



Appendix R

Transport Modelling Report

February 2018

Redacted - commercial-in-confidence

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1 Introduction

1.1 Background and context

This document summarises the strategic transport modelling undertaken for the North East Link (NEL) business case. The proposed NEL connects the eastern end of the Metropolitan Ring Road to the Eastern Freeway and EastLink.

The location of the proposed North East Link is shown in Figure 1.

Figure 1 “The Missing Link” – North East Link.



Source: North East Link Authority

The inclusion of the new link into the road network was examined using a strategic transport model. Outputs from the model were used to forecast the impact of the new road on travel patterns and to estimate the patronage of the new road. The strategic model used was the Zenith model.

1.2 Scope

This document reports on the process and outcomes of forecasting demand for travel on the proposed North East Link. It includes forecasts of patronage of the toll road and analysis of the impact of the proposed new road network link on Melbourne’s transport networks.

The traffic and transport forecasts presented in this report have been used by the following North East Link project teams:

- The technical advisory team identified the transport impacts in the study area and developed the project scope, based on observed data and modelled forecasts
- The business case development team used the model results to inform the economic benefits and dis-benefits of the project
- The commercial advisors used the model results to inform their financial advice

- The broader North East Link project team to inform the options assessment phase.

The transport model is dependent on assumptions about changes in economic, social and demographic conditions. These assumptions were provided by DEDJTR for the North East Link project, and are documented in Attachment C – Model development assumptions . There are limitations to both the model input assumptions as well as the outputs that the model produces; this is discussed in Attachment A – Appropriate use of modelled forecasts.

1.3 Approach

The North East Link business case has been developed in four phases:

- Phase 1: Strategic merit test and initial rapid appraisal
- Phase 2: Rapid appraisal
- Phase 3: Detailed appraisal
- Phase 4: Final assessment.

Details of these phases are shown in Table 1 below.

The Zenith strategic transport model for Victoria was used to provide traffic forecasts for each phase.

Table 1 Summary of North East Link options assessment phasing

Phase	Overall Purpose	Model Output Purposes
Phase 1 – Strategic merit test and initial rapid appraisal	To provide a high-level assessment of all project options, and to identify which corridors are to be taken forward for further development.	Strategic merit test. Rapid spatial analysis.
Phase 2 – Rapid appraisal	To provide an indicative assessment of the main benefits and costs, with those which yield net benefits to be taken forward for further assessment.	Rapid CBA. Rapid LUTI.
Phase 3 – Detailed appraisal	To provide a detailed economic evaluation of the remaining project options to identify a preferred option.	Detailed CBA. Detailed land use assessment.
Final assessment	To provide a comprehensive and robust appraisal of the preferred project option. The final assessment will use both 'Reference Case' and 'Do-Minimum' approaches, and provide a range of outcomes.	Full CBA. Detailed LUTI assessment. CGE modelling. Distributional analysis. Real options. Value creation assessment.

Source: Adapted from Ernst and Young

1.4 The Zenith model

1.4.1 Track record

The Zenith Victoria model is one of a family of models developed by VLC for transport planning in Australian cities and regions. It is a mature model that has been developed to its current state over a period of more than twenty years.

Zenith models have a long history, forecasting travel demand for the Victorian State Government, dating back to the early 1990s. They have been used for numerous transport infrastructure business cases, including the CityLink and EastLink, Victoria's two existing toll roads. More recently, the Zenith model of Victoria was used in business case forecasts for the Melbourne Metro project, as well as Melbourne toll road projects such as the West Gate Tunnel (WGT) and CityLink-Tulla Widening (CTW) projects.

The Zenith models have a good track record for forecasting toll road projects, as shown in Table 2; which provides a comparison between Zenith estimates of toll road traffic volumes and the observed volumes (approximately 18 months after opening).

The Zenith transport model of Victoria has been reviewed on several occasions by independent toll road forecasting and modelling experts such as John Allard, Director at Allard Transport and Management Consulting, Dr Robert Bain, Managing Director at RBconsult; Fotios Spiridonos former Manager of Transport Modelling and Analysis, Planning and Policy Division, DTPLI; and Dr Frank Carnovale former Manager Transport Network Modelling at VicRoads.

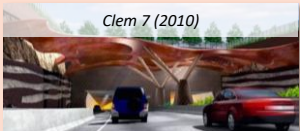
Table 2 Comparison of forecasts



Zenith: Sophisticated Toll Choice Modelling

VLC Predictions and Actual Traffic Volumes on Australian Toll Roads



Toll Road		Actual Volume	Winning Bid Forecast	Zenith Forecast
	Cross City Tunnel, Sydney	32,500	90,000 (+175%)	30,000 (-8%)
	Lane Cove Tunnel, Sydney	57,000	~115,000 (+100%)	62,000 (+9%)
	Clem 7, Brisbane	26,000	109,000 (+320%)	34,000 (+31%)
	Airport Link, Brisbane	53,300	195,000 (265%)	54,000 (+1%)

1.4.2 North East Link model development

As the project progressed, the model was adjusted to include improved data and updated assumptions. The iterations of the model are explained below:

Model A

Model A was used in Phase 1¹ of the North East Link project evaluation. It was determined that Model A would be maintained and validated across all of Melbourne for 2011, while a 2014 model would be implemented for the local area model validation specific to the North East Link project in Phase 2.

Model B

Model B has been developed for Phase 2 of the North East Link project evaluation, incorporating the options assessment process. It was determined that 2014 would be an appropriate year to validate the North East Link Phase 2 model, due to:

- The availability of observed data
- Several road upgrades which were under construction in the years prior, including the:
 - M80 upgrades completed between 2009 to 2013
 - Monash-CityLink-M1 Upgrade project completed in 2010.

Model C

Model C has been developed for use in Phase 3 and the business case. It has a base year of 2016 and contains updated assumptions from version 1.09 of the reference case as provided by Transport for Victoria (TfV).

Reporting on the validation of the Model used as Model C is contained in Attachment B – Model validation .

1.4.3 Transport modelling governance

The Deputy Secretary, Transport is responsible for transport modelling approaches and assumptions. A Project Modelling Steering Committee and Project Modelling Technical Advisory Group have been established to support the Deputy Secretary, Transport. Alternative approaches to the guidance can be endorsed by the Deputy Secretary Transport under the Department's transport modelling governance arrangements through the Transport Modelling Steering Committee.

The Project Modelling Steering Committee agrees to policy and technical issues associated with transport modelling and provides recommendations to the Deputy Secretary, Transport for authorisation.

Project Modelling Technical Advisory Group considers each individual input or approach, and provides technical advice and recommendations to the Project Modelling Steering Committee.

All assumptions documented in this report have been developed through this framework.

¹ See Table 1 Summary of North East Link options assessment phasing.

1.4.4 Peer review

Under the North East Link Transport Modelling and Evaluation Framework, a peer review process has been facilitated to assess the transport modelling undertaken for the business case. The process provides an opportunity for an independent review of the modelling and analysis framework, model validation and input assumptions, as well as the resultant demand forecasts.

1.5 Limitations and interpretation

Four-step transport models are commonly used for predicting the impacts of population and employment growth and changes to the transportation network or travel costs, for testing and analysing the impact of different scenarios and for planning of future transport infrastructure and policies. They are still the most common approach used by transport practitioners to evaluate the potential impacts of transport projects. However, they rely on third party inputs, typically forecast using current behaviour, and only partially constrained travel demand. The application and interpretation of transport models and their outputs should be qualified by their known limitations. This is discussed in detail in Attachment A – Appropriate use of modelled forecasts, which summarises a number of key limitations and uncertainties in four-step transport models.

2 Model development

The Zenith model was recalibrated in 2014 using model parameters generated from the latest available Victorian Integrated Survey of Travel and Activity (VISTA07 and VISTA09 – the combined database is referred to as VISTA), and validated to 2011 traffic and public transport patronage estimates, it was then further re-validated to 2016 data as part of the Model C development.

Details of the VISTA calibration process are described and reported on in Zenith model framework working papers and Zenith Victorian working papers which were produced as part of the Zenith Model Licensing Agreement, as listed below.

The recalibration reports are available on the Veitch Lister Consulting website at:
<http://www.veitchlister.com.au/zenith/documentation/victoria>

Zenith Framework Working Papers

- Zenith Framework Working Paper A: Model Design and Architecture
- Zenith Framework Working Paper B: Household Segmentation
- Zenith Framework Working Paper C: Trip Productions
- Zenith Framework Working Paper D: Travel Market Segmentation
- Zenith Framework Working Paper E: Destination Choice
- Zenith Framework Working Paper F: Period Allocation
- Zenith Framework Working Paper G: Mode Choice
- Zenith Framework Working Paper H: Static Traffic Assignment
- Zenith Framework Working Paper I: Static Transit Assignment.

Zenith Victorian Working Papers

- Working Paper 2 – Review of VISTA
- Working Paper 3 – Household Segmentation Model
- Working Paper 4a – Home Based Trip Production Model
- Working Paper 4b – Non Home Based Trip Productions
- Working Paper 5 – Travel Market Segmentation Model
- Working Paper 6 – Destination Choice Model
- Working Paper 7 – Period Allocation Model
- Working Paper 8 – Mode Choice Model
- Working Paper 9 – Model Validation.

3 Model validation

The objective of model validation, realism and stability process is to provide confidence that the model is accurately representing current conditions in traffic and toll road patronage, and can be relied upon to respond to cost and other changes in assumptions in a reasonable way.

The State of Victoria has prepared two transport modelling guidelines that specifically relate to traffic model validation, including:

- 1 VicRoads “*Transport Modelling Guidelines, Volume 2: Strategic Modelling, Version: Draft 3*” dated 26 April 2012 – which sets out the approach and criteria recommended by VicRoads for the validation of strategic transport models
- 2 Department of Economic Development, Jobs, Transport and Resources (DEDJTR) “*Strategic Transport Model Elasticity Guidelines*”, dated 16 December 2015 – which sets out ‘dynamic validation’ realism tests (sensitivity scenarios on the base case transport model) and provides a range of approximate elasticity values. These ranges have been estimated by DEDJTR, while ranges developed from local data are not utilised. For this reason, the modelled results were compared to elasticity ranges from both international estimates, as well as DEDJTR’s estimates.

The latest version of the Zenith model has been through a model validation process. Based on the model validation, realism comparisons (international and DEDJTR) and proof of model stability, it is reasonable to accept that the base year model provides a sound foundation which is appropriate for the evaluation of the North East Link project.

However, it should be noted that demand forecasts are dependent on the assumptions made about changes in economic, social and demographic conditions². As such the accuracy of the transport model’s validation, including realism, stability and convergence, does not assure accurate demand forecasts.

The performance of the Zenith 2016 base year model in the NEL study area is documented in Attachment B – Model validation .

² Assumptions were provided by the State Government in their reference case specifications.

4 Model assumptions

4.1 Core scenarios

A number of future year demand scenarios were considered as part of the study. The future year demand scenarios are summarised below:

- 2026 base case (no project)
- 2026 North East Link project case
- 2036 base case (no project)
- 2036 North East Link project case
- 2051 base case (no project)
- 2051 North East Link project case.

4.2 Future year assumptions

This section identifies the transport model assumptions used in the future base case scenarios.

The forecast year 2036 is the core evaluation year for the detailed appraisal phase of the NEL project options assessment because it coincides with State Government reference case forecasts and aligns with typical practice of evaluating projects approximately 10 years after opening. In addition, 2026 and 2051 forecast years were developed to assist in analysing expected changes in network benefits over time, traffic growth, expected revenue and long-term project functionality.

The TfV reference case model assumptions were used for most of the future base case assumptions. These are listed in detail in TfV Reference Case v1.09, Interim Road Networks (170710) & VIF2015 Land Use, by TfV, received 12 July 2017.

The TfV reference case model assumptions are described in the appendices of Attachment C – Model development assumptions, including any updates by the project team and the reasons for these changes.

4.2.1 Model coverage

The Zenith model covers the whole of Victoria, as shown in Figure 2.

Figure 2 Area covered by the model



4.2.2 Standard travel zone system

The modelled area is divided into travel zones. The model uses a travel zone system that was originally developed specifically for large infrastructure projects in Victoria. It is based on an aggregation of the Zenith Small Area Travel Zone System. There are 3,477 zones across the entire travel zone coverage, as seen in Figure 3.

Figure 3 The standard Zenith travel zone coverage



4.2.3 Demographics

TfV provided land use and demographic forecasts as part of its v1.09 reference case, based on Victoria In Future 2015 forecasts.

Some adjustments to the data provided were essential to be fully concordant with the variable definitions required and larger model zone system. In summary, they included:

- Changes to the model's standard travel zone system
- Changes to car ownership
- Changes to tertiary enrolments
- Inclusion of blue and white collar splits for each employment category.

4.2.4 Transport network

The model's transport network contains freeways, arterial and collector roads, railway lines and road infrastructure dedicated to the use of trams and buses. It also includes details of all public transport routes, stop locations, service frequencies and stopping patterns by time of day, along with some key shared paths (bicycle and walking only routes). TfV provided road and public transport network assumptions as part of its v1.09 reference case.

4.2.4.1 Road network

The road network specifications were provided by TfV as part of its v1.09 reference case (Interim Road Networks), detailing a list of proposed upgrades.

Key projects **included** in the base case road network are

- CityLink Tulla Widening (M1 to Melbourne Airport) in 2026
- M80 Upgrade (M1 to Greensborough Hwy) in 2026
- West Gate Tunnel in 2026
- Monash Freeway upgrade in 2026
- Aitken Boulevard (E14) in 2036
- Outer Metropolitan Ring (OMR) Road, including E6, in 2051.

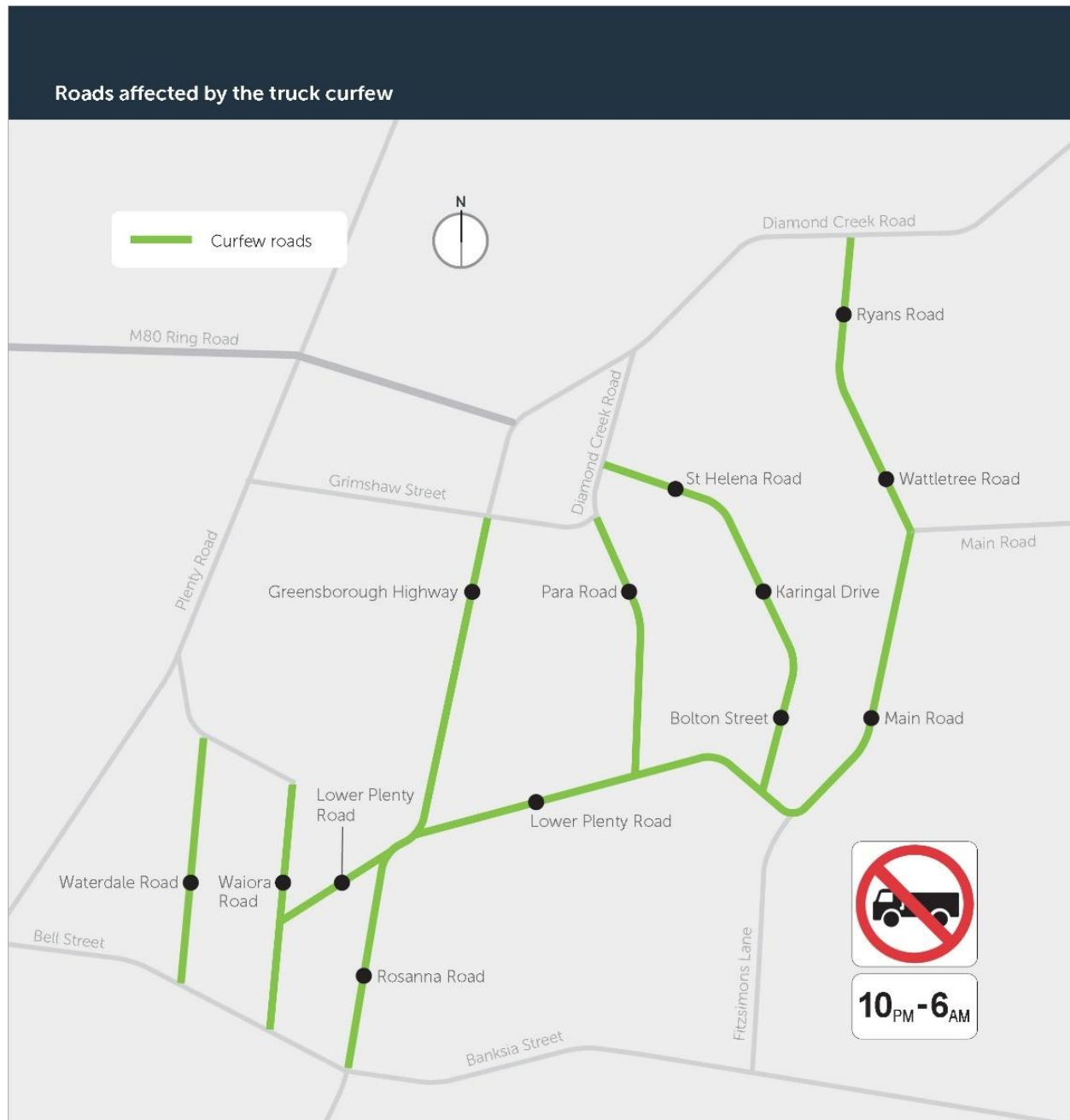
Key projects **excluded** from the future base cases are:

- North East Link (i.e. the Project)
- Craigieburn Bypass widening
- EastLink widening
- Williamsons Road / Fitzsimons Lane widening
- East West Link – Western Section (WestLink) and Eastern Section.

4.2.4.2 Commercial vehicle bans and curfews

The model's transport network also contains commercial vehicle (CV) bans, reflecting curfews and infrastructure constraints. This includes the night-time North East truck curfew trial that was implemented by VicRoads in 2017, as displayed in Figure 4.

Figure 4 North east truck curfew trial



Source: VicRoads website

4.2.4.3 Public transport

The public transport rail specifications were provided by TfV, detailing a listing of the proposed upgrades to the public transport system; including – as of 2026 – the Metro Tunnel (formally Melbourne Metro) project.

Key projects **included** in the base case rail service plans are:

- Fare Zone change to remove Zone 2 (by extending the Zone 1 / 2 overlap)
- Regional Rail Link – 2016
- Mernda Extension – 2026
- Melbourne Metro – 2026
- Baxter extension – 2026
- Wallan electrification – 2036
- Melton electrification – 2036
- Melbourne Airport Rail Link – 2051
- Rowville Rail – 2051
- Clyde electrification and extension – 2051.

The following projects have been **excluded** from the base cases:

- Avalon Airport Rail Link
- Clifton Hill Metro, Melbourne Metro 2 from Clifton Hill to Newport
- Doncaster Rail
- Geelong electrification
- Pakenham East electrification and extension
- Wollert Extension.

4.2.4.4 Tram

The tram networks were based on the PTV Metro Tunnel tram service plans and then adapted to follow the assumptions detailed in the TfV Reference Case.

Key projects **included** in the future base case scenario tram service plans include:

- Fare Zone change to incorporate the free trams in the CBD
- Parkville package – 2026
- Route 68 becomes Glenferrie Rd Shuttle (Malvern to Caulfield) – 2026
- Extension of Route 11 to Fishermans Bend – 2026
- Extension of Routes 70 and 75 to E-Gate – 2026
- Extension of Route 48 to Doncaster Park and Ride – 2036
- Extension of Route 3 to East Malvern Station – 2036
- Extension of Route 5 to Footscray via Dynon Rd – 2036.

Please note, as the reference case specifies no changes to the tram network beyond 2036, the 2036 tram network was therefore adopted for the 2051 tram network.

4.2.4.5 Bus

The model's bus network was provided by TfV as part of its v1.09 reference case for metropolitan bus (including SmartBus) networks. This includes the removal of SkyBus, with the introduction of Melbourne Airport Rail.

4.3 Commercial vehicle demand

4.3.1 Port and rail terminals

The model separately forecasts light commercial vehicle (LCV) and heavy commercial vehicle (HCV) flows for each of its four modelled time periods. It uses vehicle trip generation rates based on blue and white collar workers for 14 different employment types. The model distributes the commercial trips using a gravity based function.

The HCV trips for each port terminal are consistent with the TfV v1.09 reference case.

4.4 Melbourne Airport demand

The methodology for modelling the 'Air Travel' markets is fully integrated into the model. It was developed in 2001 to improve validation of vehicle demands on roads in the general area of Melbourne Airport. Since then, eight airport travel markets have been adopted for the model to represent the different market segments and their specific travel behaviour. These include:

- Sub-divisions of the two primary travel markets ('leisure' and 'business')
- Split between the airport terminals ('domestic' and 'international')
- Air passenger's residence ('local' and 'visitor').

The total numbers for forecast passenger movements at Melbourne Airport and Laverton Airport were sourced from the TfV v1.09 reference case.

4.5 Generalised transport cost parameters

In addition to the infrastructure and operational changes described above, the models are sensitive to transport cost parameters that include:

- Parking supply and price
- Toll levels
- Fuel prices
- Public transport fares
- Public transport reliability.

The forecasts for the transport cost parameters were sourced from the TfV v1.09 reference case. While the reference case provides forecasts for vehicle operating costs, the fuel price forecasts were sourced from a submission from the Business Case advisors to the Transport Modelling and Economics Steering Committee. It is understood that the revised forecasts were developed using historical fuel prices and vehicle efficiency and other international forecasts (e.g. forecasts by World Bank and EIA). These assumptions are summarised in Table 3.

Table 3 Assumed VOC growth rates (CAGR)

Period	TfV Reference Case v1.09	Revised VOC growth rate assumption
2011–2021	0.2%	-2.94%
2021–2031	1.2%	0.03%
2031–2041	0.6%	0.03%
2041–2051	0.1%	0.03%

Both the TfV v1.09 reference case and revised vehicle operating cost forecasts were used in the modelling undertaken for the business case.

4.6 Changes in the value of travel time savings (VTTS)

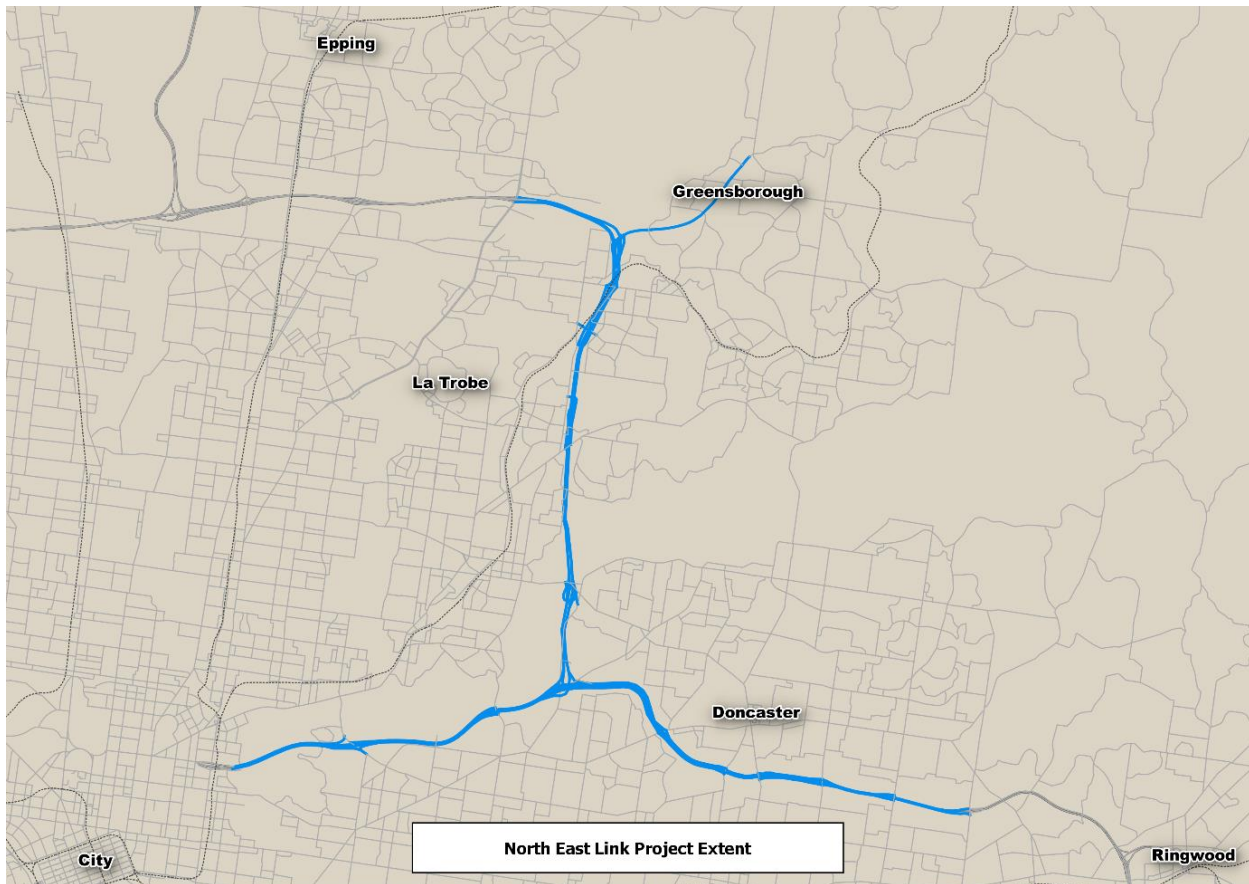
For the base case scenarios, VTTS increases by 1.55% CAGR to 2051 in real terms (i.e. over and above CPI) for cars and commercial vehicles.

4.7 Project assumptions

The project scope within the transport model can be seen in Figure 5. In summary, it includes:

- A connection to Plenty Road on the Metropolitan Ring Road (M80)
- A connection to the Greensborough Bypass
- North East Link from Metropolitan Ring Road (M80) to the Eastern Freeway, freeway management system and tolled
- Interchange connections at:
 - Grimshaw Street
 - Lower Plenty Road / Greensborough Road
 - Manningham Road
- A connection to the Eastern Freeway
- Eastern Freeway upgrades between Chandler Highway and Springvale Road
- Implementation of a freeway management system on the Eastern Freeway
- Eastern Freeway bus lanes for the Doncaster Busway, for routes 905, 906, 907 & 908.

Figure 5 North East Link project overview



4.8 Model run process

4.8.1 Model software

Zenith operates within the OmniTRANS modelling software package.

4.8.2 Model run methodology

Transport modelling methodology processes are informed by the Victorian transport modelling guidelines prepared by TfV.

These guidelines were prepared in 2017 and specify the use of a standard approach for trip distribution, referred to as the “loop through distribution” approach. However, this is not consistent with other jurisdictions, including the Australian Transport Assessment and Planning (ATAP) guidelines produced by the Transport and Infrastructure Council, which do not specify a standard approach. However, there is capacity within the Victorian transport modelling guidelines for the Steering Committee to endorse alternative approaches.

The conventional four-step model has four main steps, i.e. trip generation, trip distribution, mode choice and trip assignment. In determining the assignment of traffic trips to the transport network, the models use an iterative process, where each driver seeks to minimise their perceived travel cost (considering travel time and tolls), until no driver can reduce their perceived travel cost by choosing an alternative route.

When four-step models are used to forecast travel into the future, it is typical for the model to be run in one of many ways, including:

- 1 “Loop through distribution” approach, where trip generation is run and iterated through trip distribution, mode choice and trip assignment several times. This means that future congestion levels are considered and will impact the choice of destination and mode.
- 2 “Single distribution” approach has been developed to dampen the effect of destination switching, where trip generation and trip distribution is run once, using the skims that are input to the model in the first iteration and then iterated through mode choice and trip assignment several times.

Both approaches address induced travel demand via a variable trip matrix as specified by the national ATAP modelling guidance.

The undampened “loop through distribution” approach

The undampened “loop through distribution” is illustrated in Figure 6. The approach is the more theoretically natural of the two approaches, in that it considers the impact of future congestion levels on people’s choice of destination. However, as it does not include any dampening of the effect of destination switching, it has been shown that this method over-states destination switching and trip length shortening, thus resulting in a reduction in average trip lengths and vehicle kilometres travelled per capita. The reduction in average trip lengths is not supported by empirical evidence, where the average trip lengths around Australia have generally increased in line with land use pattern changes.

