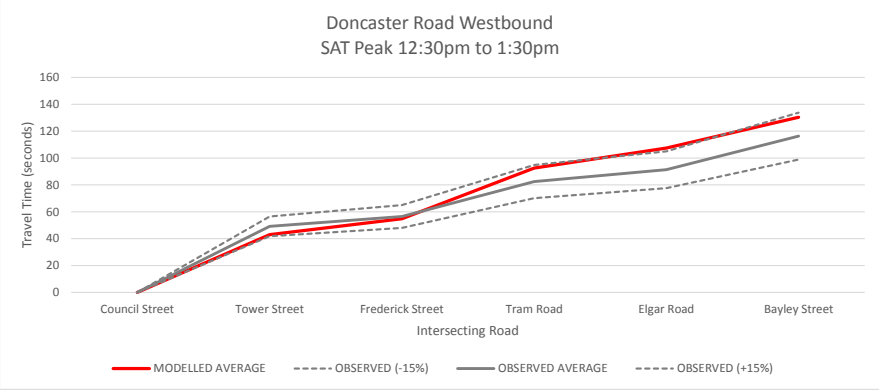

Elgar Road and Williamsons Road Northbound
SAT Peak 11:30am to 12:30pm
Travel Time (seconds)
0
50
100
150
200
250
300
350
0
Hanke Road
1
Doncaster Road
2
Tram Road
3
Westfield Southern Access
4
Westfield Northern Access
5
Westfield Drive
6
Manningham Road
7
George Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

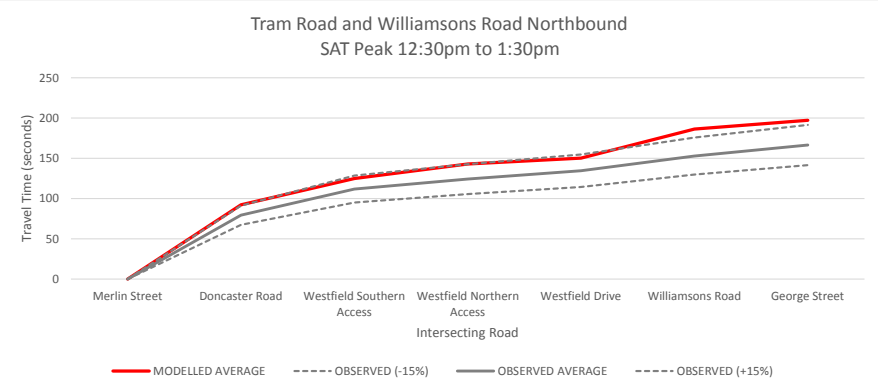

Elgar Road and Williamsons Road Southbound
SAT Peak 11:30am to 12:30pm
Travel Time (seconds)
0
50
100
150
200
250
300
350
400
450
500
0
George Street
1
Manningham Road
2
Westfield Drive
3
Westfield Northern Access
4
Westfield Southern Access
5
Tram Road
6
Elgar Road
7
Hanke Road
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

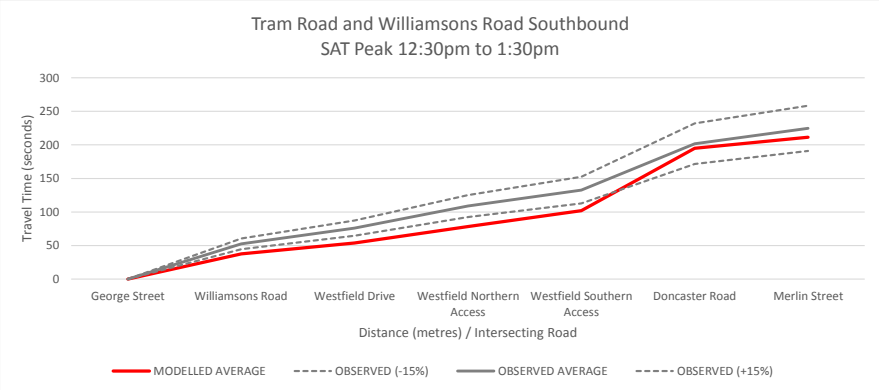
TRAVEL TIME VALIDATION
EXISTING CONDITIONS - SAT PEAK (12:30pm to 1:30pm)

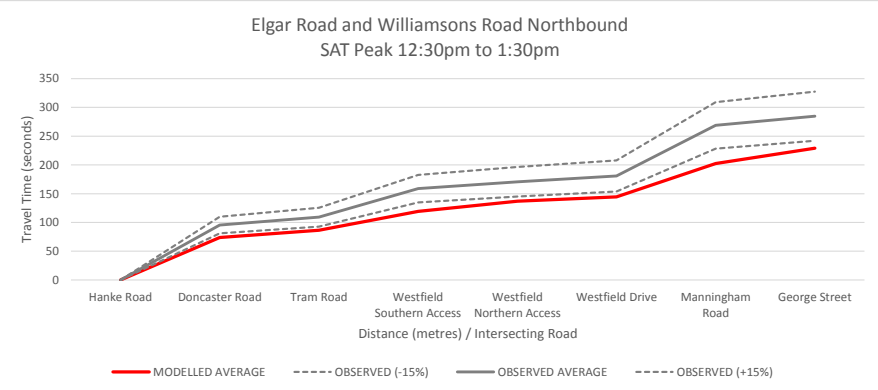
REF	ROUTE DESCRIPTION	MODELLED		OBSERVED			RELATIVE DIFFERENCE	% DIFFERENCE
		TRAVEL TIME	TRAFFIC FLOW	AVERAGE TRAVEL TIME	MINIMUM TRAVEL TIME	MAXIMUM TRAVEL TIME		
1 EB	86068: 1 Doncaster Road Eastbound: Section 1 (Bayley Street to Elgar Road)	133	1102	141	94	257	-8	-6%
	86070: 3 Doncaster Road Eastbound: Section 2 (Elgar Road to Tram Road)	32	1159	11	9	15	22	204%
	86071: 4 Doncaster Road Eastbound: Section 3 (Tram Road to Frederick Street)	40	1200	16	13	21	24	157%
	86072: 5 Doncaster Road Eastbound: Section 4 (Frederick Street to Tower Street)	9	1558	6	5	7	3	41%
	86073: 6 Doncaster Road Eastbound: Section 5 (Tower Street to Council Street)	13	885	11	10	13	2	16%
	86074: 7 Doncaster Road Eastbound: Section Full (Bayley Street to Council Street)	**227**	**389**	**185**	**134**	**279**	**42**	**23%**
1 WB	86075: 8 Doncaster Road Westbound: Section 1 Council Street to Tower Street)	43	1416	49	16	68	-6	-13%
	86076: 9 Doncaster Road Westbound: Section 2 (Tower Street to Frederick Street)	12	1707	7	5	10	5	62%
	86077: 10 Doncaster Road Westbound: Section 3 (Frederick Street to Tram Road)	38	960	26	21	40	12	45%
	86078: 11 Doncaster Road Westbound: Section 4 (Tram Road to Elgar Road)	15	1046	9	8	11	6	69%
	86079: 12 Doncaster Road Westbound: Section 5 (Elgar Road to Bayley Street)	23	933	25	21	28	-2	-8%
	86081: 14 Doncaster Road Westbound: Full Section (Council Street to Bayley Street)	**130**	**282**	**116**	**80**	**142**	**14**	**12%**
2 NB	86082: 15 Tram Road and Williamsons Road Northbound: Section 1 (Merlin Street to Doncaster Road)	92	713	79	67	101	13	16%
	86083: 16 Tram Road and Williamsons Road Northbound: Section 2 (Doncaster Road to Westfield Southern Access)	33	1881	33	22	62	0	1%
	86084: 17 Tram Road and Williamsons Road Northbound: Section 3 (Westfield Southern Access to Westfield Northern Access)	18	1793	12	10	14	6	46%
	86085: 18 Tram Road and Williamsons Road Northbound: Section 4 (Westfield Northern Access to Westfield Drive)	7	2036	10	9	12	-3	-29%
	86086: 19 Tram Road and Williamsons Road Northbound: Section 5 (Westfield Drive to Williamsons Road)	36	1963	18	18	19	18	96%
	86087: 20 Tram Road and Williamsons Road Northbound: Section 6 (Williamsons Road to George Street)	11	1340	14	13	14	-3	-20%
	86088: 21 Tram Road and Williamsons Road Northbound: Full Section (Merlin Street to George Street)	**197**	**319**	**167**	**141**	**189**	**31**	**18%**
2 SB	86089: 22 Tram Road and Williamsons Road Southbound: Section 1 (George Street to Williamsons Road)	38	1110	53	28	91	-15	-29%
	86090: 23 Tram Road and Williamsons Road Southbound: Section 2 (Williamsons Road to Westfield Drive)	16	1116	24	21	30	-7	-31%
	86091: 24 Tram Road and Williamsons Road Southbound: Section 3 (Westfield Drive to Westfield Northern Access)	25	1557	33	13	51	-8	-25%
	86092: 25 Tram Road and Williamsons Road Southbound: Section 4 (Westfield Northern Access to Westfield Southern Access)	24	1867	24	19	29	0	-1%
	86093: 26 Tram Road and Williamsons Road Southbound: Section 5 (Westfield Southern Access to Doncaster Road)	93	938	69	25	117	24	35%
	86094: 27 Tram Road and Williamsons Road Southbound: Section 6 (Doncaster Road to Merlin Street)	16	1328	23	19	27	-7	-29%
	86095: 28 Tram Road and Williamsons Road Southbound: Section Full Section (George Street to Doncaster Road)	**211**	**587**	**225**	**141**	**278**	**-13**	**-6%**
3 NB	86096: 29 Elgar Road and Williamsons Road Northbound: Section 1 (Hanke Road to Doncaster Road)	74	686	96	78	115	-22	-23%
	86097: 30 Elgar Road and Williamsons Road Northbound: Section 2 (Doncaster Road to Tram Road)	13	651	14	11	18	-1	-9%
	86098: 31 Elgar Road and Williamsons Road Northbound: Section 3 (Tram Road to Westfield Southern Access)	33	1881	50	29	79	-17	-34%
	86099: 32 Elgar Road and Williamsons Road Northbound: Section 4 (Westfield Southern Access to Westfield Northern Access)	18	1793	12	11	13	6	50%
	86100: 33 Elgar Road and Williamsons Road Northbound: Section 5 (Westfield Northern Access to Westfield Drive)	7	2036	10	9	11	-3	-27%
	86101: 34 Elgar Road and Williamsons Road Northbound: Section 6 (Westfield Drive to Manningham Road)	58	876	88	86	91	-30	-34%
	86102: 35 Elgar Road and Williamsons Road Northbound: Section 7 (Manningham Road to George Street)	27	912	16	15	17	11	66%
	86103: 36 Elgar Road and Williamsons Road Northbound: Section Full Section (Hanke Road to George Street)	**229**	**145**	**285**	**255**	**312**	**-56**	**-20%**
3 SB	86104: 37 Elgar Road and Williamsons Road Southbound: Section 1 (George Street to Manningham Road)	44	913	18	16	20	26	142%
	86105: 38 Elgar Road and Williamsons Road Southbound: Section 2 (Manningham Road to Westfield Drive)	19	955	31	18	69	-12	-40%
	86106: 39 Elgar Road and Williamsons Road Southbound: Section 3 (Westfield Drive to Westfield Northern Access)	25	1557	44	15	58	-19	-44%
	86107: 40 Elgar Road and Williamsons Road Southbound: Section 4 (Westfield Northern Access to Westfield Southern Access)	24	1867	46	14	122	-23	-49%
	86108: 41 Elgar Road and Williamsons Road Southbound: Section 5 (Westfield Southern Access to Tram Road)	145	498	152	36	278	-7	-5%
	86109: 42 Elgar Road and Williamsons Road Southbound: Section 6 (Tram Road to Elgar Road)	6	558	12	11	13	-5	-46%
	86110: 43 Elgar Road and Williamsons Road Southbound: Section 7 (Doncaster Road to Hanke Road)	25	269	33	26	41	-8	-25%
	86111: 44 Elgar Road and Williamsons Road Southbound: Full Section (George Street to Hanke Road)	**286**	**27**	**336**	**201**	**542**	**-50**	**-15%**

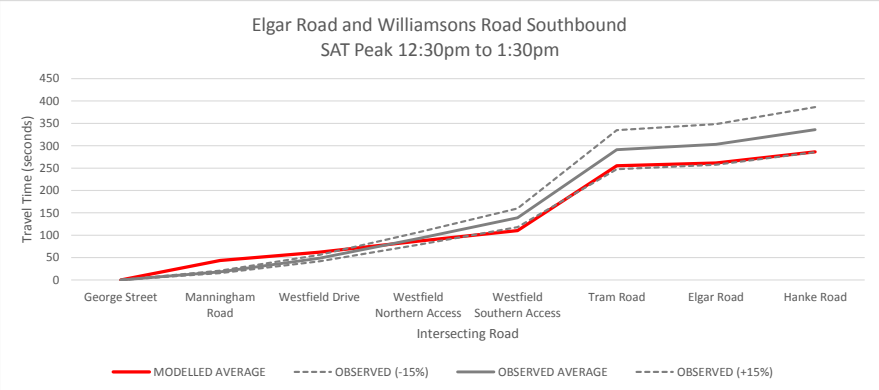

Doncaster Road Eastbound
SAT Peak 12:30pm to 1:30pm
Travel Time (seconds)
250
200
150
100
50
0
Bayley Street
Elgar Road
Tram Road
Frederick Street
Tower Street
Council Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)


Doncaster Road Westbound
SAT Peak 12:30pm to 1:30pm
Travel Time (seconds)
160
140
120
100
80
60
40
20
0
Council Street
Tower Street
Frederick Street
Tram Road
Elgar Road
Bayley Street
Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

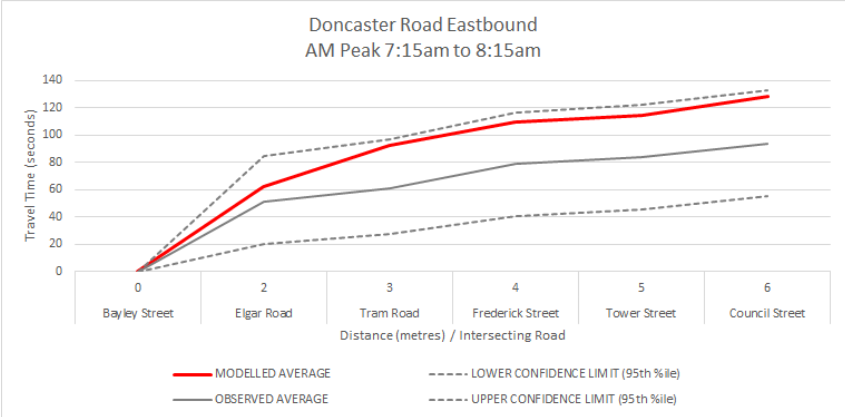

Tram Road and Williamsons Road Northbound
SAT Peak 12:30pm to 1:30pm
Travel Time (seconds)
250
200
150
100
50
0
Merlin Street
Doncaster Road
Westfield Southern Access
Westfield Northern Access
Westfield Drive
Williamsons Road
George Street
Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

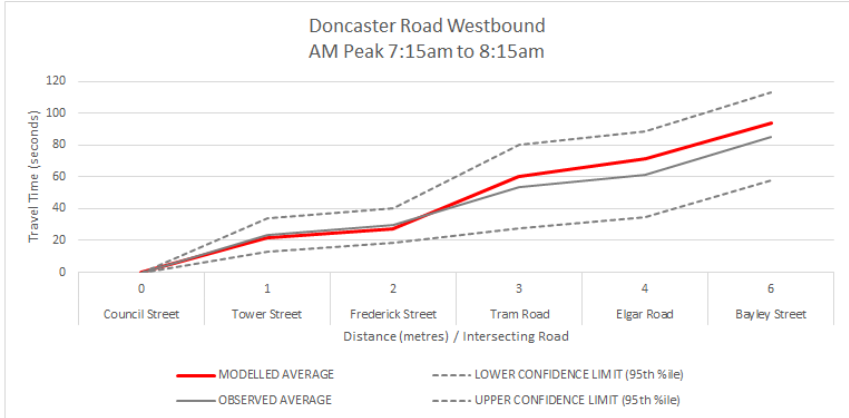

Tram Road and Williamsons Road Southbound
SAT Peak 12:30pm to 1:30pm
Travel Time (seconds)
300
250
200
150
100
50
0
George Street
Williamsons Road
Westfield Drive
Westfield Northern Access
Westfield Southern Access
Doncaster Road
Merlin Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

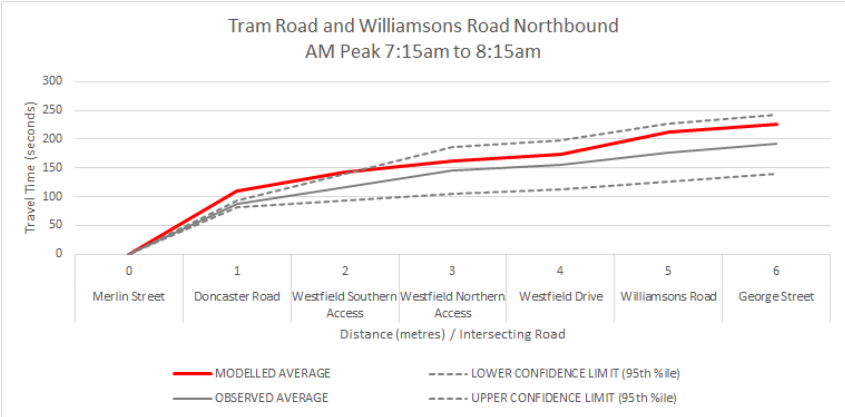

Elgar Road and Williamsons Road Northbound
SAT Peak 12:30pm to 1:30pm
Travel Time (seconds)
350
300
250
200
150
100
50
0
Hanke Road
Doncaster Road
Tram Road
Westfield Southern Access
Westfield Northern Access
Westfield Drive
Manningham Road
George Street
Distance (metres) / Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

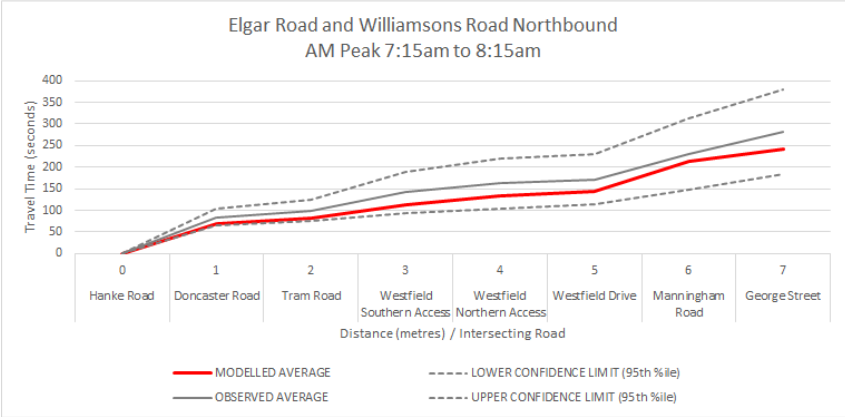

Elgar Road and Williamsons Road Southbound
SAT Peak 12:30pm to 1:30pm
Travel Time (seconds)
450
400
350
300
250
200
150
100
50
0
George Street
Manningham Road
Westfield Drive
Westfield Northern Access
Westfield Southern Access
Tram Road
Elgar Road
Hanke Road
Intersecting Road
MODELLED AVERAGE
OBSERVED (-15%)
OBSERVED AVERAGE
OBSERVED (+15%)

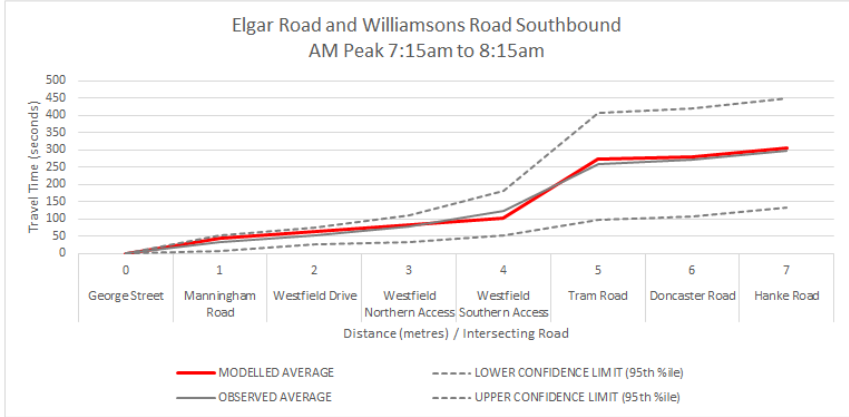
TRAVEL TIME COMPARISON WITH 95TH PERCENTILE CONFIDENCE LIMITS (AM PEAK – 7:15am to 8:15am)