The “single distribution” approach

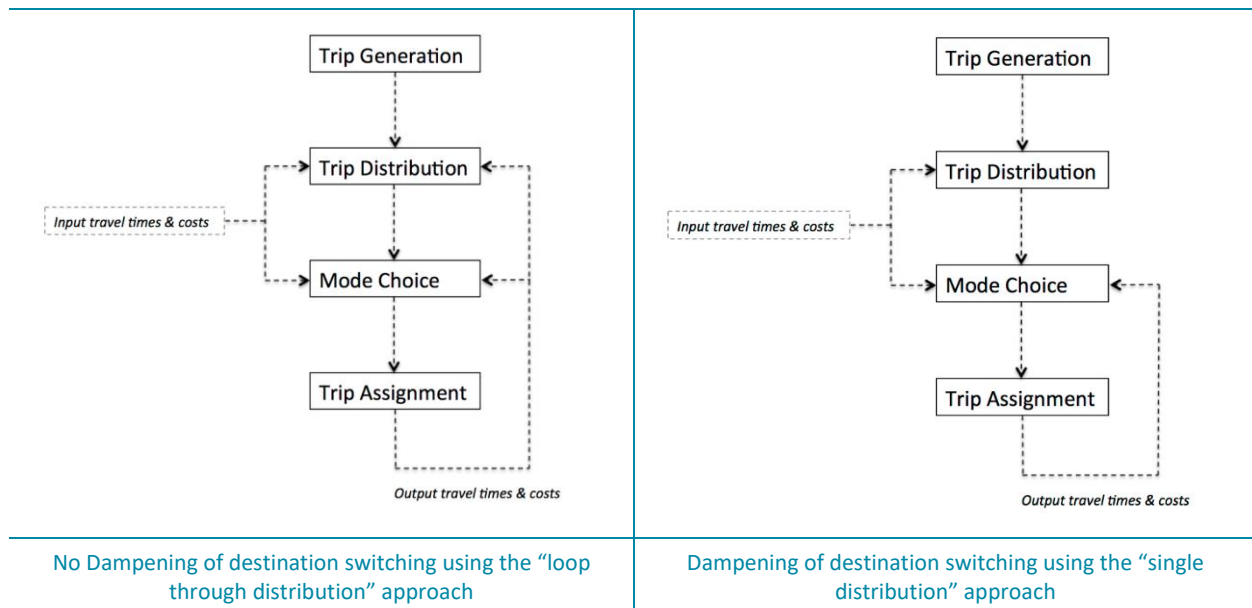
The “single distribution” approach is also illustrated in Figure 6. It is intended as a more pragmatic approach, based on managing the limitations of transport models, in particular, the inability of the model to predict peak spreading.

The “single distribution” approach for travel forecasting dampens the effect of destination switching and best reflects the long term and recent trends in travel behaviour. The results, using this approach, have been compared to long term travel demand datasets sourced both locally and internationally from the Australian Bureau of Infrastructure, Transport and Regional Economics (BITRE), VicRoads, Sydney Household Travel Surveys (SHTS), Victorian Integrated Survey of Travel and Activity (VISTA), Australian Bureau of Statistics (ABS), U.S. Department of Transport, UK Department for Transport as well as numerous academic papers.

As this approach accounts for the impacts of induced demand, best reflects the long term and recent trends in travel behaviour, performs best in “backcasting” scenarios, and has been successfully used on many major projects in Victoria and around Australia, the “single distribution” approach was the preferred four-step travel forecasting methodology for the North East Link project.

The impact of the “loop through distribution” approach on North East Link traffic volume forecasts is additionally presented in Section 9.

Figure 6 Structure of a four-step model with feedback the demand model



Utilising the base case assumptions (listed in the above sections), the models was iterated through the mode choice and assignment (private vehicle, public transport and active transport) five times using a trip matrix averaging technique. Within each forecast full model iteration, the highway assignment was iterated 100 times using a volume averaging technique and the public transport assignment was run once for the unconstrained public transport model runs.

4.8.3 Toll diversion road assignment

The Zenith traffic assignment algorithm allows the presence of tolls (single tolls or multiple tolls) to influence driver route choice. A series of toll diversion curves were used to calculate the proportion of drivers that would pay a specified toll for a given travel time saving.

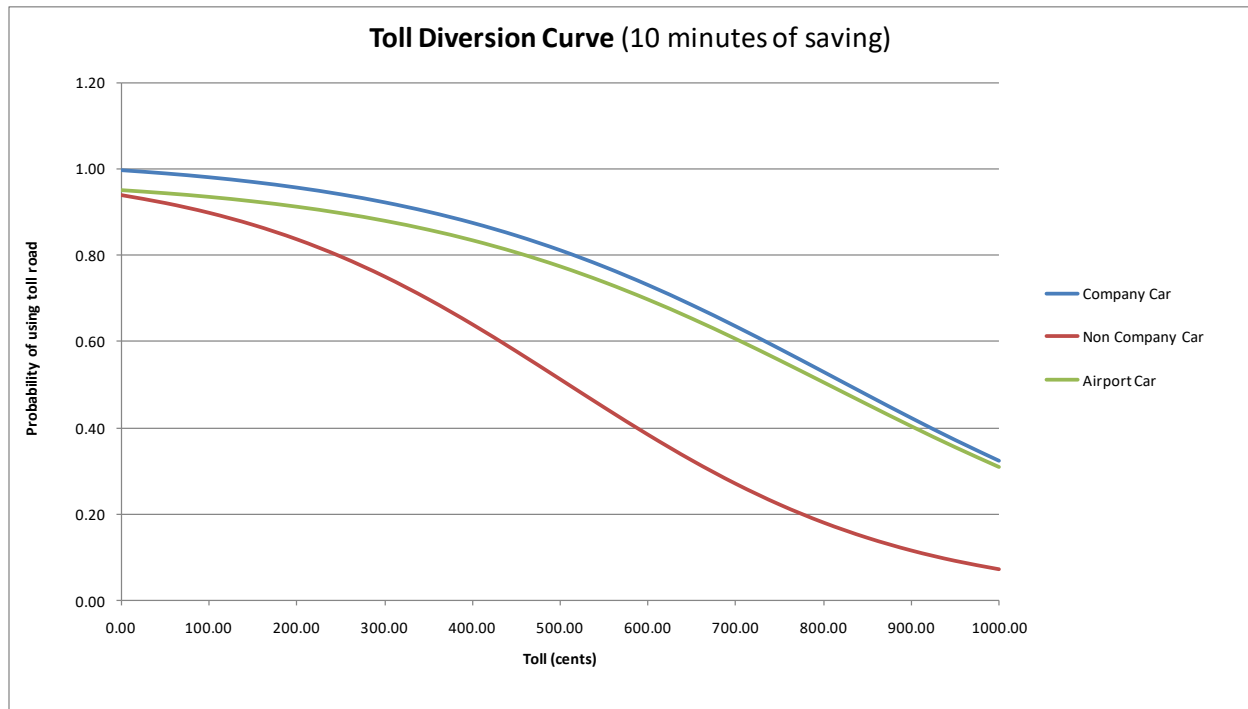
For the car travel market, separate toll diversion curves were applied for company cars, non-company cars and vehicles travelling to and from the airport. For commercial vehicles, separate toll diversion curves were applied for light commercial vehicles and heavy commercial vehicles.

Based on research undertaken in Melbourne, it was concluded that the accuracy of traffic forecasts under tolling regimes are significantly improved when this level of market segmentation is included in the traffic assignment process.

An example of the toll diversion algorithm is presented in Figure 7. In this example, the curves show how the number of toll payers reduces as tolls are increased in the case where the tolled route options offer a 10 minute time saving.

The toll diversion curves used to construct Figure 7 were derived from over 5,000 revealed preference interviews conducted in Melbourne. These have also been applied successfully within both the Sydney and South East Queensland versions of the Zenith model.

Figure 7 Example Zenith toll diversion curves



During the Zenith traffic assignment processing the traffic travelling between each origin – destination zone pair was split into toll payers and non-toll payers, based on the utility of the tolled route options versus the best non-tolled route option. The routes that toll payers would choose was then spread across the tolled route options based on their relative utility.

The latter step is required when there is more than one tolled route option available – which in many instances is the case in Melbourne. The toll diversion process is documented in detail within the recalibration reports available on the Veitch Lister Consulting website.

5 Model results

– A future without the project

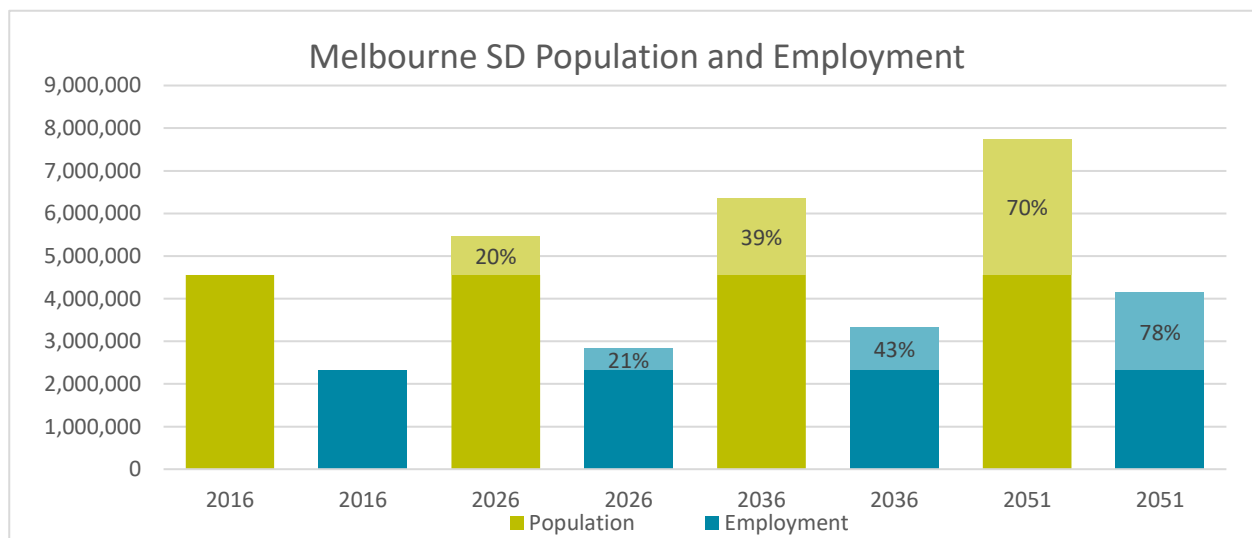
5.1 Growth in travel demand

The transport model incorporates a number of key drivers of travel growth, including:

- Population growth in the outer suburbs
- Employment growth in the CBD and inner suburbs
- Transport infrastructure investment
- Costs of travel (e.g. fares, tolls, fuel, parking).

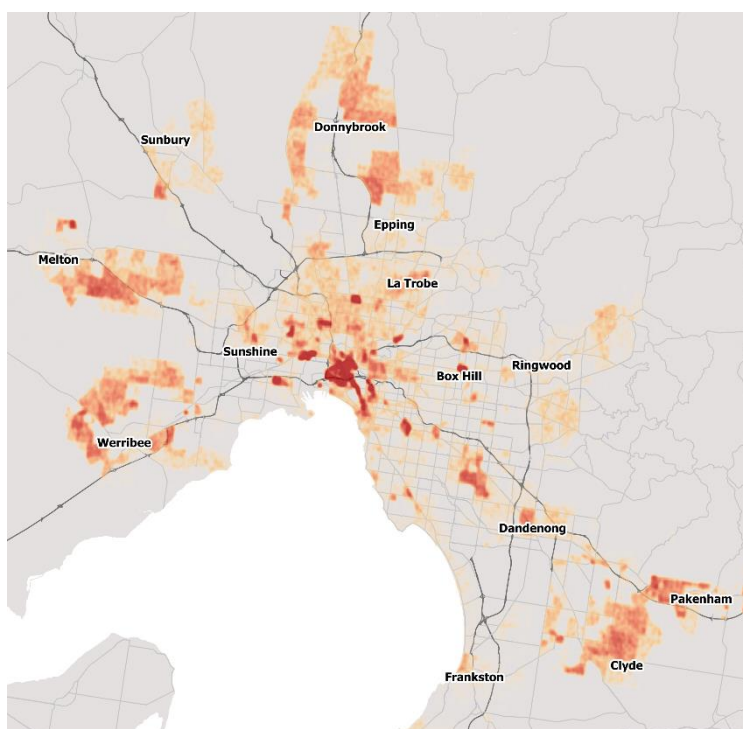
The State Government population forecasts (Victoria in Future) and employment forecasts (produced by SGS for DEDJTR) suggest significant growth in population and employment for the Melbourne area over the forecast period. The increases in population are forecast to be of the order of 20% between 2016 and 2026, 39% between 2016 and 2036 and almost 70% between 2016 and 2051, as highlighted in Figure 8. Employment is also expected to grow strongly with increases of 21% between 2016 and 2026, 43% between 2016 and 2036 and almost 78% between 2016 and 2051 predicted.

Figure 8 Forecast population and employment, metropolitan Melbourne



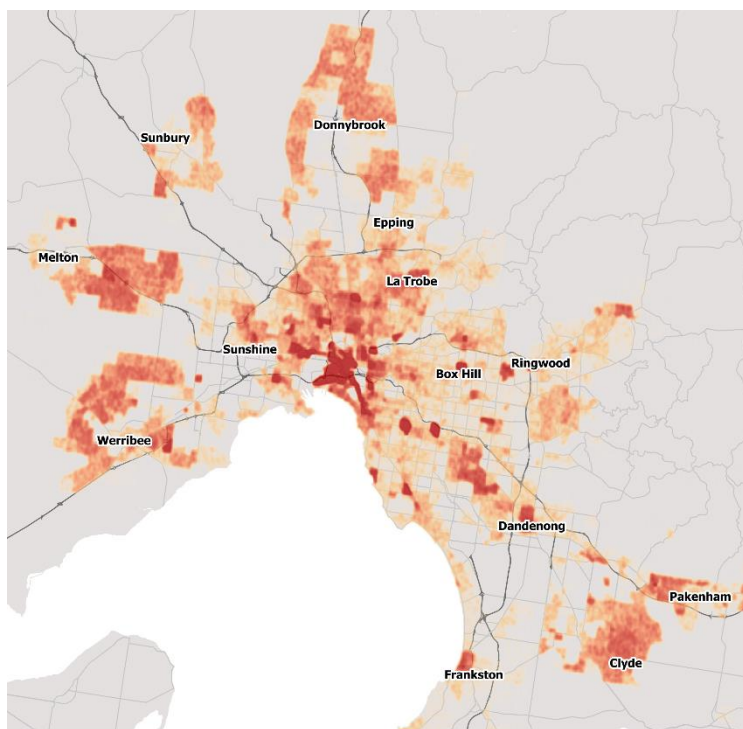
The spatial distribution of the population growth will shape the future transport demand. Figure 9 shows the geographic areas of population growth within metropolitan Melbourne, while Figure 10 shows the resultant distribution of population as a result of the expected population growth.

Figure 9 Growth of population around Melbourne (2016 to 2036, 2016 to 2051)



Population growth by 2036 (VIF 2015)

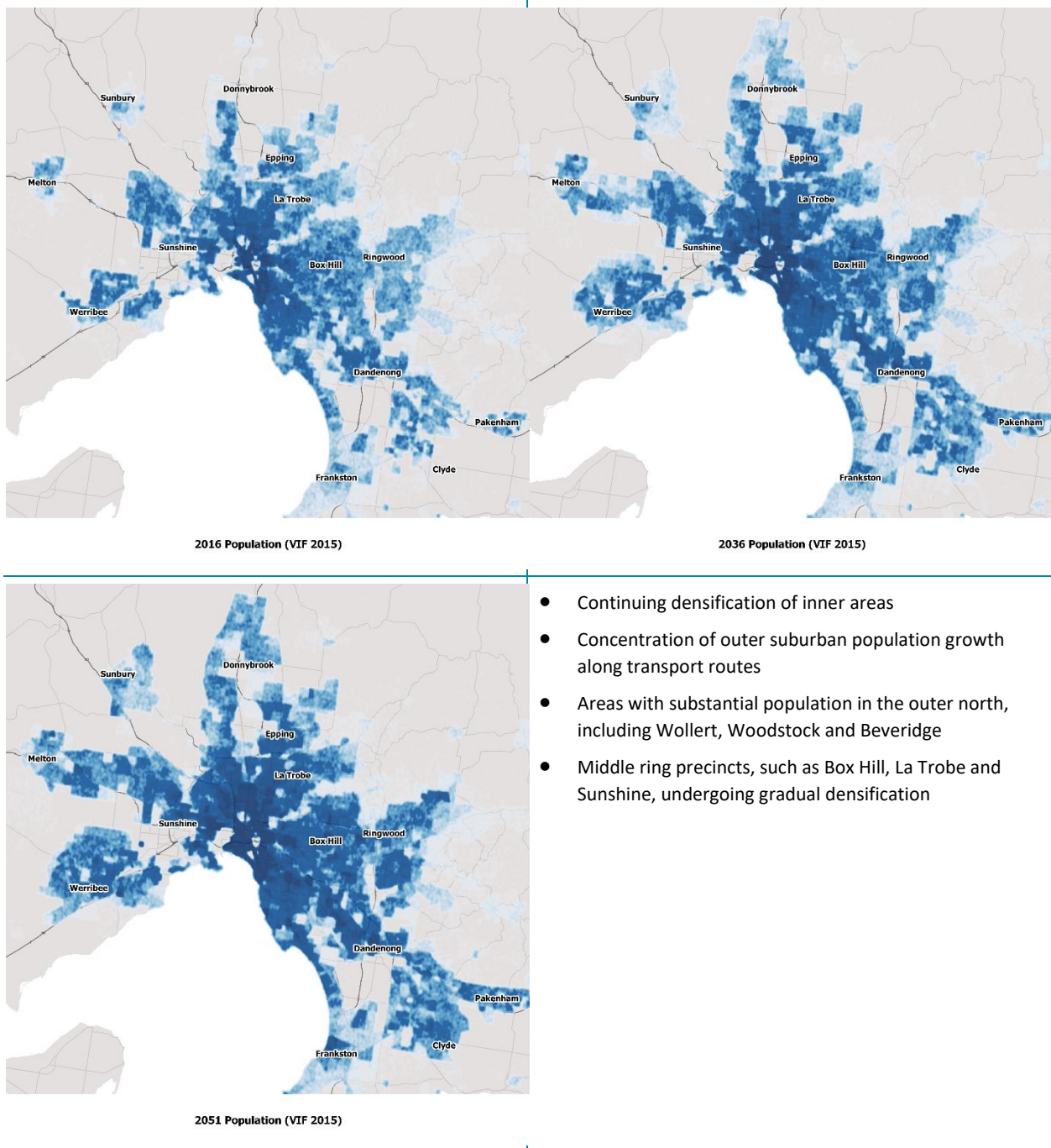
- Strong growth in the inner City and St. Kilda Road corridor
- Strong growth in suburban centres of Box Hill, Doncaster, Watsonia, as well as the inner northern suburbs
- Growth in outer growth areas, including Donnybrook, Wollert, Werribee, Melton, Dandenong, Pakenham, Clyde
- Growth in the LaTrobe NEIC precinct



Population growth by 2051 (VIF 2015)

- Strong growth in the inner City, Footscray and St. Kilda Road corridors
- Continued strong growth in centres of Box Hill, Doncaster, Watsonia as well as the northern suburbs
- Strong growth in suburban centres of Nunawading and Lilydale
- Strong growth in outer growth areas, including Donnybrook, Wollert, Werribee, Melton, Dandenong, Pakenham, Clyde
- Continued growth in the LaTrobe NEIC precinct

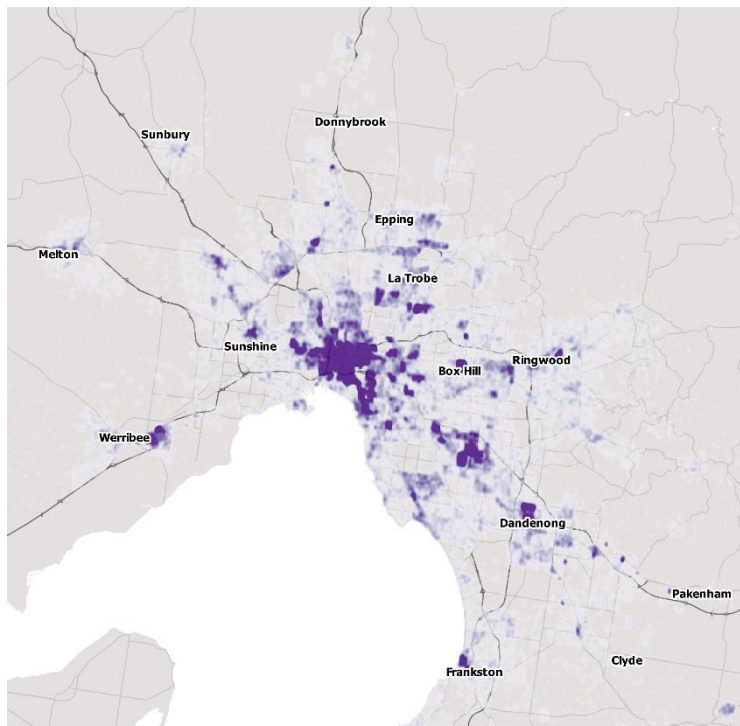
Figure 10 Forecast of population distribution (2016, 2036 & 2051)



Along with population, employment and activity centres are also important determinants of transport, and their distribution around the metropolitan area will affect transport demand patterns. Figure 11 shows the geographic areas of growth in employment around metropolitan Melbourne, while Figure 12 displays the resultant distribution of employment into the future.

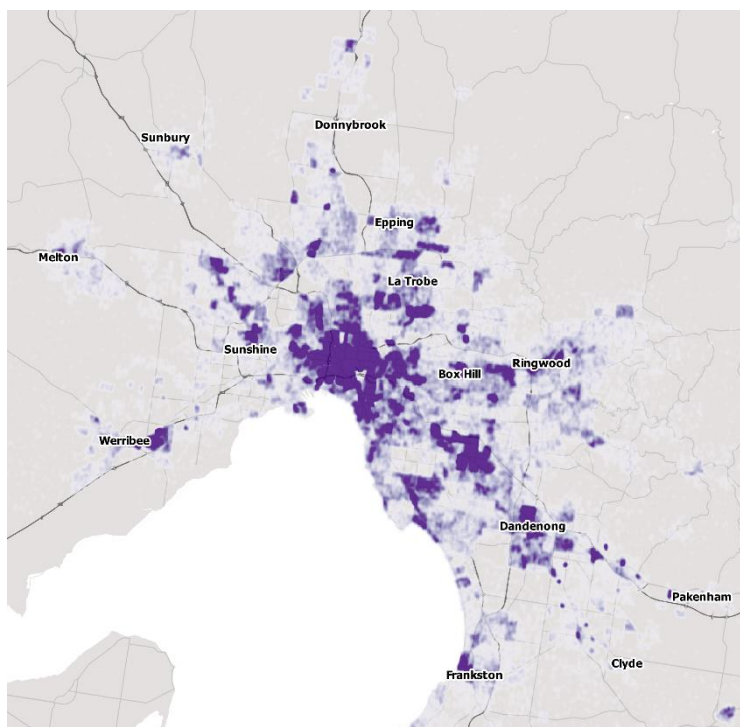
It is interesting to note that other than the central area, employment is expected to be concentrated in suburban centres, and not always located near areas of population growth.

Figure 11 Distribution of employment growth around Melbourne (2016–2036, 2016–2051)



Employment growth by 2036 (VIF 2015)

- Strong growth in the central areas of Melbourne, and South Yarra / St Kilda Road Corridor
- Strong growth in National Employment and Innovation Clusters including La Trobe
- Strong growth in Metropolitan Activity Centres, including Box Hill, Ringwood, Epping and Broadmeadows



Employment growth by 2051 (VIF 2015)

- Continuing strong growth in the central areas of Melbourne, and South Yarra / St Kilda Road Corridor
- Accelerated growth in National Employment and Innovation Clusters including La Trobe
- Accelerated growth in Metropolitan Activity Centres, including Box Hill, Ringwood, Epping and Broadmeadows

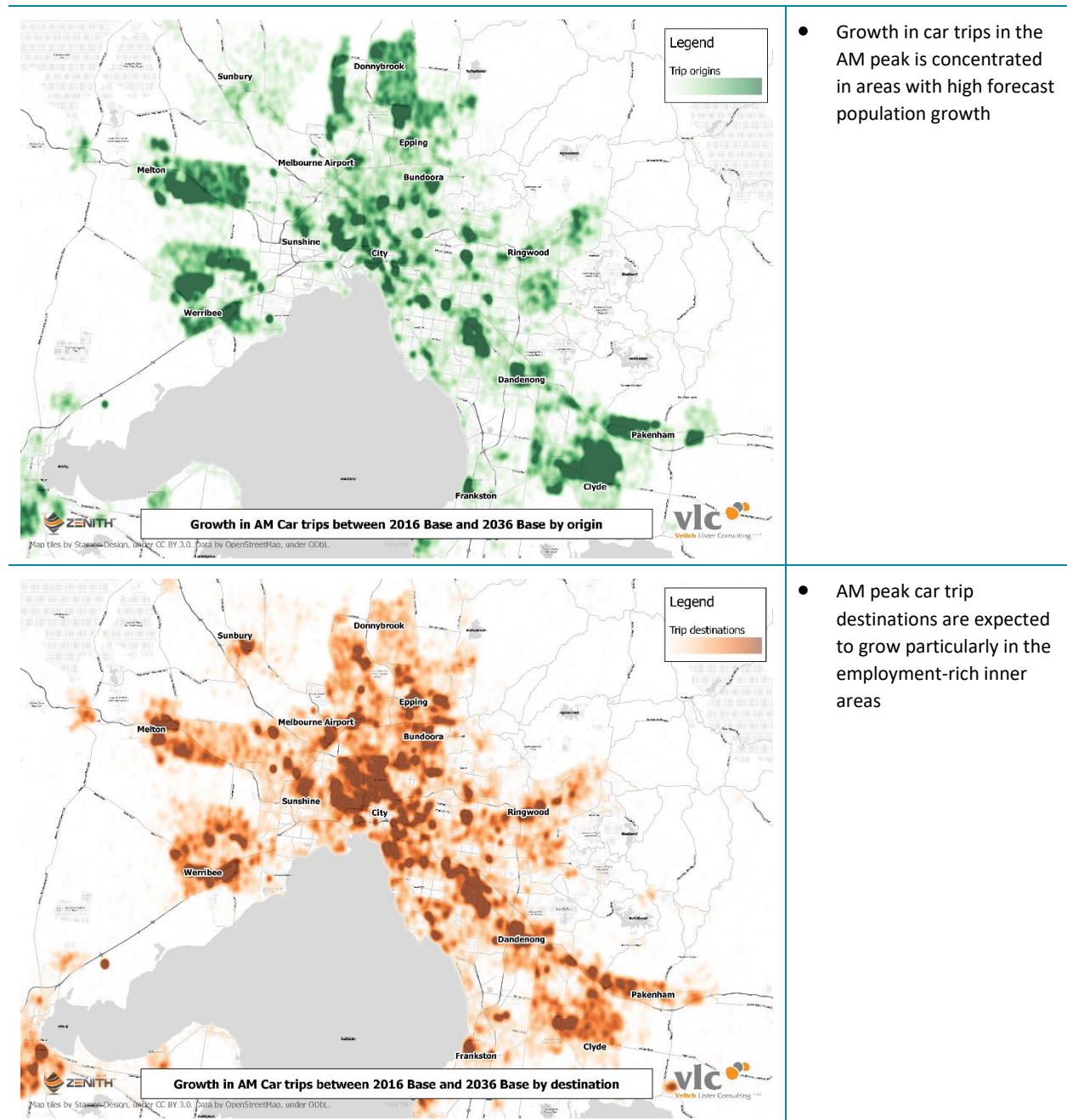
Figure 12 Distribution of employment around Melbourne (2016, 2036 & 2051)



Among others, the location of population and employment drives the pattern of trip making.