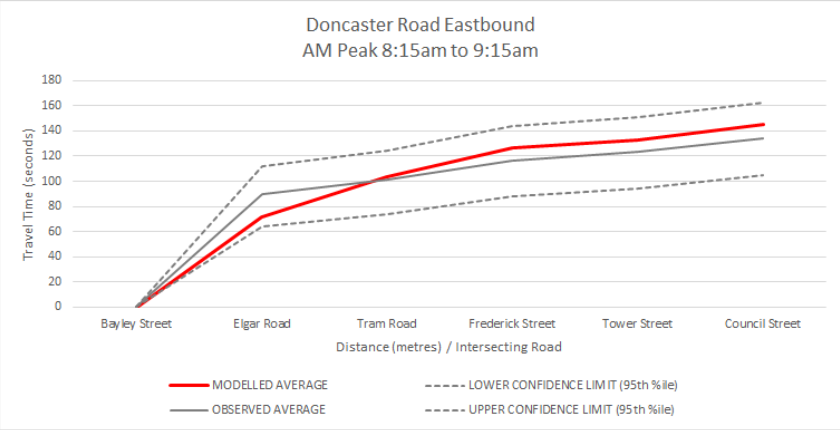


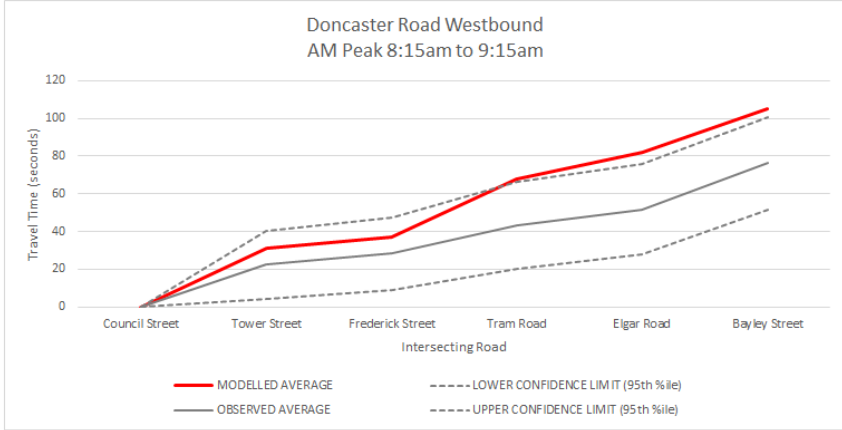


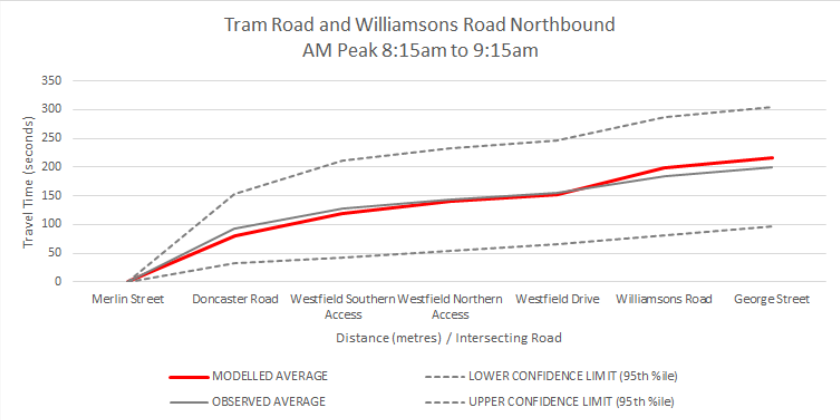


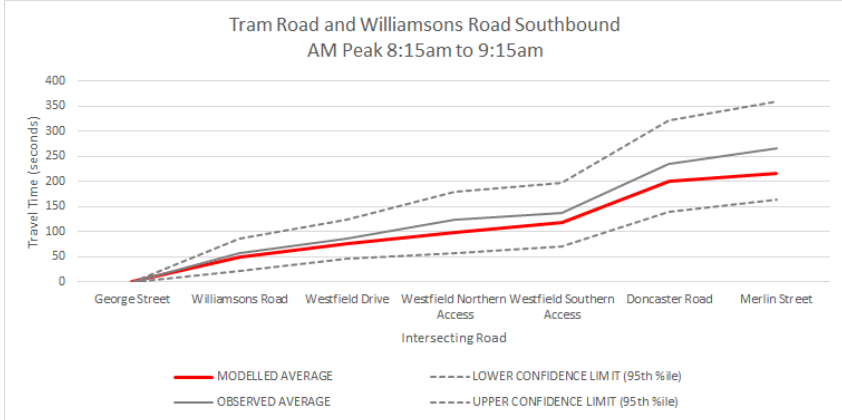


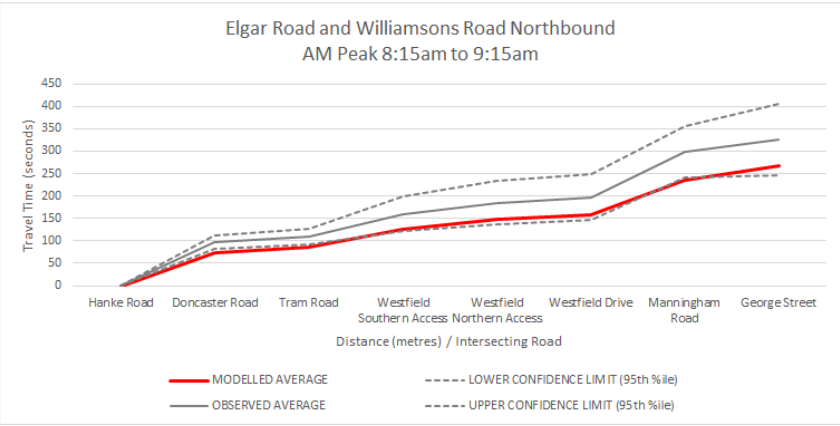
TRAVEL TIME COMPARISON WITH 95TH PERCENTILE CONFIDENCE LIMITS (AM PEAK – 8:15am to 9:15am)

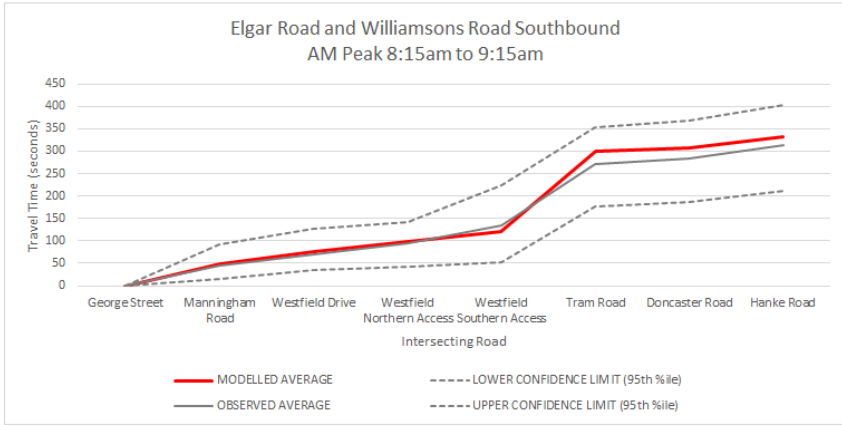




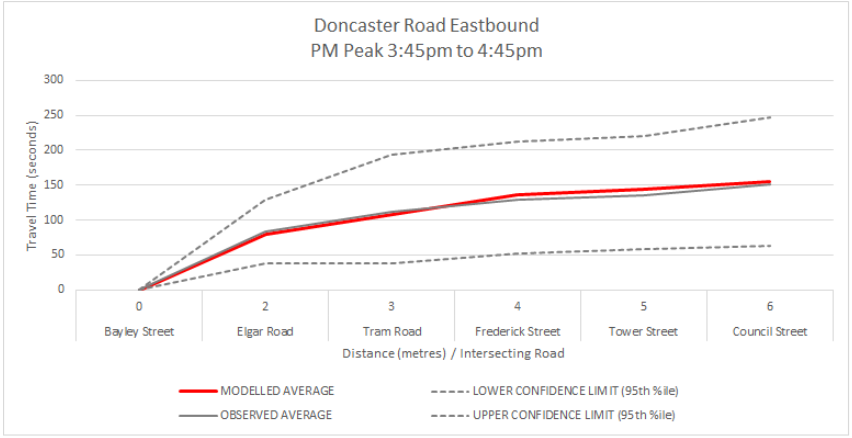


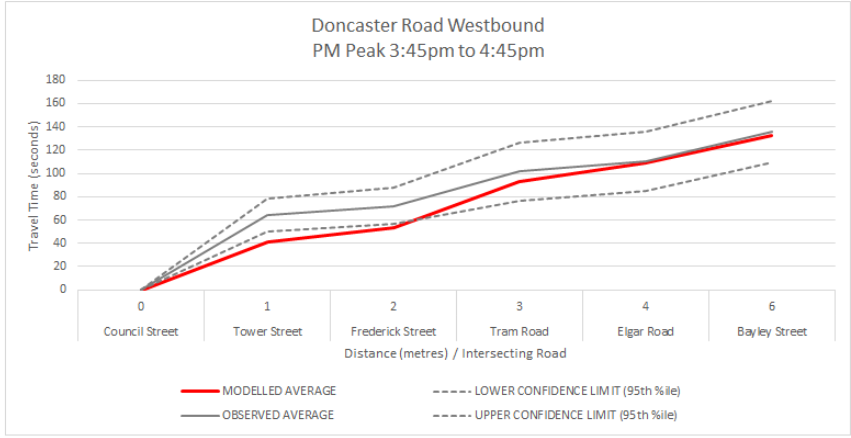


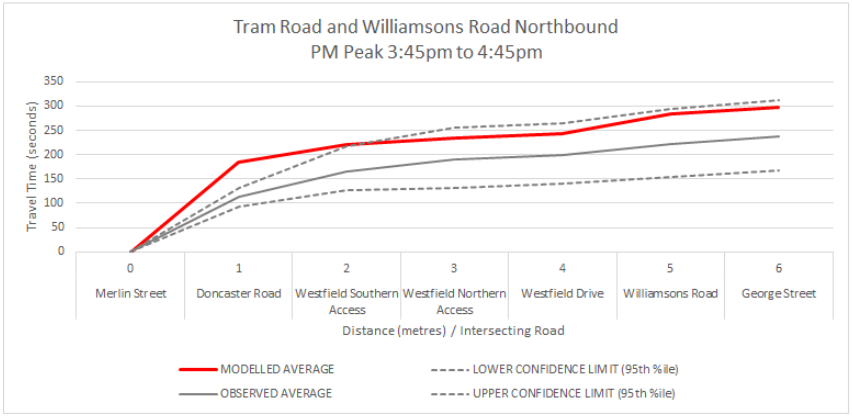


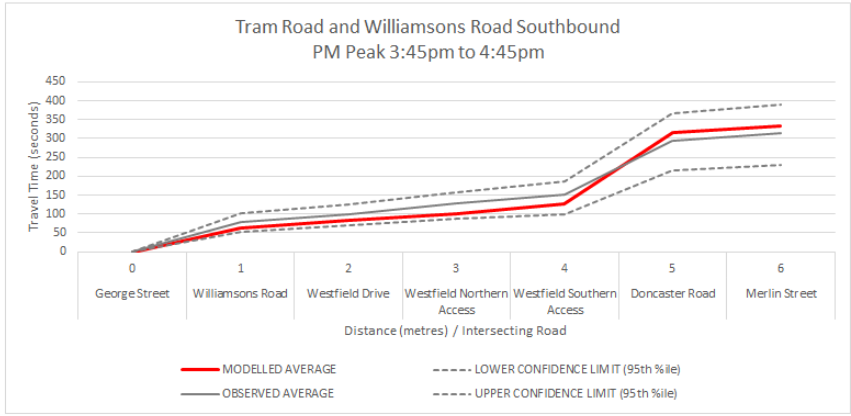


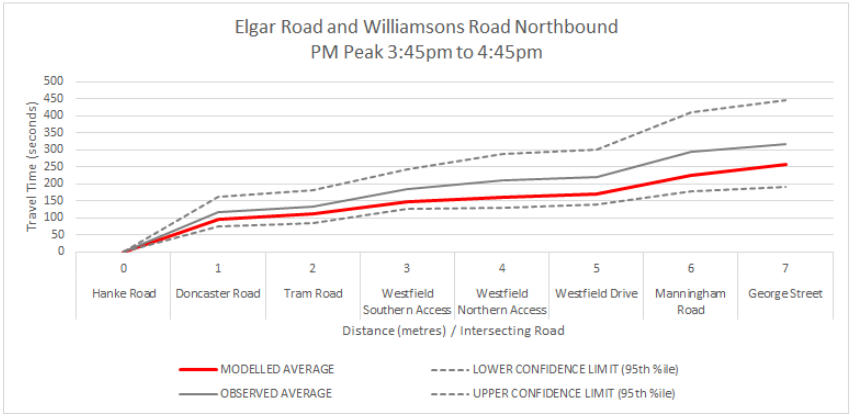
TRAVEL TIME COMPARISON WITH 95TH PERCENTILE CONFIDENCE LIMITS (PM PEAK – 3:45pm to 4:45pm)

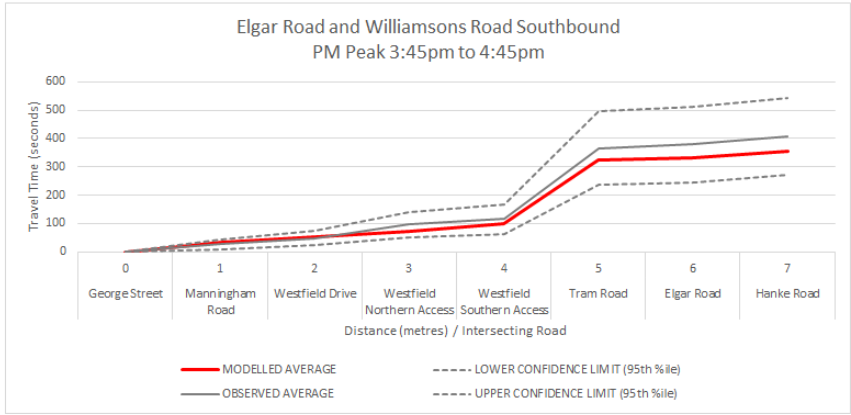




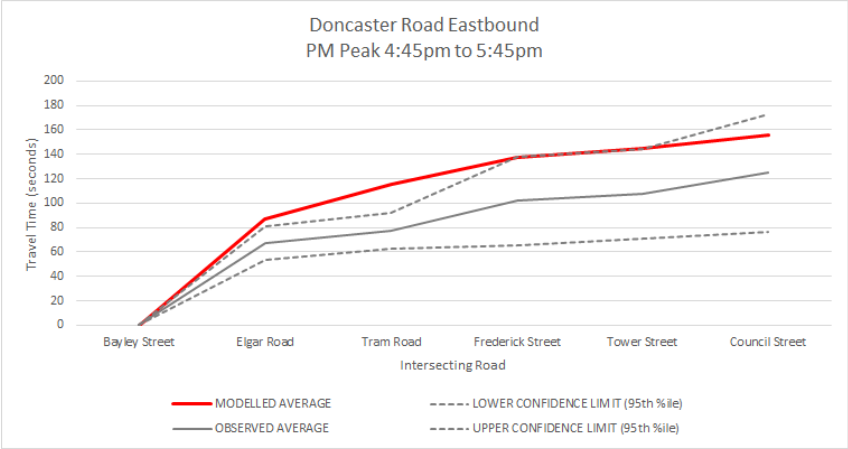


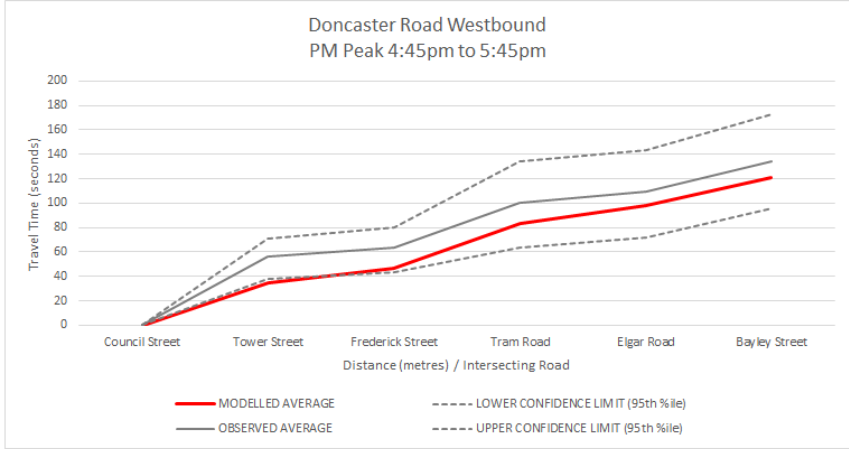


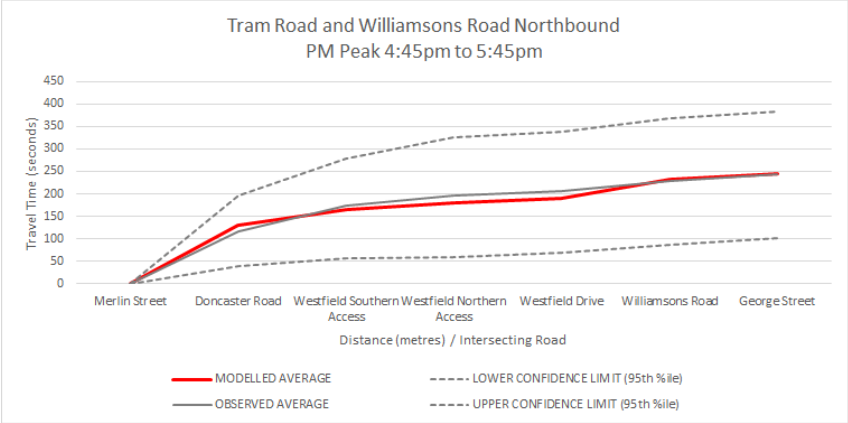


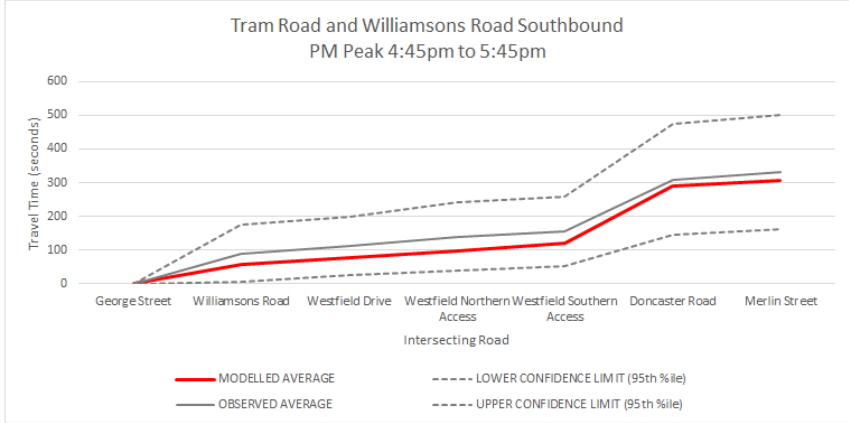


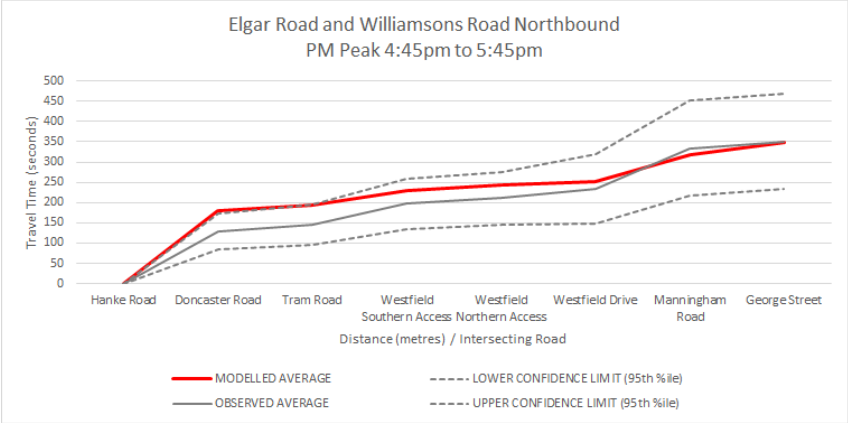
TRAVEL TIME COMPARISON WITH 95TH PERCENTILE CONFIDENCE LIMITS (PM PEAK – 4:45pm to 5:45pm)

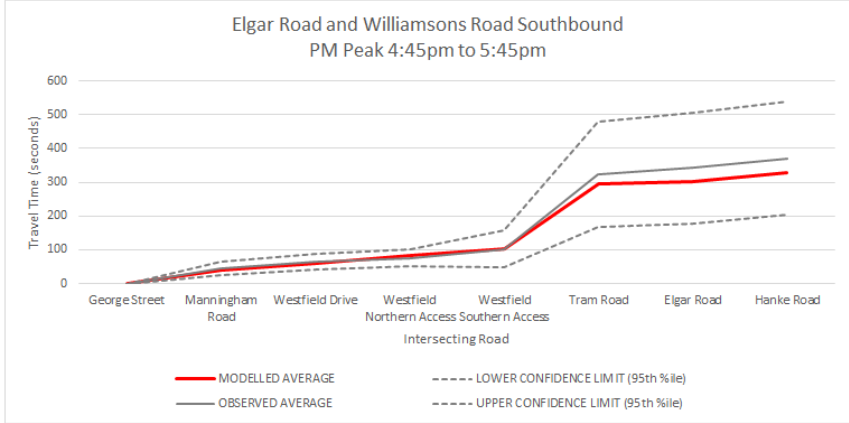




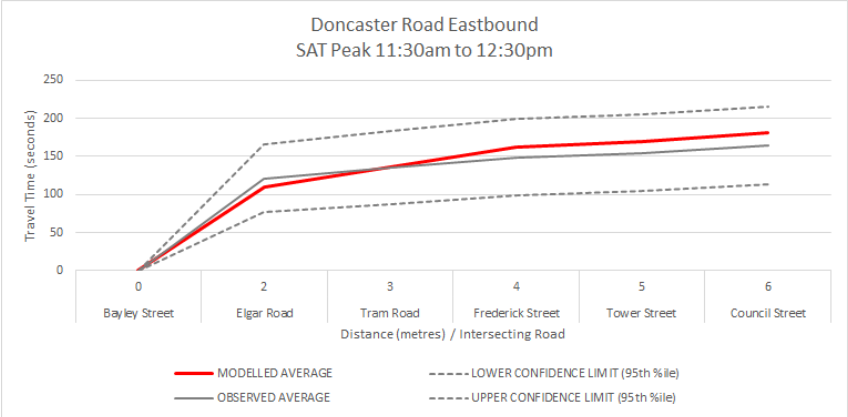


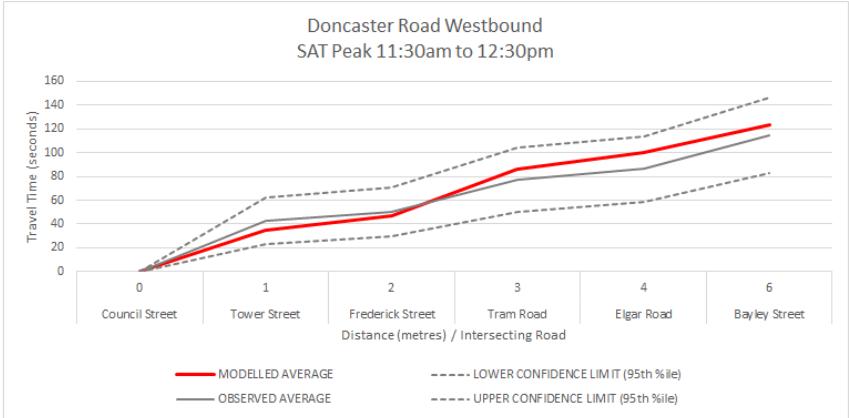


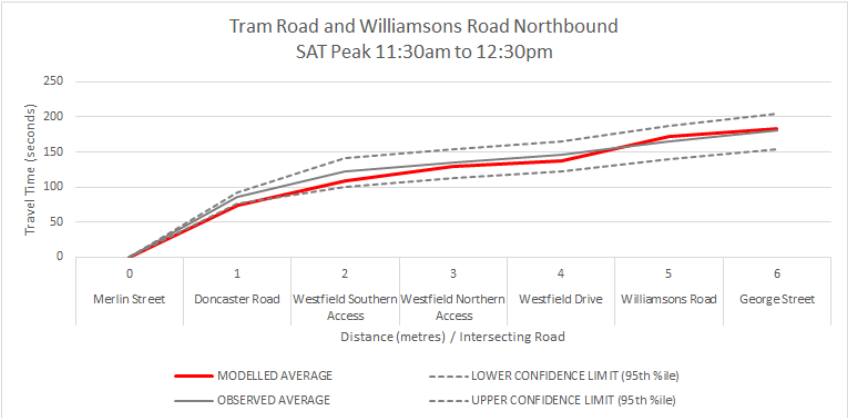


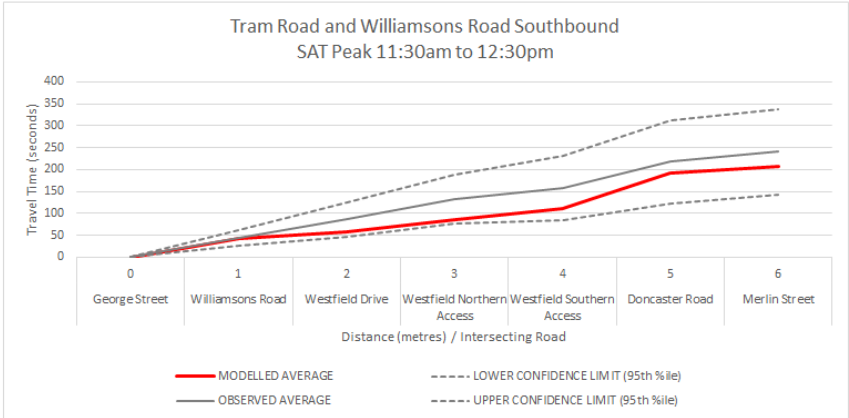


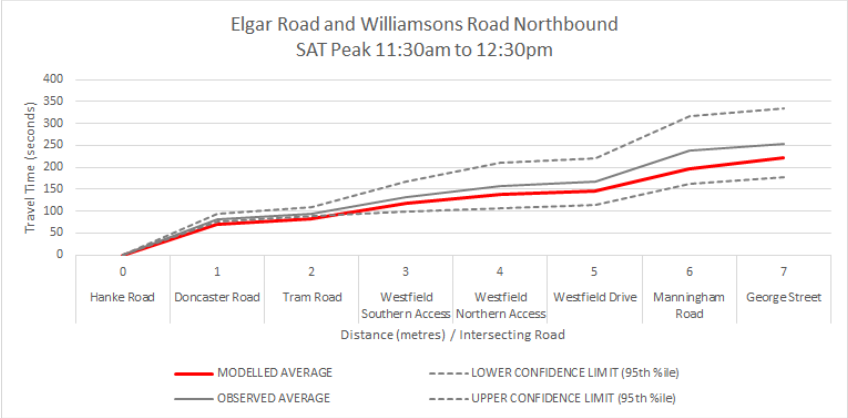
TRAVEL TIME COMPARISON WITH 95TH PERCENTILE CONFIDENCE LIMITS (SAT PEAK – 11:30am to 12:30pm)

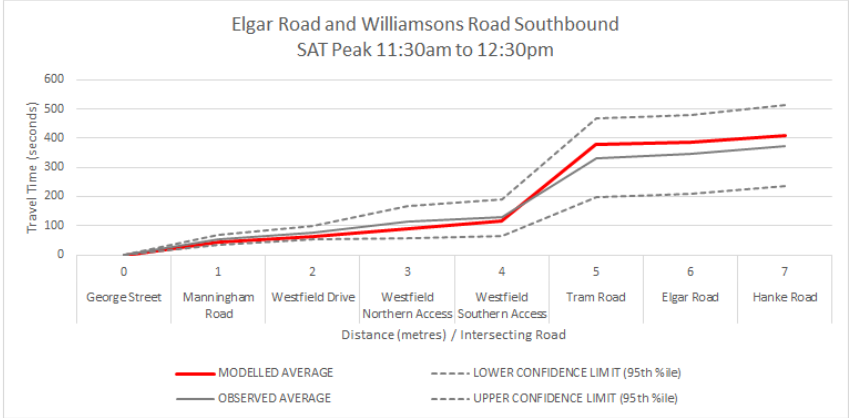




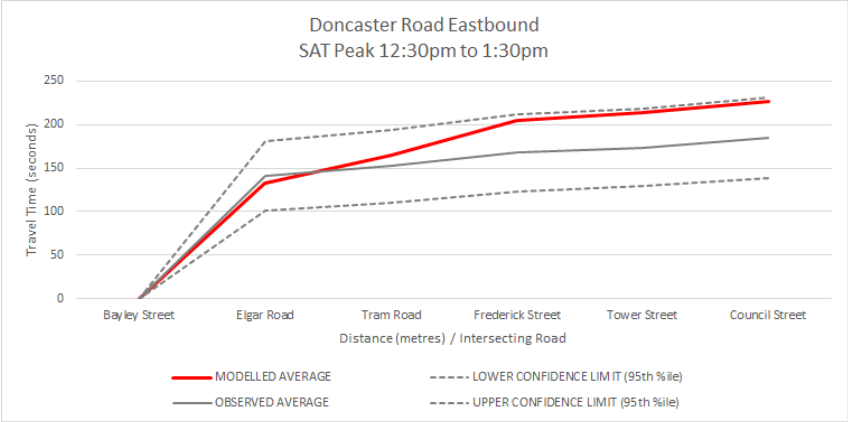


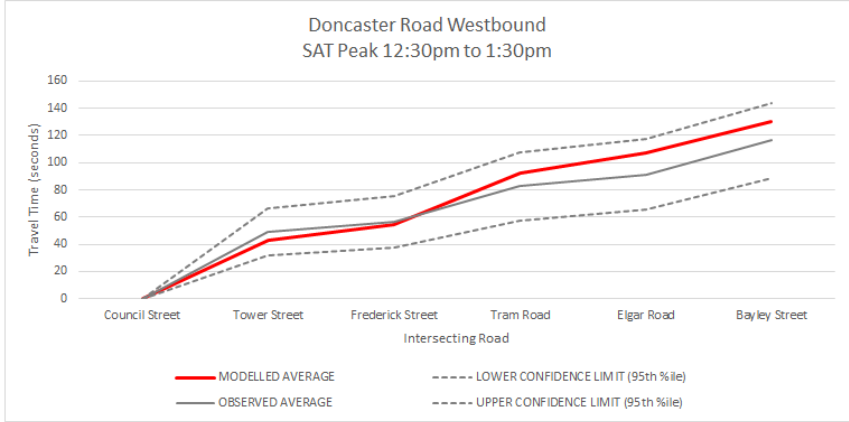


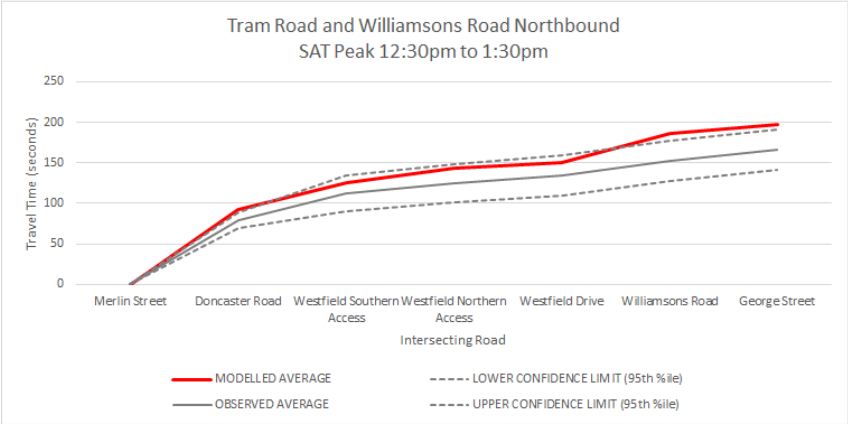


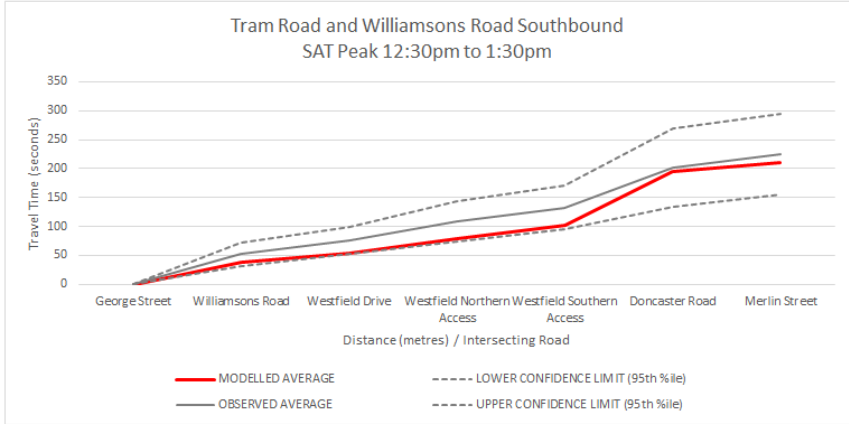


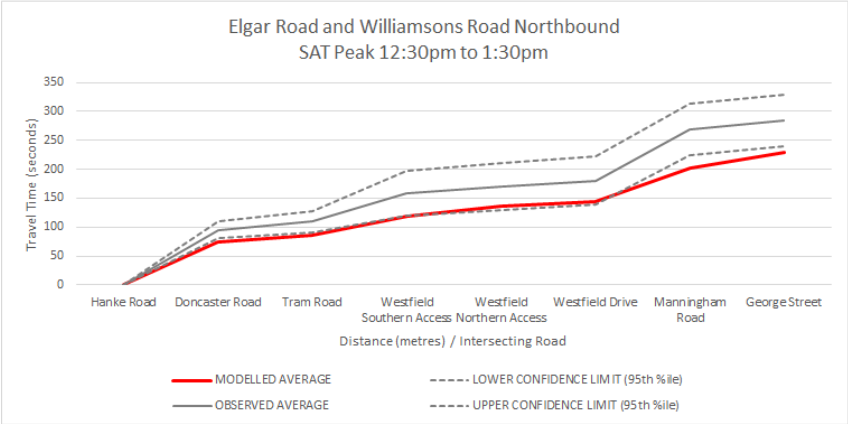
TRAVEL TIME COMPARISON WITH 95TH PERCENTILE CONFIDENCE LIMITS (SAT PEAK – 12:30pm to 1:30pm)

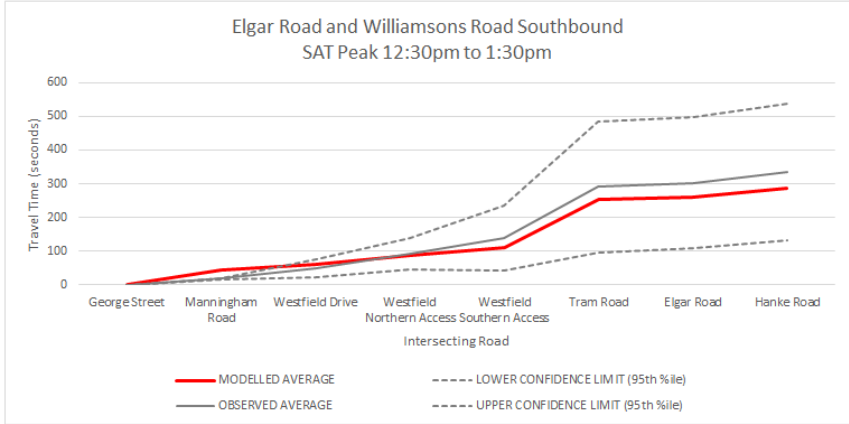












Appendix E

Signal Timing Comparison

317 WILLIAMSONS ROAD / MANNINGHAM ROAD

Time Interval: 7:15am - 8:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	33	50	32	86	31	51	36	77
B	0	0	0	0	0	0	0	0
C	34	24	15	38	31	26	17	36
D	3	14	14	15	2	13	13	13
E	32	32	15	51	31	36	15	51
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 8:15am - 9:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	31	51	27	72	29	48	34	67
B	0	0	0	0	0	0	0	0
C	32	27	15	39	29	32	23	38
D	2	15	14	15	0	0	0	0
E	31	34	23	50	29	38	26	51
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 15:45pm - 16:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	32	43	32	59	31	42	27	64
B	0	0	0	0	0	0	0	0
C	31	21	16	39	31	22	12	39
D	2	15	15	15	0	0	0	0
E	31	48	31	64	31	53	30	63
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 16:45pm - 17:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	32	47	37	58	29	43	31	85
B	0	0	0	0	0	0	0	0
C	32	19	15	38	25	25	15	39
D	0	0	0	0	1	13	13	13
E	32	46	30	55	29	52	34	73
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 11:30am - 12:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	32	51	33	72	30	60	48	76
B	0	0	0	0	0	0	0	0
C	33	21	16	38	30	20	15	25
D	0	0	0	0	1	13	13	13
E	32	38	19	52	30	39	17	49
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 12:30pm - 13:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	34	46	28	76	28	58	40	74
B	0	0	0	0	0	0	0	0
C	34	22	15	39	28	24	18	38
D	1	15	15	15	1	13	13	13
E	33	38	20	57	28	38	23	51
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

318 WILLIAMSONS ROAD / NORTHERN ACCESS ROAD

Time Interval: 7:15am - 8:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	33	79	53	98	32	84	56	105
B	0	0	0	0	0	0	0	0
C	34	21	13	33	32	23	13	34
D	7	15	11	19	6	12	11	12
E	9	13	12	13	11	13	8	17
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 8:15am - 9:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	31	77	59	99	29	82	54	95
B	0	0	0	0	0	0	0	0
C	32	28	13	34	29	30	18	33
D	6	13	11	15	1	12	12	12
E	16	13	12	16	10	14	12	18
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 15:45pm - 16:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	31	65	46	85	31	77	64	91
B	0	0	0	0	0	0	0	0
C	32	30	19	40	31	24	13	37
D	4	12	11	13	15	12	6	16
E	28	20	12	31	19	15	12	22
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 16:45pm - 17:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	32	69	45	88	29	81	62	103
B	0	0	0	0	0	0	0	0
C	32	27	15	38	29	22	14	35
D	8	12	11	17	16	12	11	15
E	24	16	12	21	11	15	12	24
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 11:30am - 12:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	32	58	37	83	30	78	62	92
B	0	0	0	0	0	0	0	0
C	32	27	16	35	30	26	14	33
D	3	12	11	14	9	13	12	15
E	33	23	13	34	20	18	12	25
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 12:30pm - 13:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	33	58	31	81	28	80	60	98
B	0	0	0	0	0	0	0	0
C	34	28	16	37	28	26	14	34
D	5	12	11	12	9	12	12	14
E	32	20	12	31	16	18	13	24
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

319 WILLIAMSONS ROAD / SOUTHERN ACCESS ROAD / SHOPPINGTOWN HOTEL

Time Interval: 7:15am - 8:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	33	61	30	110	32	67	36	111
B	11	15	13	16	13	15	13	17
C	27	29	16	38	31	23	12	35
D	29	20	14	49	28	21	14	28
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 8:15am - 9:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	31	31	32	91	28	59	31	91
B	9	9	15	16	11	16	14	17
C	32	32	15	38	28	32	16	35
D	32	32	15	27	28	21	14	25
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 15:45pm - 16:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	31	50	26	66	31	54	32	75
B	14	15	13	16	14	16	13	17
C	32	36	18	38	31	32	20	36
D	31	21	15	24	30	23	17	29
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 16:45pm - 17:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	32	46	28	83	29	54	30	73
B	21	15	13	16	13	16	13	17
C	32	34	16	38	29	34	16	35
D	32	20	15	30	29	21	16	25
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 11:30am - 12:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	32	47	25	79	30	57	37	73
B	21	15	13	16	13	17	13	17
C	32	33	16	38	30	34	29	35
D	33	20	15	28	29	22	14	25
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 12:30pm - 13:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	33	48	23	74	28	56	42	70
B	17	15	13	16	14	16	13	17
C	34	31	16	38	28	35	29	35
D	34	20	15	25	28	21	16	25
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

325 WILLIAMSONS ROAD / TRAM ROAD / DONCASTER ROAD / ELGAR ROAD

Time Interval: 7:15am - 8:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	30	16	15	17	28	16	12	16
B	29	26	20	33	28	27	21	33
C	28	28	22	36	28	26	19	30
D	3	11	11	11	4	11	9	11
E	28	12	12	13	28	13	10	18
F	29	14	8	17	28	15	5	18
G	30	27	18	39	28	29	17	36

Time Interval: 8:15am - 9:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	28	28	15	16	27	16	15	16
B	27	27	28	33	27	24	21	34
C	28	28	22	35	27	27	22	32
D	3	3	11	11	2	11	11	11
E	28	28	12	14	27	13	12	14
F	28	28	8	17	27	14	9	17
G	28	28	14	35	27	31	26	40

Time Interval: 15:45pm - 16:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	28	16	15	16	27	16	15	16
B	28	32	29	36	27	29	23	33
C	27	29	22	36	27	29	22	32
D	4	11	11	12	2	11	11	11
E	27	13	12	14	27	14	12	14
F	27	16	13	17	27	16	13	18
G	28	23	15	28	27	24	22	27

Time Interval: 16:45pm - 17:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	28	16	15	16	26	16	16	16
B	27	33	31	37	26	29	25	34
C	27	30	24	36	26	29	23	33
D	4	11	11	11	3	11	11	11
E	28	13	12	14	26	14	12	18
F	28	17	13	17	26	16	10	17
G	28	20	14	26	26	25	22	31

Time Interval: 11:30am - 12:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	30	16	15	16	28	16	11	16
B	29	28	22	33	28	30	28	32
C	29	27	24	33	28	29	25	29
D	0	0	0	0	0	0	0	0
E	30	13	13	14	28	14	13	14
F	30	14	8	17	28	13	6	17
G	30	23	16	32	28	28	22	34

Time Interval: 12:30pm - 13:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	28	16	15	16	27	16	15	16
B	28	32	28	36	27	28	25	33
C	29	28	22	33	27	27	22	31
D	2	11	11	11	2	11	11	11
E	29	13	12	14	27	14	12	14
F	29	14	8	17	27	14	10	17
G	28	21	14	36	27	26	19	33

326 DONCASTER ROAD / FREDERICK STREET / TOWER STREET

Time Interval: 7:15am - 8:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	29	79	59	99	28	78	63	101
B	21	19	18	20	20	19	17	19
C	28	21	14	30	28	23	14	26
D	0	0	0	0	0	0	0	0
E	23	13	11	18	27	13	9	18
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 8:15am - 9:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	27	27	45	81	27	60	34	77
B	28	28	18	20	26	19	18	19
C	28	28	16	34	27	24	14	26
D	0	0	0	0	0	0	0	0
E	28	28	11	31	27	23	13	30
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 15:45pm - 16:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	27	65	26	108	28	62	29	90
B	22	19	18	20	23	19	17	19
C	27	25	14	29	28	25	14	29
D	9	12	8	23	12	11	9	22
E	27	20	14	35	28	22	15	29
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 16:45pm - 17:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	27	63	26	99	26	65	50	96
B	21	19	18	20	17	19	18	19
C	28	26	25	30	26	27	25	34
D	13	12	8	24	7	17	9	23
E	28	21	14	31	26	20	12	29
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 11:30am - 12:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	29	56	25	89	27	64	24	101
B	24	19	17	20	19	19	17	19
C	30	25	15	29	27	27	25	32
D	8	16	10	22	6	11	9	18
E	30	20	11	33	27	22	12	33
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 12:30pm - 13:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	28	60	34	86	27	67	28	89
B	22	19	18	20	9	19	18	19
C	29	25	20	29	27	26	20	30
D	12	13	8	20	10	10	9	15
E	28	21	12	32	27	22	12	32
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

327 DONCASTER ROAD / COUNCIL STREET

Time Interval: 7:15am - 8:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	29	98	72	115	28	103	76	120
B	29	23	14	33	28	22	14	33
C	0	0	0	0	0	0	0	0
D	1	12	12	12	3	15	14	16
E	0	0	0	0	0	0	0	0
F	1	12	12	12	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 8:15am - 9:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	27	27	74	123	26	98	83	120
B	28	28	15	34	26	27	14	33
C	0	0	0	0	0	0	0	0
D	4	4	11	12	2	13	12	13
E	0	0	0	0	0	0	0	0
F	4	4	13	17	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 15:45pm - 16:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	27	89	73	116	28	104	82	116
B	27	21	14	34	28	23	14	33
C	0	0	0	0	0	0	0	0
D	10	12	11	16	2	12	12	12
E	0	0	0	0	0	0	0	0
F	17	26	12	39	1	12	12	12
G	0	0	0	0	0	0	0	0

Time Interval: 16:45pm - 17:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	27	81	73	107	25	101	85	113
B	28	24	14	34	25	22	14	33
C	0	0	0	0	0	0	0	0
D	13	13	11	16	12	14	12	17
E	0	0	0	0	0	0	0	0
F	23	23	12	38	1	12	12	12
G	0	0	0	0	0	0	0	0