Figure 13 below shows the growth in AM peak car trips by origin and destination for an average weekday during school term. The similarity of the pattern of location between trip origins and population is apparent, as is the similarity of trip destinations to employment.

Figure 13 Growth in AM peak car trips by origin and destination, 2016 to 2036



Demand for travel across the Greater Metropolitan Area can be expected to grow at rates that are proportional to population and employment growth, tempered or intensified by location of the growing areas of population and employment.

Figure 14 shows the resultant growth in trips on an average weekday during school term. The forecasts show that the growth of travel demand is expected to nearly double between 2016 and 2051, in line with population growth. However, the annual growth is expected to slow from nearly 2% per year to 1.4% per year.

Figure 14 Daily person trips and growth

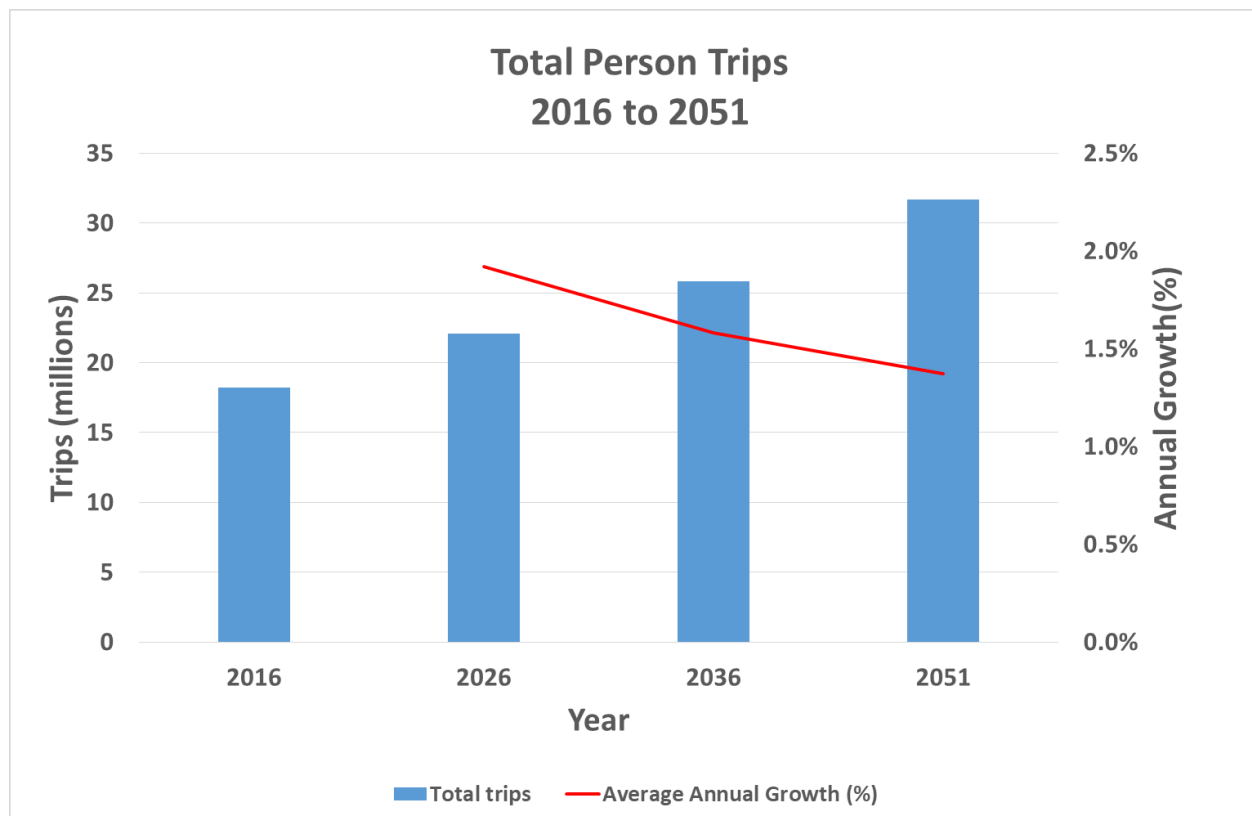
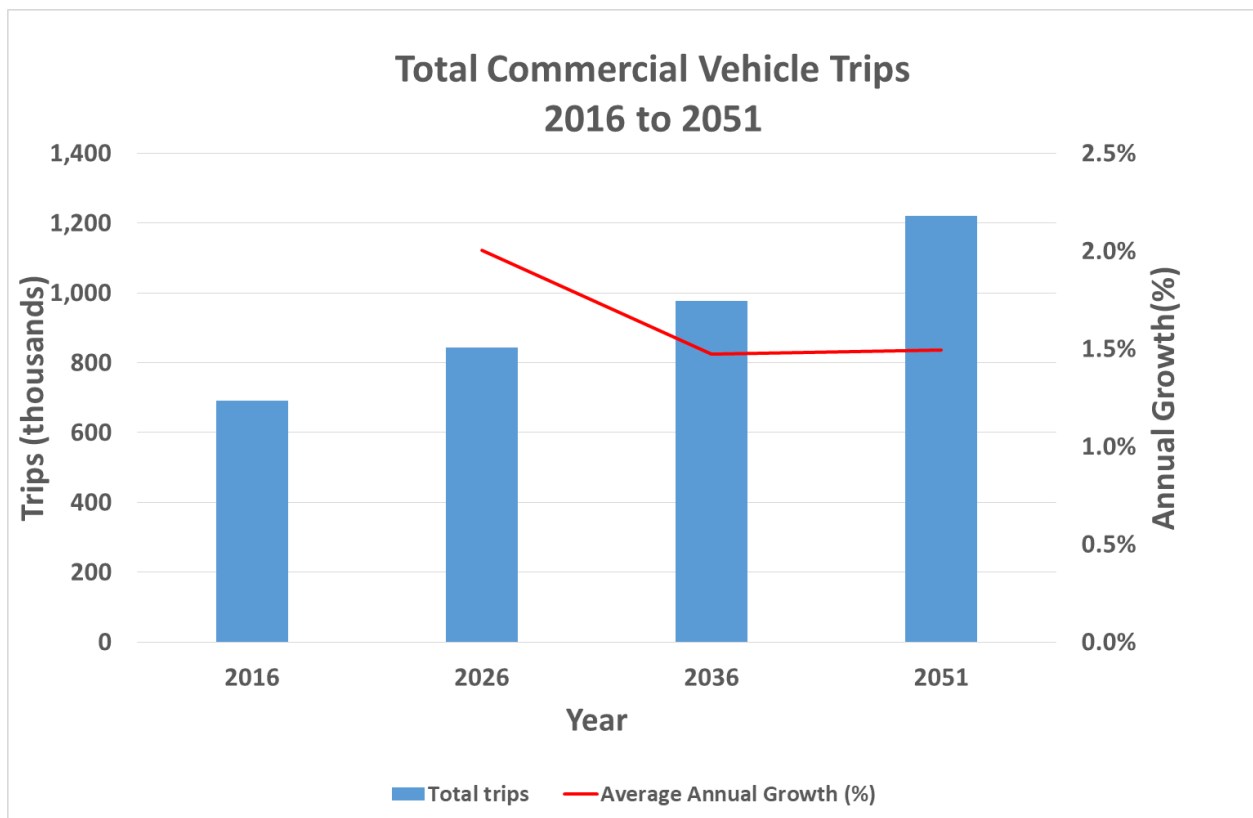


Figure 15 charts the growth in commercial vehicle trips for an average weekday during school term, for 2016 to 2051. It shows that the annual growth rate is expected to decrease from 2% per year to 1.5% per year beyond 2026.

Figure 15 Daily commercial vehicle trips and growth



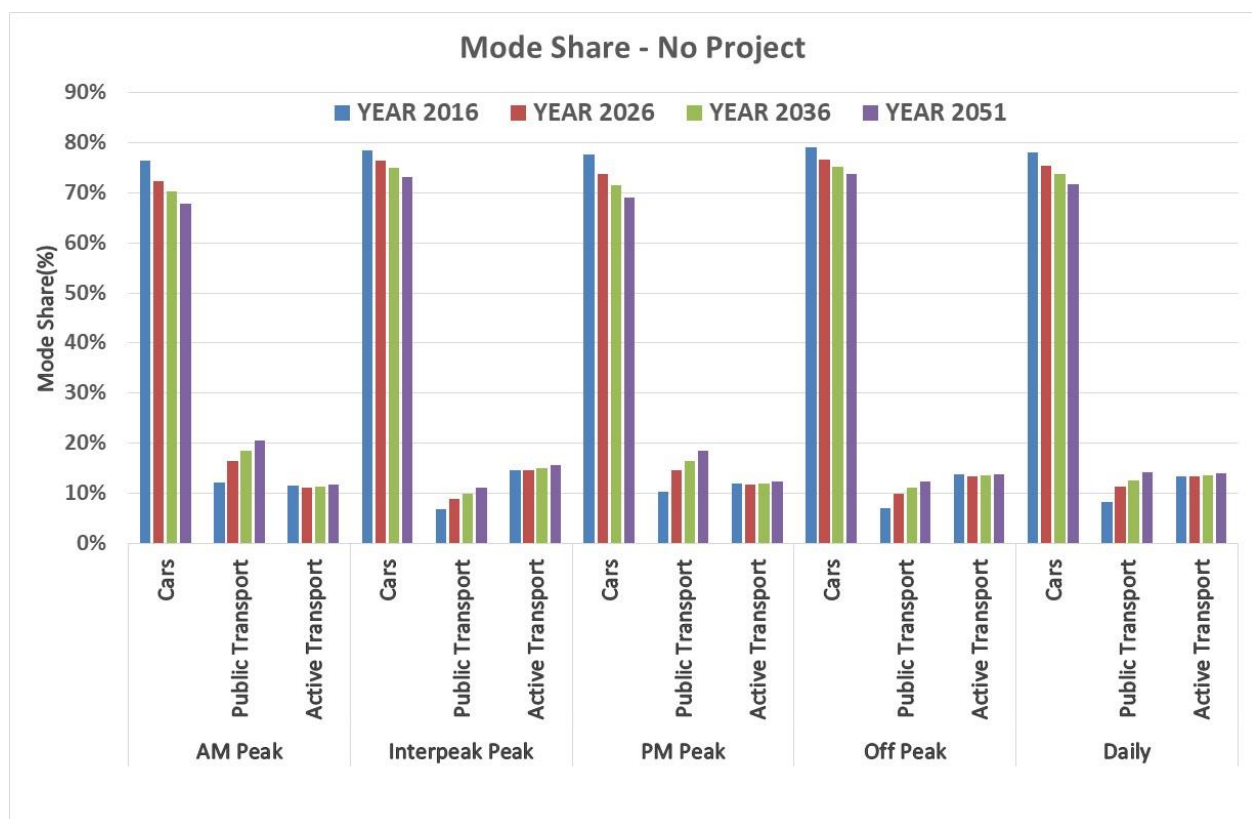
5.1.1 Mode choice

Figure 16 shows the forecast changes in transport mode by period of the day, from 2016 to 2051. Across the network, a shift from car to public transport is expected. The public transport share of daily trips is expected to increase from the current 8% to 14% in 2051. This corresponds to an increase in public transport share from 9% to 16% for mechanised trips (i.e. car and public transport trips only). The proportion of active trips (walk or cycle) are forecast to remain constant to 2051, at around 14% across the day.

The increase in public transport share of trips is expected in each of the time periods, with the growth in peak periods expected to be higher. The share of public transport trips outside the peak periods remain at a little more than half that in the peak periods.

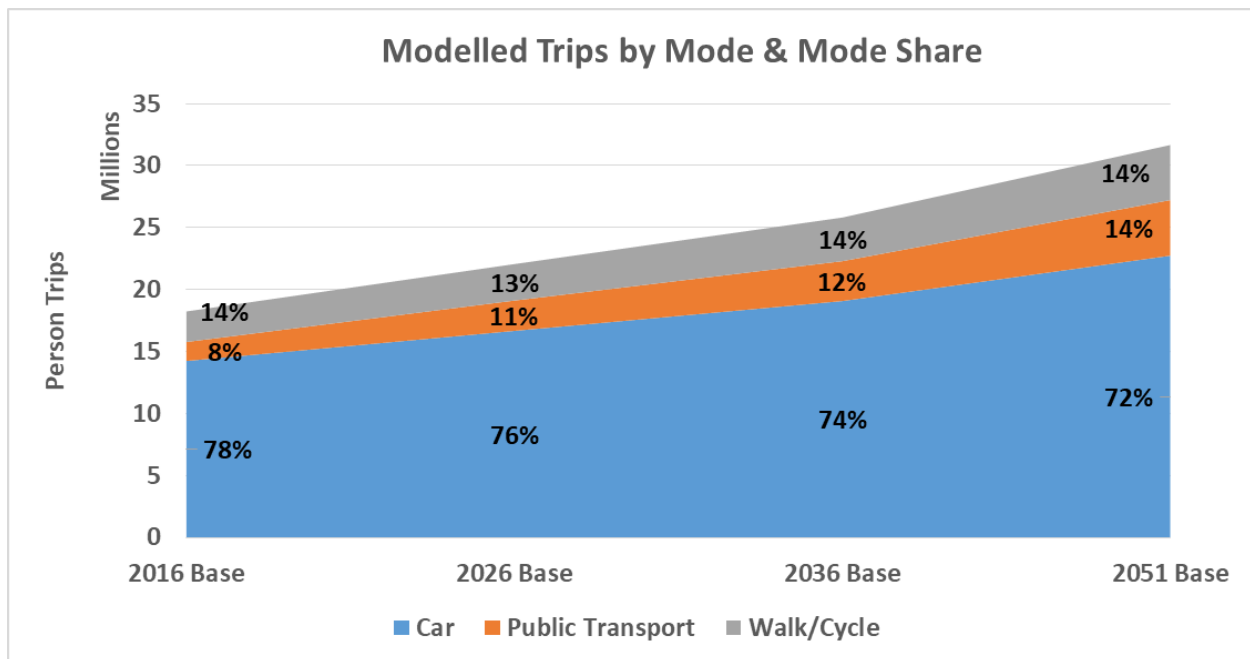
Figure 16 also emphasises the continued dominance of the car mode share, which is expected to continue into the future, when cars could make 2.5 times the number of active and public transport trips combined.

Figure 16 Mode share by modelled time period



A major driver of the increase in the public transport mode share will be the worsening congestion on the roads. However, despite the reducing car mode share, the actual number of cars on the road is expected to continue to grow. Figure 17 below depicts modelled total person trips for an average weekday across 2016 to 2051, split by mode. It shows that while car mode share is forecast to gradually reduce, it is still expected to grow in absolute terms and remain as the dominant mode of private transport by 2051.

Figure 17 Mode share by modelled time period



5.1.2 Road volumes

Figure 18 represents the growth in daily traffic volumes on the road network between 2016 and 2036. Note that projections of EastLink and CityLink volumes are not shown.

The chart shows that the forecast growth for car travel is expected to be especially strong in growth areas, particularly the western and northern suburbs. Daily traffic volumes for freeways that service these areas, such as the M80 and the Hume Freeway, are expected to grow substantially by 2036.

In the north-east, traffic volumes on Plenty Road and Yan Yean Road are likely to grow as a result of the outer northern growth areas. Chandler Highway also stands out on the chart due to the completion of the widening works post-2016.

Figure 18 Expected growth in daily traffic on road links, 2016 to 2036



5.2 Travel times

In the future, growing traffic demand can be expected to cause more congestion and increase travel times across Melbourne.

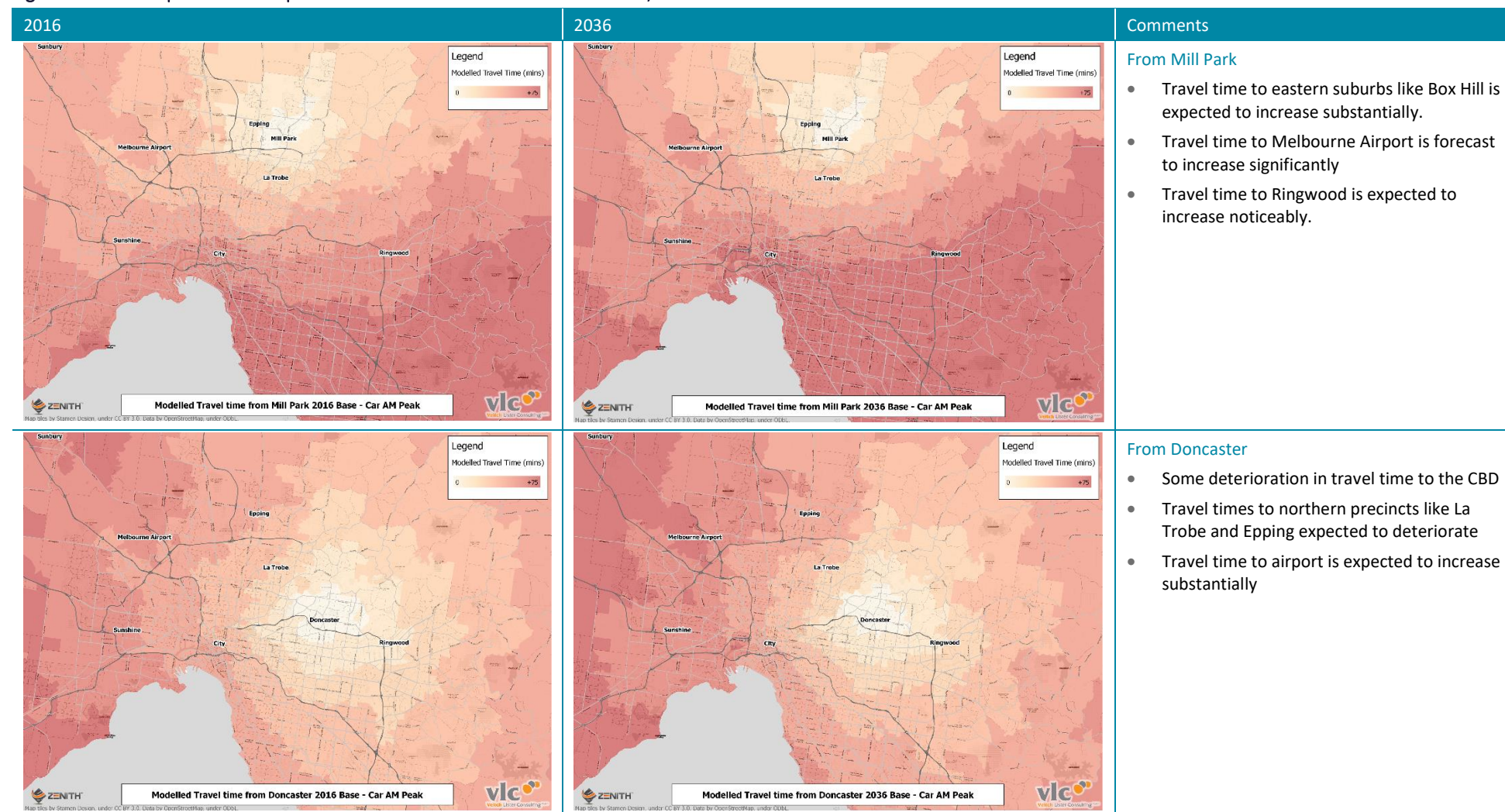
Figure 19 shows the forecast morning peak travel times from Mill Park and Doncaster, for 2016 and 2036.

For travel from Mill Park, the travel time in the northbound direction can be expected to deteriorate marginally. For travel to northern areas west of the Hume Freeway, however, such as Melbourne Airport, substantial lengthening of travel times in the morning peak can be expected. This indicates that congestion on the M80 – Mill Park’s main freeway connection – is expected to worsen in the future. Journeys from Mill Park to the inner and eastern suburbs, which would be reliant on arterial connections, are also expected to deteriorate substantially.

Doncaster is relatively well connected for car travel, with an established arterial network and freeway access via the Eastern Freeway and EastLink. As such a larger range of destinations are accessible within 20 or 30 minutes’ drive in the 2016 morning peak. There are, however, likely to be some increases in travel times to destinations to the south and CBD, as well as northern precincts such as Epping and La Trobe. Travel to the western suburbs and Melbourne Airport from Doncaster are expected to experience substantial lengthening in travel time.

More travel time plots are available in Attachment D – Travel time plots for selected origins.

Figure 19 Comparison of AM peak travel times from selected destinations, 2016 and 2036



5.3 Commercial vehicles

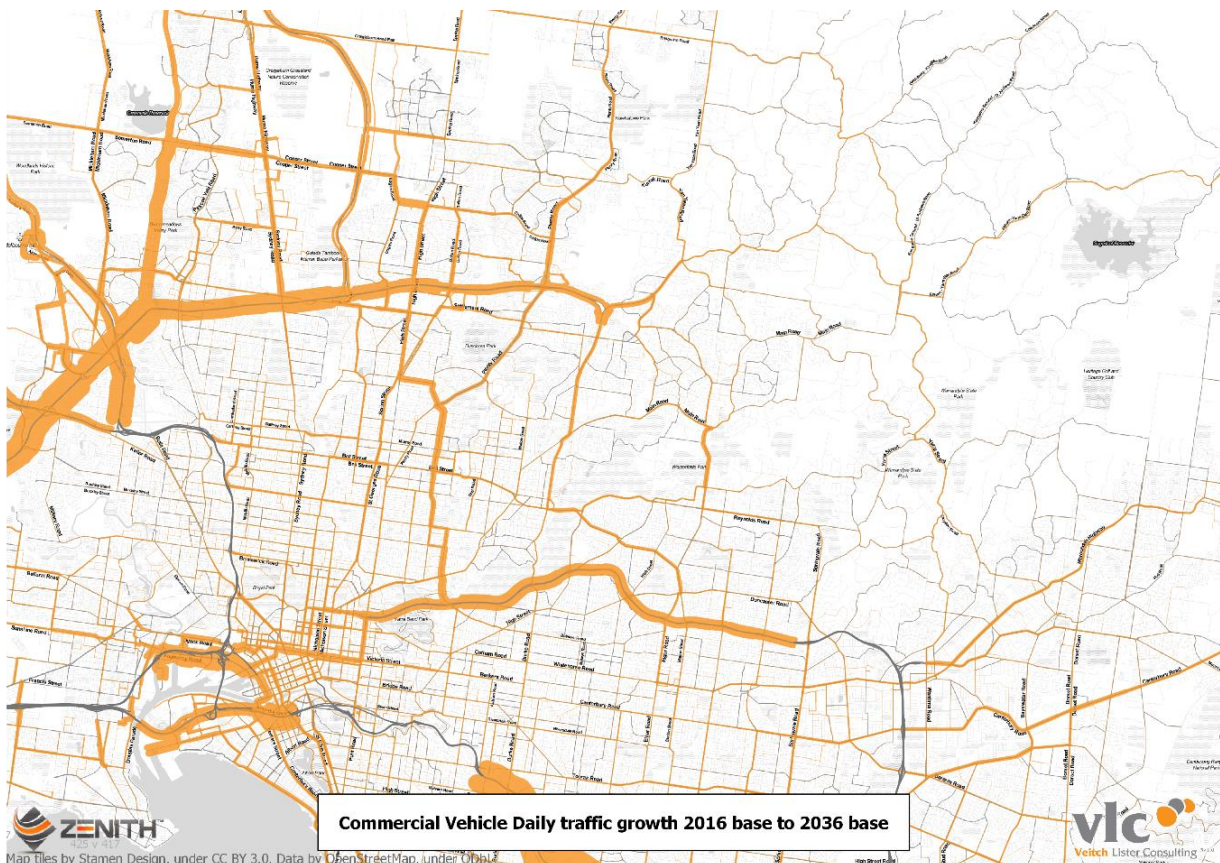
Figure 20 shows the expected growth in daily commercial vehicle trips in a comparison of 2016 and 2036 bandwidth plots. Again, projections of EastLink and CityLink volumes are not shown.

The plots show that large growth in commercial vehicle volumes can be expected on the freeway network. Of note are the significant increases in the commercial vehicle demand likely on the Eastern Freeway west of Bulleen Road and on the M80 east of the Hume Freeway. Once completed, commercial vehicles are expected to utilise the West Gate Tunnel for its improved access to the Port of Melbourne.

In the north east, the recent move of the Melbourne Market to Epping is expected to increase commercial vehicle volumes on Cooper Street, High Street, Hume Freeway and the M80.

Commercial vehicle volumes are expected to increase generally in the study area on arterials such as Greensborough Road, Rosanna Road, Fitzsimons Lane and Manningham Road.

Figure 20 Expected growth in daily commercial vehicle trips, 2016 to 2036



5.4 Traffic volumes – North East

The Yarra River provides a natural geographic traffic screenline between the eastern and northern suburbs. Although much of the expected population growth is expected to occur in the outer northern, south-eastern and western suburbs, this is expected to result in additional travel demand across the Yarra River in Melbourne’s north east. Figure 21 below depicts the Yarra River screenline crossings analysed in this section.

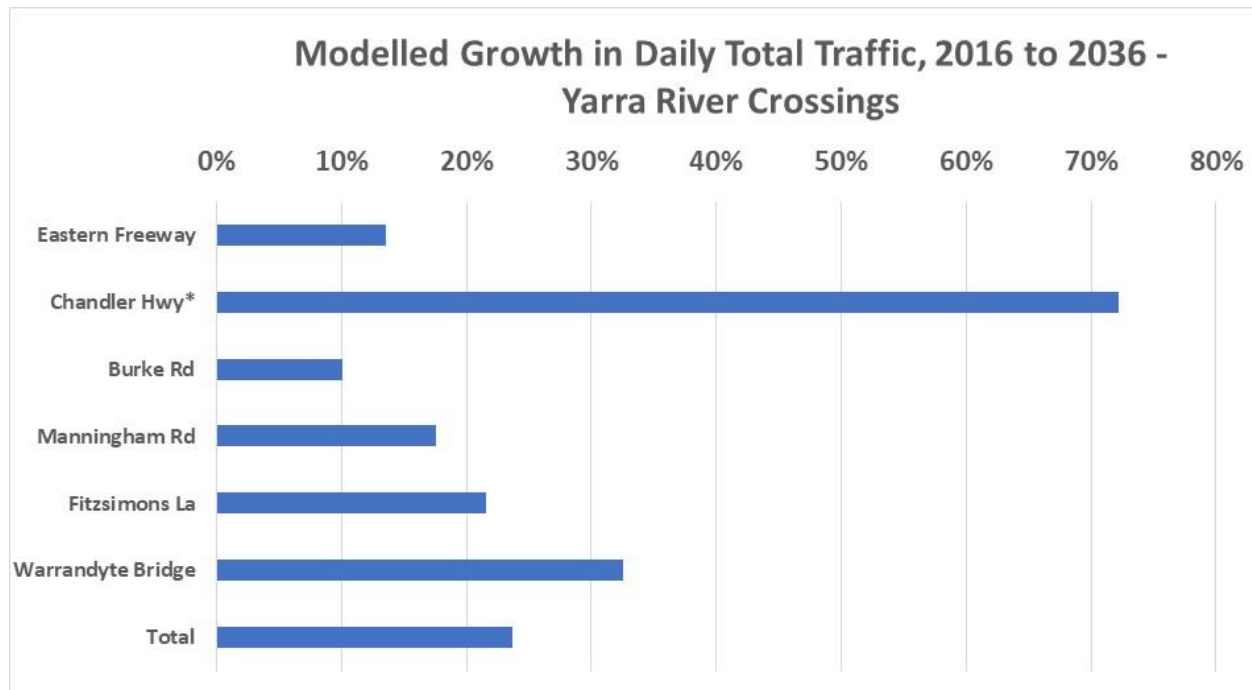
Figure 21 Yarra River screenline



Figure 22 shows the forecast growth between 2016 and 2036 for total traffic volumes across the Yarra River screenline, as well as the Eastern Freeway west of Chandler Highway.