Time Interval: 11:30am - 12:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	28	79	58	104	28	104	66	116
B	29	18	14	33	28	22	14	33
C	0	0	0	0	0	0	0	0
D	5	12	11	12	3	13	12	14
E	0	0	0	0	0	0	0	0
F	22	27	12	38	1	12	12	12
G	0	0	0	0	0	0	0	0

Time Interval: 12:30pm - 13:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	28	81	65	115	26	101	74	133
B	29	23	14	34	26	22	14	33
C	0	0	0	0	0	0	0	0
D	1	16	16	16	4	14	12	14
E	0	0	0	0	0	0	0	0
F	23	27	12	39	1	12	12	12
G	0	0	0	0	0	0	0	0

687 WILLIAMSONS ROAD / GEORGE STREET

Time Interval: 7:15am - 8:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	32	54	26	86	32	47	22	73
B	4	11	10	12	1	12	12	12
C	33	24	16	37	32	22	16	28
D	0	0	0	0	0	0	0	0
E	32	21	15	34	31	18	15	22
F	3	12	12	13	0	0	0	0
G	15	15	12	21	29	29	11	54

Time Interval: 8:15am - 9:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	31	31	25	72	28	51	34	82
B	0	0	0	0	2	12	11	12
C	32	32	17	36	28	23	17	28
D	4	4	13	13	0	0	0	0
E	32	32	15	40	28	20	15	26
F	1	1	12	12	2	12	12	12
G	24	24	14	22	26	24	14	40

Time Interval: 15:45pm - 16:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	32	48	25	78	30	41	35	64
B	2	12	11	13	0	0	0	0
C	32	23	15	32	30	22	15	28
D	1	14	14	14	1	13	13	13
E	31	27	17	36	30	23	13	30
F	1	11	11	11	2	12	12	12
G	25	17	12	21	30	29	15	43

Time Interval: 16:45pm - 17:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	32	44	22	60	29	48	34	78
B	0	0	0	0	3	12	12	12
C	32	21	15	31	22	24	19	28
D	2	13	13	13	0	0	0	0
E	32	30	15	40	29	24	17	30
F	1	12	12	12	1	12	12	12
G	32	17	13	23	29	25	14	40

Time Interval: 11:30am - 12:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	32	47	28	72	30	47	31	68
B	0	0	0	0	0	0	0	0
C	32	22	14	31	30	22	17	28
D	0	0	0	0	1	13	13	13
E	33	23	16	34	30	24	17	37
F	2	12	11	12	1	12	12	12
G	31	18	13	29	30	26	14	42

Time Interval: 12:30pm - 13:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	33	49	23	70	28	48	37	82
B	2	11	10	11	0	0	0	0
C	34	21	14	32	28	22	15	28
D	0	0	0	0	0	0	0	0
E	34	25	15	38	28	22	16	31
F	0	0	0	0	0	0	0	0
G	26	15	13	20	26	30	14	45

2043 DONCASTER ROAD / WHITTENS LANE / MUNICIPAL OFFICES ENT.

Time Interval: 7:15am - 8:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	26	98	68	298	28	98	76	116
B	25	20	14	30	23	15	11	19
C	0	0	0	0	0	0	0	0
D	18	23	12	45	27	17	9	24
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 8:15am - 9:15am

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	27	27	71	122	26	98	70	116
B	28	28	15	30	21	15	14	19
C	3	3	13	13	1	13	13	13
D	27	27	13	38	25	16	11	22
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 15:45pm - 16:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	27	81	70	94	28	96	80	114
B	27	27	15	30	28	21	16	27
C	4	13	13	13	1	13	13	13
D	28	21	14	30	22	14	12	18
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 16:45pm - 17:45pm

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	27	82	70	97	26	98	88	115
B	28	27	15	30	26	20	16	30
C	5	13	13	14	0	0	0	0
D	28	19	13	29	21	14	12	18
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 11:30am - 12:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	29	79	60	100	27	95	81	113
B	30	23	14	30	27	24	16	30
C	2	13	13	13	0	0	0	0
D	29	18	11	39	18	14	12	20
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Time Interval: 12:30pm - 13:30pm SAT

	SCATS HISTORY DATA (OBSERVED)				SCATS IDM DATA (MODELLED)			
	Frequency	Average	Minimum	Maximum	Frequency	Average	Minimum	Maximum
A	28	83	61	112	27	96	76	121
B	28	23	14	30	26	23	14	30
C	2	14	14	14	1	13	13	13
D	29	20	11	37	14	14	11	16
E	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0

Melbourne

A Level 25, 55 Collins Street
PO Box 24055
MELBOURNE VIC 3000
P +613 9851 9600
E melbourne@gta.com.au

Brisbane

A Level 4, 283 Elizabeth Street
BRISBANE QLD 4000
GPO Box 115
BRISBANE QLD 4001
P +617 3113 5000
E brisbane@gta.com.au

Adelaide

A Suite 4, Level 1, 136 The Parade
PO Box 3421
NORWOOD SA 5067
P +618 8334 3600
E adelaide@gta.com.au

Townsville

A Level 1, 25 Sturt Street
PO Box 1064
TOWNSVILLE QLD 4810
P +617 4722 2765
E townsville@gta.com.au

Sydney

A Level 6, 15 Help Street
CHATSWOOD NSW 2067
PO Box 5254
WEST CHATSWOOD NSW 1515
P +612 8448 1800
E sydney@gta.com.au

Canberra

A Tower A, Level 5,
7 London Circuit
Canberra ACT 2600
P +612 6243 4826
E canberra@gta.com.au

Gold Coast

A Level 9, Corporate Centre 2
Box 37, 1 Corporate Court
BUNDALL QLD 4217
P +617 5510 4800
F +617 5510 4814
E goldcoast@gta.com.au

Perth

A Level 27, 44 St Georges Terrace
PERTH WA 6000
P +618 6361 4634
E perth@gta.com.au

Appendix D

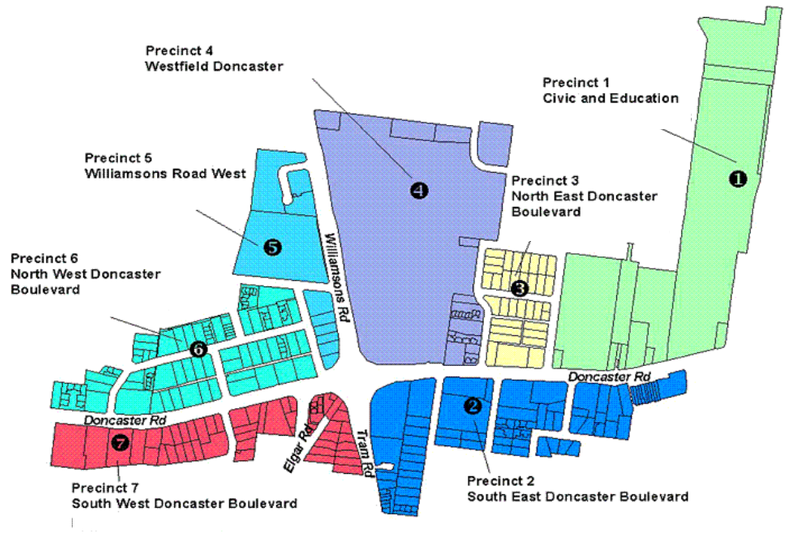
Doncaster Hill Land Use Summary

DONCASTER HILL LAND USE PROJECTIONS 2014

Precinct	EXISTING LAND USES (CONSTRUCTED)					ADDITIONAL LAND USES (APPROVED AND PROJECTED INCREASE)					FULL BUILD OUT (TOTAL)				
	Dwellings	Commercial (m²)	Retail (m²)	Entertainment (m²)	Community Services (m²)	Dwellings	Commercial (m²)	Retail (m²)	Entertainment (m²)	Community Services (m²)	Dwellings	Commercial (m²)	Retail (m²)	Entertainment (m²)	Community Services (m²)
Precinct 1	0	0	0	700	5,300	63	0	0	0	0	63	0	0	700	5,300
Precinct 2	185	1,061	300	0	0	1,463	3,043	9,808	0	0	1,648	4,104	10,108	0	0
Precinct 3	232	0	0	0	0	513	1,516	10,000	0	0	745	1,516	10,000	0	0
Westfield *(does not include additional 30,000sqm in masterplan)*		5,039	103,566	4,500											
Precinct 4	20	5,039	103,566	4,500	0	185	0	0	0	0	205	5,039	103,566	4,500	0
Precinct 5	221	0	0	0	0	723	15,000	5,000	0	0	944	15,000	5,000	0	0
Existing commercial / office / retail component to be retained			6300												
Precinct 6	8	0	6,300	0	0	870	0	0	0	0	878	0	6,300	0	0
Existing commercial / office / retail component to be retained			6800												
Precinct 7	181	0	6,800	0	0	908	8,807	1,138	0	0	1,089	8,807	7,938	0	0
Sub Total															
TOTAL AT FULL BUILD OUT	847	6,100	116,966	5,200	5,300	4,725	28,366	25,946	0	0	5,572	34,466	142,912	5,200	5,300

Original dwelling forecast: 4081

Total projected dwelling numbers inclusive of constructed 847 dwellings



Appendix E

Master Plan Traffic Generation Assessment

Reference: #15M1090000

8 May 2015

VicRoads Metropolitan South-East
12 Lakeside Drive
BURWOOD EAST VIC 3151

Attention: Mr. Steven Yang

Dear Steven

RE: WESTFIELD DONCASTER MASTER PLAN
TRAFFIC ESTIMATES AND THE IMPACT OF THE STAGE 1 CAR PARK EXPANSION

Background

We refer to your email dated 9 April 2014 regarding the proposed traffic generation rates for land uses proposed in association with the proposed Master Plan for Westfield Doncaster.

We understand that issues have been raised with the traffic implications associated with the Stage 1 Multi-Deck Car Park currently under construction and how an associated increase in car parking supply might affect the traffic generation estimates presented in the GTA traffic generation memorandum dated 13 March 2015.

GTA have now had an opportunity to review your response and provide the following for adoption.

It is noted that the regression analysis presented in the memorandum dated 23 March 2015 represents by contemporary standards a robust assessment of the future traffic generation rate estimates using floor area as the unit variable upon which a determinative estimate has been prepared.

As you are aware, the assessment draws upon the relationship of almost 40 shopping centres of varying sizes, Australia wide. The approach as we assess it, satisfies each of the key statistical validation guidelines. As a result, the adopted methodology substantiates traditional *'rule-of-thumb'* assumptions around the non-linear relationship between traffic generation and floor area including early analysis completed by Grogan Richards Pty Ltd (now Cardno) in the early 1990's.

Stage 1 Car Park Application Analysis

The assessment provided by GTA which underpinned the Stage 1 car park expansion and the 40% allowance for traffic generation (of the existing car space turnover rate) pioneered an analysis which contemplated growth in traffic activity without growth in floor area.

Additional research since undertaking this assessment has established that the relationship between traffic generation and parking supply (as a rate) for retail uses using the selected data set relied upon in the aforementioned regression analysis indicates a poor correlation. This analysis casts some doubt over the original assumption of traffic growth particularly

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Level 25, 55 Collins Street
MELBOURNE VIC 3000

PO Box 24055
MELBOURNE VIC 3000

t// +613 9851 9600

www.gta.com.au

when parking demands during the weekday AM and PM peak periods are substantially less than the available supply.

Not-with-standing, GTA have undertaken a further review of the changing rate of car parking proposed between the various development phases from the existing condition to Stage 1 to the ultimate Master Plan and have sought to make some allowance for the changing rate of car parking noting that planning aspirations for the precinct seek to reduce the overall rate of car parking in association with land use. This analysis is set out below. An update to the floor area schedule is also provided for VicRoads use and consideration.

Update to Floor Area Schedule

As the Master Plan has evolved, the project team has settled on a range of likely (indicative) increases in floor area and car parking. The land use area changes now anticipated are set out in Table 1 along with recorded but adjusted traffic generation data for the 85th percentile design day.

Table 1: Past, Present and Future Floor Area Statistics & Traffic Generation

Period	Floor Area (sq.m)		Traffic Volumes (IN/OUT)			Parking Supply
	Retail	Commercial	AM Peak	PM Peak	Sat Midday	
2002 (Pre 2008 Expansion)	58,505	-	2,225	3,435	4233	3,606
2014 (Existing Conditions	123,549	-	2,020[1]	4,607[1]	5,235[1]	4,782
2015 (Stage 1 – Car Park Expansion)	123,549	-				5,338 (+556)
Master Plan	166,549 (+43,000)	18,000				Refer Later

[1] Represents 85th percentile values

Given the above, the regression analysis presented in the memorandum dated the 23 March 2015 has been revised to reflect the change (increase) in floor space.

Retail Traffic Increase - Regression Analysis

Utilising the formulae derived from the regression analysis, traffic generation rates were calculated for both the existing floor area (based on 123,549sqm) and for the post development floor area (retail component only – 166,549sqm).

Friday Equation

$$y = 693.75x^{-0.459} \quad where\ x = floor\ area$$

Saturday Equation

$$y = 478.165x^{-0.414} \quad where\ x = floor\ area$$

Friday PM Existing Rate (Based on Equation)

$y = 693.75x^{-0.459} \quad where\ x = 123{,}549sqm$

$y = 3.19 \quad where\ y = peak\ hour\ rate$

Friday PM Proposed Rate (Based on Equation)

$y = 693.75x^{-0.459} \quad where\ x = 166{,}549sqm$

$y = 2.79 \quad where\ y = peak\ hour\ rate$

Saturday Midday Existing Rate (Based on Equation)

$y = 478.165x^{-0.414} \quad where\ x = 123{,}549sqm$

$y = 3.73 \quad where\ y = peak\ hour\ rate$

Saturday Midday Proposed Rate (Based on Equation)

$y = 478.165x^{-0.414} \quad where\ x = 166{,}549sqm$

$y = 3.30 \quad where\ y = peak\ hour\ rate$

The relativity (percentage difference) between these rates derived from the formulae were then calculated.

Friday PM

$$\frac{Proposed}{Existing} = \frac{2.79}{3.19} = 87\%$$

Saturday Midday

$$\frac{Proposed}{Existing} = \frac{3.30}{3.73} = 89\%$$

These relativity factors (percentage difference) were then applied to the existing Centre traffic generation rates (as surveyed and factored – see Existing Traffic Data items i and ii of this memo) to determine a post development rate.

Formula

$Existing\ Rate\ (Surveyed)\ \times \%\ Difference = Future\ Rate$

Future Friday PM Rate

$3.73\ \times 0.87 = \mathbf{3.26}$

Future Saturday Midday Rate

$4.24 \times 0.89 = \mathbf{3.76}$

Due to the limited data available for the Friday AM peak, the Friday PM peak rate has been adopted using the existing (AM/PM) proportions surveyed at the Centre.

Formula

$$\frac{Existing\ Surveyed\ Friday\ AM\ Rate}{Existing\ Surveyed\ Friday\ PM\ Rate} = \%\ Differnce$$

$$\frac{1.64}{3.73} = \mathbf{44}\%$$

$$Future\ Fri\ PM\ Rate\ \times \%Diff\ = Future\ Fri\ AM\ Rate$$

Future Friday AM Rate Calculation

$$3.26\ \times 0.44\ = \mathbf{1.43}$$

Table 2 indicates the calculated (post development) retail traffic generation rates, while Table 3 provides a summary of the calculated traffic rates for the post development scenario and the additional traffic anticipated to be generated.

Table 2: Post Development Traffic Generation Rates (Retail)

Peak	Existing Traffic Generation Rate	Master Plan Traffic Generation Rate (Retail Only)
Friday AM	1.64	**1.43**
Friday PM	3.73	**3.26**
Saturday	4.24	**3.76**

Table 3: Summary of Traffic Rates & Volumes

Peak	Master Plan Floor Area	Peak Hour Traffic Rate	Post Development Traffic Volumes	Existing Traffic Volumes	Addition Traffic Generated
Friday AM	166,549	1.43	2,382	2020	+362
Friday PM		3.26	5,429	4607	+822
Saturday Midday		3.76	6,262	5235	+1027

Historic Allowance for an Increase in Parking Provision (Stage 1)

As noted in the GTA report that accompanied the Stage 1 car park planning permit application (dated 15 November 2013), an additional 556 car parking spaces at the Centre is not expected to generate traffic at the equivalent rate of the existing car park.

We understand this principle has been accepted noting that evidence included reference to recent surveys at Chadstone Shopping Centre which confirmed a non-linear traffic generation relationship between 2002 and 2011 for unit floor area growth. These surveys found that the additional floor area constructed between these years generated traffic at a rate of 33% of the floor area that existed prior to the 2002 expansion.

A similar outcome was also outlined for Highpoint Shopping Centre with a corresponding value of 40%.

Accordingly and in the spirit of preparing a conservative (on the high side) assessment of potential impacts of the increase in car parking (without any additional floor area) at

Westfield Doncaster during the Stage 1 car park expansion the upper end of the identified range was adopted. Again, noting that no additional floor area was proposed.

In response to a request for further information (RFI) issued by Wilson Ma from your office on 31 March 2014 querying the validity of the 40% value, additional research was presented which reviewed the traffic generation rate for Westfield Doncaster between 2002 and 2012 (pre and post expansion). This assessment is replicated in Table 4 based on the most current traffic data collected in September 2014.

Table 4: Traffic Generation Review – 2002 vs 2014

	Survey Year		Difference
	2002	2014	
Total Floor Area (sq.m)	58,505	123,547 [1]	65,042
Traffic Counts (IN / OUT) – Friday PM	3,400vph	4,607vph	1,207
Traffic Generation Rate (per 100sqm of Floor Area – Friday Peak Hour)	5.81vph	3.73vph	-2.08
Traffic Gen Rate of Additional Floor Area (per 100sqm of Additional Floor Area)			**1.86**
Traffic Gen Rate of Additional Floor Area as %			**32%**

[1] Compared to a previously advised floor area of 117,000sqm.

Table 4 indicates that the traffic generation rate for the overall Centre decreased in the 12 years between 2002 and 2014 by some 2.08 movements per 100sqm of unit floor area. During this period the floor area of the Centre increased by 65,042sqm.

When reviewed in isolation, the additional floor area as part of the last expansion generates traffic at a rate of 1.86 movements per 100sqm. This represents a **32%** increase in overall traffic generation when compared to the Centre prior to the expansion.

Given the above comparisons, the utilisation of a **40%** traffic generation rate applied to the additional car parking proposed as part of the car park expansion permit application was (and is considered) excessively conservative given documented evidence for the Centre supports a value of **32%** for any growth in floor space.

Traffic Generation Allowance for any Change in Parking Rate

Commentary set out earlier in this letter indicated that research on traffic generation as it relates to parking provision on a unit rate basis (per 100sqm) provides a poor correlation. In support of this observation, analysis set out in Figure 1 and 2 for a Friday and Saturday demonstrate R^2 values of 0.34 and 0.37 for the line of best fit "power function", respectively.

Figure 1: Parking Provision vs Traffic Generation Rate – Friday PM Peak

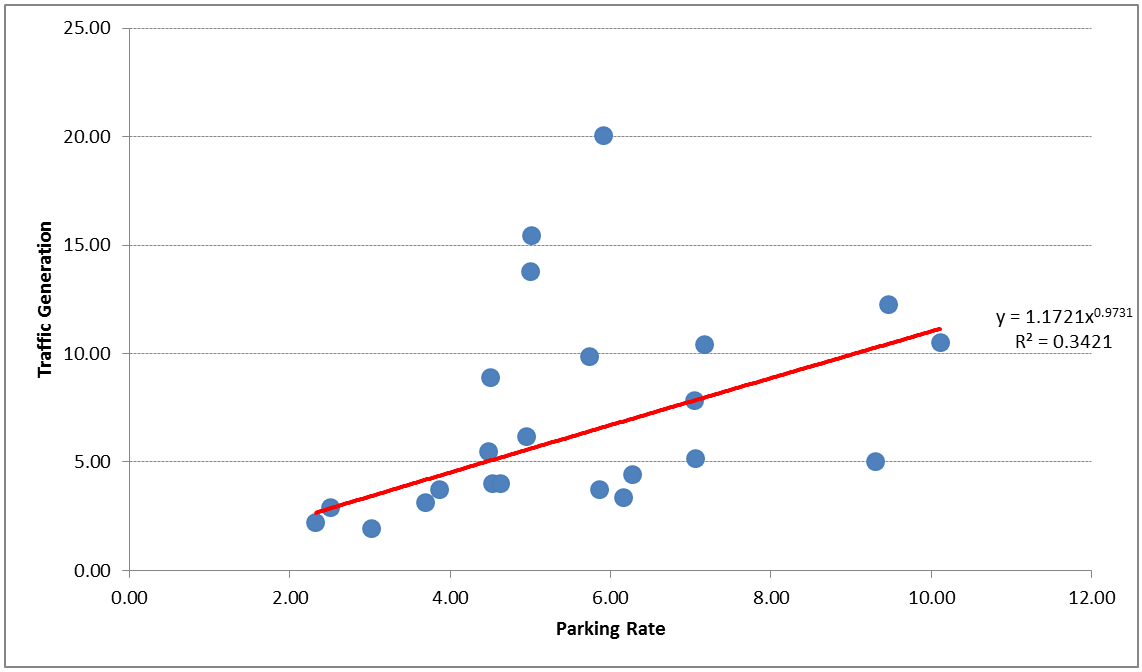
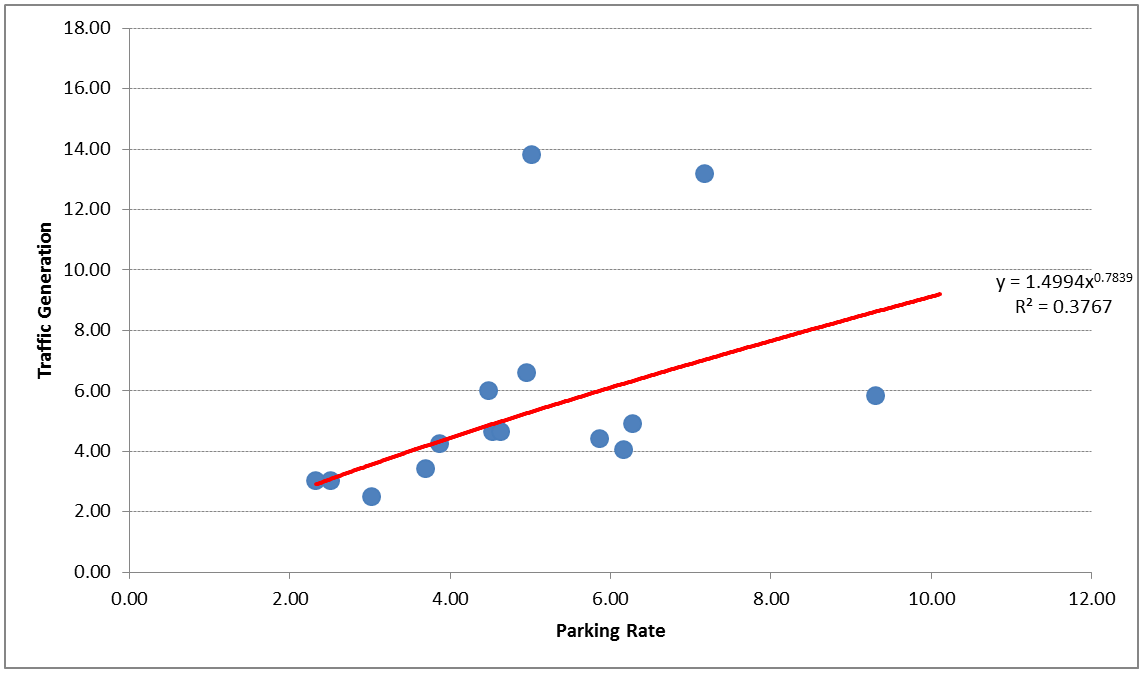


Figure 2: Parking Provision vs Traffic Generation Rate – Saturday Midday Peak



This analysis raises some doubt over the likelihood of an additional 556 car parking spaces generating any significant additional traffic activity during the recorded road network peak hours.