Most volumes on river crossing are forecast to grow between 10-30% by 2036, except for the Chandler Highway. VicRoads are currently undertaking widening of the Chandler Highway from two to six lanes, which is expected to be completed by 2018.

Figure 22 Expected growth in daily volumes crossing the Yarra River from 2016 to 2036



*increase due to widening works

The total number of trips crossing the Yarra River is expected to grow significantly into the future. If the Victoria in Future population forecasts are achieved, the growth could be in the order of:

- +15% between 2016 and 2026
- +24% between 2016 and 2036
- +40% between 2016 and 2051.

6 Model results

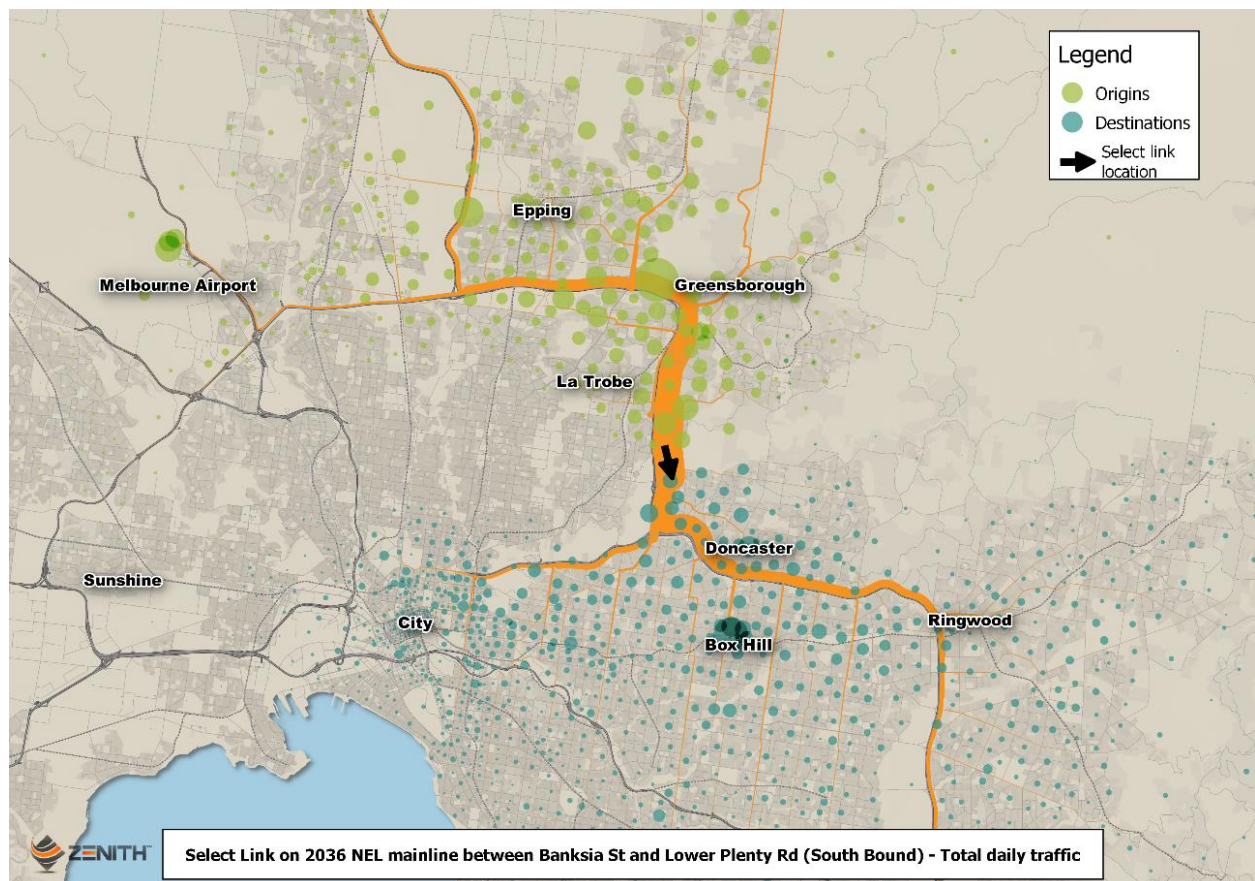
– A future with the project

6.1 Market capture

6.1.1 Origins and destinations of potential NEL users

Figure 23 shows the expected origins and destinations for users of the North East Link at the Yarra River crossing, based on select link traffic volumes, thus indicating the extent of the project's market capture. The modelled forecast catchment extends from north-eastern suburbs such as Diamond Creek and Heidelberg to outer northern suburbs such as Epping and Mernda, and as far west as Melbourne Airport. On the east of Melbourne, its market penetration is broader, and spans across the inner, south-eastern and outer-eastern suburbs.

Figure 23 Origins and destinations of trips using the North East Link, daily, 2036



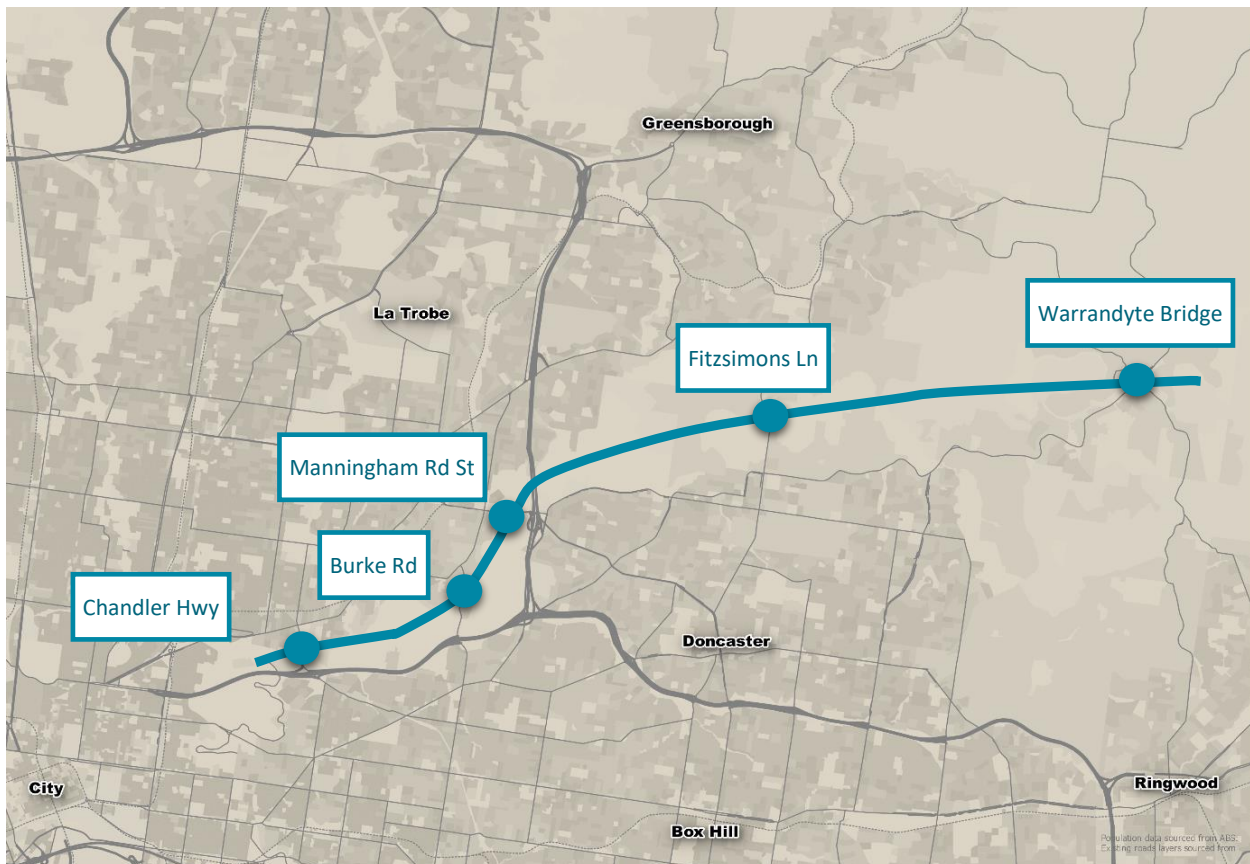
6.1.2 Induced demand catchments of potential North East Link users

Given the broad nature of the expected market catchment of the North East Link project, a breakdown analysis of its demand was undertaken. Zenith is a four-step strategic model, and as such in its estimate of the users of the project it can draw upon the following potential catchments of demand (including induced demand):

- Route choice: existing car users who adjust their route to utilise the project
- Mode choice: those who switch to driving from another mode (such as walking, cycling or public transport) in order to use the project
- Re-distribution of trip destinations: those who change their trip destination in order to take advantage of the accessibility offered by the project
- New trips: generated by a project-specific land use scenario.

To gauge the contribution of each individual component above, a waterfall analysis was undertaken as presented in Figure 24. The chart depicts the contribution of each induced demand catchment as described above to the overall growth of the existing Yarra River screenline crossings (i.e. not including North East Link), when compared to 2036 no project volumes. The screenline analysed in this waterfall chart is presented again in Figure 24 below.

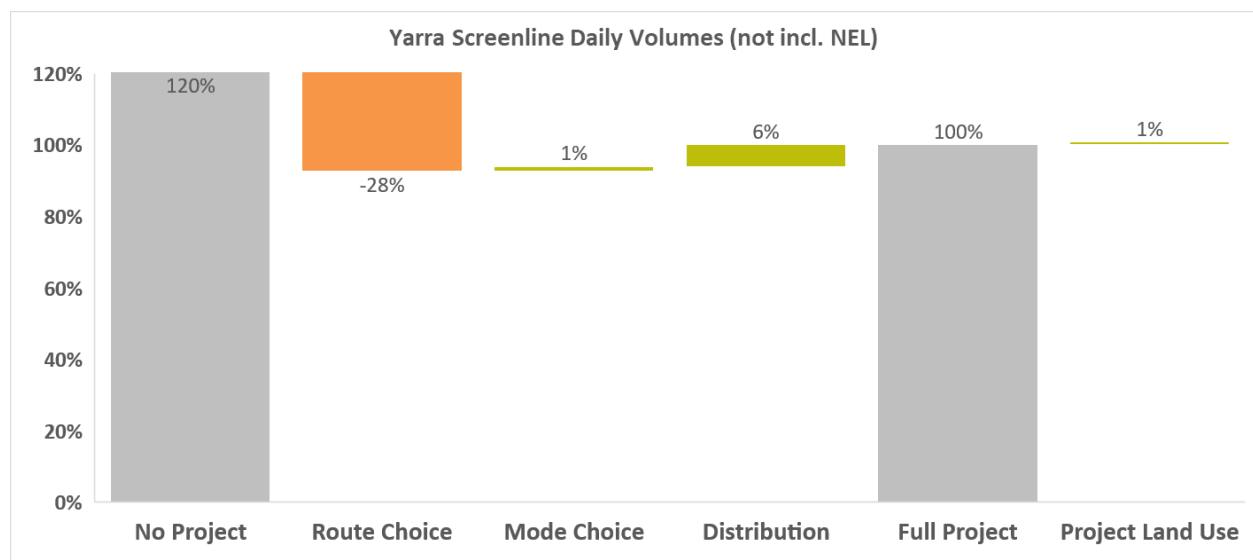
Figure 24 Yarra River screenline, excluding North East Link



In summary, the waterfall analysis indicates that the North East Link project is expected to reduce daily traffic volumes using the existing Yarra River crossings by approximately 20%. Of this, route choice is expected to reduce volumes by approximately 28%, while mode choice and trip re-distribution effects are expected to offset this by approximately 1% and 6% respectively. The increases in traffic expected from mode choice and trip re-distribution effects would be due to the project providing congestion relief to the existing Yarra River crossings, which would in turn attract some induced traffic from alternative modes and destinations.

Uplifts to the forecast population and employment as a result of the North East Link project may contribute an additional 1% to traffic volumes crossing the Yarra River.

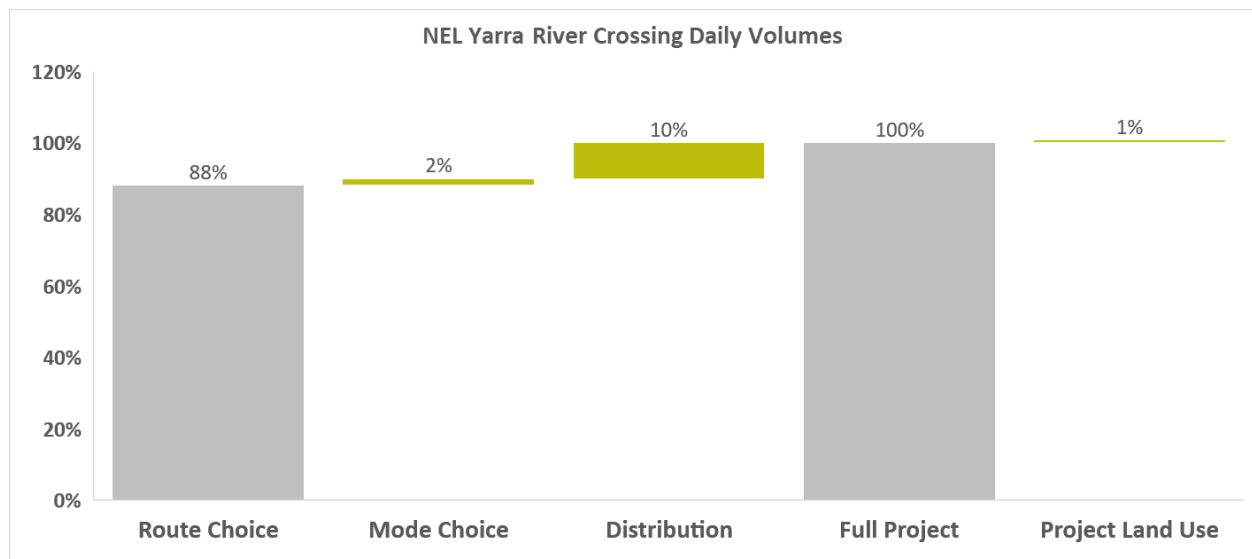
Figure 25 Contribution of induced demand catchments to the existing Yarra River screenline two-way daily traffic volumes (2036 no project to 2036 NEL project) – excluding NEL



A similar analysis was undertaken using forecast daily volumes on the North East Link itself (at the Yarra River crossing). Figure 26 shows that the induced demand arising from mode choice – project users who have switched from an alternative mode – is expected to contribute a 2% increase in daily volumes. Trip re-distribution is conversely expected to contribute an additional 10% of daily traffic volumes. These project users have opted to change trip destination to take advantage of the improved accessibility offered by the project. The vast majority of project users – approximately 88% – are expected to be existing car users who divert to the North East Link from other routes such as Greensborough Road, Rosanna Road and the Tullamarine Freeway.

When accounting for uplifts in population and employment assumptions as a result of the North East Link project, an additional 1% in total daily traffic is estimated.

Figure 26 Contribution of induced demand catchments to North East Link two-way daily volume growth, 2036

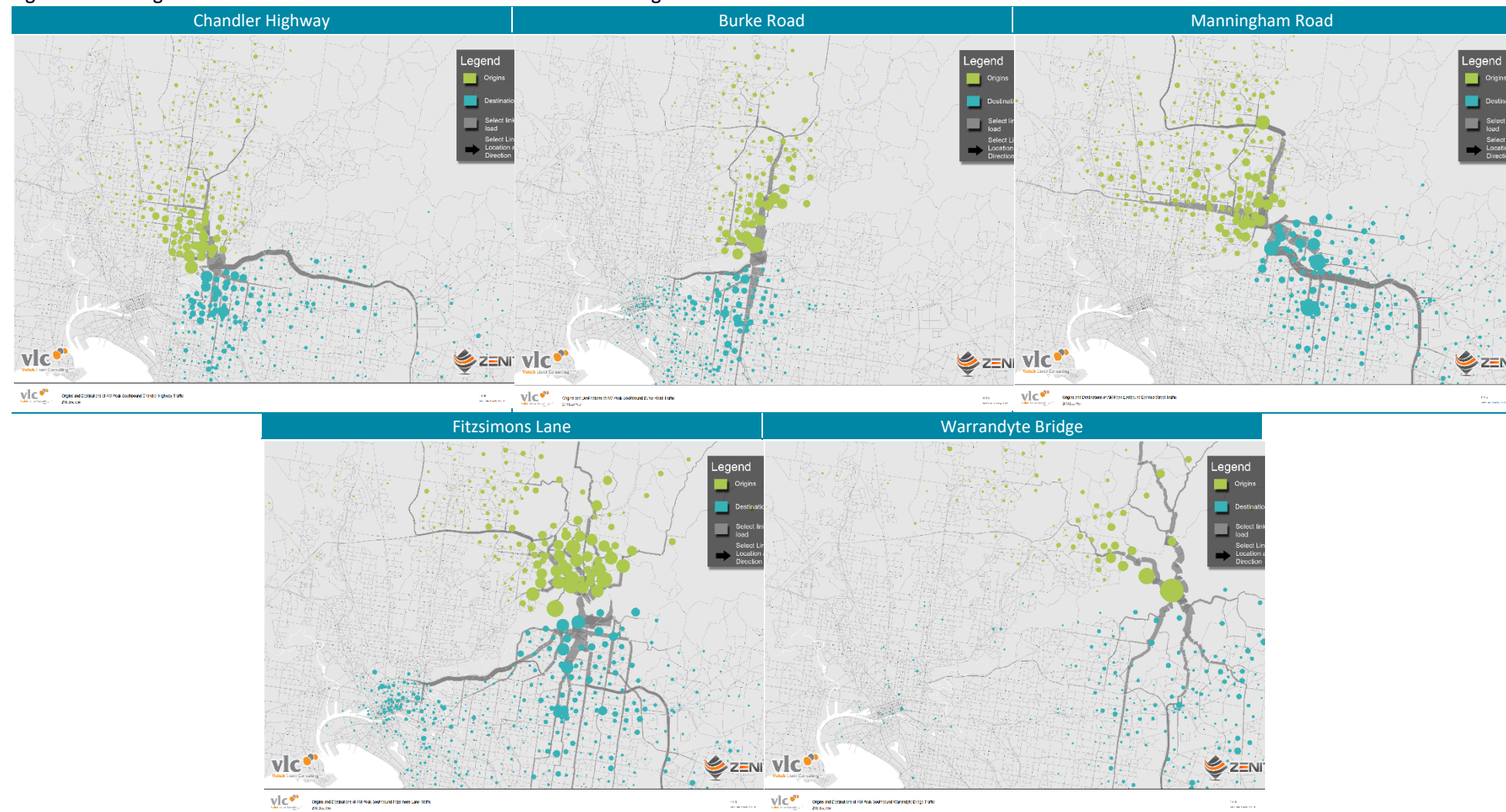


6.1.3 Route catchments of potential North East Link users

The North East Link project provides an additional crossing to the Yarra River to the east of Melbourne. It therefore follows that potential demand for the project would be driven by demand for the existing crossings at Chandler Highway, Burke Road, Manningham Road, Fitzsimons Lane and the Warrandyte Bridge.

Figure 27 below depicts the origins and destinations for modelled daily southbound traffic along each of the existing river crossings in base year. Each crossing, apart from Manningham Road, services a strong north-south movement, with origins typically more localised to the south of the M80 and destinations more widespread across the eastern suburbs. In contrast, in addition to the north-south movement Manningham Road also services a distinct east-west movement via Bell Street.

Figure 27 **Origins and destinations for modelled southbound traffic crossing the Yarra River**



6.2 Traffic volumes

Figure 28 summarises the changes in 2036 forecast daily traffic volumes on the local road network post-completion of the North East Link project. It shows that the project is expected to lead to reduced daily traffic volumes on arterials in the north-east, in particular for parallel north-south routes such as Plenty Road (south of the M80), Rosanna Road, Chandler Highway, Fitzsimons Lane and Warrandyte Bridge.

Certain roads are expected to experience an increase in traffic as a result of the North East Link, usually due to their role as a ‘feeder’ route to the project. In the north these include the M80, Greensborough Bypass and Plenty Road, while in the east these include Eastern Freeway feeder routes such as Elgar Road, Springvale Road and Bulleen Road (south of the freeway).

Figure 28 Change in daily traffic volumes (zoomed in, project links faded), 2036

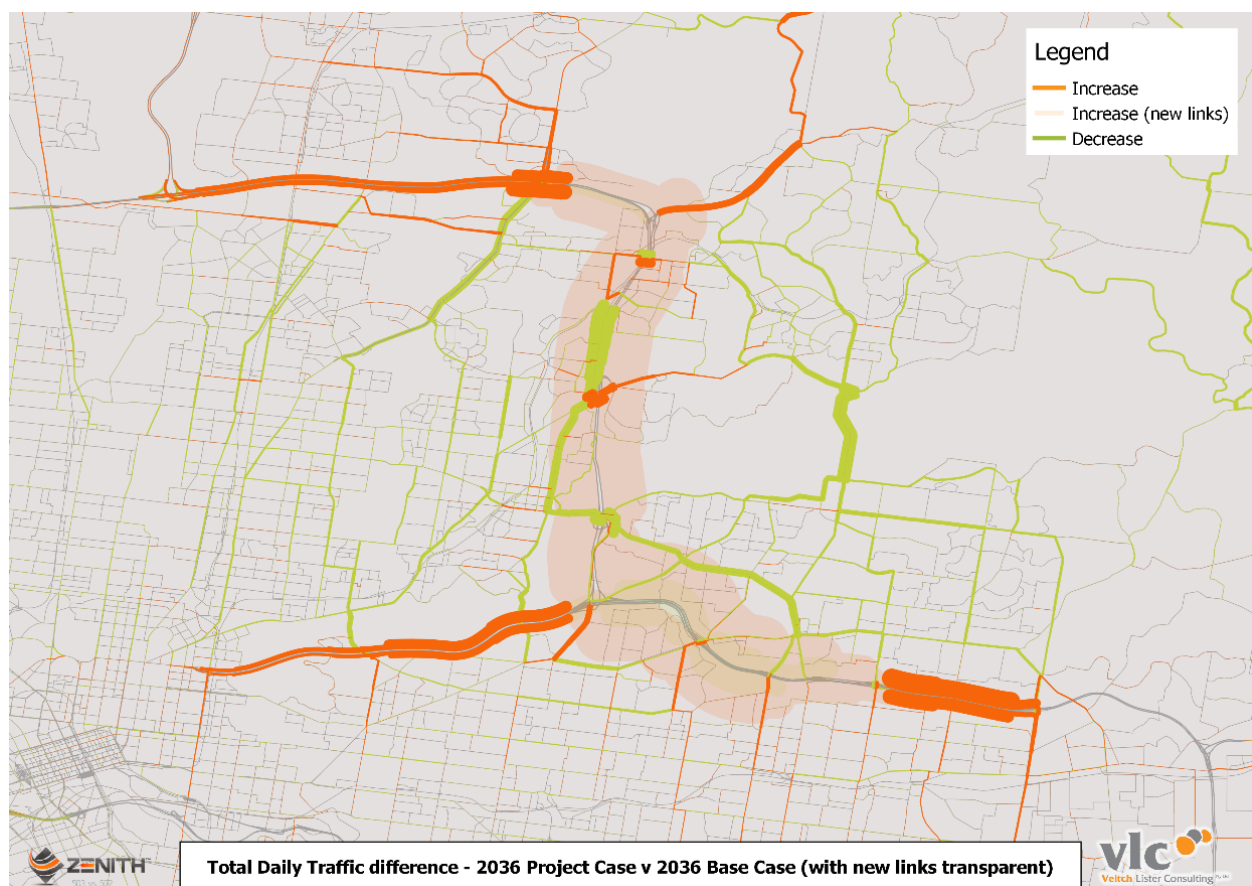


Figure 29 below charts the expected percentage changes in total daily traffic volumes crossing the Yarra River in 2036, as a result of the project. It shows that, except for the Eastern Freeway, all river crossings are expected to experience a substantial decrease in total daily traffic volumes with the completion of the North East Link.

Figure 29 Change in daily traffic volumes across the Yarra River, 2036 NEL Project vs 2036 No Project

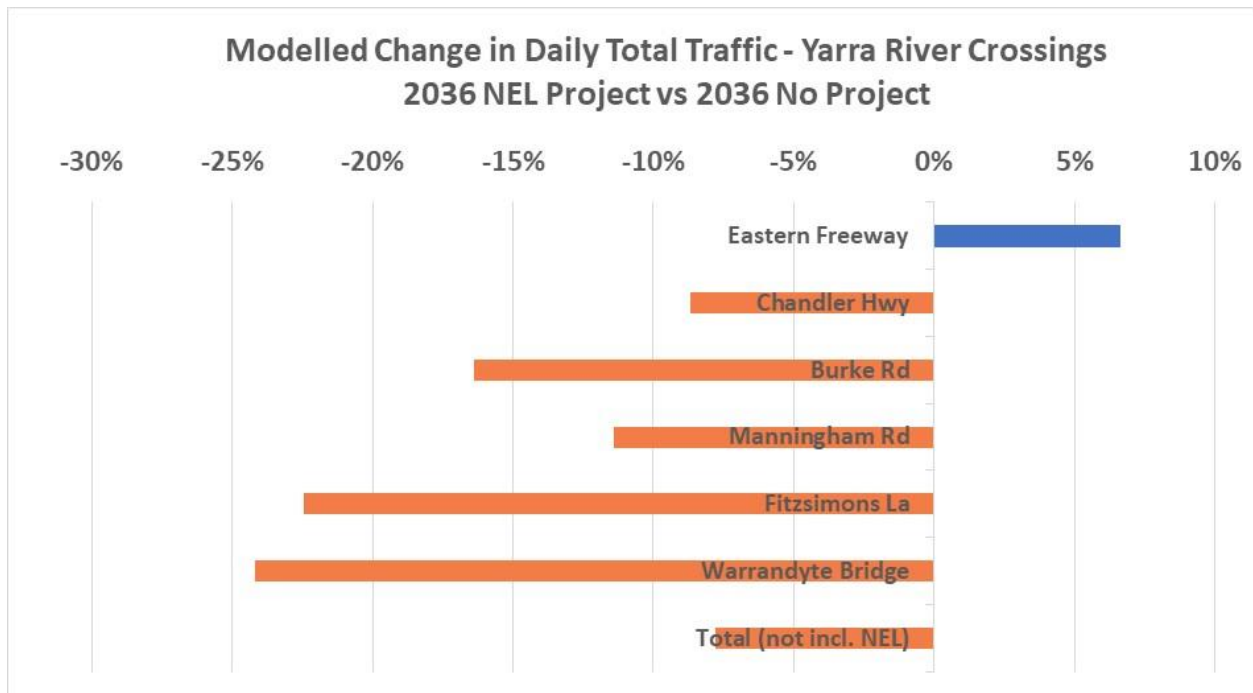
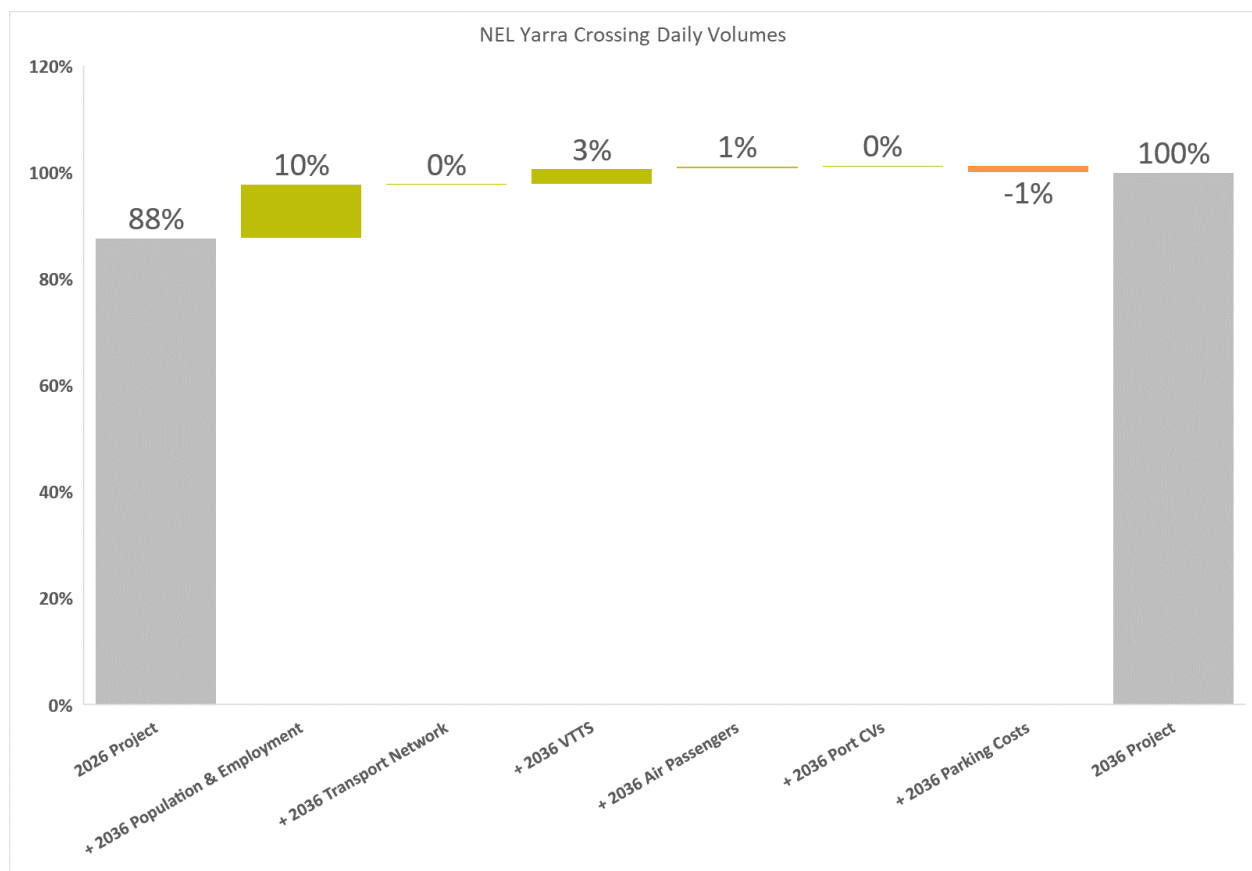


Figure 30 below presents a waterfall analysis, profiling the growth in daily total traffic volumes on the North East Link river crossing between the 2026 and 2036 forecasts. The chart shows that land use (including population and employment growth) is the largest driver of traffic growth on the project. Assumptions surrounding increases to the value of travel time savings (VTTS) in the future also contribute to a lesser extent. Growth rates between 2026 and 2036 seem relatively insensitive to other assumptions such as the future transport network, airport and port commercial vehicle growth, as well as parking price increases.

Figure 30 2026 to 2036 waterfall analysis, growth in North East Link traffic volumes

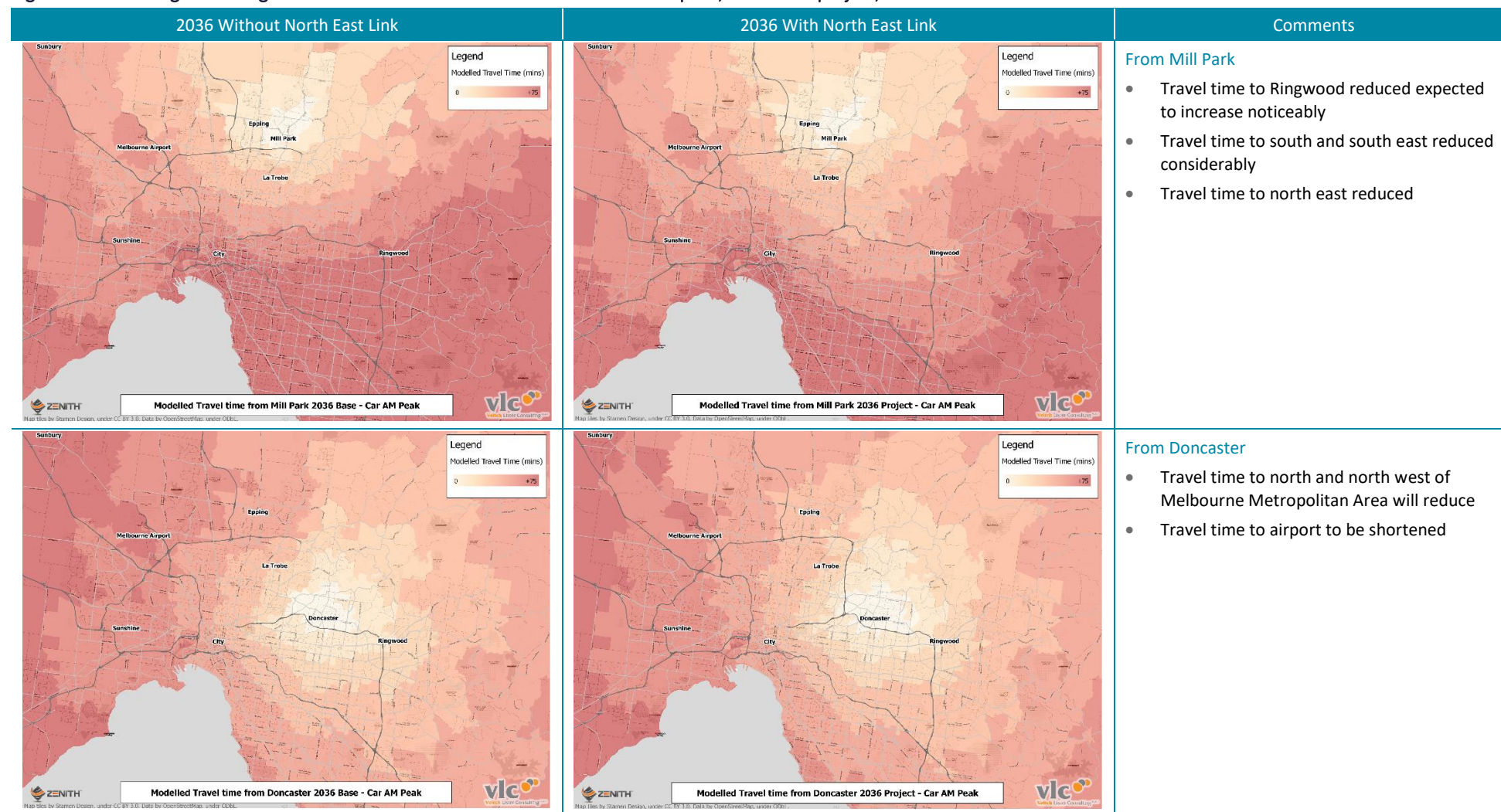


6.3 Travel times

Figure 31 shows the expected change in average travel times by car in the morning peak from Mill Park and Doncaster with and without the North East Link.

The plots show a significant reduction in car travel times, with broadening of the areas within each travel time band. For Mill Park, the travel time bands broaden mainly towards the south. For travel from Doncaster, the time bands broaden to the north and west.

Figure 31 Change in average travel time to Mill Park and Doncaster in the AM peak, due to the project, 2036



6.4 Levels of service

Level of service is a scale that categorises the traffic conditions. The usual ways of measuring level of service include use of a calculated density, volume capacity ratio (V/C) or delay in travel speeds. A level of service measure was defined using the ratio of modelled speeds to free-flow speeds (representing uncongested conditions) as outlined in Table 4 below.

Table 4 Level of service definitions

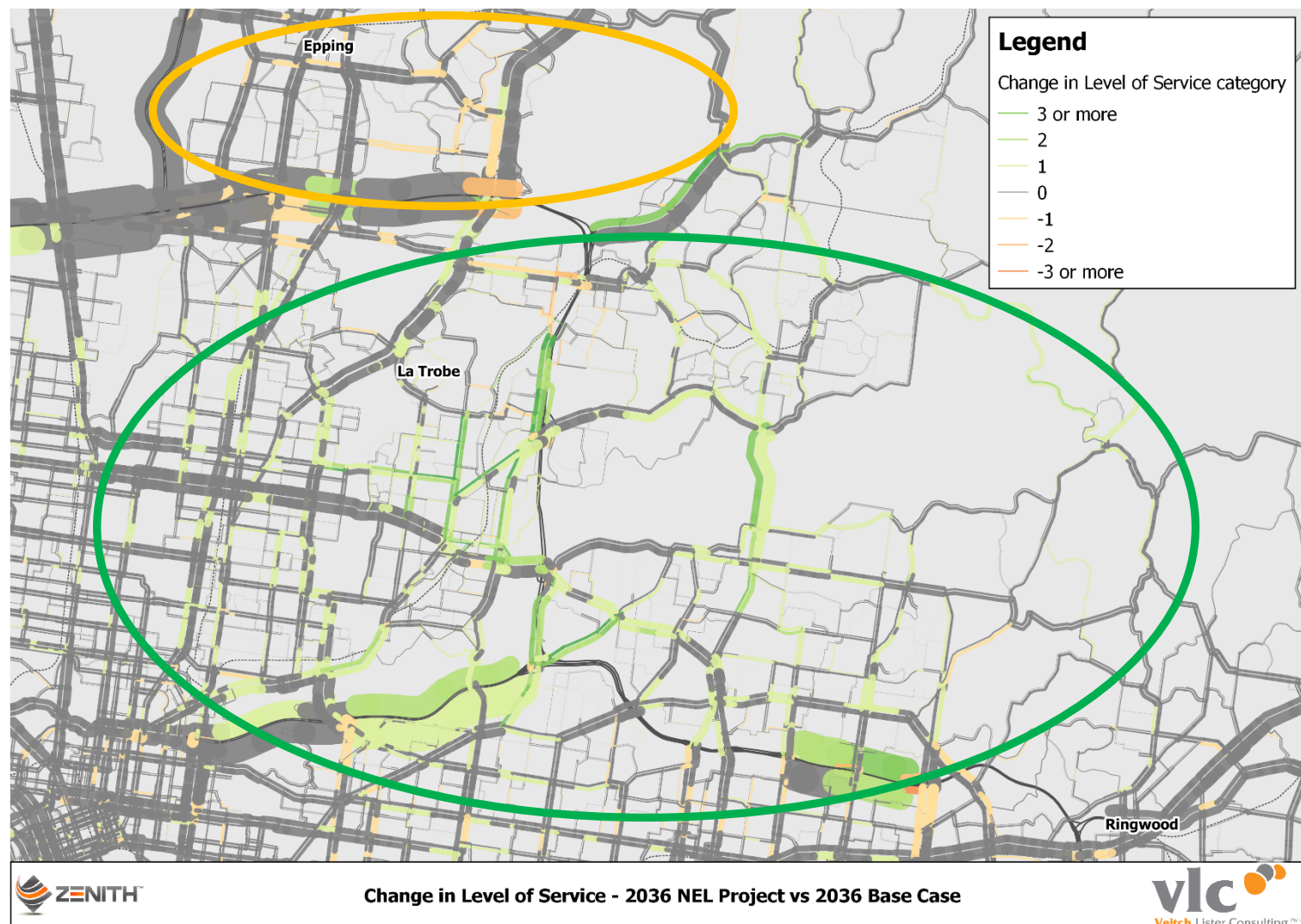
Level of Service category	% of free-flow speed
1	95–100%
2	85–95%
3	70–85%
4	50–70%
5	30–50%
6	< 30%

The modelled change in level of service for 2036 is shown in Figure 32. This figure compares the level of service for the North East Link project case against the no project case in 2036. Road links which change level of service category as a result of the project are coloured according to the number of categories changed.

Figure 32 shows that there are likely to be significant improvements in service levels on the Yarra River crossings, as well as in counter peak directions across the north east corridor, as highlighted by the green circle.

Level of service is shown to deteriorate in the outer northern suburbs, as shown by the orange circle. This is likely to be caused by additional traffic using arterial roads in this area to access the project.

Figure 32 Change in Levels of Service as a result of North East Link, 2036

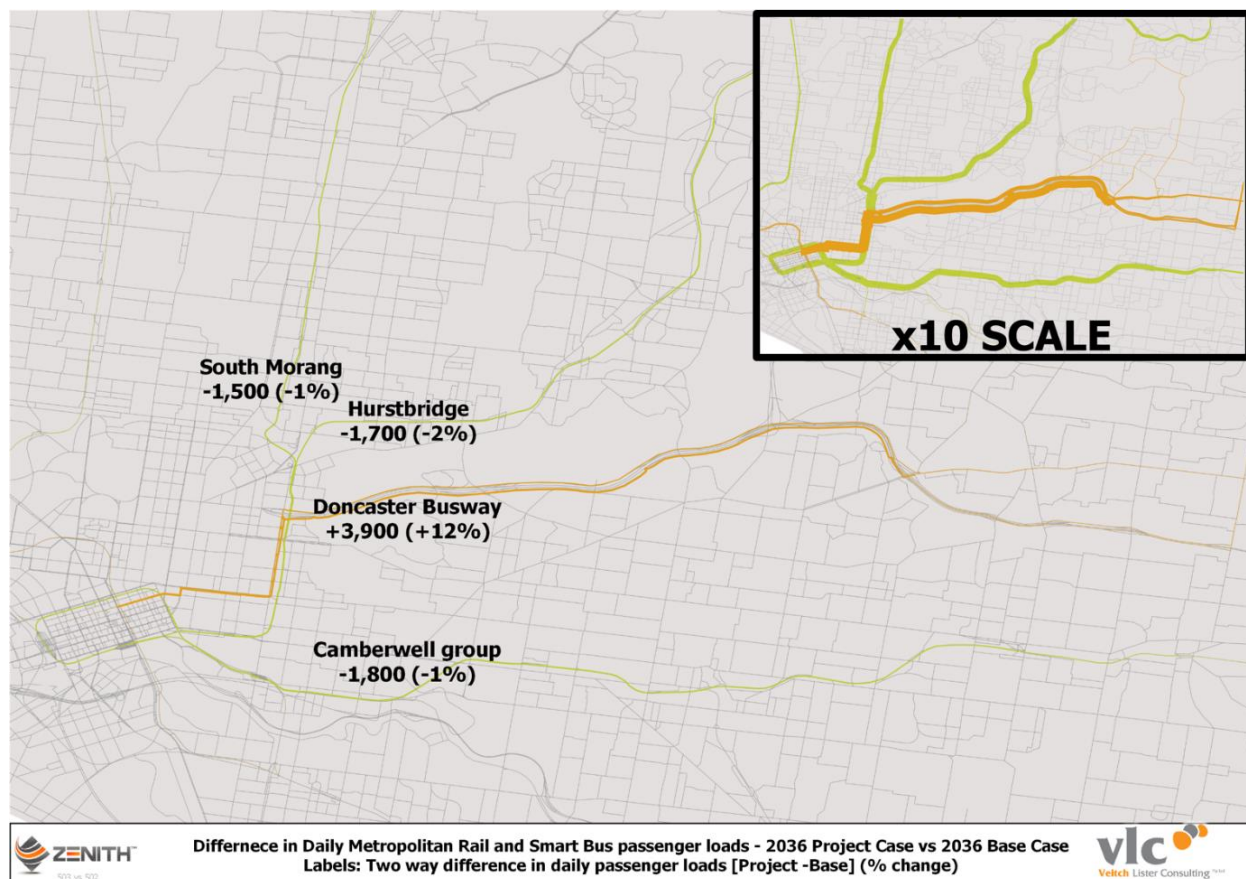


6.5 Public transport

Figure 33 depicts expected changes in daily rail and SmartBus passenger loads expected in 2036 at a range of locations, due to the North East Link project.

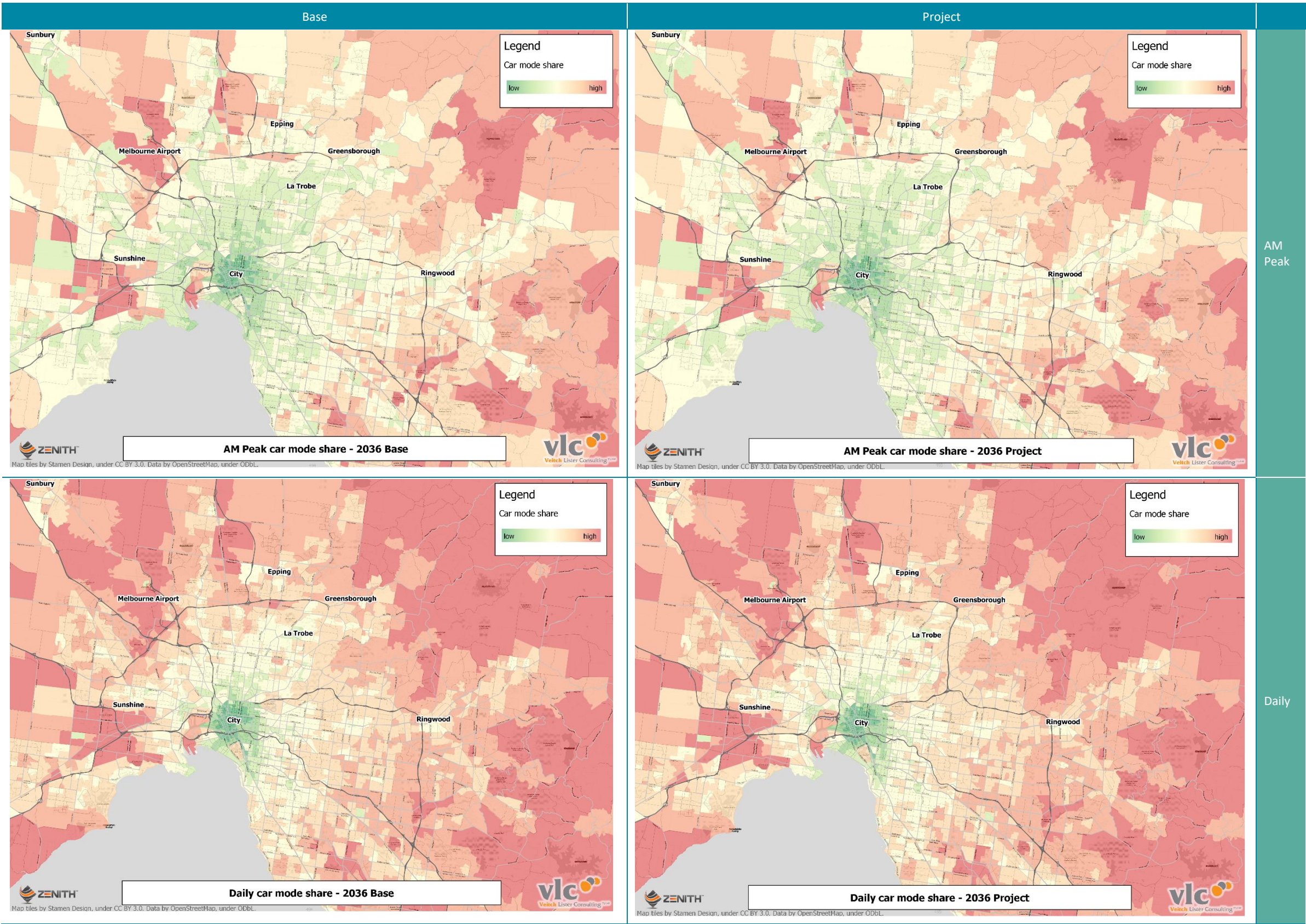
The Doncaster Busway component of the North East Link project will improve travel speeds for the SmartBus routes 905, 906, 907 and 908 along the Eastern Freeway west of Doncaster Road, and thus attract higher patronage. In the 2036 project model, the daily passenger loads on these routes approaching the CBD is expected to increase by approximately 12%. Inner-city passengers loads for the Camberwell, South Morang, and Hurstbridge corridors are expected to reduce slightly (-1% to -2%), due to a combination of both the North East Link and Doncaster Busway projects.

Figure 33 Difference in daily metropolitan rail and SmartBus passenger loads, 2036



The car mode share has been charted separately for the 2036 project and no project scenarios, and is shown in Figure 34. Plots for both AM peak and daily car mode share are presented. Overall, there appears to be no material change expected for car mode share as a result of the project

Figure 34 Daily and AM Peak car mode share, 2036



6.6 Toll diversion

Due to the paucity of robust data relating to observed toll diversion for existing toll roads, it is difficult to compare existing toll roads in Australia with the North East Link forecasts in terms of predicted toll diversion.

Therefore, sensitivity testing was undertaken of the North East Link project in a 2036 untolled scenario. It was found that with the addition of the core tolling scenario, daily two-way traffic volumes decreased by 32% compared to the untolled project.

7 Economic results

7.1 Spatial distributions of travel time benefits & dis-benefits

Travel time benefits and dis-benefits for the North East Link project have been visualised spatially in Figures 35 to 38 below.

Figure 35 below depicts expected travel time benefits in 2036 for cars in the AM peak by destination zone. It shows that trips destined generally in the north-east, east and inner regions of Melbourne are likely to experience travel time improvements as result of the project. Trips to Melbourne Airport and Box Hill may also experience reductions in travel time. This is an intuitive outcome for the North East Link project, which provides new connectivity across the Yarra River between these regions.

Conversely, Figure 36 below depicts expected travel time dis-benefits in 2036 for cars in the AM peak by destination zone, by 2036. Dis-benefits by destination appear to be concentrated in the outer northern suburbs including Epping and Mill Park, with smaller dis-benefits appearing in eastern suburbs south of the Eastern Freeway. This is likely due to the additional traffic generated in these areas as a result of the project.

Figure 35 Travel time benefits for cars in the AM peak by destination, 2036

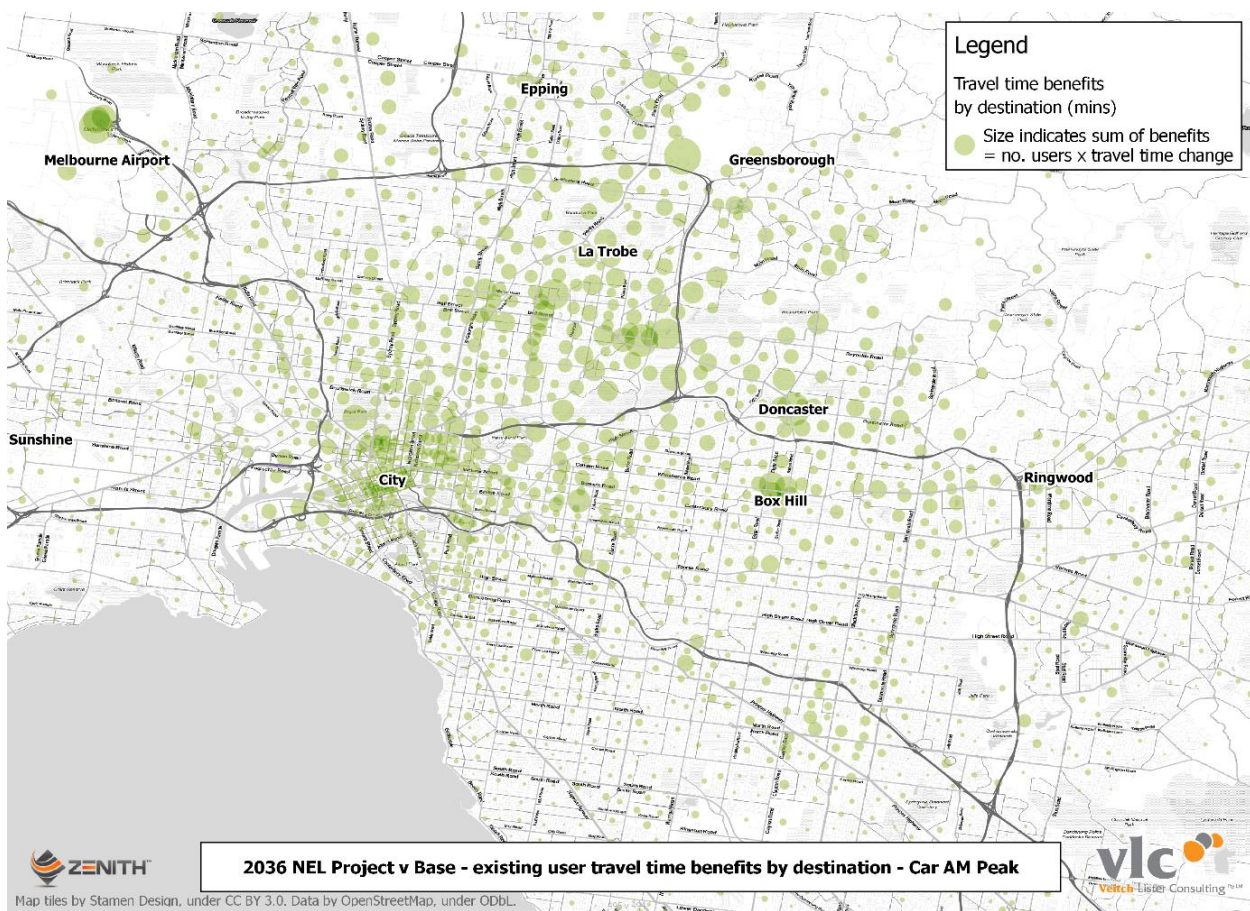


Figure 36 Travel time dis-benefits for cars in the AM peak by destination, 2036

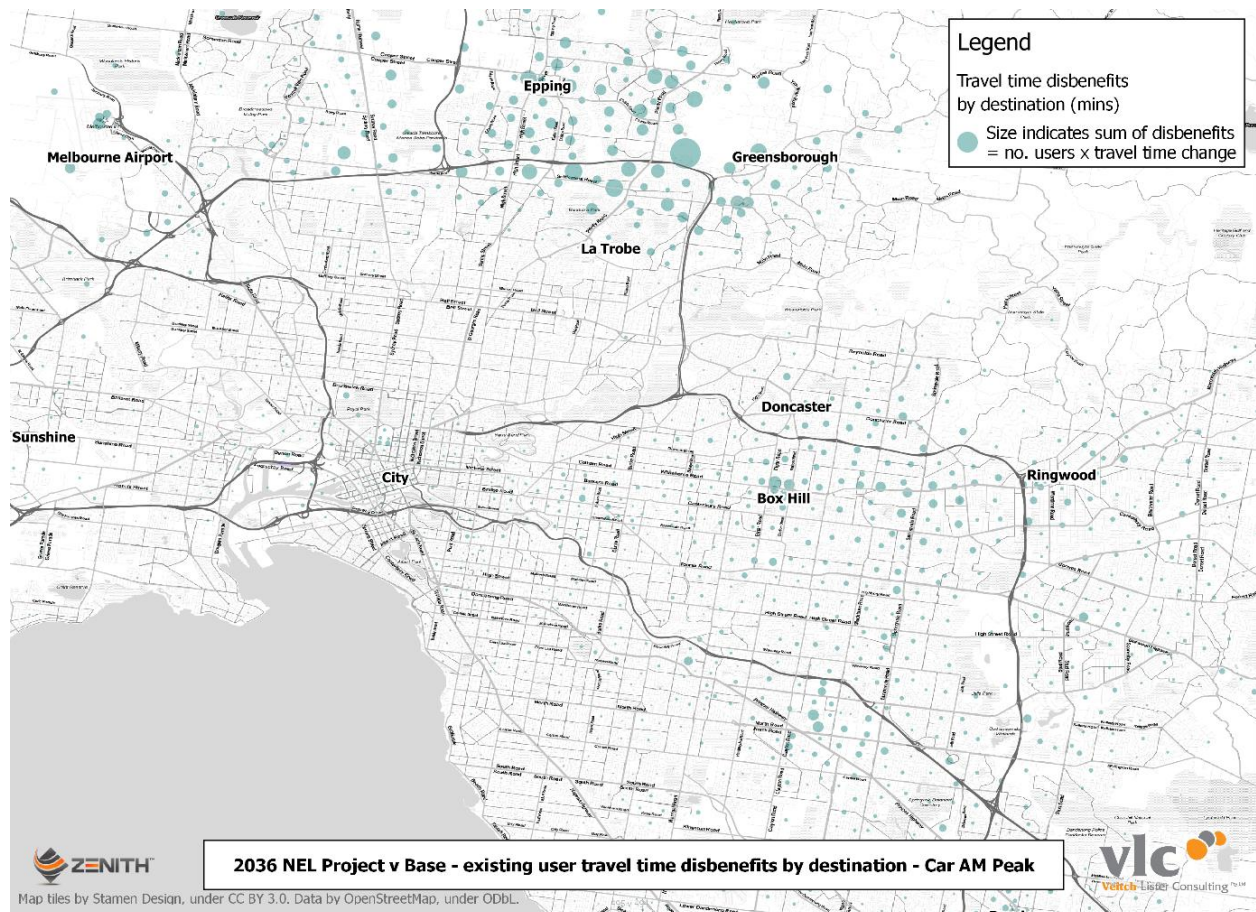


Figure 37 below depicts expected 2036 travel time benefits for cars in the AM peak by origin zone. The plot shows a heavy concentration of travel time benefits in the north-eastern suburbs, including the Greensborough, La Trobe and Heidelberg regions. Smaller benefits are also expected for car trips from eastern suburbs including Doncaster and Box Hill, as well as outer northern suburbs such as Epping.