However, in the spirit of preparing a conservative on the high side assessment, an allowance has been made for the change in rate of parking proposed to be provided. This rate is less than the rate of 40% adopted in the original analysis and also likely to be less than the value of 32% measured for Doncaster for the last floor area expansion. Not-with-standing, the value of 32% has been adopted in the updated analysis set out below.

Before outlining any analysis, an outline of the change in parking provision, both historic and future (predicted) is set out in Table 5.

Table 5: Parking Provision Statistics – Historic & Future

Year / Scenario	Floor Area (Retail Only) (sq.m)	Car Parking Provision	
		Spaces	spaces /100sqm
2002 (Pre 2008 Expansion)	58,505	3,606	6.16
2014 (Existing Conditions)	123,549	4,782	3.87
2015 (Stage 1 – Car Park Expansion)	123,549	5,338 (+556)	4.32
Master Plan	166,549 (+43,000)	6,811	4.09

Utilising the information presented in Table 5, it is evident that the rate of parking will decrease between Stage 1 and the Master Plan (although still represent an overall increase when viewed against existing conditions). Given that Stage 1 has received statutory approval, analysis set out below explores the change in rate between existing conditions (when the last traffic surveys were completed) and the ultimate Master Plan provision.

In order to complete this assessment, the difference in parking provision for the Master Plan (retail floor area 166,549sqm) is assessed against the current rate of parking (3.87 spaces per 100sqm) and the proposed rate of parking (4.09 spaces per 100sqm). This assessment is set out below.

Formula

$$Rate\ of\ Parking \times \frac{Floor\ Area}{100} = Number\ of\ Spaces$$

Post Master Plan Parking Spaces (at Existing Parking Rates)

$$3.87 \times \frac{166{,}549}{100} = 6446\ spaces$$

Post Master Plan Parking Spaces (at Proposed Parking Rates)

$$4.09 \times \frac{166{,}549}{100} = 6811\ spaces$$

$$6811 - 6446 = \mathbf{365\ spaces}$$

Utilising the same methodology presented in your email dated 9 April 2015, the traffic generated by the additional 365 spaces is calculated utilising a proportion (32% as calculated) of the post development traffic generation rate (on a movements per space basis). The calculations for this increase in traffic are presented below.

Formula

$$Traffic\ Generation\ Rate = \frac{Total\ Peak\ Hour\ Movements[1]}{Number\ of\ Space} \times 32\%$$

[1] Calculated from the regression analysis.

Friday AM Traffic Generation Rate & Movements

$$\frac{2382\ movements}{6811\ spaces} \times 32\% = 0.11$$

$$0.11 \times 365\ spaces = \mathbf{40\ movements}$$

Friday PM Traffic Generation Rate & Movements

$$\frac{5429\ movements}{6811\ spaces} \times 32\% = 0.25$$

$$0.25 \times 365\ spaces = \mathbf{91\ movements}$$

Saturday Traffic Generation Rate & Movements

$$\frac{6262\ movements}{6811\ spaces} \times 32\% = 0.29$$

$$0.29 \times 365\ spaces = \mathbf{106\ movements}$$

Table 6 indicates the calculated (post development) increase in traffic allowing for the increase in on-site parking provision between the existing conditions surveyed in 2014 and the proposed master plan rates.

Table 6: Additional Forecast Traffic Generation (Retail Land Use)

Peak	Additional Traffic Generated from the Increase in Floor Area [1]	Additional Traffic Generated from the Increase in Parking Provision	Total Additional Traffic (Retail)
Friday AM	362	40	**+402**
Friday PM	822	91	**+913**
Saturday	1,027	106	**+1,133**

[1] Based on the regression analysis.

Multi-Purpose Trip Discounts

An important characteristic of the traffic generation is the different types of trips which may occur. These different trip types correspond to:

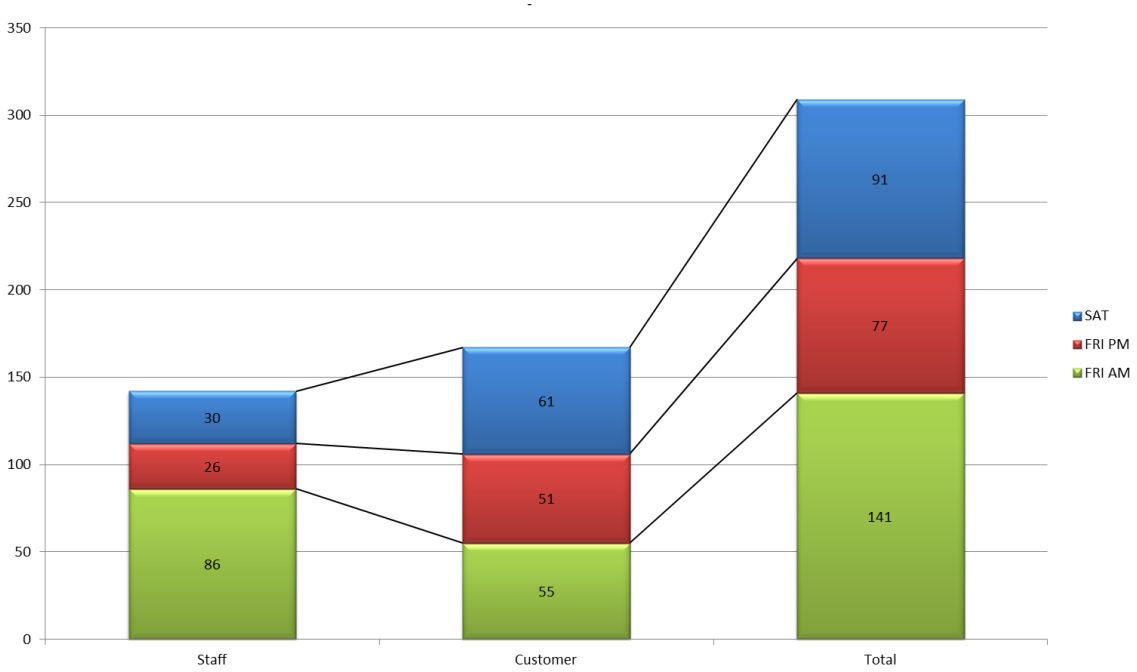
- 'Primary Trips'
- 'Link-diverted Trips'
- 'Non-link-diverted Trips'.

Primary trips and *link-diverted trips* involve a vehicle either making a special trip or a modification of the route to an existing trip. *Non-link-diverted trips,* on the other hand, correspond to those trips which do not involve a diversion from the route that would

otherwise have been taken, or in other words are trips generated by passing traffic. The important distinction here is that it is only *primary trips* and *link-diverted trips* which impact upon the external road network. *Non-link-diverted trips (*or non-primary*)* are already present on the adjacent road network, and although these trips need to be considered in the design of access driveways, turning lanes and so on, they do not constitute additional traffic per se.

Questionnaire surveys were conducted by GTA on Friday 5 September 2014 between 7:00am-10:00am and 3:30pm-6:30pm and on Saturday 6 September 2014 between 11:00am-2:00pm. The surveys were undertaken at the south-western and north-western access points as well as within the Centre. A total of 309 responses were collected from a broad demographic of customers and traders at the Centre. A summary of the number of customer and staff responses collected is shown in Figure 3.

Figure 3: Questionnaire Survey Response Rate



The surveys sought responses to a number of questions regarding their travel to Westfield Doncaster and their intentions while present. Specifically, questions regarding the primary reason for their visiting the Centre were asked and whether the trip was the primary visit for the journey. The results of the questionnaire are presented in Table 7.

Table 7: Questionnaire Survey - Trip Purpose Results

Peak Hour	Primary Visit %	Multi-Purpose Trip %	Non-Primary Visit %
Friday AM	58%	7%	35%
Friday PM	82%	4%	14%
Saturday	72%	8%	20%

Given the results in Table 7, the percentages for Non-Primary trips have been applied to the retail traffic volumes generated. These results are presented in Table 8.

Table 8: Trip Discount Volumes

Peak	Total Additional Traffic (Retail)	Trip Discount %	Trip Discount Volumes
Friday AM	402	35%	**+141**
Friday PM	913	14%	**+128**
Saturday	1,133	20%	**+227**

[1] Based on the regression analysis.

Commercial Floor Area Traffic

Guidance on traffic generation rates for the commercial uses have now been sourced from RMSNSW, which indicate (2013):

- Weekday AM Peak 1.6movements /100sqm
- Weekday PM peak 1.2 movements / 100sqm

These values are equal to those being adopted for the broader Doncaster Hill area in the updated 'base case' analysis.

GTA has also adopted a nominal traffic generation for the Saturday peak of 0.2 movements/100sqm (representing approx. 10% of the weekday AM peak) given that the office component will generate limited traffic activity on a weekend.

Based on the above, Table 9 presents the increase in traffic associated with the commercial component of the Master Plan.

Table 8: Post Development Traffic Generation (Commercial)

Peak	Floor Area Increase (sq.m)	Traffic Generation Rate	Additional Traffic Generated
Friday AM	18,000	1.6	**+288**
Friday PM		1.2	**+216**
Saturday		0.2	**+36**

Overall Traffic Rates

Based on the information and calculations presented in this letter, Table 10 provides a summary of the calculated traffic rates for the post development (Master Plan) scenario and the additional traffic anticipated to be generated and adopted.

Table 10: Summary of Post Development Traffic Generation to be Adopted

Peak	Use	Post Development Traffic Volumes	Trip Discounts	Total Post Development Traffic	Existing Traffic Volumes	Additional Traffic Generated
Friday AM	Retail	2,382	-141	2,529	2020	**+509**
	Commercial	288				
Friday PM	Retail	5,429	-128	5,517	4607	**+910**
	Commercial	216				
Saturday Midday	Retail	6,262	-227	6,071	5235	**+836**
	Commercial	36				

We trust that the information enclosed provides a clarity and certainty around the traffic generation rates presented. Naturally, should you have any questions or require any further information, please do not hesitate to contact John Kiriakidis or me in our Melbourne office on (03) 9851 9600.

Yours sincerely

GTA CONSULTANTS

Fabian Guadagnuolo
Senior Project Manager
encl.

Appendix F

Microsimulation Modelling Results

Speed - Queue Lengths Plots

An analysis of queue lengths has been undertaken by reviewing the average speed of vehicles across links in the model network. In typical modelling practice, queues are defined as when a vehicle speed drops below 5km/h to 10km/h and remains in a queue until it exceeds a speed of 10km/h, or exceeds a certain distance from the vehicle ahead.

In order to replicate this measure, queue lengths have been assessed from the microsimulation model by presenting the average speed on links in the model network over the respective peak hour, with the colour indicating the speed ranges (Table F.1) that vehicles travel.

Table F.1: Average Speed Ranges

Colour	Average Speed	
	Vehicles in a queue	Less than 10km/h
		Between 10km/h and 20km/h
		Between 20km/h and 40km/h
		Between 40km/h and 60km/h
	Free flow conditions	Greater than 60km/h

The average speed ranges defined in Table 7.13 suggest that queues are formed when vehicles are travelling at a speed less than 10km/h, in a rolling queue between 10km/h to 20km/h and reach free flow conditions at speeds greater than 60km/h.

Figure F.1 to Figure F.3 present the average speed (queue) plots for the Future Base and Westfield Master Plan options for the weekday AM, weekday PM and Saturday midday peaks.

The weekday AM peak average speed plots are shown in Figure F.1, with key observations noted as follows:

- In the Future Base, Williamsons Road is highly congested and queues are predominately a result of the right turn movement (north to west) at the Doncaster Road / Williamsons Road / Tram Road intersection, as shown in Figure 7.2.
- The addition of the Westfield development in the Westfield Master Plan option adds to the congestion on Williamsons Road given the limited capacity improvements able to be undertaken at the junction, and as a result queues extend further north on Williamsons Road and Manningham Road.
- In the Westfield Master Plan Option, the triple right turn reduces the right turn queue, thus having a significant improvement to speeds on Williamsons Road, and subsequently all other approaches as signal timings are able to be properly distributed amongst the intersection approaches at the junction.

The weekday PM peak average speed plots are shown in Figure F.2, with key observations noted as follows:

- The weekday PM peak traffic conditions are more congested than the AM peak with the Future Base indicating that Williamsons Road, Tram Road and Doncaster Road are carrying a lot of traffic and travelling at speed less than 60km/h.
- Congestion on these roads stems from the Doncaster Road / Williamsons Road / Tram Road intersection, with critical movements being the north approach right turn, east approach right turn and the west approach through movement.
- Speeds in the Westfield Master Plan option is similar to the Future Base however with traffic from side roads and the Westfield accesses having more difficulty getting into the main traffic stream.

- In the Westfield Master Plan Option, the triple right turn reduces the congestion on Williamsons Road, however does not provide any benefit to the other approaches given the more balanced traffic flows on all roads. Notwithstanding, slightly quicker speeds can be achieved in the Westfield Master Plan Option compared to the other options indicating shorter queue lengths, or more rolling queues are expected, rather than standstill queues.

The Saturday midday peak average speed plots are shown in Figure F.3, with key observations noted as follows:

- The Saturday midday traffic conditions are very similar to the weekday PM peak however with traffic moving at lower speeds.
- The Doncaster Road / Williamsons Road / Tram Road intersection struggles to cope with the increased demands on the Saturday, causing long queues on all approaches.
- The triple right turn improves speeds and reduces queues on Williamsons Road, however all other approaches are similar to the other Westfield Master Plan options.

Figure F.1: Average Speed (Queue Length) Plots – Weekday AM Peak (8:15am to 9:15am)

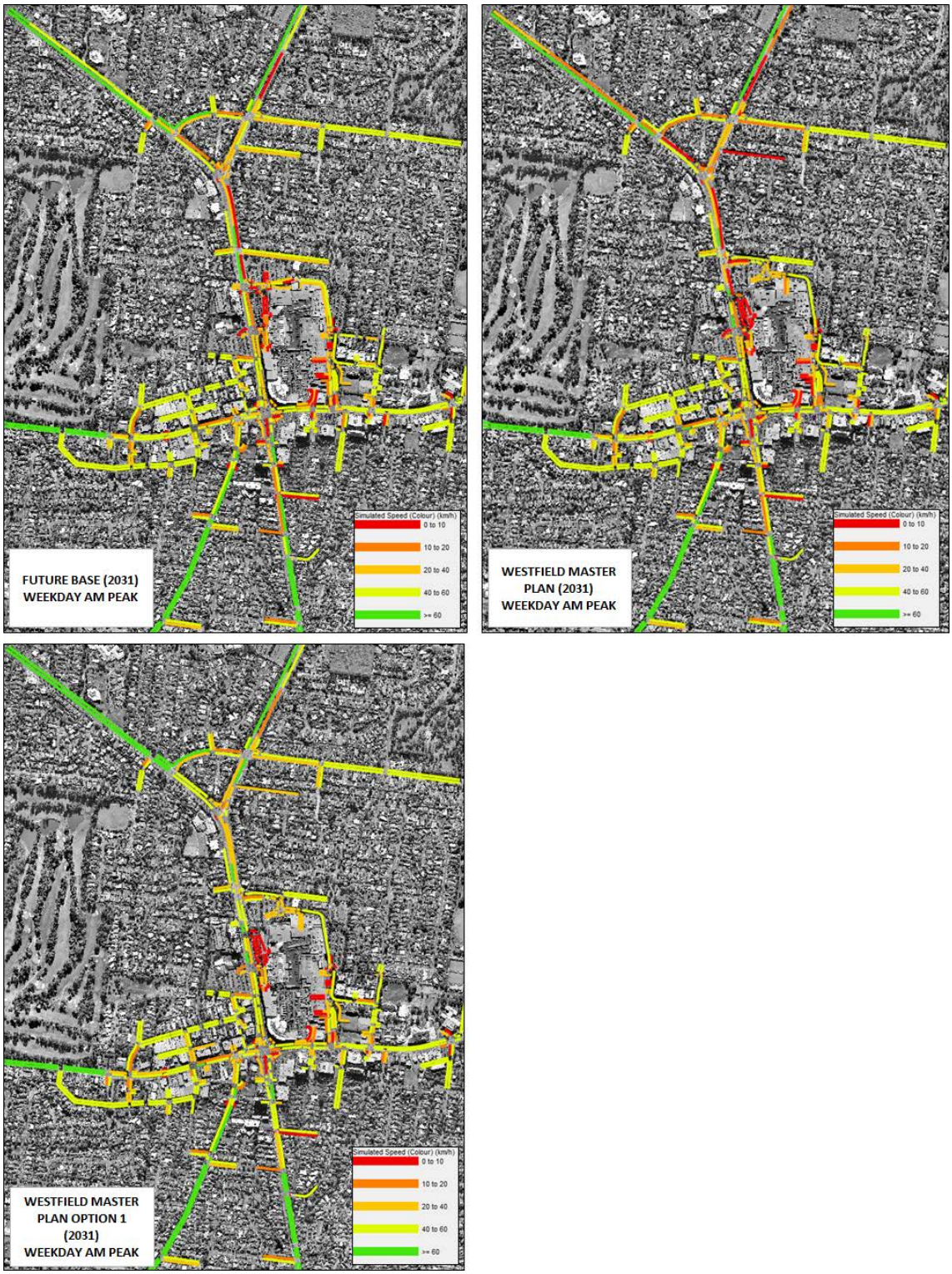


Figure F.2: Average Speed (Queue Length) Plots – Weekday PM Peak (4:45pm to 5:45pm)