Conversely, Figure 36 above depicts expected travel time dis-benefits for cars in the AM peak by origin. The dis-benefits are spread over the outer northern areas and eastern suburbs generally.

Figure 37 Travel time benefits for cars in the AM peak by origin, 2036

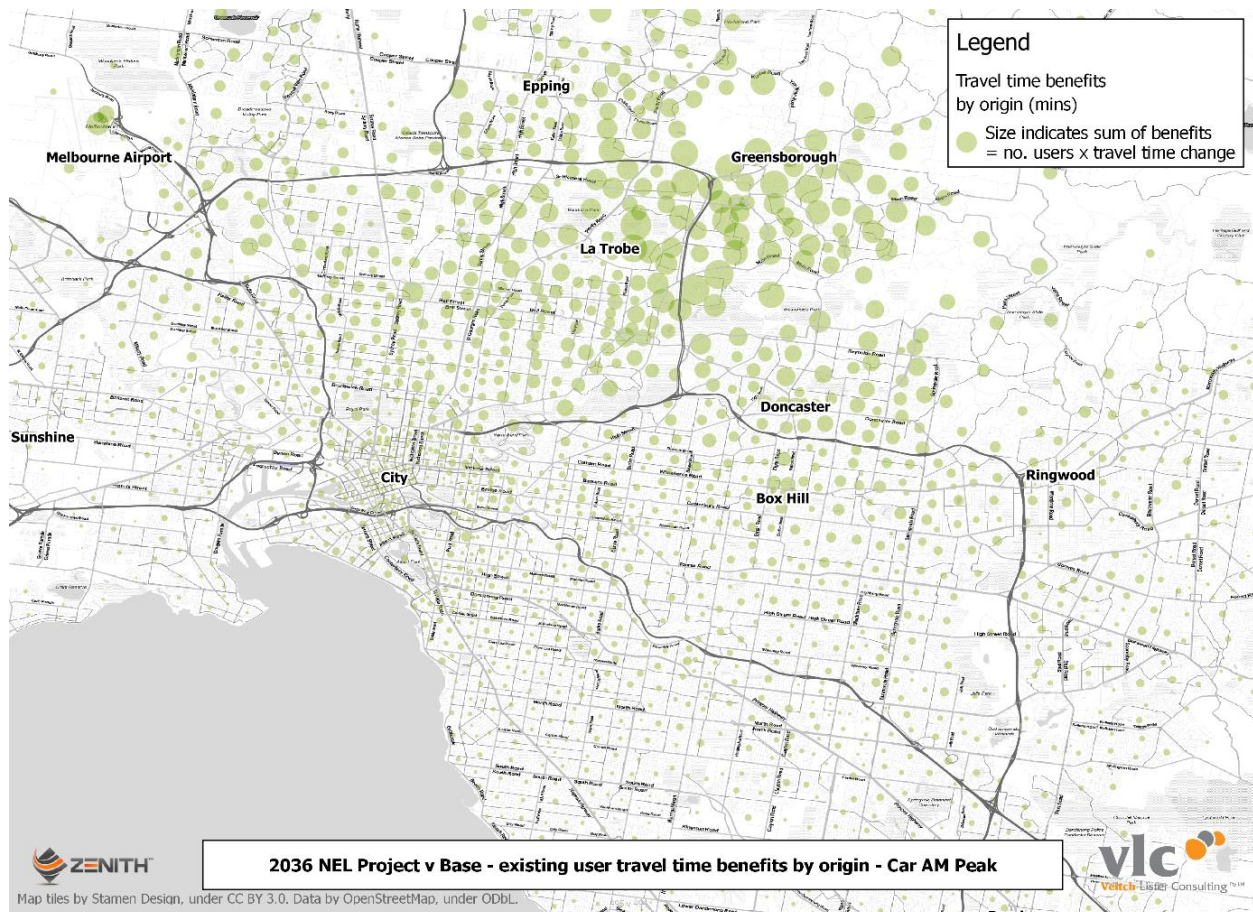


Figure 38 Travel time dis-benefits for cars in the AM peak by origin, 2036

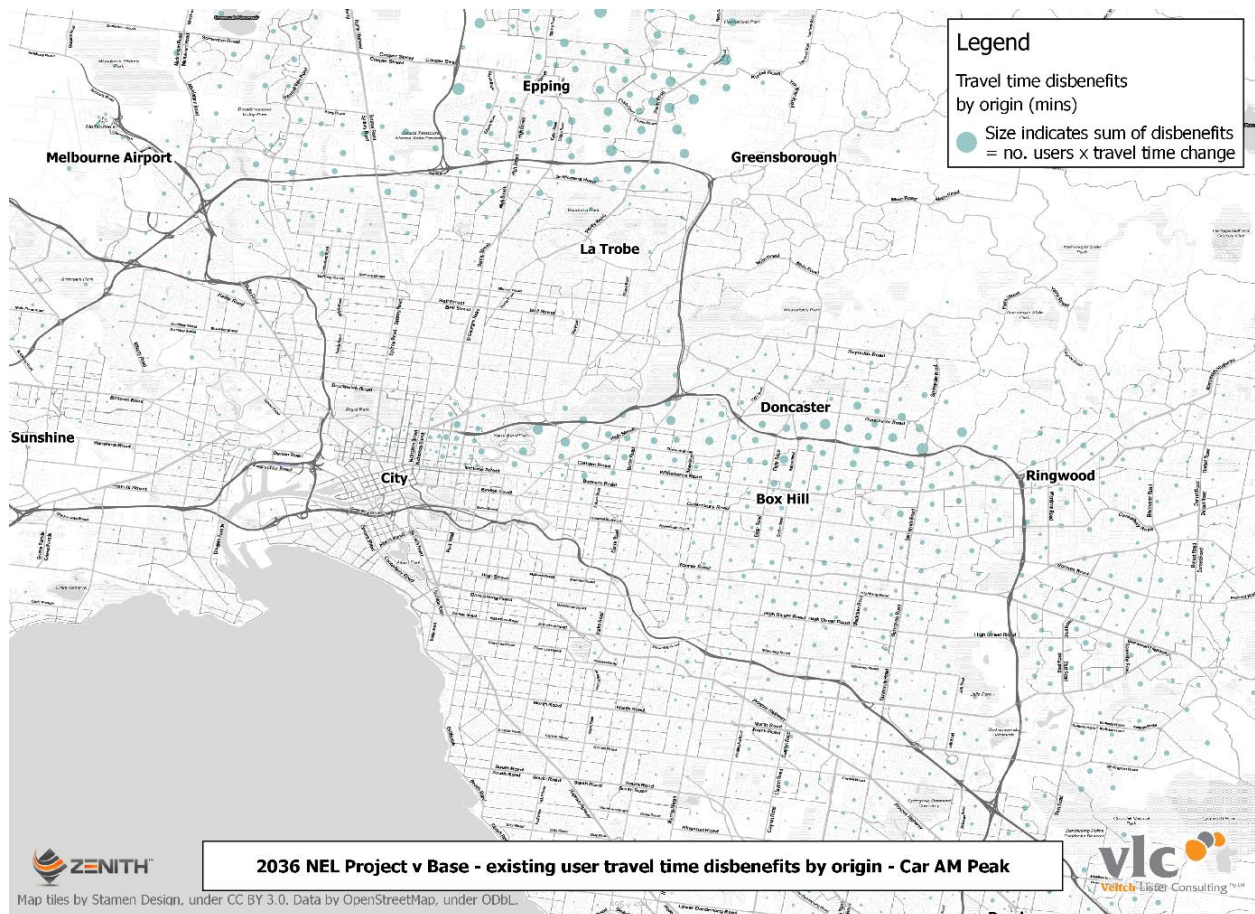
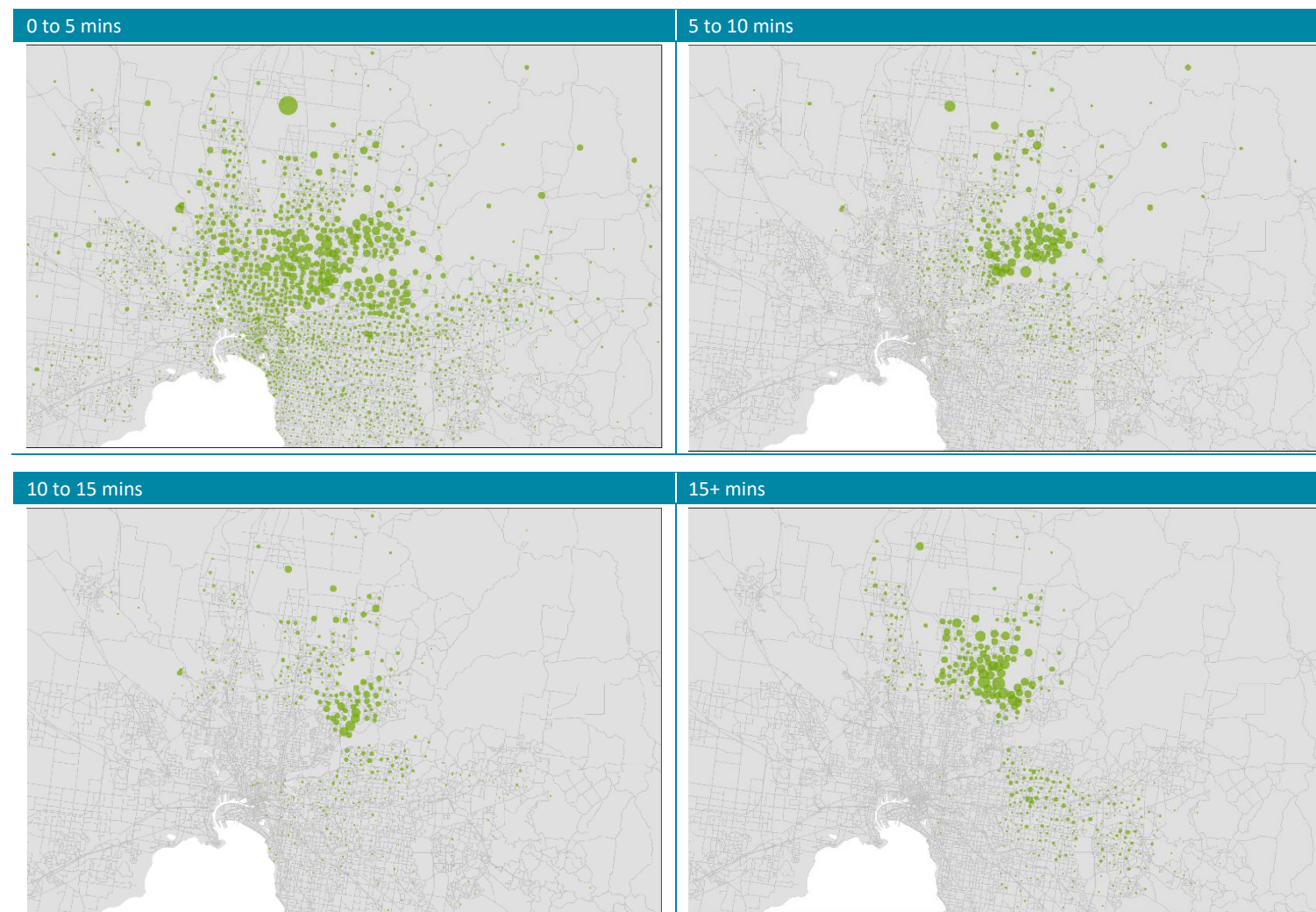


Figure 39 below provides a breakdown of the AM peak car travel time benefits by time saving interval. The charts show that time savings of zero to five minutes are incurred fairly broadly across the network, which implies the scale of general road network decongestion benefits provided by the project. Time savings of five minutes or more are typically concentrated around the project itself, with the very large time savings (over 20 minutes) situated near each terminus of the project.

Figure 39 Breakdown of AM peak travel time benefits for cars, by origin and time saving intervals (mins), 2036



7.2 Commercial vehicle benefits

Travel time benefits and dis-benefits by origin were also visualised for commercial vehicles (CVs), which are depicted in Figure 40 and Figure 41 below respectively. Expected benefits for commercial vehicles appear to be more concentrated around industrial employment precincts, as well as the Port of Melbourne. Dis-benefits are distributed around the northern and eastern suburbs, but at a smaller scale.

Figure 40 Travel time benefits for CVs in the AM peak by origin, 2036

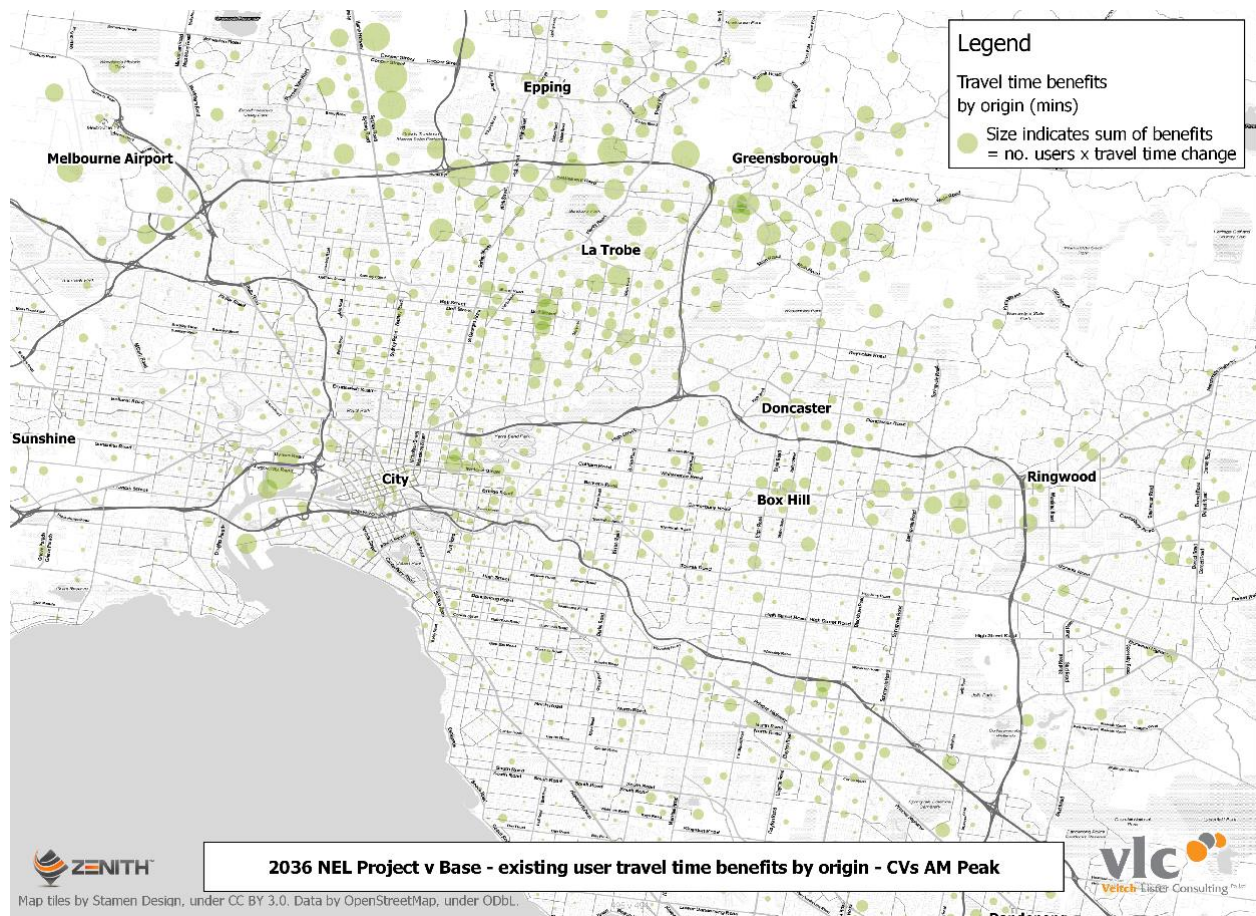
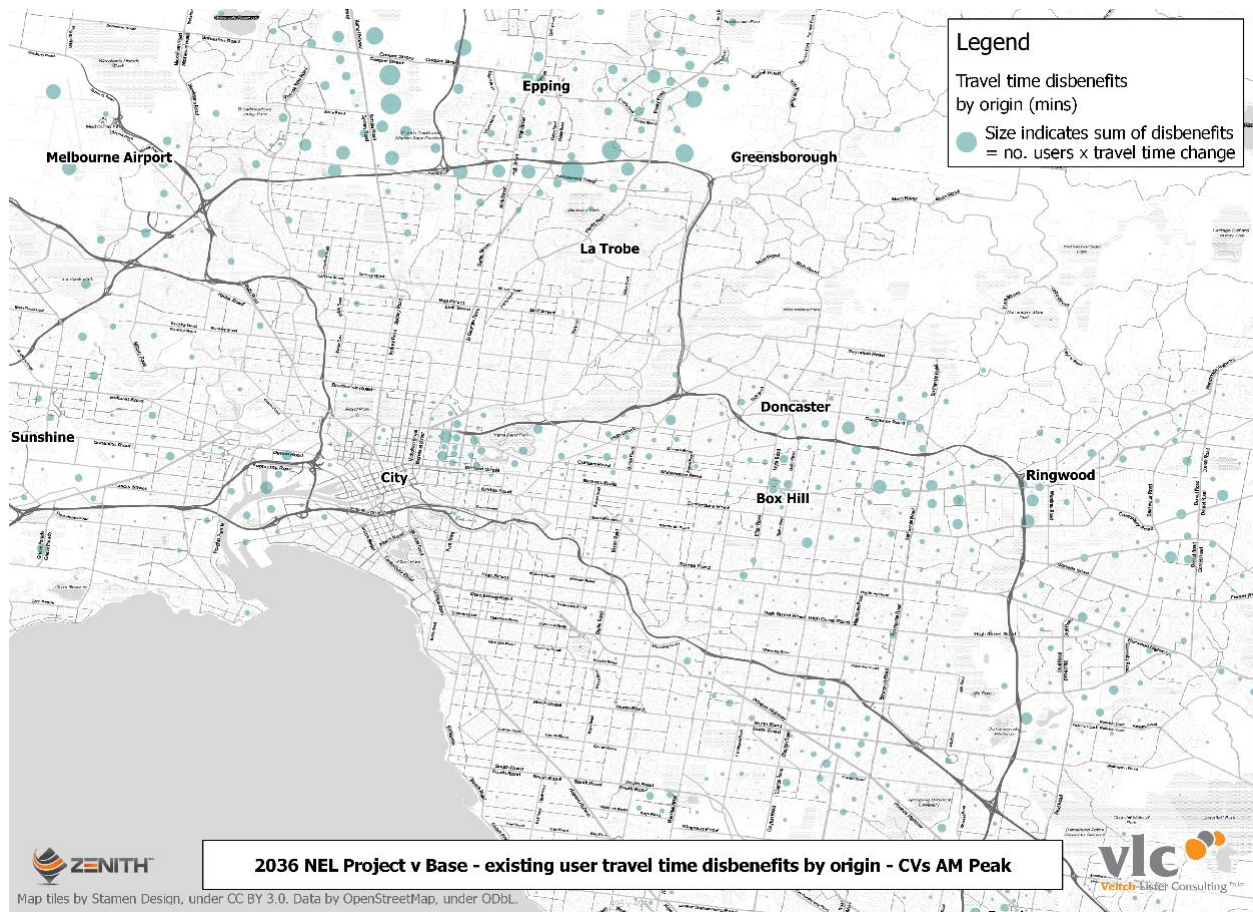


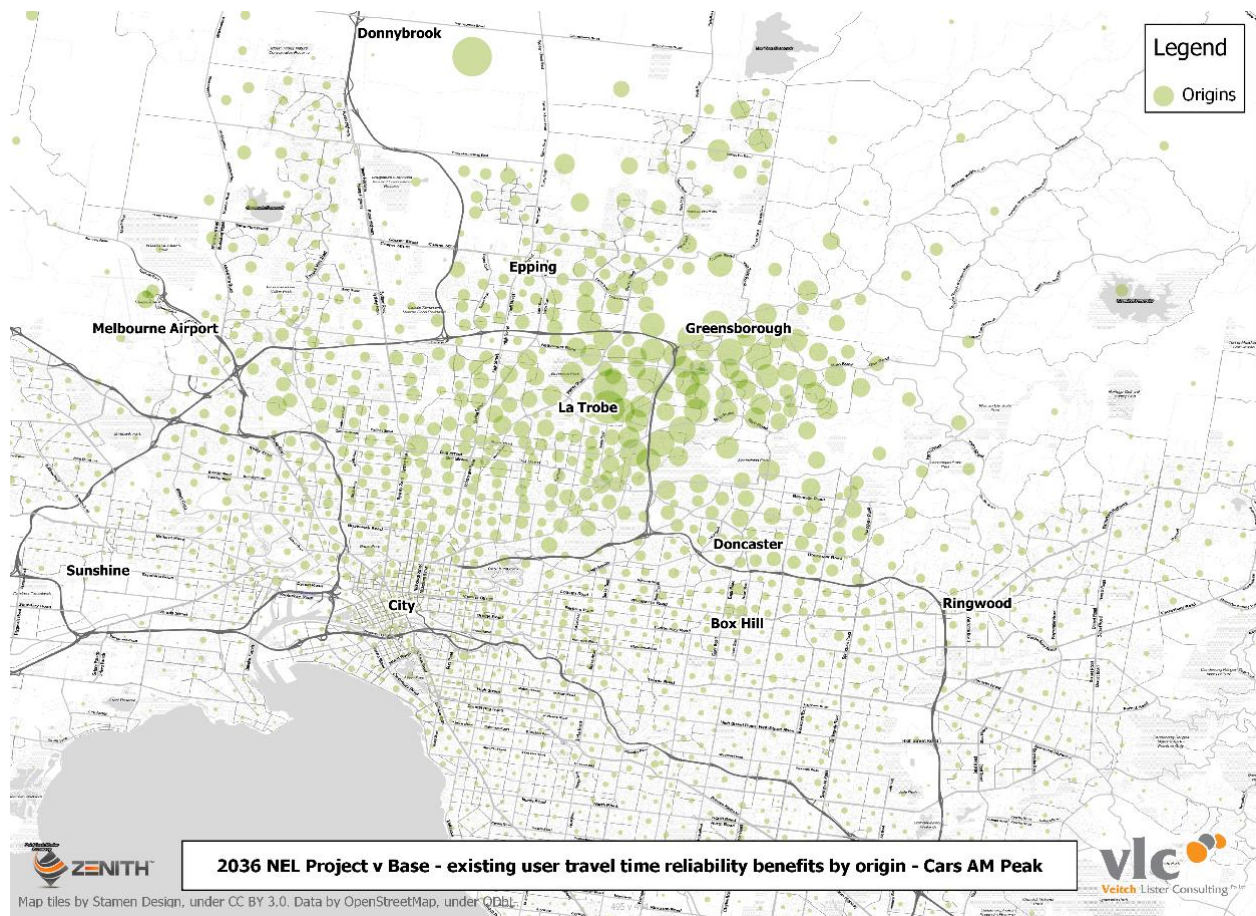
Figure 41 Travel time dis-benefits for CVs in the AM peak by origin, 2036



7.3 Reliability benefits

Travel time reliability benefits for cars in the AM peak as a result of the project have been mapped in Figure 42 below. The correlation broadly matches the overall travel time benefits by origin presented in Figure 37 earlier, with the north-eastern suburbs expected to receive the largest improvements.

Figure 42 Travel time reliability benefits for cars in the AM peak by origin, 2036



7.4 Agglomeration benefits

Agglomeration benefits for the North East Link have been calculated using the methodology outlined by the UK WebTAG. Table 5 summarises the LGAs with the largest expected agglomeration benefits, indicating that these are accrued in areas that are also expected to receive travel time improvements from the project.

Table 5 LGAs with the largest expected agglomeration benefits, 2036

LGA	Proportion of total agglomeration benefits
Banyule	15%
Darebin	11%
Whittlesea	9%
Hume	7%
Nillumbik	7%

8 Convergence

Convergence refers to iterative methods to reach an equilibrium state, with which more iterations will only result in slight change of modelling results and that changes are within acceptance limits defined by a user. The convergent feedback process can relate to either the convergence of a complete four-step demand model or within a traffic assignment model.

As model convergence is affected by the level of congestion in the network, detailed assignment and demand model convergence results have been reported on the most congested model, in this case, the 2051 base case. A summary of model convergence has been provided for all other core model runs in Section 8.2.

8.1 Detailed model convergence – 2051 Base Case

8.1.1 Traffic assignment convergence

The latest Draft VicRoads transport model guidance (26/04/2012) specifies the following criteria for traffic assignment convergence:

- To address proximity, RGAP should be < 1%
- To address stability, one of the following, should be met
 - RAAD in flows < 1% or
 - Pdiff (changing less than 5%) > 95% or
 - AAD in flows < 1 veh/h.

The RGAP values of the penultimate and final traffic assignment iteration for each time period of the 2051 Base Case are listed in Table 6, indicating that the VicRoads RGAP target for traffic assignment convergence has been met for each time period.

Table 6 Assignment convergence results (RGAP) – 2051 Base Case

Time Period	RGAP Target	Traffic RGAP (Final Iteration)	Traffic RGAP(Penultimate Iteration)
AM	< 1%	0.58%	0.59%
MD	< 1%	0.21%	0.21%
PM	< 1%	0.56%	0.56%
OP	< 1%	0.04%	0.04%

The relative average absolute difference (RAAD) values and the average absolute difference (AAD) values of the penultimate and final traffic assignment iteration for each time period; as well as the 'PDiff' statistic (percentage of links with a volume change of less than 5% between given iterations) of the last traffic assignment iteration for each time period are listed in Table 7, Table 8; and Table 9 respectively.

The model meets the VicRoads targets for RGAP and all of RAAD, AAD and Pdiff. As such the traffic assignment is considered converged for proximity, and stability.

Table 7 Assignment convergence results (RAAD) – 2051 Base Case:

Time Period	RAAD Target	Traffic RAAD (Final Iteration)	Traffic RAAD (Penultimate Iteration)
AM	< 1%	0.149%	0.152%
MD	< 1%	0.086%	0.087%
PM	< 1%	0.148%	0.149%
OP	< 1%	0.041%	0.041%

Table 8 Assignment convergence results (AAD) – 2051 Base Case

Time Period	AAD Target	Traffic AAD (Final Iteration)	Traffic AAD (Penultimate Iteration)
AM	< 1	0.785	0.779
MD	< 1	0.343	0.336
PM	< 1	0.744	0.765
OP	< 1	0.112	0.118

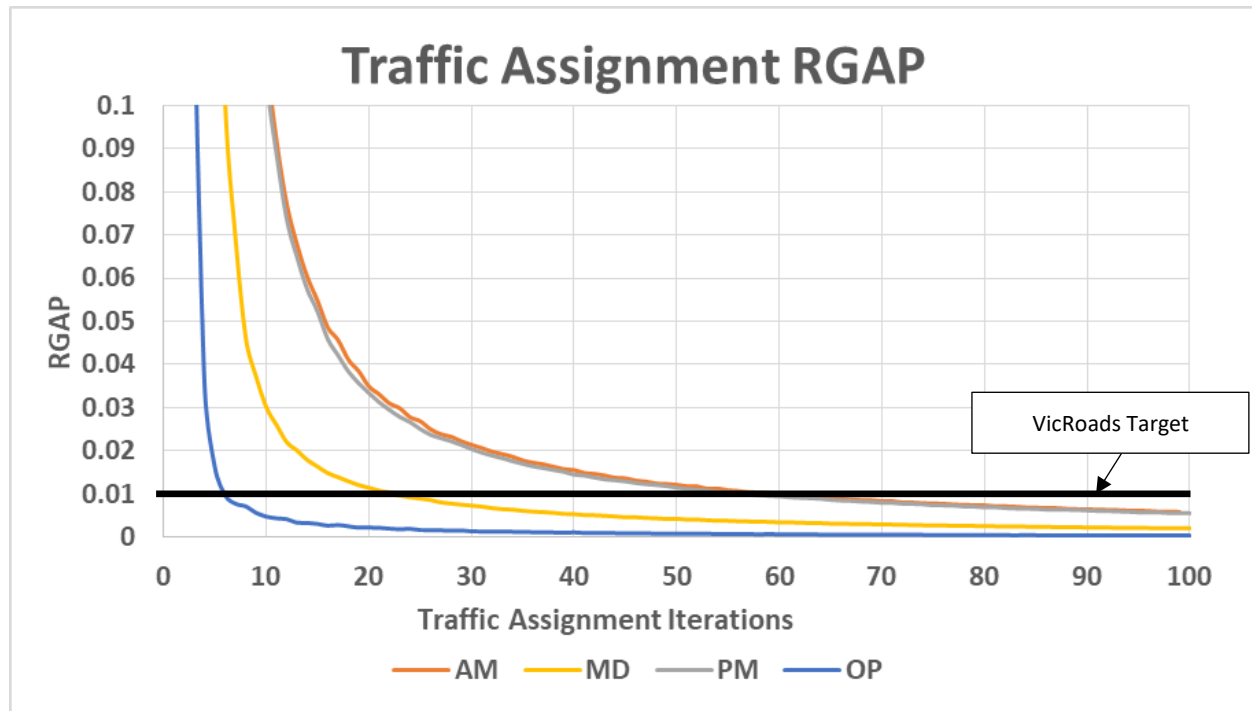
Table 9 Assignment convergence results (PDiff) – 2051 Base Case

Time Period	PDiff Target	Traffic PDiff (Final Iteration)	Traffic PDiff (Penultimate Iteration)
AM	> 95%	99.952%	99.935%
MD	> 95%	99.985%	99.960%
PM	> 95%	99.945%	99.945%
OP	> 95%	99.992%	99.984%

8.1.2 Assignment stability

Figure 43 depicts the RGAP value for each of the 100 highway assignment iterations for the 2051 base case model. The VicRoads target of 0.01 is achieved for all four modelled time periods.

Figure 43 Traffic assignment convergence (RGAP) – 2051 Base Case



8.1.3 Demand model convergence

The demand cycle convergence results for each iteration are displayed in Table 10 and include the %RMSE for the change in AM peak car cost skims, as well as the %RMSE for change in daily link volumes and change in maximum daily GEH.

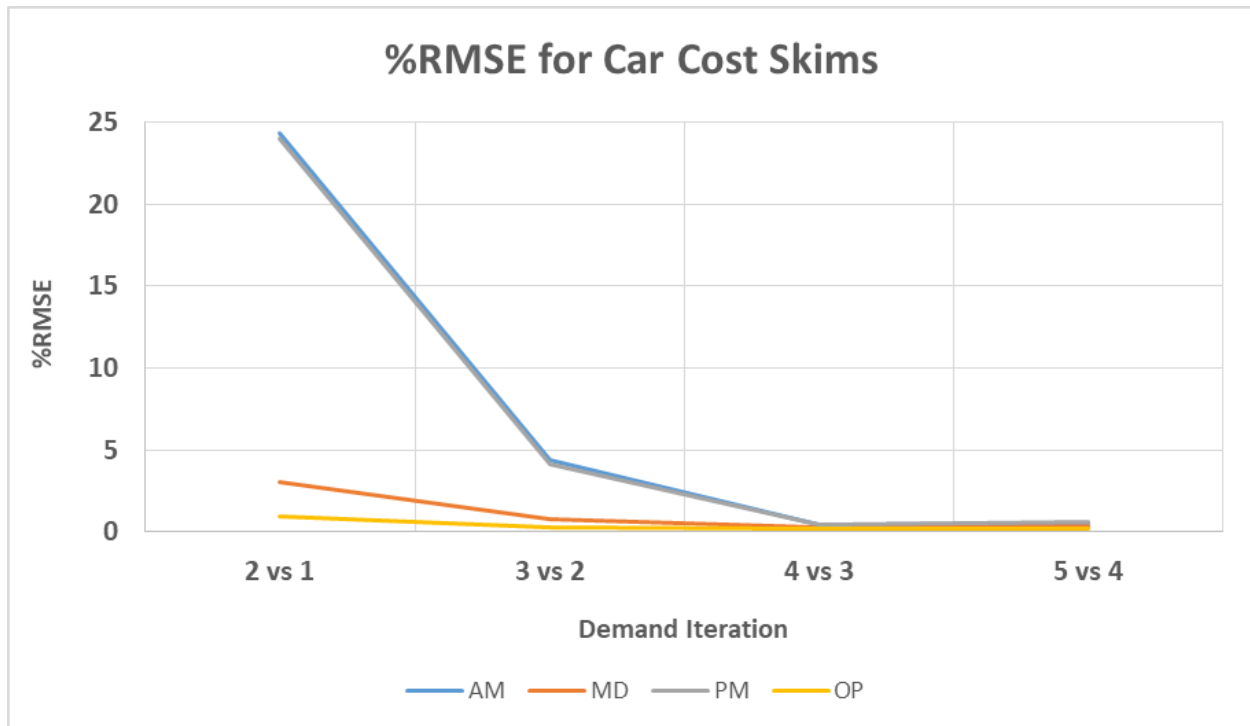
Table 10 Demand model convergence results – 2051 Base Case

Demand Iteration	%RMSE AM Car Cost Skims	%RMSE Daily Link Loads	Max. GEH Daily Link Loads
2 vs 1	24.32	10.78	17.86
3 vs 2	4.42	1.64	4.18
4 vs 3	0.45	0.61	2.90
5 vs 4	0.49	1.09	3.53

8.1.4 Demand model stability

Figure 44 below charts the %RMSE for car generalised cost skims from the 2051 base case, for each modelled time period and demand iteration. Note that there are no specific demand convergence targets required by VicRoads guidance.

Figure 44 Demand model convergence (%RMSE, Car cost skims)



8.2 Summary of traffic assignment convergence statistics

Table 11 summarises the status of the traffic assignment convergence criteria across a range of core forecast runs, including the Base Case and core Project Case for the 2026, 2036 and 2051 forecast years. Each cell denotes the number of modelled time periods (of which there are four in total: AM peak, inter peak, PM peak and evening off peak) that meet the criteria.

For each modelled time period, all core forecasts meet the VicRoads targets for RGAP and at least one of RAAD, AAD and Pdiff. Therefore, the traffic assignment is considered converged for both proximity and stability.

Table 11 Summary of traffic assignment convergence results – Core model runs

Assignment Convergence	Statistic	2026 Base	2026 Project	2036 Base	2036 Project	2051 Base	2051 Project
Proximity	RGAP	4/4	4/4	4/4	4/4	4/4	4/4
Stability	RAAD or AAD or PDiff	4/4	4/4	4/4	4/4	4/4	4/4

9 Forecast uncertainty and sensitivity tests

In order to evaluate the potential risks and uncertainties associated with the forecasts of demand on the North East Link, a series of sensitivity tests were carried out. These tests included:

Alternative futures

- Base Project case.
- High land use scenario (population and employment approx. +13%).
- Low land use scenario (population and employment approx. -10%).
- Autonomous vehicles Infrastructure Victoria scenario (including +60% capacity to freeways and +15% to arterials).

Changes in travel costs & perception

- Price of fuel (Reference Case assumption).
- CBD and inner parking charges (10-year lag in growth).
- Halved value of travel time savings.

Changes in model run methodology

- Single distribution approach.
- Single distribution approach with 10-year cost skim lag.
- Loop though distribution approach (Zenith speed-flow curves).
- Loop though distribution approach (VITM speed-flow curves).
- “Fixed” base case matrix assignment model run.

Changes in base case infrastructure & assumptions

- E6 project.
- Hume Freeway widening.
- Melbourne Metro 2 and Doncaster Rail.
- Airport passengers (10-year lag in growth).
- Port growth (10-year lag in growth).

Components of the project

- $\pm 20\%$ toll price.
- Untolled North East Link.

Table 12 shows the impact of each of the tests while Figure 45 illustrates the impacts of the major influences.

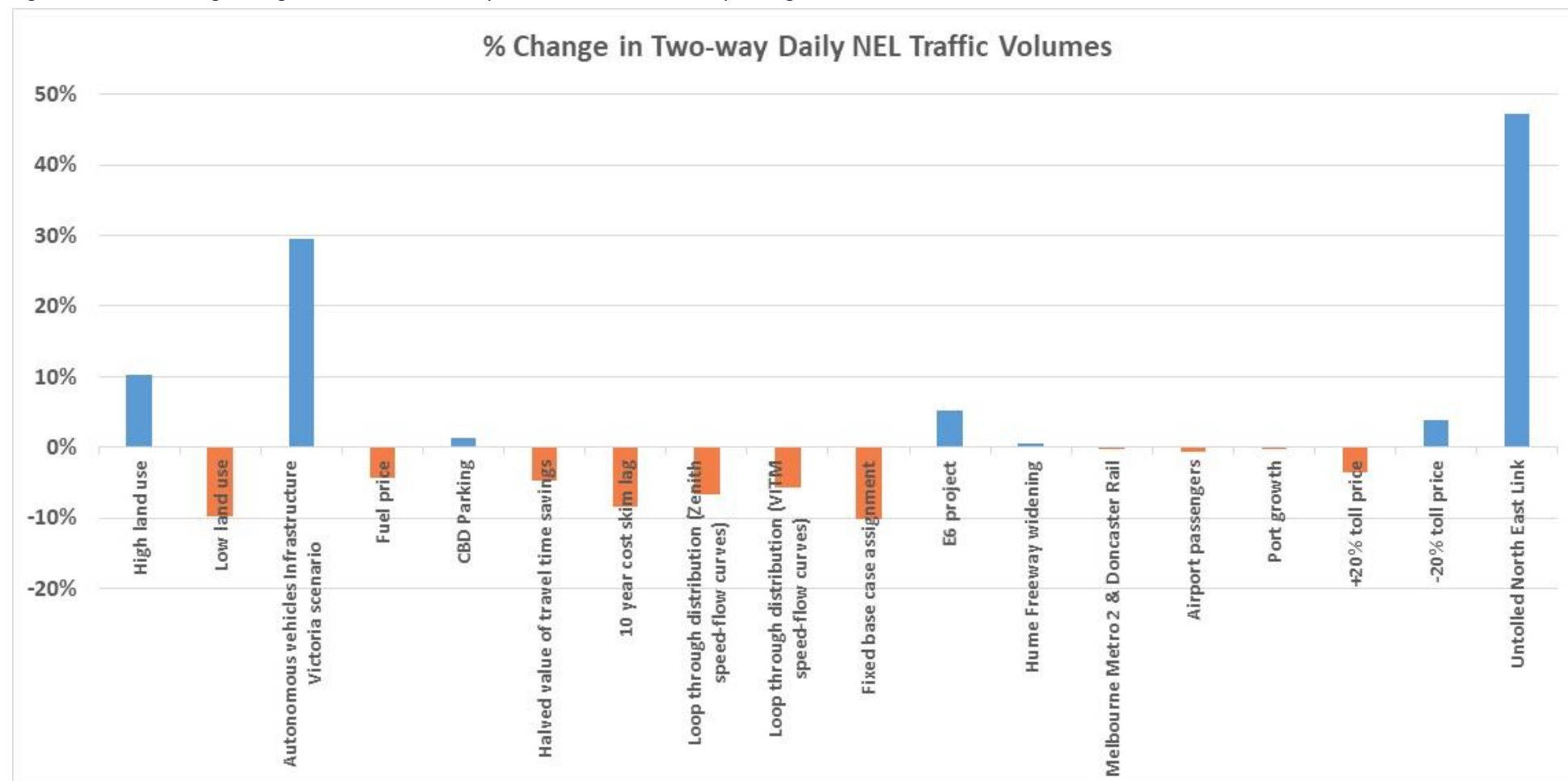
Table 12 Summary of results of sensitivity tests in 2036 – North East Link traffic volumes

Sensitivity Test	NEL Volumes
Two-way (% Diff)	
High land use	10%
Low land use	-10%
Autonomous vehicles Infrastructure Victoria scenario	29%
Fuel price	-4%
CBD Parking	1%
Halved value of travel time savings	-5%
10-year cost skim lag	-8%
Loop through distribution (Zenith speed-flow curves)	-7%
Loop through distribution (VITM speed-flow curves)	-6%
Fixed base case assignment	-10%
E6 project	5%
Hume Freeway widening	Smaller than 1%
Melbourne Metro 2 & Doncaster Rail	Smaller than -1%
Airport passengers	Smaller than -1%
Port growth	Smaller than -1%
+20% toll price	-4%
-20% toll price	4%
Untolled North East Link	47%

As Table 12 and Figure 45 show, the forecasts are most sensitive to toll price and the autonomous vehicles scenario. The high and low land use scenarios each have an impact of approximately 10%, which closely follows the changes in total population and employment assumed in each test. The run methodology tests have moderate impacts ranging up to 10%.

Base case assumptions such as fuel and parking prices, as well as port commercial vehicle and airport passenger growth are shown to have small impacts. Changes to the base case road network assumptions, such as Hume Freeway widening and Melbourne Metro 2 / Doncaster Rail, are also shown to be small.

Figure 45 Percentage change in North East Link daily traffic volumes – sensitivity testing



Attachment A –

Appropriate use of modelled forecasts

Recommendations for interpretations of the model in the use of its outputs for economic and financial analysis follow.

Land use inputs for long term forecasts

The modelling of a future planning scenario is enhanced if the urban fabric for the entire modelled area is fully defined. The urban fabric will comprise the future distribution of population (including socio-economic profiles) and employment (by type) for each travel zone. In addition, the locations of schools, higher education institutions and shopping centres are also needed. The location and scale of other special travel generators such as ports and airports are also important inputs to the model. On the supply side, all transport modes of the entire transport network envisaged for the scenario need to be identified and defined separately.

It is important to recognise that the model produces travel demand forecasts for a pre-defined land use and transport network structure that is specified exogenously (i.e. external to the model and based on the inputs provided by DEDJTR, on behalf of the Victorian State Government). Therefore, the DEDJTR land use forecasts do not account for the impact of new transport infrastructure on accessibility and travel demand patterns. This may lead to understatements of travel demands in areas of the city with substantially improved accessibility.

Some degree of incompatibility between the forecast land use and transport networks (and therefore exogenous modelling error) needs to be acknowledged; generally, understanding of the complex interactions of changes in transport networks, accessibility and land use are not well-understood. The inherent uncertainty associated with modelled forecasts depends upon the skills of land use planners and urban economists as much as it does the travel modeller.

Peak spreading and model time period

The model produces separate travel demand forecasts for the AM peak, PM peak, inter-peak and the evening off-peak. The daily demand modelled (i.e. number of journeys) is fixed for a given land use. Trips are separated into matrices for each trip purpose and these are then assigned to the time periods using factors derived from household travel surveys.

Distribution of trips into origins and destinations and the mode of choice depend on the spatial distribution of land use and the configuration and performance of the transport networks. Consequently, traffic congestion and associated delays impact choice of destination and mode of travel, but not the time period of travel.

The model therefore does not account for peak spreading, the shifting of trips to alternative departure times aimed at avoiding excessive travel times and delays. In reality, as our cities grow, the number of trips will increase and cost-effective options for improving transport network capacity diminish, peak demand will extend to increasingly longer periods. Peak spreading applies to the road and public transport networks.

Because the model cannot currently account for peak-spreading, it will generally overstate forecasts of peak travel demands and under-predict forecasts of inter-peak and off-peak travel demands.

Uncertainty in modelling intense traffic congestion

Strategic transport models are link-based models. In these models, travel speeds on road links (ie sections of road between intersections) are a function of the traffic volume on the links and the capacity. On each link, travel speed reduces as traffic volume increases and this relationship is defined using a speed-flow curve.

Strategic transport models generally do not directly account for queuing delays at intersections and do not, therefore, represent travel in separate lanes for separate turning movements. Consequently, the model does not account for queueing back, where congested conditions prevent the smooth passage of vehicles from one link to another (through an intersection). Typically, in extremely congested networks, strategic transport models over-estimate traffic speeds and under-estimate traffic delays.

Unconstrained public transport network capacity

While the Zenith model has the capability to represent over-crowding on public transport and station parking constraints accessing public transport, it has not been used for this project. In effect, the public transport network is unconstrained. As a result, demand for public transport may be overstated during the peak periods.

Unconstrained parking capacity

The model includes parking charges, which are added to the perceived generalised cost of car travel to selected travel zones (including the CBD, inner suburbs and universities). The charge that is applied to individual zones is designed to not only reflect actual parking charges, but also any disincentive there may be for car travel resulting from a shortage of parking supply in a zone.

The component of the charge that represents capacity restraint is fairly arbitrary and is set to reflect the car parking demand/supply situation at the time the model was last validated. The model does not yet have a capability to balance parking demand and supply.

In the case of the Melbourne CBD, where the amount of parking in new developments is strictly controlled by the Melbourne City Council Planning Scheme, the parking demand/supply balance may change over time, making travel by car to the CBD more or less attractive. The model makes allowance for expected changes in CBD parking costs, but assumes that the demand/supply balance does not change in the future.

Paradigm shifts in travel behaviour

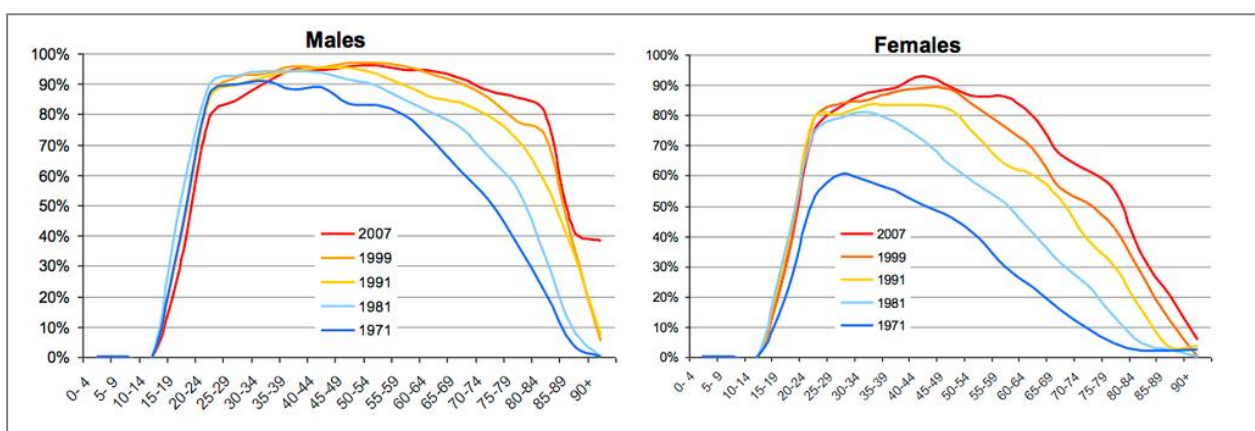
The model has been calibrated using the VISTA household travel survey data including VISTA 07 and VISTA 09. The model's behavioural relationships therefore reflect peoples' attitudes and preferences at the time the VISTA surveys were conducted (between 2007 and 2010),

Some key model parameters, such as how people value their time and make trade-offs when deciding whether, where and how to travel, may change over time. In the model these travel behaviour characteristics and preferences are assumed to remain constant over time. The model makes no attempt to predict "paradigm shifts" in travel behaviour that might occur in the future, and assumes that such changes will not occur.

It is not only plausible, but likely, that travel behaviour will change in the future in response to such issues as concern for the environment, younger people driving less and older people driving more than previous generations, emerging technologies, improvements in fuel efficiency etc.

An example of an emerging trend of this nature includes changes to licence-holding rates over time. Figure 46 shows the rates of licence holders in Sydney SD, by gender, for 1971 to 2007. Of note is the significant increase in licence-holding for older people – particularly males over 60 – as well as the overall increase in licence-holding for females since 1971.

Figure 46 Licence-holding rates in Sydney SD, by gender and age, 1971 to 2007.
Source: Raimond and Milthorpe, 2010



Average weekday traffic volumes

The Zenith model parameters are calibrated using VISTA house hold travel surveys collected for an average weekday during school term (AWDT). This excludes weekends, school holidays and public holidays. The model is then validated against traffic volumes collected for an average weekday (during school term), and non-typical surveys not included (eg outliers caused by incidents and faulty data collection). As a rule of thumb, VicRoads data indicates that average weekday (during school term) traffic volumes (AWDT) are approximately 5 to 10% higher than the average annual daily traffic (AADT).

Expected margins of uncertainty for strategic transport model forecasts

In 2011 the internationally-renowned toll road forecasting expert Dr Robert Bain published the results of a survey he conducted amongst transport modelling professionals across numerous countries, which gauged their expectations surrounding the uncertainty of model forecasts. Respondents were asked to nominate their expected error range for model forecasts for both new and existing roads, for a next day, one year, five year and 20 year forecast horizon. The results of this survey are shown in Table 13.

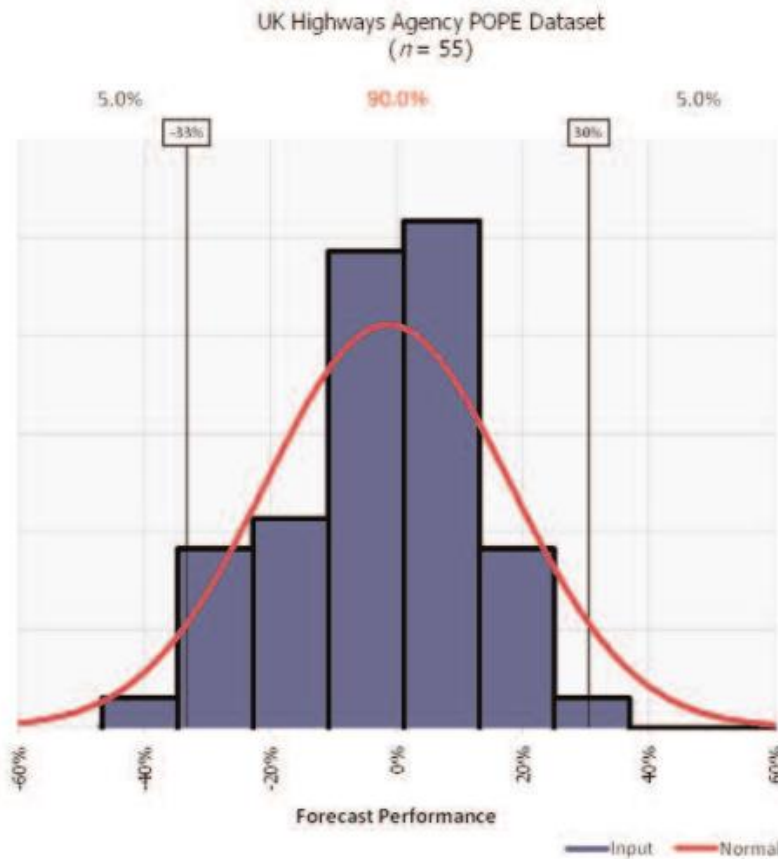
Table 13 Summary of survey results from transport modelling professionals (Source: Dr Robert Bain, “The Wisdom of Crowds: A Survey of Forecasting Accuracy”)

Table 1: Survey Results (n = 46)		
Forecast Horizon	Likely Error Range	
	Existing Road	New Road
The next day	± 7.5%	n/a
One-year ahead	± 10%	± 15%
Five-years ahead	± 15%	± 25%
20-years ahead	± 32.5%	± 42.5%
Notes: Respondents were not asked about 'next day' forecasts for new builds. Percentages have been rounded.		

The responses suggest that the industry’s general consensus is, that the forecast of a revenue or traffic volume in a five-year period, should be expected to be within approximately ±15% of the actual value, while a 20-year forecast was typically estimated to be within ±33%.

Bain compared this to a chart published by the UK Highways Agency in 2010, shown in Figure 45, which compares modelled forecasts across 55 road projects compared to their actual, eventual traffic volumes. The 90% confidence interval across the sample was found to be within -33% and +30%, and on average the forecast horizon was five years. This compared to a ±15% expected error for an equivalent period from the survey responses shown in Figure 47.

Figure 47 Variance in model forecast vs. actual values (Source: UK Highways Agency, 2010)



There are inherent uncertainties in forecasts because demographic, social, technological and economic conditions may change unexpectedly. For this reason, sensitivity testing of model inputs is often undertaken within the context of demand forecasting for an infrastructure project.

Describing the influence of a factor on a forecast is a matter of judgment. Realistically, for a 20-year forecast, any impact around 1% could be considered to be negligible, particularly when shorter range forecasts have been shown to only reliably fall within approximately $\pm 30\%$ of eventual actual values. In reality, even day to day, the travel demands on a given section of the network can fluctuate, with variations of around $\pm 10\%$ commonly observed.

Other changes in assumptions

There are numerous exogenous factors affecting travel demand forecasting which are difficult to predict or quantify. Changes in government policy, for example, occur on a regular basis and can affect modelled outcomes. Even during recent forecasting exercises, numerous policy changes were announced by the Victorian Government. For example, in January 2017, VicRoads modified the truck curfews in the north-east. Other major assumptions, in particular fuel costs, can also prove difficult to foresee. Various factors impact the petrol price paid by motorists at the pump, including the Australian dollar exchange rate and perceptions of potential oil supply (Gargett 2010).

Attachment B – Model validation



Prepared for



Transport Modelling for North East Link

Local Area Model Validation Report, Model C

January 2018



Transport Modelling for North East Link
Local Area Model Validation Report, Model C
Project 16-081

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1 Introduction

1.1 Background

The Zenith model is being used for the North East Link (NEL) project evaluation. This version of the Zenith model is referred to as Model C.

The State of Victoria has prepared two transport modelling guidelines that specifically relate to traffic model validation, including:

1. VicRoads “*Transport Modelling Guidelines, Volume 2: Strategic Modelling, Version: Draft 3*” dated 26 April 2012 – which sets out the approach and criteria recommended by VicRoads for the validation of strategic transport models
2. Department of Economic Development, Jobs, Transport and Resources (DEDJTR) “*Strategic Transport Model Elasticity Guidelines*”, dated 16 December 2015 – which sets out ‘dynamic validation’ realism tests (sensitivity scenarios on the base case transport model) and provides a range of approximate elasticity values. These ranges have been estimated by DEDJTR, while ranges developed from local data are not utilised. For this reason, the modelled results were compared to elasticity ranges from both international estimates, as well as DEDJTR’s estimates.

This document summarises the performance of the Zenith 2016 base year model in the NEL study area, using the above guidelines.

1.2 Appropriateness for the NEL project

The objective of model validation, realism and stability process is to provide confidence that the model is accurately representing current conditions in traffic and toll road patronage, and can be relied upon to respond to cost and other changes in assumptions in a reasonable way.