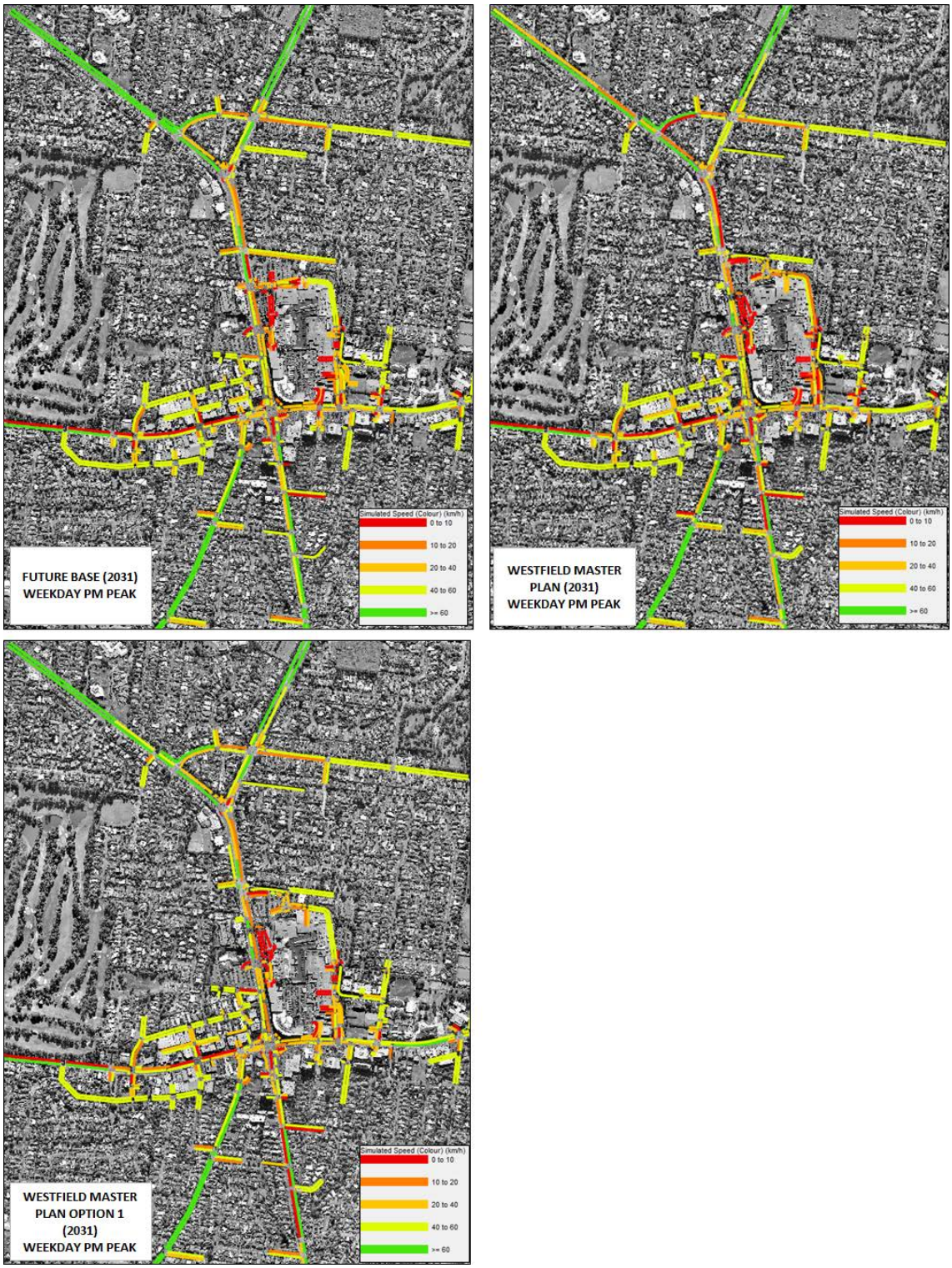
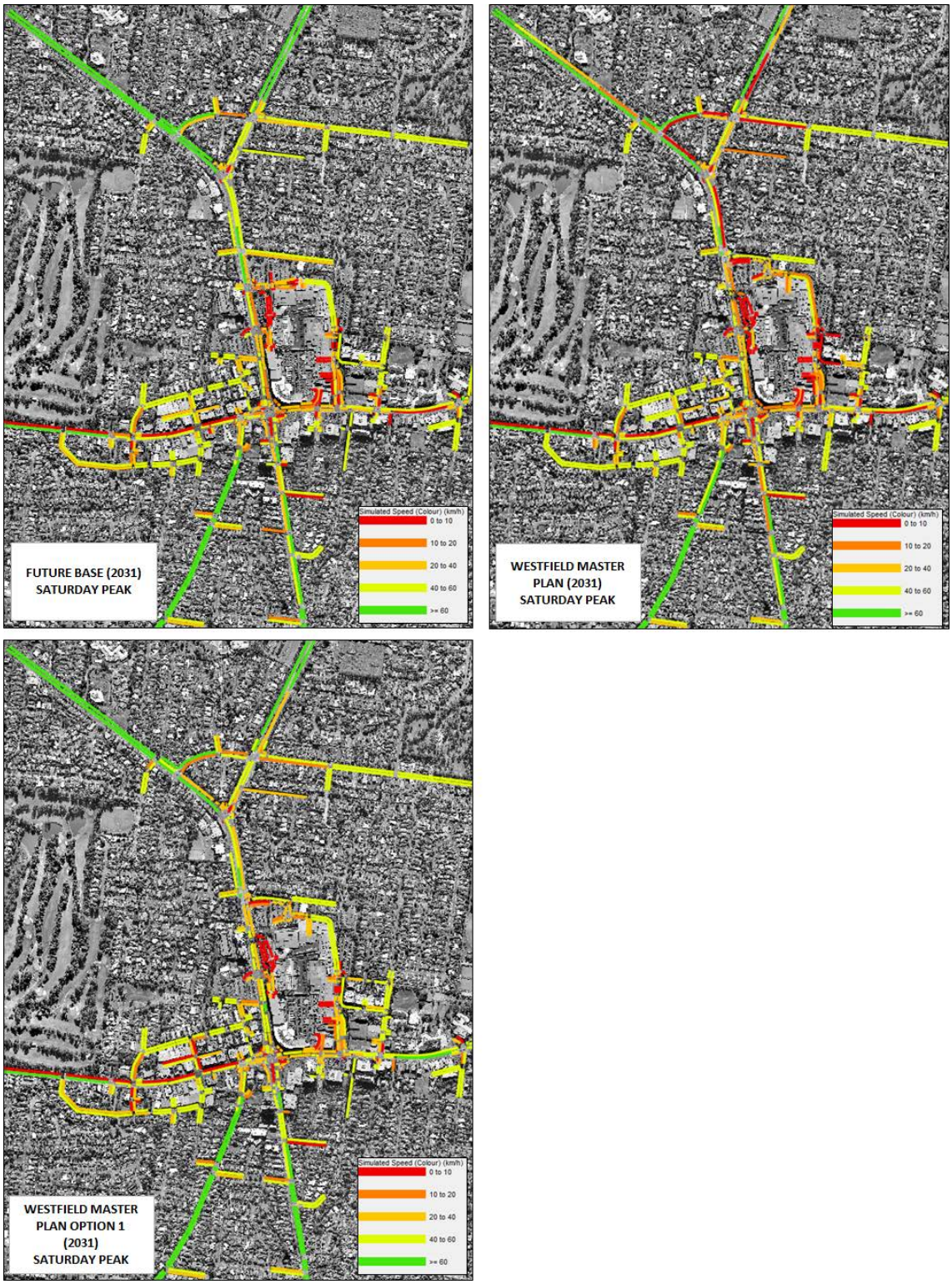


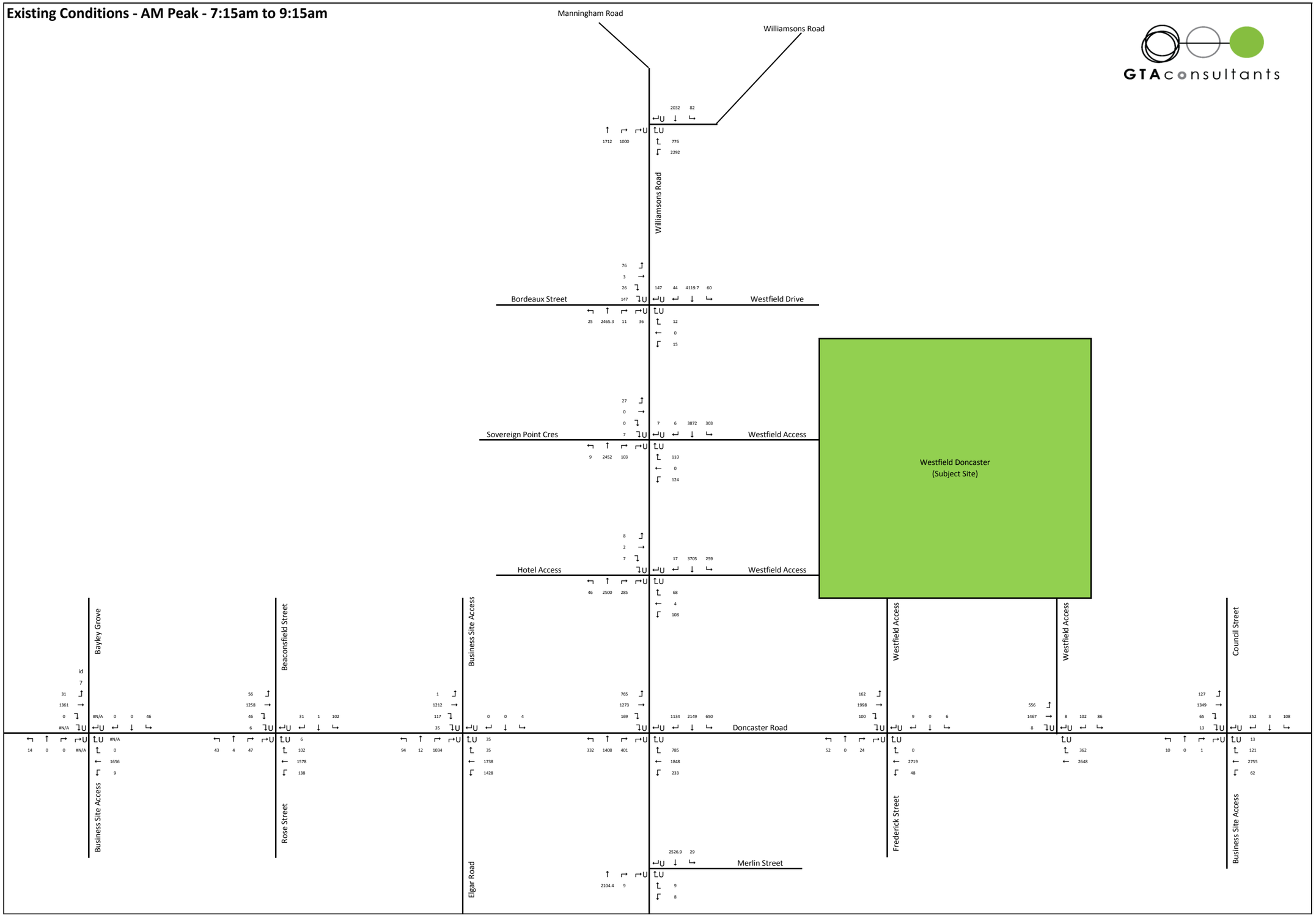
Figure F.3: Average Speed (Queue Length) Plots – Saturday Midday Peak (12:30pm to 1:30pm)



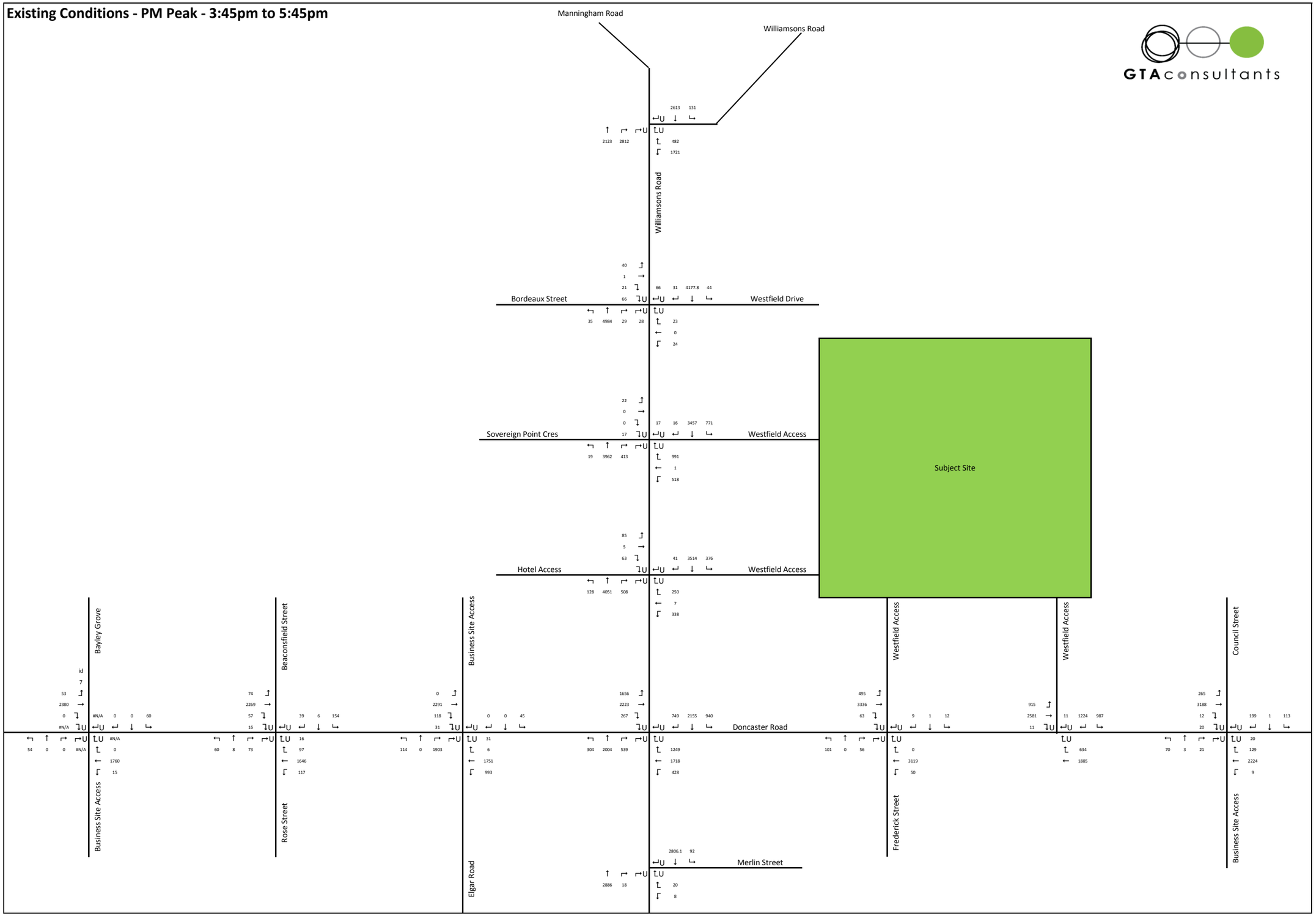
Appendix G

Traffic Volume Plots

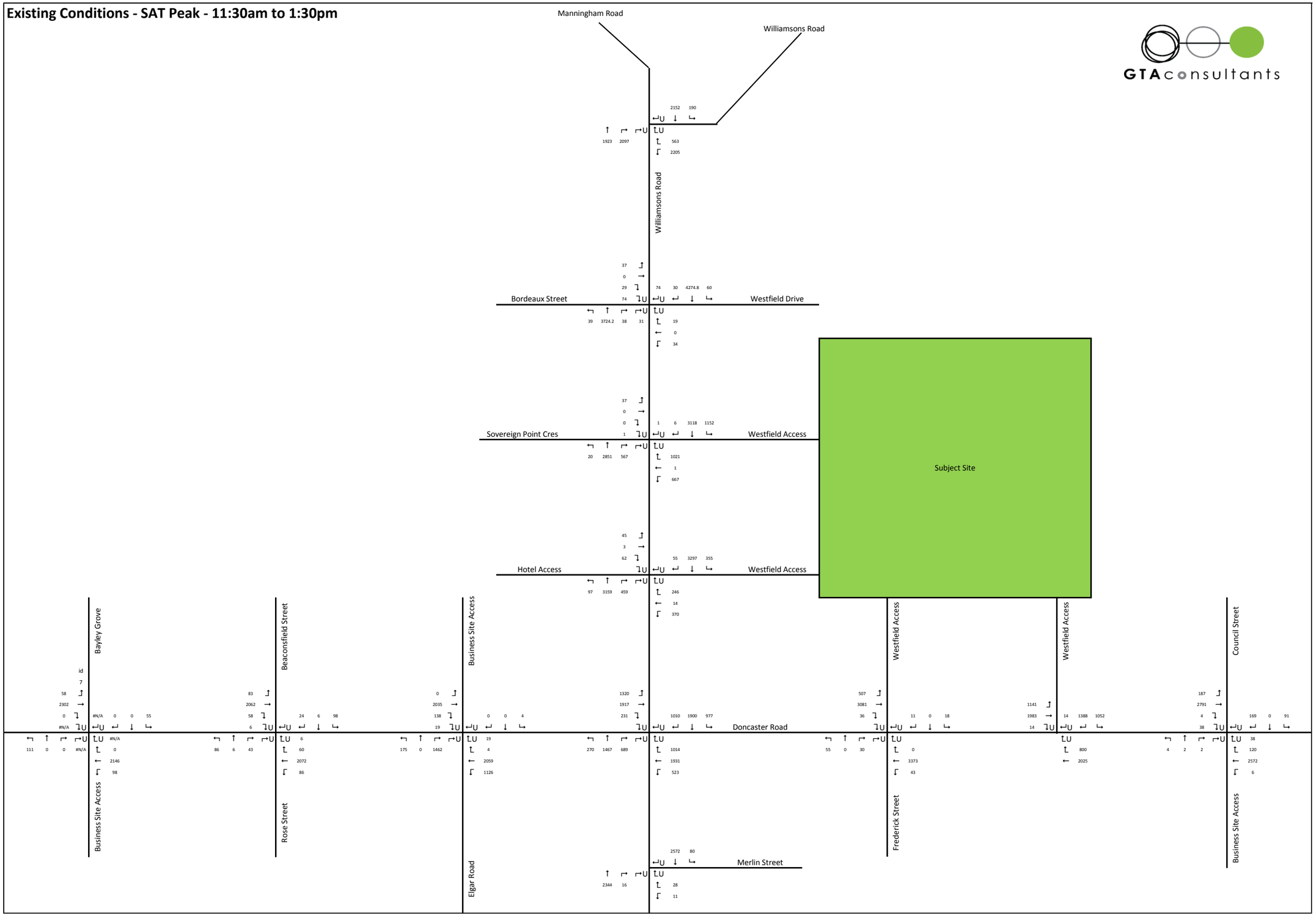
Existing Conditions - AM Peak - 7:15am to 9:15am



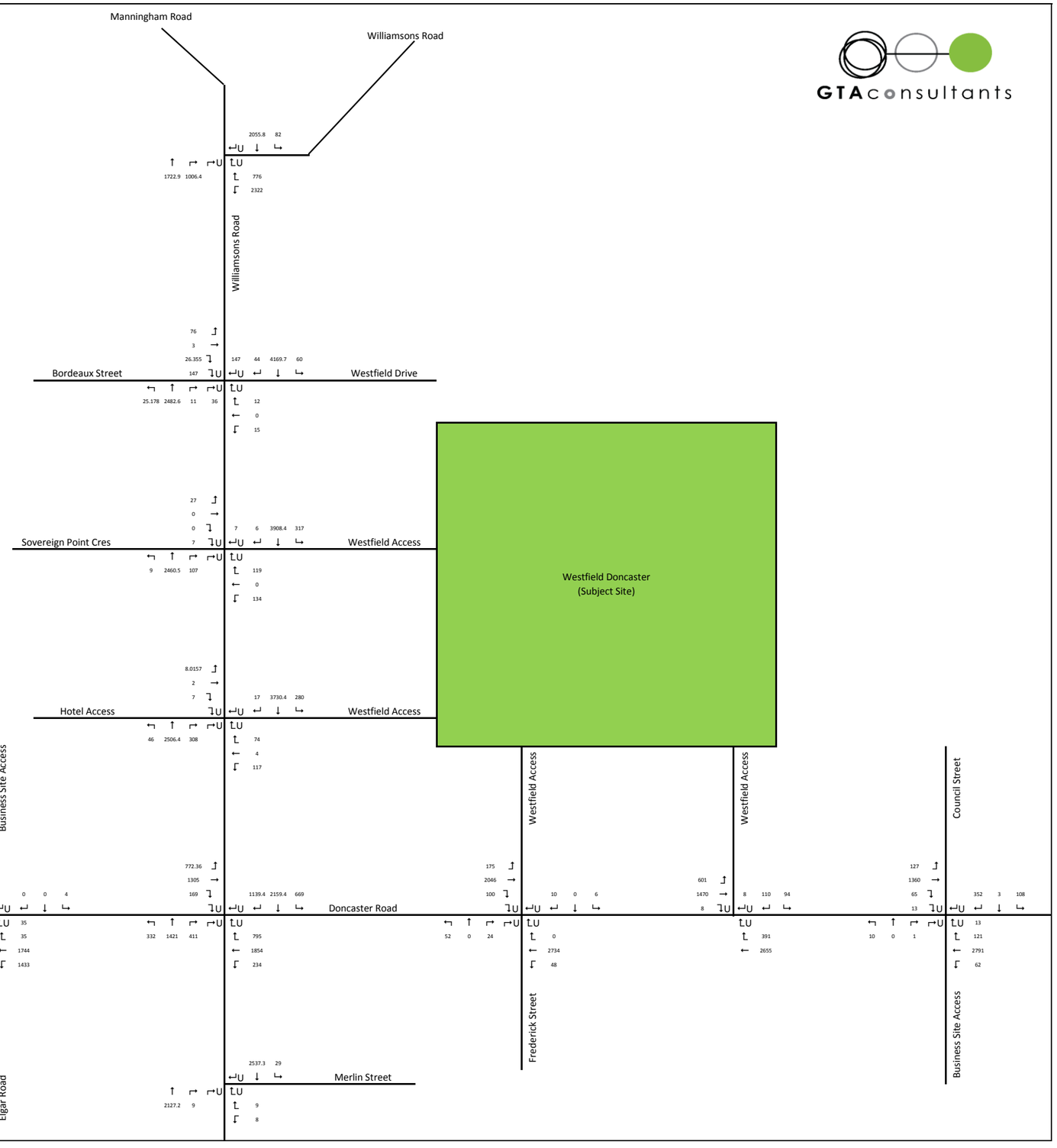
Existing Conditions - PM Peak - 3:45pm to 5:45pm



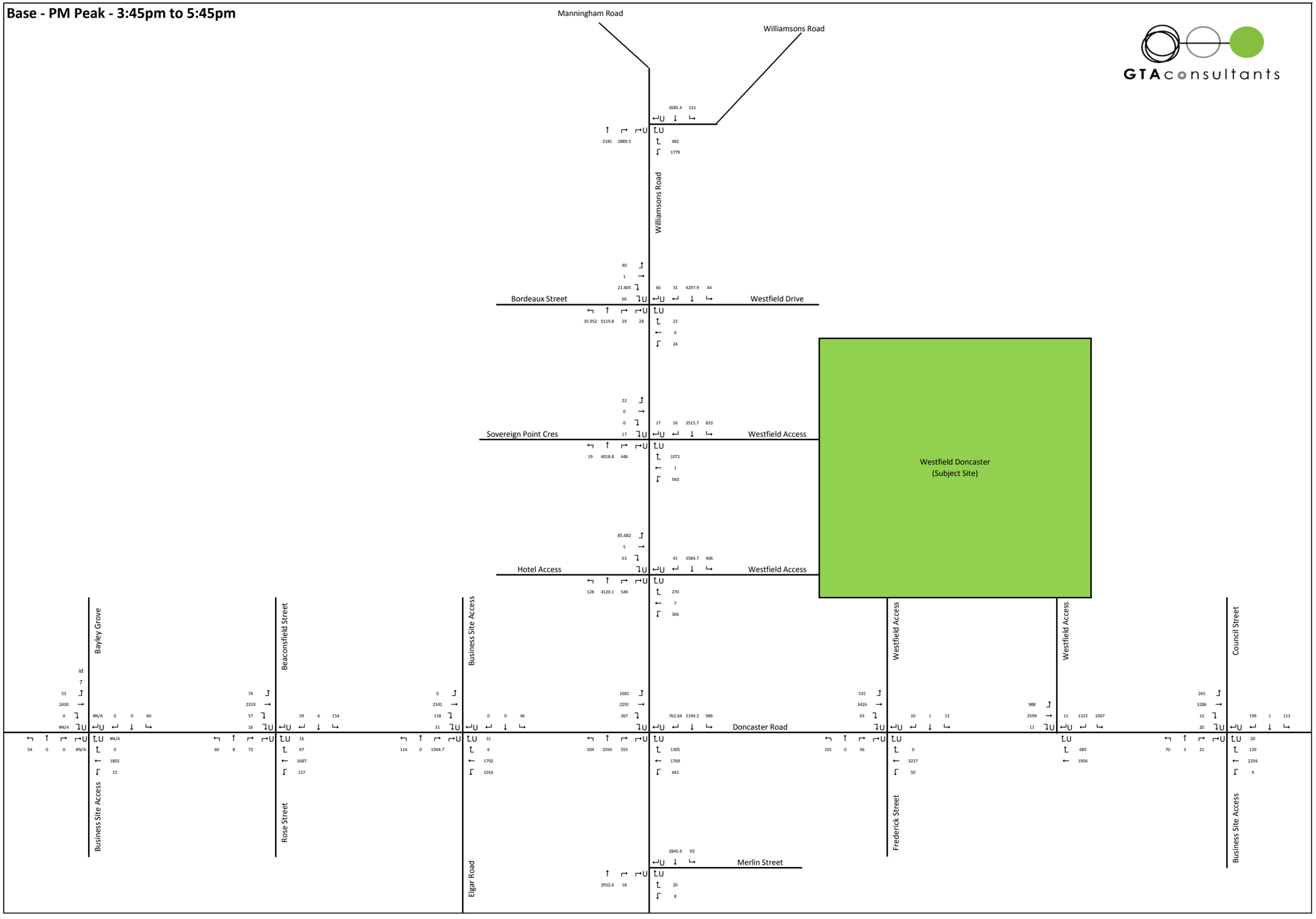
Existing Conditions - SAT Peak - 11:30am to 1:30pm



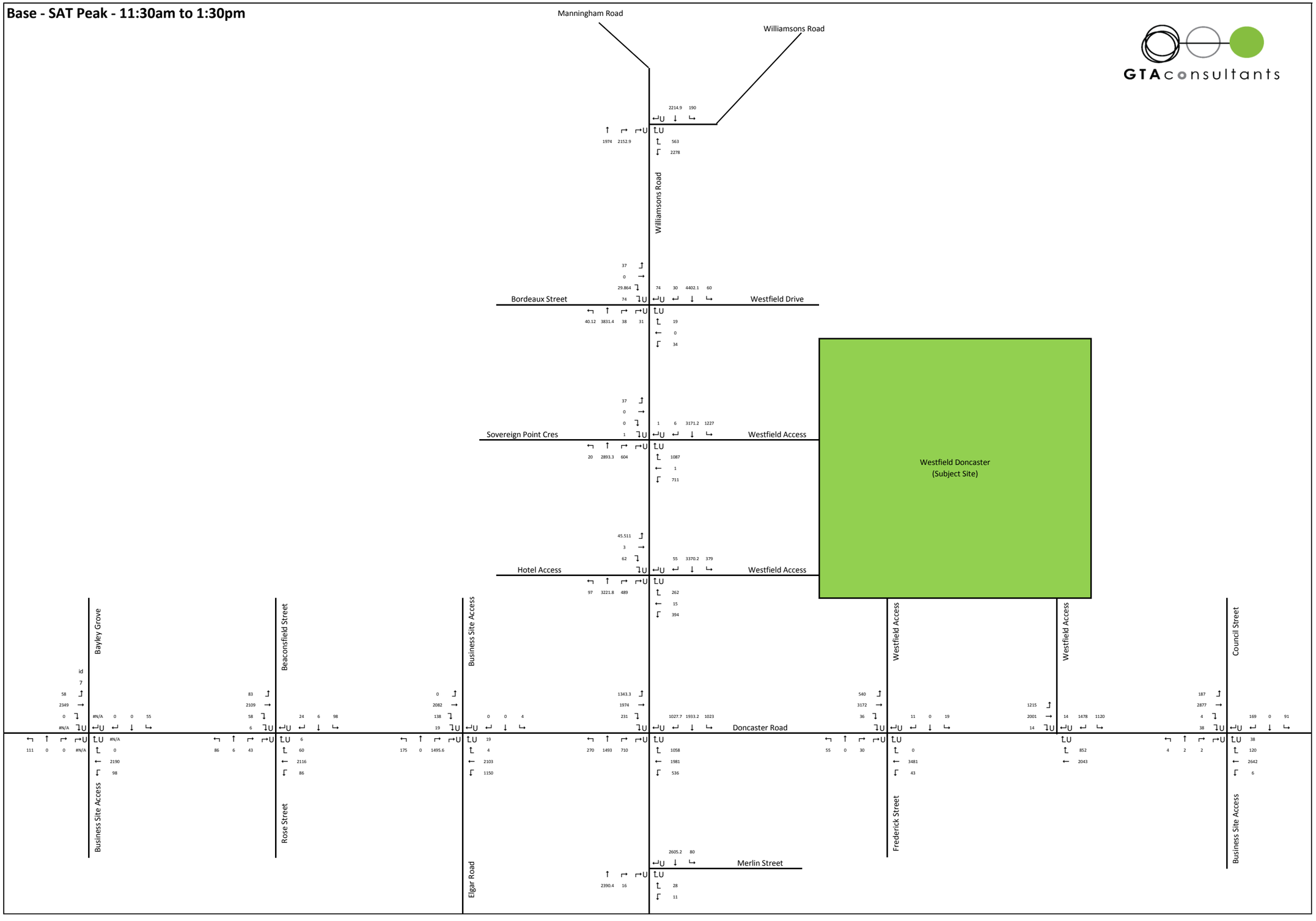
Base - AM Peak - 7:15am to 9:15am



Base - PM Peak - 3:45pm to 5:45pm



Base - SAT Peak - 11:30am to 1:30pm



Appendix H

Active Travel Review

Reference: #15M1090005

23 October 2015

Manningham Council
PO Box 1
DONCASTER VIC 3108

Dear Sir/Madam,

RE: WESTFIELD DONCASTER SHOPPING CENTRE
PEDESTRIAN & BICYCLE FACILITIES

Background & Purpose

A Master Plan is being developed for a proposed expansion of Westfield Doncaster Shopping Centre in support of further growth and development between 2015 and 2031, which will form Amendment C104 of the Manningham Planning Scheme.

The Master Plan seeks to increase the retail floor area of Westfield Doncaster by up to 43,000sqm from a total of 120,000sqm (existing) to a potential 163,000sqm (future). In addition, it is proposed to provide approximately 18,000sqm of commercial floor area.

The proposal will involve a significant investment in public transport and active travel infrastructure including an expanded bus interchange, new pedestrian and cyclist connections between the Shopping Centre and the surrounding Doncaster Hill precinct.

The proposal will also be accompanied by modifications to vehicle access arrangements, an increase in parking at the Centre for cars, bicycles, and the provision of associated new loading areas.

Initial comments on the Master Plan prepared by Contour and supporting Integrated Transport & Access Plan prepared by GTA Consultants have been received from Manningham City Council through their letter dated 24 September 2015. Majority of the comments in the letter are considered to be relatively minor in nature and will be addressed in subsequent updates to the associated reports.

However, an area raised by Council that they have concerns relate to Active Transport, where they indicate that there is limited discussion on what the objectives, principles and desired outcomes will be as part of the proposal.

As such, this letter has been prepared to set out the broad level objectives, principles and desired outcomes for active transport as part of the proposal and in context with the Doncaster Hill Activity Centre.

Policy Context

There are a number of policy documents relating to the overarching objectives, principles and desired outcomes of active transport. Those most specific to the site and with the Doncaster Hill Activity Centre are summarised below.

melbourne
sydney
brisbane
canberra
adelaide
gold coast
townsville
perth

Level 25, 55 Collins Street
MELBOURNE VIC 3000

PO Box 24055
MELBOURNE VIC 3000

t// +613 9851 9600

www.gta.com.au

Doncaster Hill Strategy 2002 (revised 2004)

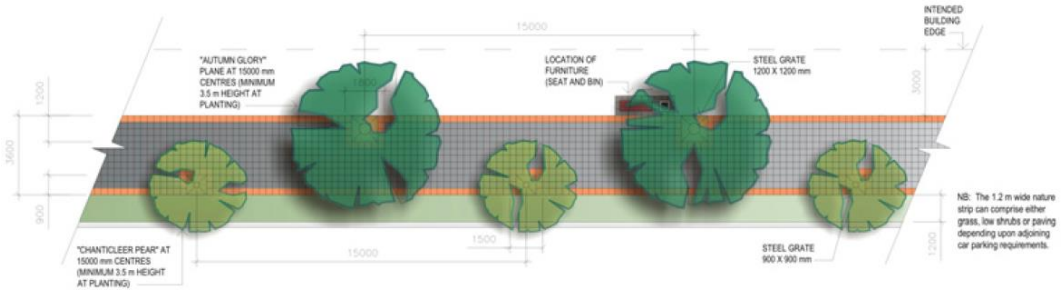
The Doncaster Hill Strategy provides an integrated planning response to the social, economic and environmental issues facing the activity centre. Most notably, it covers the following aspects of the future development of the activity centre:

- Vision, strategic context and objectives
- Development application requirements
- Ecologically sustainable development requirements
- Urban design requirements

In terms of active transport, the following key guidance is provided within the strategy:

- Doncaster Hill offers the opportunity to provide a more sustainable and accessible transport system that will support changed travel behaviour to decrease car dependency and increase use of public transport, walking and cycling.
- Doncaster Hill aims to be pedestrian in nature with tree-lined streets alive with restaurants, cafes, shops, public art and open spaces.
- Ensure that development facilitates a permeable, activated, connected, safe (includes passive surveillance) and comfortable pedestrian environment adjacent to the proposed boulevards and with strong linkages within Doncaster Hill to key trip generators and passive open space.
- Provide appropriate amenities for pedestrians and bike riders as part of new developments, including:
  - 'after trip' facilities for bicycle users, joggers, etc. (e.g. such as secure bicycle storage, showers and changing rooms)
  - access to facilities to be centrally and easily accessed.
- Boulevard landscape treatments are to be provided along both sides of Doncaster Boulevard, Williamsons Road and Tram Road. The general layout of the boulevard landscape treatments is reproduced in Figure 1.

Figure 1: Doncaster Hill Boulevard Landscape Details – Sample Paving & Furniture Strip



Source: Insert between pages 49 and 50 of the Doncaster Hill Strategy

Doncaster Hill Mode Shift Plan 2014

In response to strategic transport modelling for the Doncaster Hill Activity Centre it was acknowledged that in order to support the anticipated level of development in the area there needs to be a shift away from the current level of private car use by those living, working and visiting the precinct.

This is presented in the Doncaster Hill Mode Shift Plan 2014, and identifies that the level of mode shift away from private car use being targeted is a change from its existing 80% mode share to a 70% mode share (based on 2011 ABS journey to work data). The majority of the existing alternative travel modes already being used relate to bus travel, with some 15%

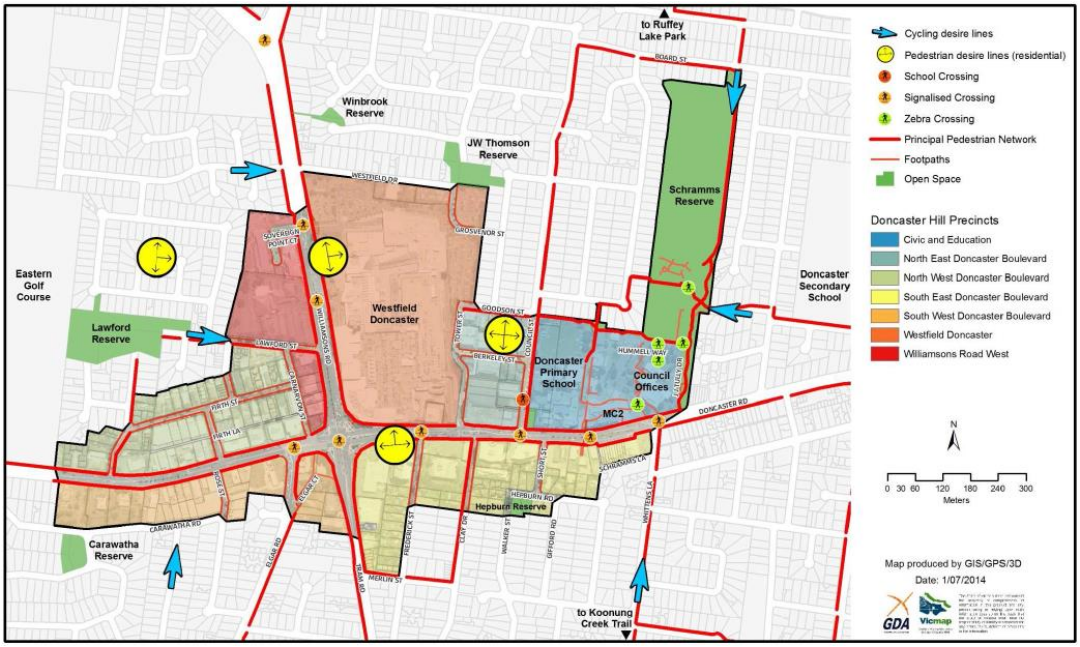
existing mode sharing. Ongoing improvements to public transport services and facilities are being provided, namely through the DART bus services and long-term proposal to provide a train line between Doncaster Hill and the existing Melbourne Rail Network.

In terms of active transport, the current mode share of some 5% almost solely relates to those that walk (i.e. almost no one currently cycles). However, it is noted that some 50% of all trips in Melbourne are less than 2.5km and undertaken by private car. As such, there is a significant opportunity to help achieve the desired mode shift through an increased use of active transport for these short trips of 2.5km or less.

In order to achieve this goal, the Mode Shift Plan provides an outline of how the active transport network should be developed, namely through the following high level directions and aligning facilities with the key walking and cycling desire lines for the Doncaster Hill Activity Centre, as shown in the plan reproduced in Figure 2:

- The development of strategies and plans targeting pedestrians should be complemented by traffic speed reduction campaigns, strategies and infrastructure.
- The provision of well-spaced and convenient pedestrian operated signals at key locations along arterial roads within Doncaster Hill is required to ensure safe road crossing points.
- Boulevard treatments, as outlined in the Doncaster Hill Strategy are required to be provided where new development occurs.
- The majority of the footpath widths do not provide safe shared access for both pedestrians and off-road cyclists. It is therefore essential that the planning for the VicRoads Principal Bicycle Network through Doncaster Hill be undertaken.
- Enhanced wayfinding signage is required.

Figure 2: Key Walking & Cycling Desire Lines for the Doncaster Hill Activity Centre



Source: Page 26 of the Doncaster Hill Mode Shift Plan 2014

SmartRoads Policy

SmartRoads is a VicRoads policy which sets strategic 'modal' priorities on the road network and underpins many of the strategies significant to the operational directions that support broader strategies around land use and transport.

"There is no single solution to managing congestion on our roads. Sustainable management of congestion will require an integrated approach involving better management of the existing network, building new infrastructure, visionary land use planning, encouraging sustainable transport modes, and changes in behaviour by individuals, businesses and a level of government."

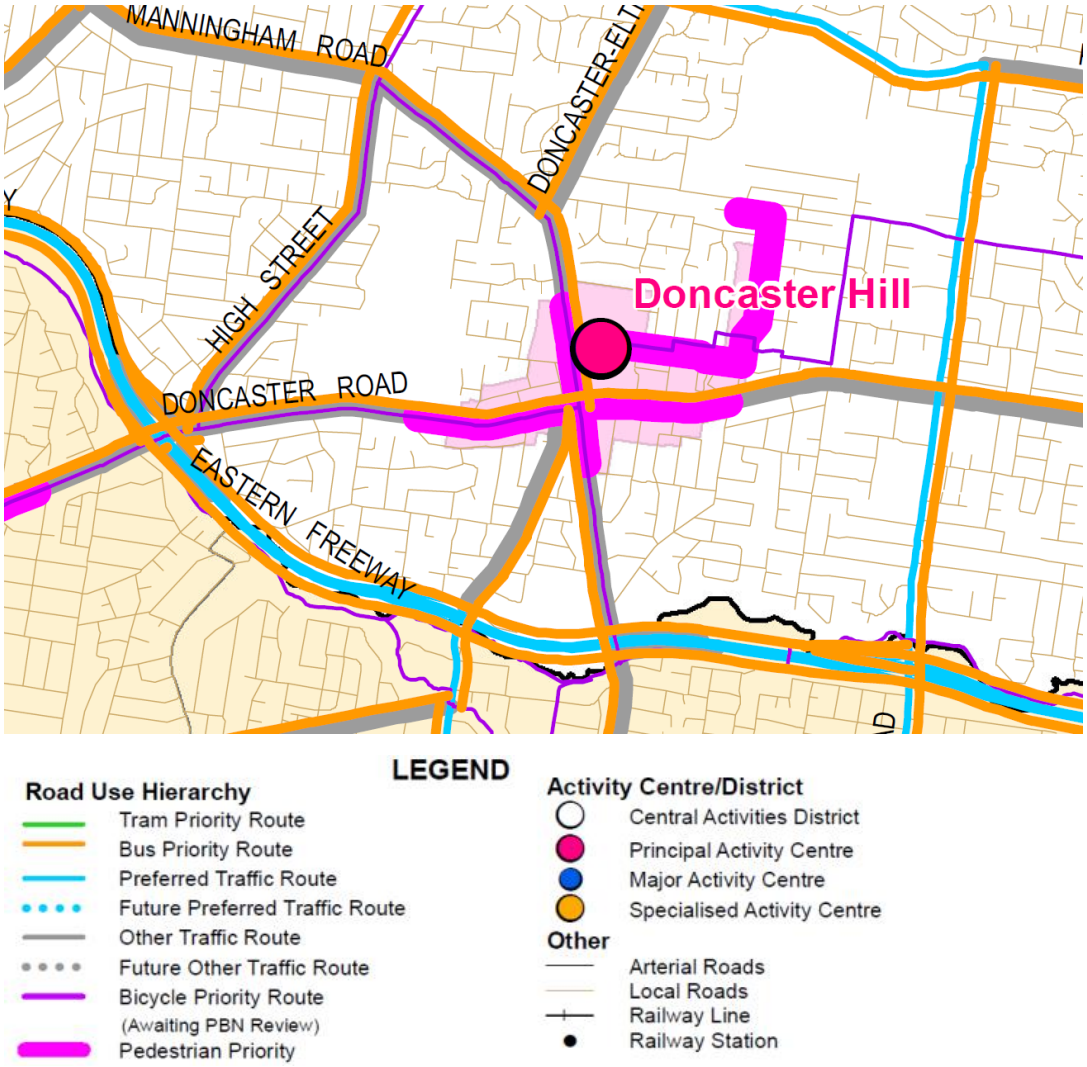
All road users will continue to have access to all roads. However, certain routes will be managed to work better for cars while others for public transport, cyclists and pedestrians during the various peak and off-peak periods. In this regard, the following is noted by VicRoads for the various modes assigned to arterial roads across the network that form part of the Network Operating Plans:

- *Facilitate good pedestrian access into and within activity centres in periods of high demand*
- *Prioritise trams and buses on key public transport routes that link activity centres during morning and afternoon peak periods*
- *Encourage cars to use alternative routes around activity centres to reduce the level of 'through' traffic*
- *Encourage bicycles through further developing the bicycle network*
- *Prioritise trucks on important transport routes that link freight hubs and at times that reduce conflict with other transport modes*

An extract focused on Doncaster Hill of the VicRoads SmartRoads Network Operating Plan for Manningham is reproduced in Figure 3, noting that the following active transport priorities exist within the Doncaster Hill Activity Centre:

- Pedestrian priority routes along Doncaster Road and Williamsons Road, as well as a route to the northeast that connects Schramms Reserve and Ruffey Lake Park.
- Bicycle priority routes along Doncaster Road and Williamsons Road, as well as a route along local roads to the east that connects with Church Road and George Street.

Figure 3: Doncaster Hill Extract of the Manningham Network Operating Plan



Source: VicRoads Website

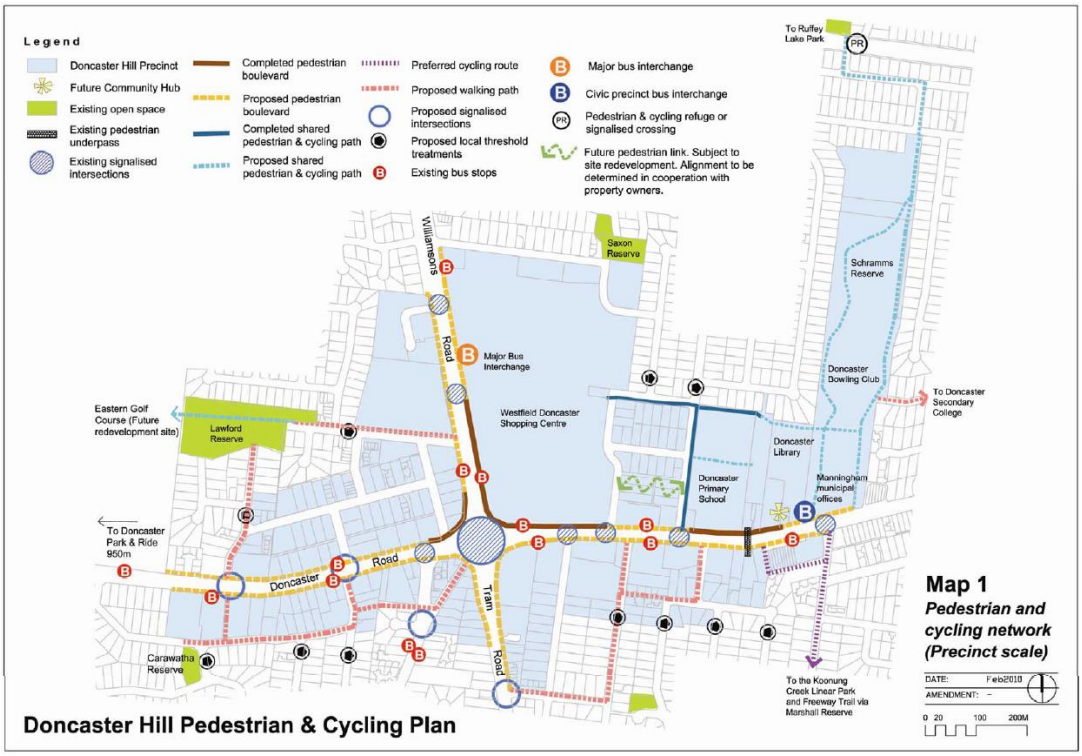
Doncaster Hill Pedestrian and Cycling Plan, 2010

The Doncaster Hill Pedestrian and Cycling Plan sets out the facilities, services and activities proposed to be undertaken to help facilitate the option for people who choose to walk or cycle to and within the Doncaster Hill Activity Centre. It also looks to support public transport use, as it typically requires people to walk or cycle either end of such a trip to access many trip generators in the precinct.

The core of the Plan is based around providing the proposed facilities indicated in the plan reproduced in Figure 4, which directly connecting the site, included the following facilities:

- Pedestrian boulevards along Doncaster Road and Williamsons Road
- Walking path along Lawford Street
- Shared pedestrian and bicycle path along south side of Goodson Street and north side of the Doncaster Primary School and Manningham Municipal Offices.

Figure 4: Doncaster Hill Pedestrian and Cycling Plan – Pedestrian and Cycling Network



Source: Page 13 of the Doncaster Hill Pedestrian and Cycling Plan, 2010

Summary of Overarching Objectives, Principles & Desired Outcomes for Active Transport

Given the above summaries of the policy documents relating to active transport for the site and within the Doncaster Hill Activity Centre, the overarching objectives, principles and desired outcomes are considered to exist:

- A more sustainable and accessible transport system is required to support the future level of development in the area, i.e. increase the current alternative transport mode share from 20% to 30%.
- There is a significant opportunity to help achieve the desired mode shift through an increased use of active transport for trips of 2.5km or less.
- Boulevard landscape treatments are to be provided along both sides of Doncaster Boulevard, Williamsons Road and Tram Road in order to help provide a pedestrian focused environment.
- Ensure that development facilitates a permeable, activated, connected, safe (includes passive surveillance) and comfortable pedestrian environment adjacent to the proposed boulevards and with strong linkages within Doncaster Hill to key trip generators and passive open space.
- Provide appropriate amenities for pedestrians and bike riders as part of new developments, including:
  - 'after trip' facilities for bicycle users, joggers, etc. (e.g. such as secure bicycle storage, showers and changing rooms)
  - access to facilities to be centrally and easily accessed.

Pedestrian Network & Facilities

Generally speaking the pedestrian network and facilities within the Doncaster Hill Activity Centre are of a good level, with footpaths on both sides of roads and crossing facilities provided at each key intersection and at regular spacings along the major roads.

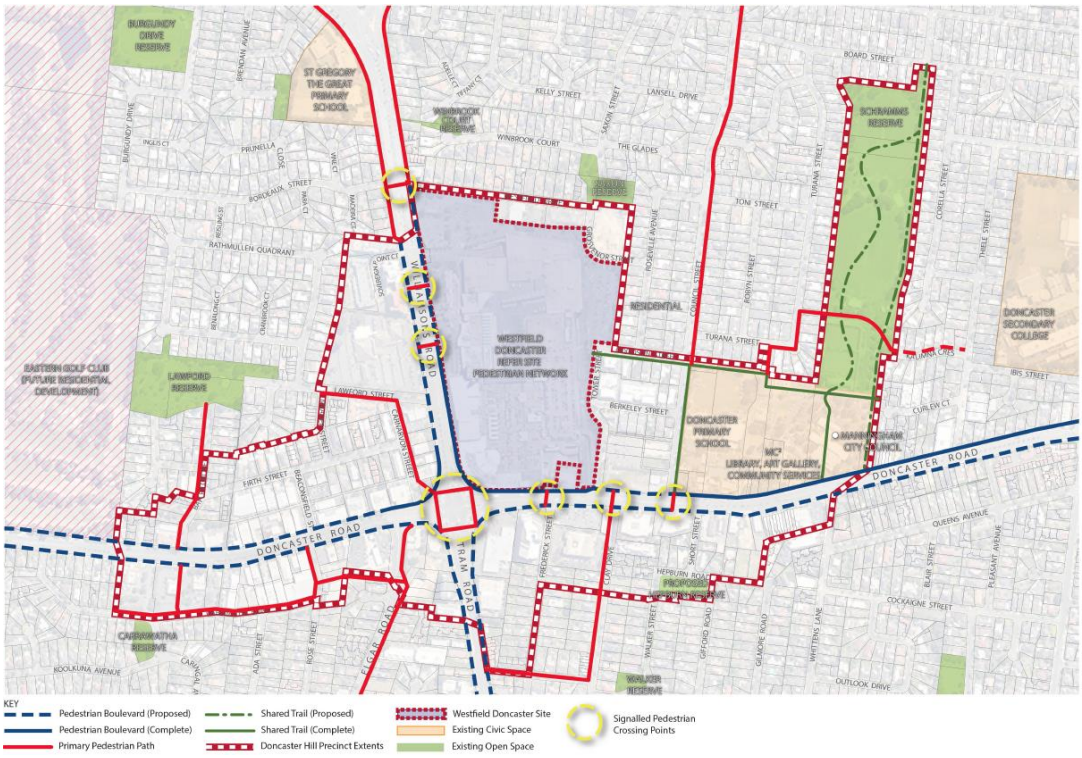
However, given the proposed level of development at the Doncaster Westfield Shopping Centre and the desire by Council to provide a high quality pedestrian environment within the overall precinct, it provides an opportunity to improve the offering and level of attractiveness for pedestrians to access the site by walking. How this is ideally and feasibly provided is outlined below from a context and site specific perspective.

Surrounding Site Context

The surrounding site context is a function of the existing pedestrian network and location of the key trip generators. As such, and based on the background policy documents summarised above, the main desire lines and facilities in the Doncaster Hill Activity Centre, as well as to/from the site, are presented in Figure 5.

With regard to the provision of the majority of the surrounding pedestrian facilities, this is considered to generally be the responsibility of Council, except where there is opportunity along the frontage of new development to coordinate it with them, such as the frontages with the proposed development of the Doncaster Westfield Shopping Centre, as further discussed below.

Figure 5: Pedestrian Network & Facilities - Surrounding Site Context

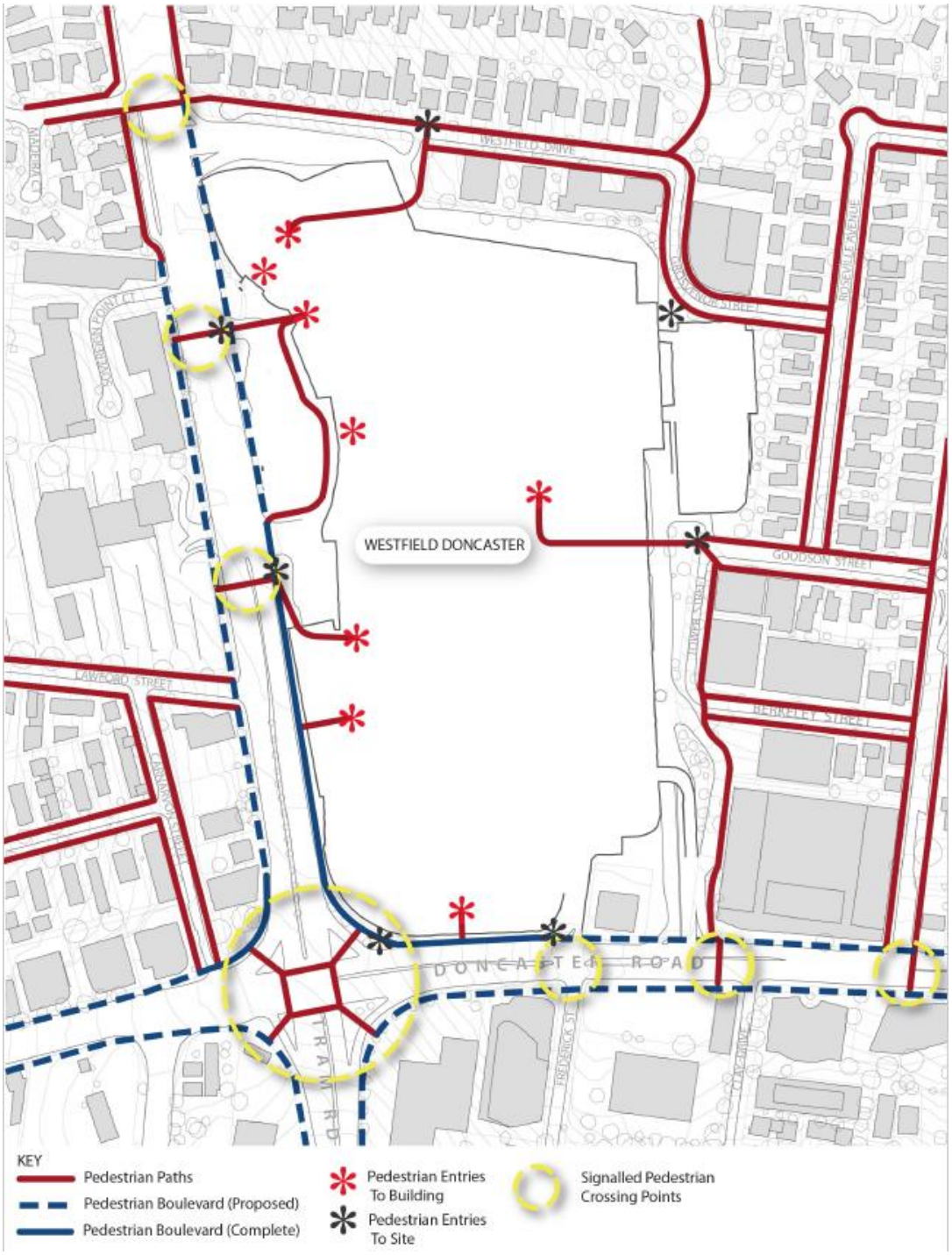


(prepared by Land Design Partnership)

Site Interface & Internal Access Arrangements

Consideration has been given to where the desire lines associated with the surrounding site context shown in Figure 5 interface with the site and how they align with the key pedestrian entrances to the shopping centre building proper. These are broadly shown within Figure 6.

Figure 6: Pedestrian Network & Facilities – Site Interface & Internal Access Arrangements



(prepared by Land Design Partnership)

Figure 6 indicates that the site has a high level of access from Doncaster Road and Williamsons Road through the pedestrian boulevard treatments and regular signalised crossing facilities. In terms of access from the other frontages, they are of a lower level but considered to be appropriate given the likely level of demand being generated by the proximate land uses.

These pedestrian facilities proposed along the road frontages and internal to the site in Figure 6 are what can be expected to be generally provided as part of the development proposal for the Doncaster Westfield Shopping Centre.

It is noted that given the terrain and existing constrains, not all facilities or to a standard that is considered desirable may be possible, such as the pedestrian boulevard along the Williamsons Road frontage of the site, which is constrained by the proposed bus interchange improvements and the existing building that will remain.

Bicycle Network & Facilities

Bicycle use within the Doncaster Hill Activity Centre is currently very low. This is considered to be due to the terrain, lack of network and facilities that generally users would consider safe, as well as a general lack of end-of trip facilities.

As such, there is considered to be limited ability as part of the proposed development of the Doncaster Westfield Shopping Centre to achieve any significant growth in bicycle use. However, opportunities to start providing and future-proofing for a suitable network and facilities that will attract users are outlined below from a context and site specific perspective.

Surrounding Site Context

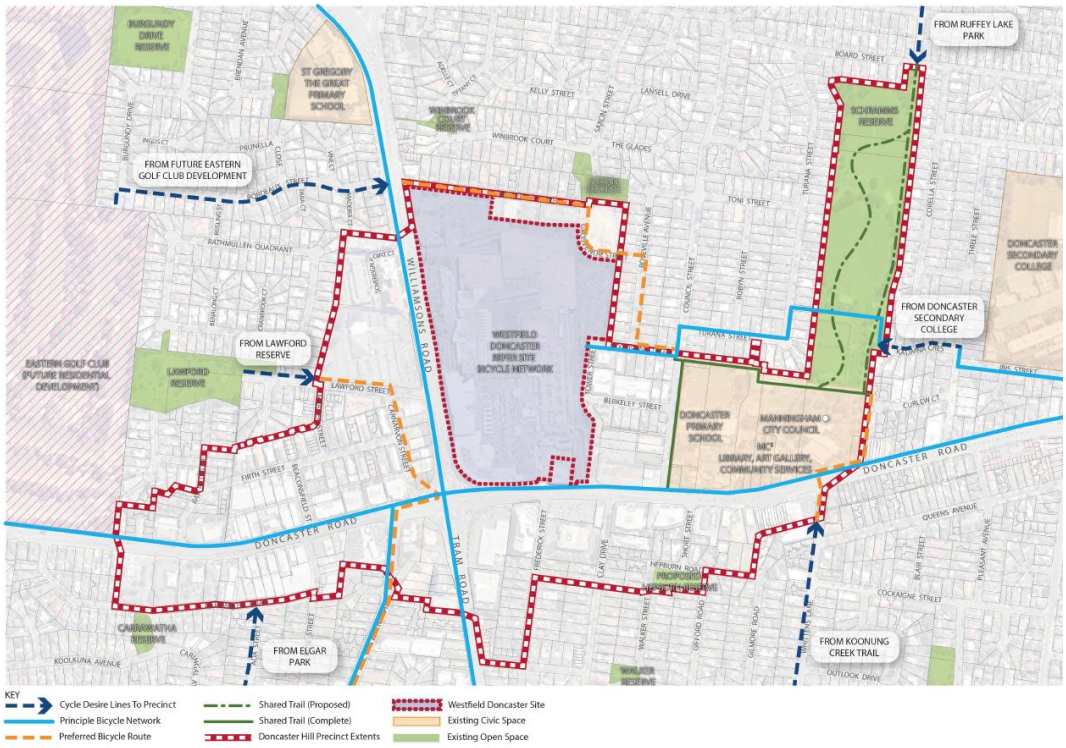
Based on the background policy documents summarised above, the main desire lines and facilities through the Doncaster Hill Activity Centre, as well as to/from the site, are presented in Figure 7.

Connecting bicycle routes, indicated as 'Preferred Bicycle Routes' in Figure 7, have been identified for Council's consideration in starting to provide a suitable network. The development of the PBN is not considered feasible along Doncaster road and Williamsons Road, as suitable facilities would require the removal of traffic lanes, which would not likely be supported by VicRoads.

However, the use of quiet local roads, such as Westfield Drive, Grosvenor Street, Roseville Avenue and Goodson Street to provide an east-west route, are considered to be suitable and feasible for Council to implement. This would likely require signage and markings that indicate it as a bike route, as well as local area traffic management measures that ensure vehicles volumes and speeds are low and generally consistent with Figure 2.2 from Cycling Aspects of Austroads Design Guides (2014).

Opportunities will exist where signalised intersections are being upgraded or proposed as part of the development proposal for the Doncaster Westfield Shopping Centre to support cyclists, such as the proposed signalised site access on Williamsons Road just south of Westfield Drive. A linking shared path to Westfield Drive and bicycle lanterns on the southern approach to the proposed signalised site access could help support cyclists between Westfield Drive and Bordeaux Street.

Figure 7: Bicycle Network & Facilities - Surrounding Site Context



(prepared by Land Design Partnership)

Site Interface & Internal Access Arrangements

On the basis of the 'Preferred Bicycle Routes' in Figure 7, consideration of how to provide suitable levels of access to, and location of, end-of-trip facilities is provided in Figure 8.

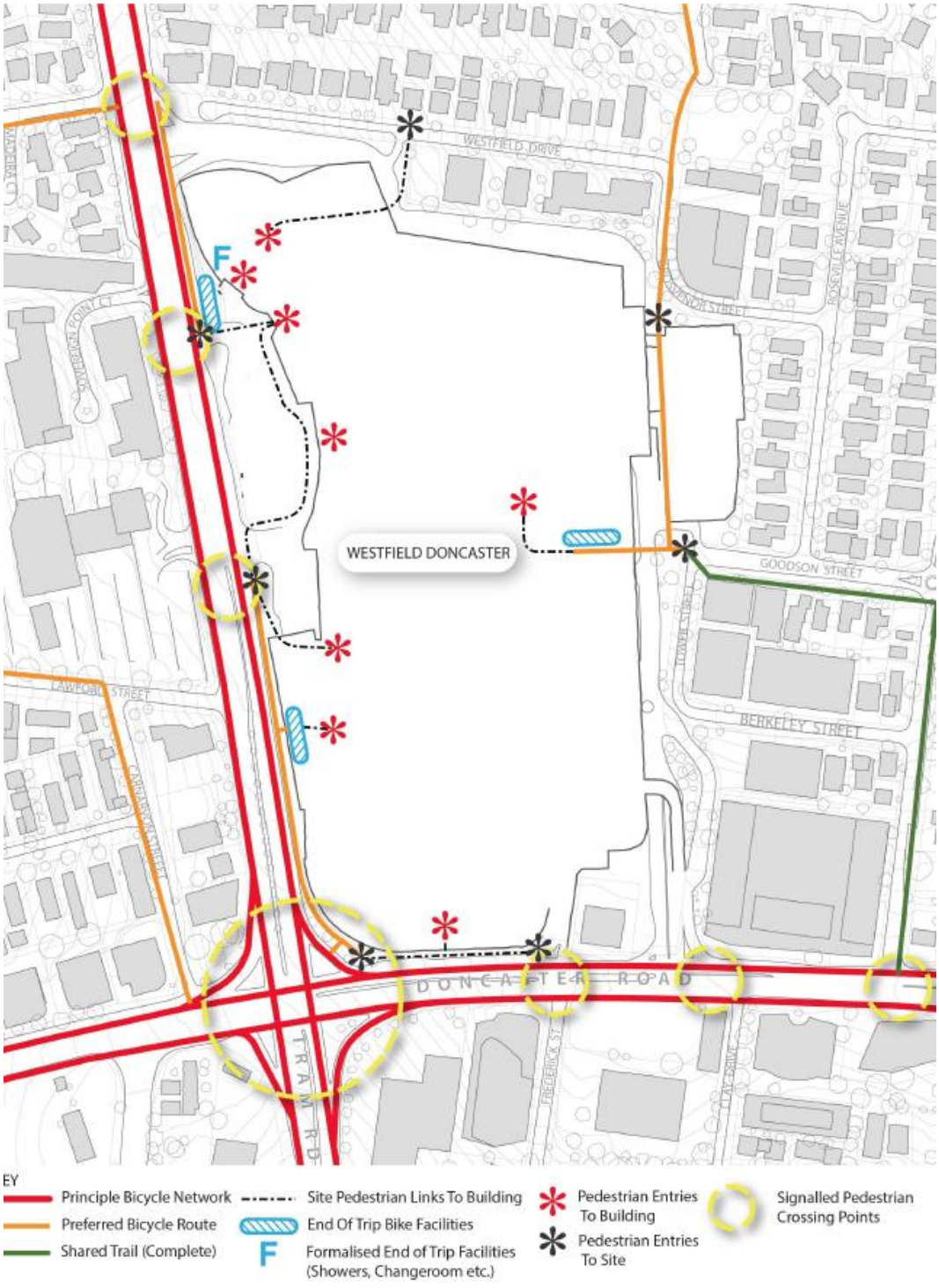
In total there are three locations that end-of-trip facilities are being provided around the site as follows:

- Southwest corner - along Williamsons Road between Doncaster Road and Lawford Street
- Northwest corner - along Williamsons Road opposite Sovereign Point Court
- Midway along the eastern side – opposite Goodson Street

With these locations, they are expected to provide both visitor and staff parking facilities, with only the northwest location proposed to accommodate staff end-of-trip facilities.

It is noted that for the locations along Williamsons Road cyclists will need to travel for short distances along the pedestrian boulevards from the surrounding network to access the parking facilities. This is considered appropriate when supporting the last section of trips terminating within the site. It wouldn't be recommended that through routes for cyclists be encouraged to use the pedestrian boulevard facilities as it will reduce the level of comfort and service to pedestrians, who should be prioritised in this area.

Figure 8: Bicycle Network & Facilities - Site Interface & Internal Access Arrangements



(prepared by Land Design Partnership)

I trust that the above suitably outlines the broad level objectives, principles and desired outcomes for active transport as part of the proposed development of the Doncaster Shopping Centre. Naturally, should you have any questions or require any further information, please do not hesitate to contact me in our Melbourne office on (03) 9851 9600.

Yours sincerely

GTA CONSULTANTS

Alex Blackett
Senior Consultant

Melbourne

A Level 25, 55 Collins Street
PO Box 24055
MELBOURNE VIC 3000
P +613 9851 9600
E melbourne@gta.com.au

Brisbane

A Level 4, 283 Elizabeth Street
BRISBANE QLD 4000
GPO Box 115
BRISBANE QLD 4001
P +617 3113 5000
E brisbane@gta.com.au

Adelaide

A Suite 4, Level 1, 136 The Parade
PO Box 3421
NORWOOD SA 5067
P +618 8334 3600
E adelaide@gta.com.au

Townsville

A Level 1, 25 Sturt Street
PO Box 1064
TOWNSVILLE QLD 4810
P +617 4722 2765
E townsville@gta.com.au

Sydney

A Level 6, 15 Help Street
CHATSWOOD NSW 2067
PO Box 5254
WEST CHATSWOOD NSW 1515
P +612 8448 1800
E sydney@gta.com.au

Canberra

A Tower A, Level 5,
7 London Circuit
Canberra ACT 2600
P +612 6243 4826
E canberra@gta.com.au

Gold Coast

A Level 9, Corporate Centre 2
Box 37, 1 Corporate Court
BUNDALL QLD 4217
P +617 5510 4800
F +617 5510 4814
E goldcoast@gta.com.au

Perth

A Level 27, 44 St Georges Terrace
PERTH WA 6000
P +618 6361 4634
E perth@gta.com.au