Based on the model validation, realism comparisons (international and DEDJTR) and proof of model stability (through model convergence) in this report, it is reasonable to accept that the base year model provides a sound foundation which is appropriate for the evaluation of the North East Link project.

However, it should be noted that demand forecasts are dependent on the assumptions made about changes in economic, social and demographic conditions¹.

The application and interpretation of all transport models and their outputs should be qualified by their known limitations. This is discussed in detail in Appendix A - Model limitations, which summarises a number of key limitations and uncertainties in the model.

As such the accuracy of the transport model’s validation, including realism, stability and convergence, does not assure accurate demand forecasts.

¹ Assumptions were provided by DEDJTR in their reference case specifications.



1.3 Report structure

The balance of this report is structured as follows:

Section 2: A summary of the observed traffic and public transport data used for the local area model validation

Section 3: Presents demand model validation results

Section 4: Compares model's estimates of traffic volumes against a database of observed count data for the local area

Section 5: Compares model's estimates of public transport patronage against a database of observed public transport data for the local area

Section 6: Provides a summary of the model elasticity results

Section 7: Provides a summary of the model convergence and stability analysis



2 Data used for local area model validation

In this section, the data used for the validation of the 2016 model (and its sources) will be discussed.

The model produces travel demand estimates for an average weekday during school term, for the following four time periods:

- AM peak (7am – 9am)
- Inter peak (9am – 4pm)
- PM peak (4pm – 6pm)
- Evening off peak (6pm – 7am)

2.1 Road traffic data

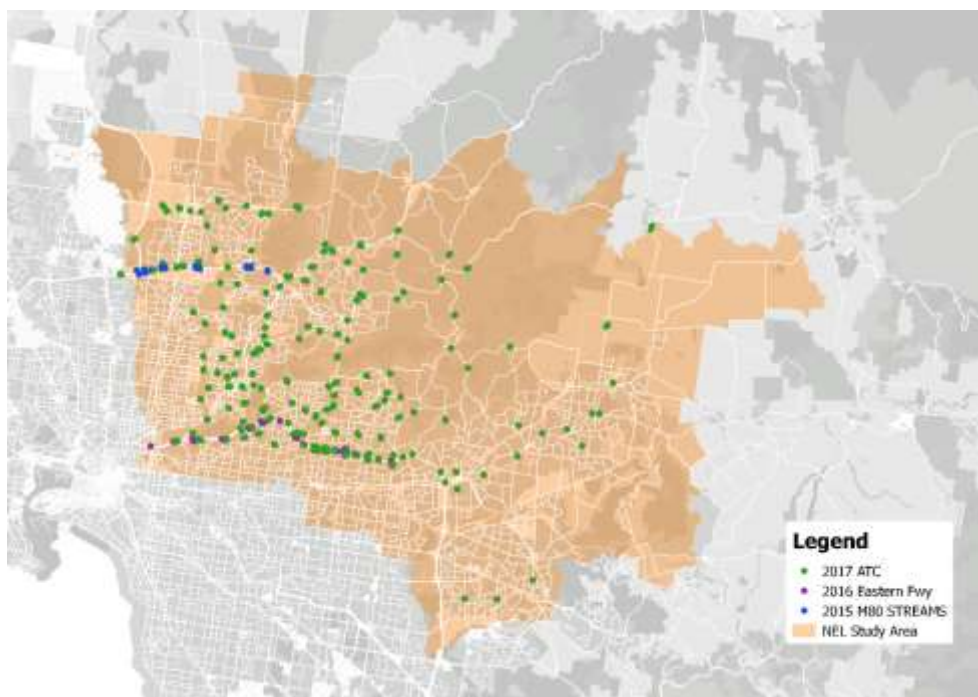
2.1.1 Local area individual traffic counts

After the commencement of the transport modelling for the NEL business case, traffic counts and surveys were received from VicRoads and NELA for the purposes of the NEL local area validation exercise.

A total of 363 AM peak, PM peak and daily traffic counts (all are defined as average weekday during school term), reflecting 2016 conditions in the vicinity of the proposed project were used. They included the following surveys as shown in Figure 2.1:

- 2017 NELA ATC counts, pictured in green
- 2016 VicRoads Eastern Freeway counts, pictured in purple
- 2015 VicRoads Metropolitan Ring Road (M80) STREAMS volumes, pictured in blue

Figure 2.1 - Local Study Area Total Traffic Count Locations





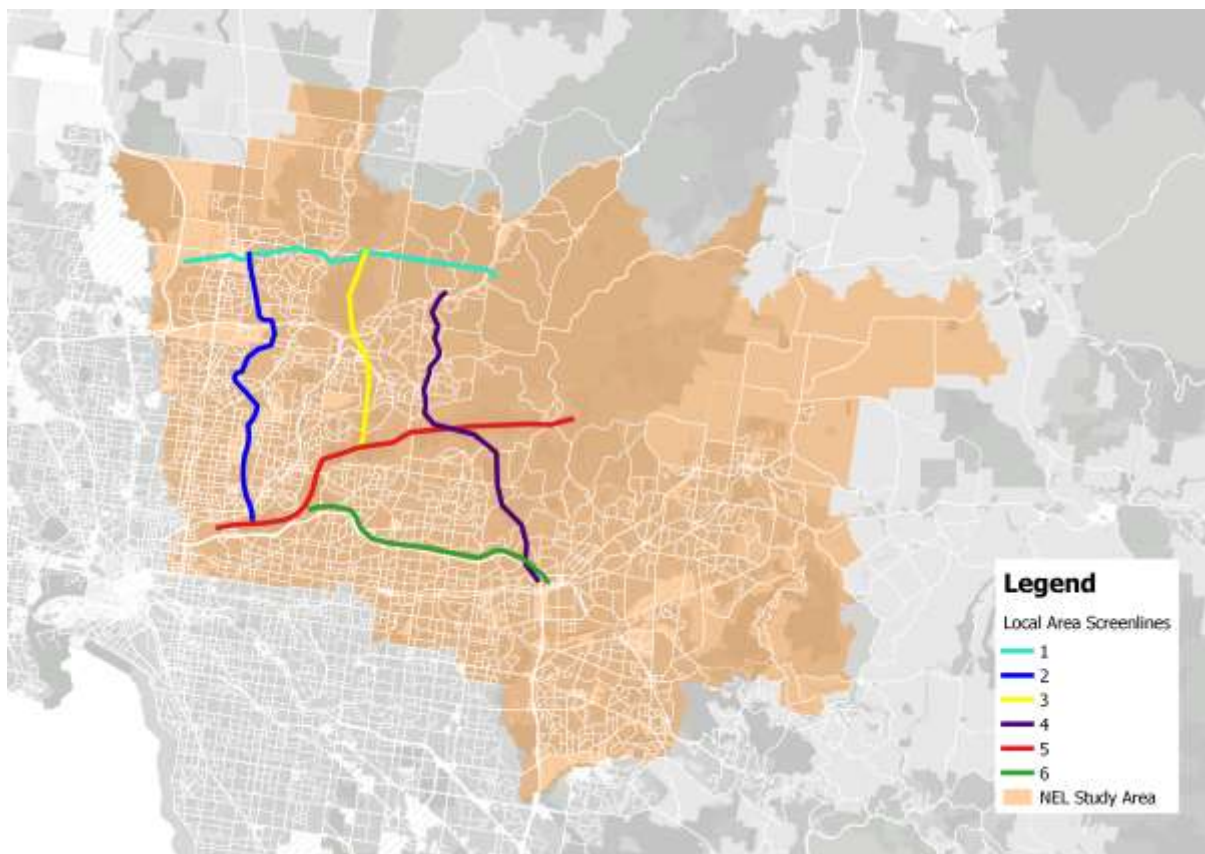
2.1.2 Local area screenline traffic counts

A total of 6 traffic screenlines were collected for the NEL project. These screenlines included:

1. Cooper St/Kurrak Rd crossings between Edgars Road and Heidelberg-Kinglake Road
2. Darebin Creek crossings between Childs Road and Heidelberg Road
3. Plenty River crossings between Kurrak Rd and Main Road
4. Diamond Creek/Mullum Mullum Creek crossings between Main Street and Loughnan Road
5. Yarra River crossings between Chandler Highway and Kangaroo Ground-Warrandyte Road
6. Eastern Fwy/EastLink crossings between Bulleen Road and Ringwood Bypass

The screenlines are shown in Figure 2.2.

Figure 2.2 - Local Study Area Screenline traffic count



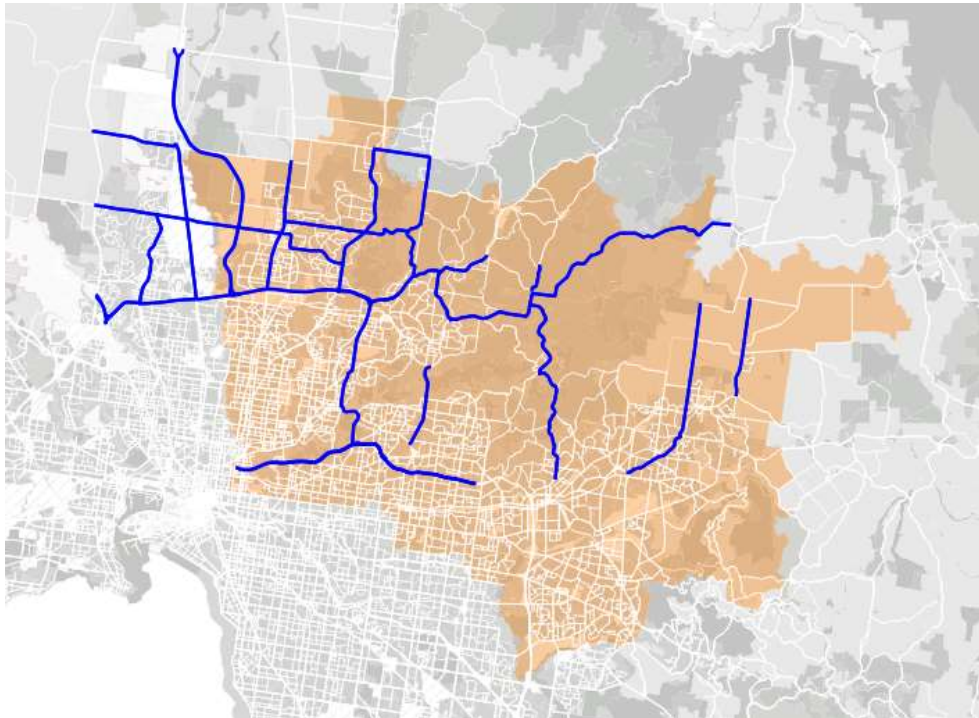


2.1.3 Local area traffic travel time surveys

A total of 44 peak and 24 interpeak travel time surveys (all are defined as average weekday during school term) in the vicinity of the proposed project were used. They included the following surveys as shown in Figure 2.3:

- 2017 NELA travel time surveys
- 2017 OSARs travel time surveys

Figure 2.3 - Local Study Area Travel Time Routes





Redacted - commercial-in-confidence



2.2 Public transport patronage data

2.2.1 North East Link – local area rail data

The estimated average weekday AM peak inbound CBD cordon train passenger loads have been processed and provided by Transport for Victoria (TfV), as well as weekday station entries at metropolitan stations within the study area for 2016 (by time period).

2.2.2 North East Link – local area bus data

Average weekday patronage data for 2016 across the metropolitan Melbourne bus network have been provided by TfV.



3 Local area validation of demand models

Travel demand models are built-in algorithms that model aggregated travel behaviour at a strategic level. These include components that capture travel behaviour such as trip generation, choice of destination and choice of travel mode of different trip purpose.

VISTA is a household travel survey that includes details of household travel behaviour. The built-in trip algorithms, such as the trip generation model, trip distribution model and mode choice model have been validated against the VISTA07/09 recorded travel patterns. The details of the algorithms being used and their parameters, as well the calibration and validation to VISTA07/09 data can be found in the Zenith model recalibration working papers and will therefore not be discussed in this report.

3.1 Journey to work validation

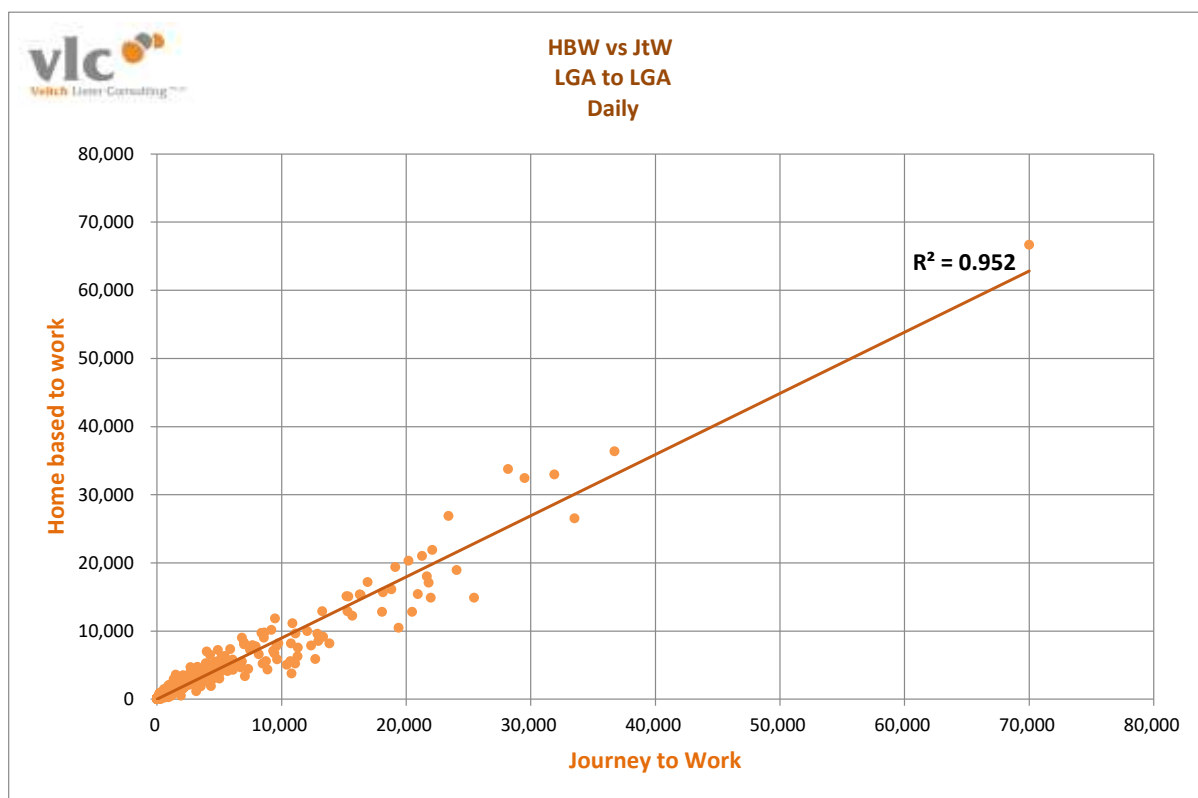
Figure 3.2 below compares 2016 modelled home-based work trips (at an LGA to LGA level) against observed data from the 2011 ABS Journey to Work (JtW) Survey. At the time of writing this report, the latest ABS JtW survey was not available. It should be noted that the model classifies home-based work trips as direct home-to-work trips only, (i.e. trips that involve a stop-over along the way, such as the shops, or dropping children off at school, are not classified as such), while the ABS survey includes all commuter trips regardless of stopovers. However, this is countered by the fact that the comparison is between 2011 observed data and 2016 modelled values, due to a lack of more recent observed data. Therefore, it is difficult to infer much from the gradient.

The R-squared value of 0.95 however, indicates that – proportionally – the model is allocating a scale of commuter trips between each LGA pair which correlates well to the ABS survey.

The ABS JtW Survey has been included in this report as it is an independent data source which was not used in the generation of the model calibration parameters. Full validation of the demand model for each modelled trip purpose against VISTA can be found in the Zenith recalibration technical notes for Destination Choice and Mode Choice.



Figure 3.1 – Modelled vs Observed ABS Journey to Work (LGA to LGA)





4 Local area validation of traffic assignment

In this section, the traffic assignment validation results are presented to demonstrate the performance of the model in the North East Link study area.

Modelled traffic volumes will be validated against observed traffic counts by time of day.

As recommended by VicRoads in their report “*Transport Modelling Guidelines, Volume 2: Strategic Modelling, Version: Draft 3*” dated 26 April 2012, the Zenith model of Melbourne does not use matrix estimation or k-factors.

A detailed listing of modelled vs. observed individual count comparisons can be found in Table B.2 of Appendix B - Validation of traffic flows.

4.1 North East Link corridor traffic validation

4.1.1 Traffic volumes - individual traffic counts

Table 4.1 and Table 4.2 show the modelled validation results against the individual local area traffic counts in terms of the %RMSE statistic. The %RMSE for traffic counts is approximately 13% across the day, 25% in the AM peak and 21% in the PM peak and is well below the VicRoads criteria of a maximum %RMSE of 30%.

Table 4.1 - Validation to Individual Counts – Peak Periods (%RMSE)

Volume Bins	AM	PM
0 - 999	60.91	61.87
1000 - 1999	33.89	25.06
2,000 - 4,999	21.23	21.57
5,000 - 9,999	12.08	12.43
10,000 +	16.42	10.18
ALL	24.88	20.92

Table 4.2 - Validation to Individual Counts - Daily (%RMSE)

Volume Bins	Daily
0 - 4,999	56.09
5,000 - 9,999	25.55
10,000 - 24,999	14.69
25,000 - 49,999	9.43
50,000 +	5.18
ALL	12.65

The scatter plots of AM peak, PM peak and daily one-way modelled volumes as compared to traffic counts in the local area are shown in Figure 4.1 to Figure 4.6. Each plot is followed by an accompanying plot which zooms in on smaller values. The R-squares and gradients are all close to 1 and meet the VicRoads criteria.



Figure 4.1 - Local Area AM Peak Individual Counts Scatter Chart (Observed Vs 2016 Modelled)

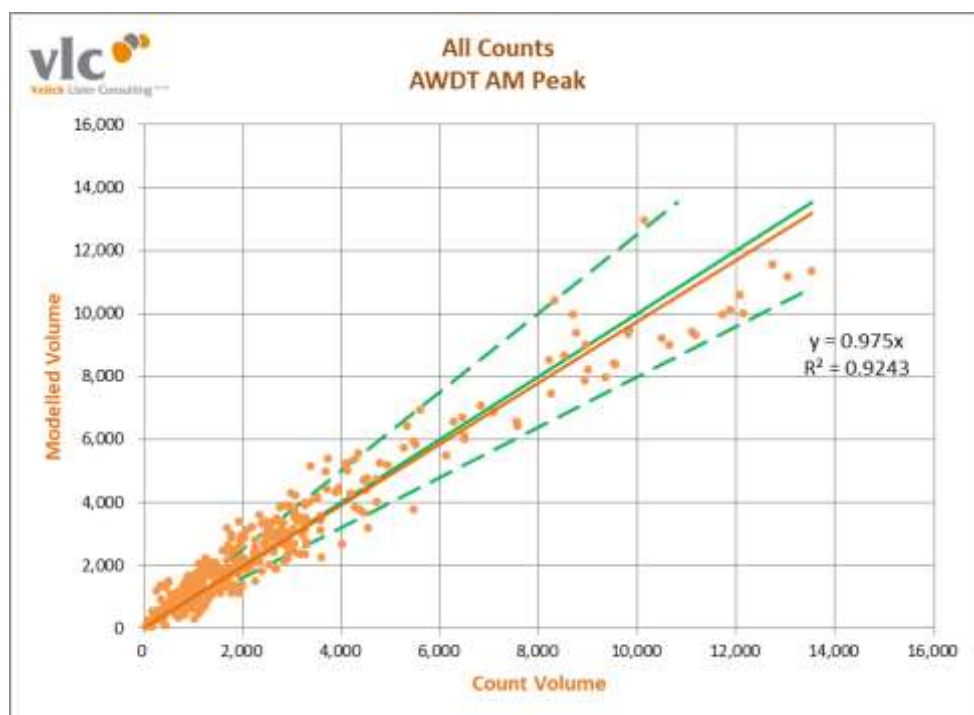


Figure 4.2 - Local Area AM Peak Individual Counts Scatter Chart (Zoomed In, zero to 8,000)

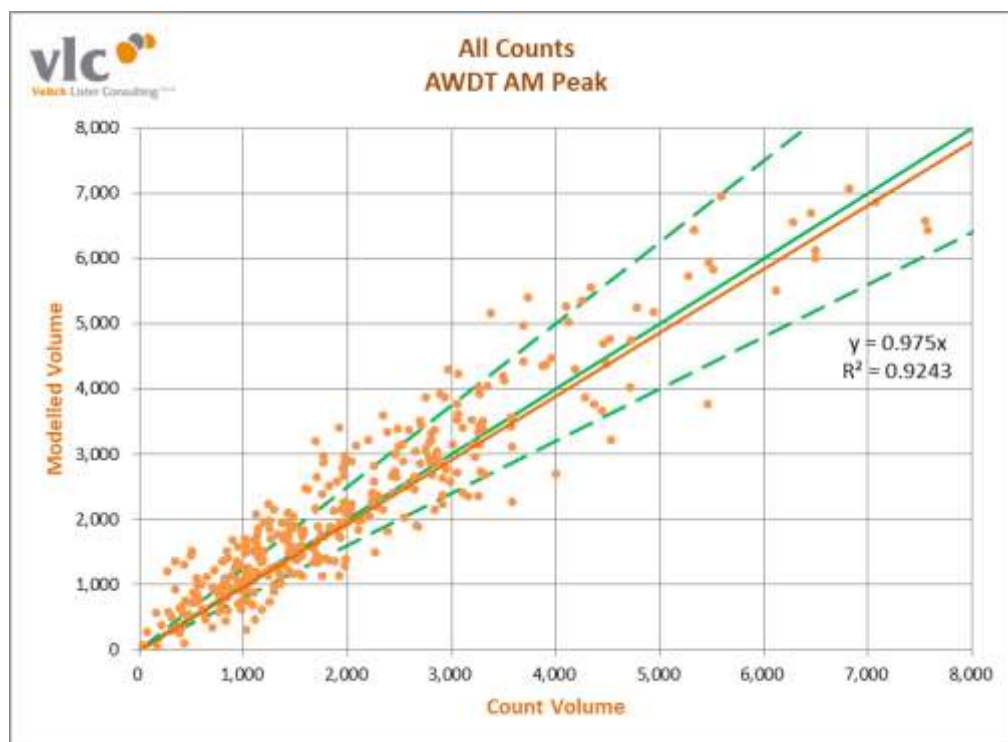




Figure 4.3 - Local Area PM Peak Individual Counts Scatter Chart (Observed Vs 2016 Modelled)

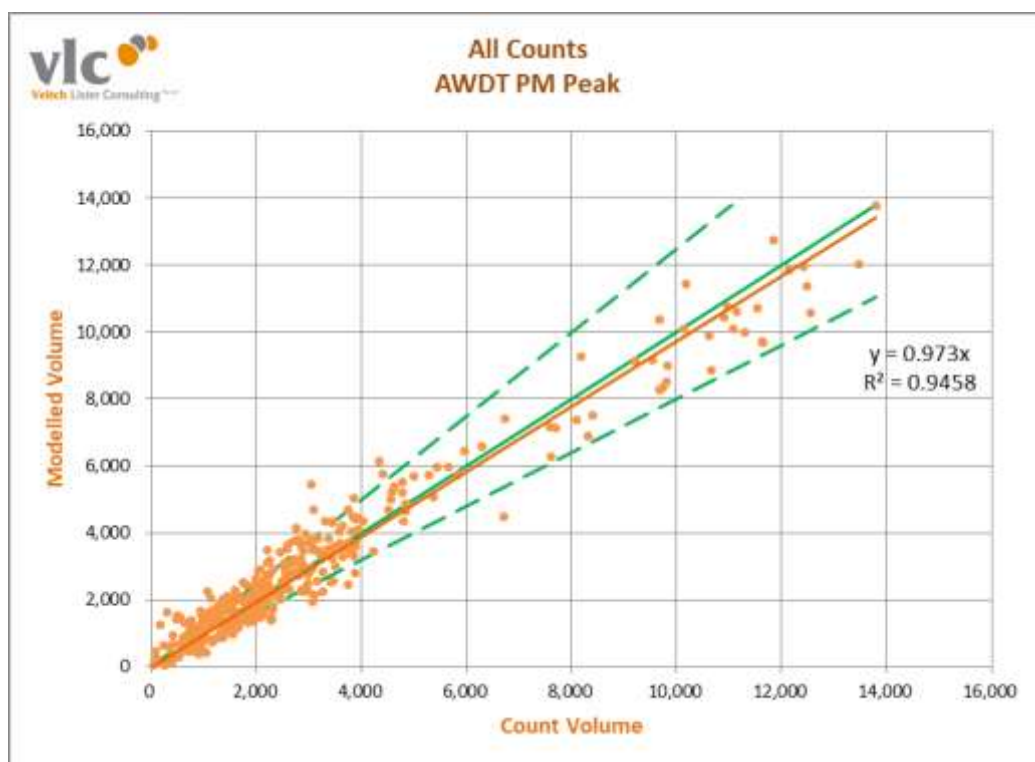


Figure 4.4 - Local Area PM Peak Individual Counts Scatter Chart (Zoomed In, zero to 8,000)

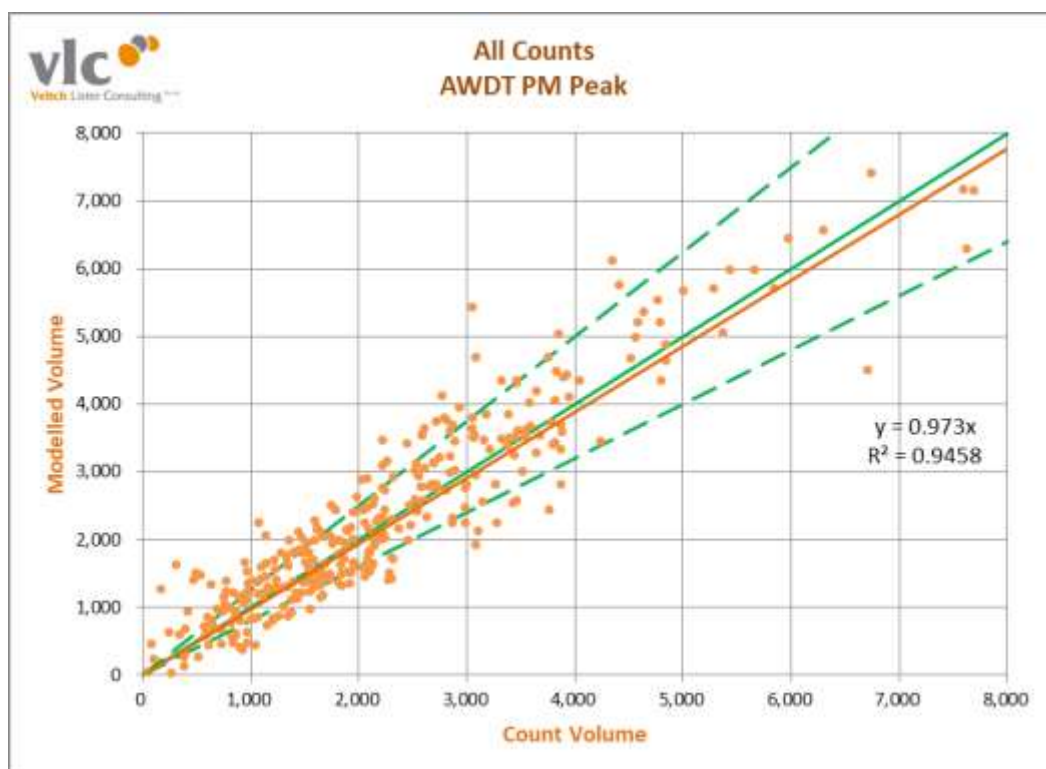




Figure 4.5 - Local Area Daily Individual Counts Scatter Chart (Observed Vs 2016 Modelled)

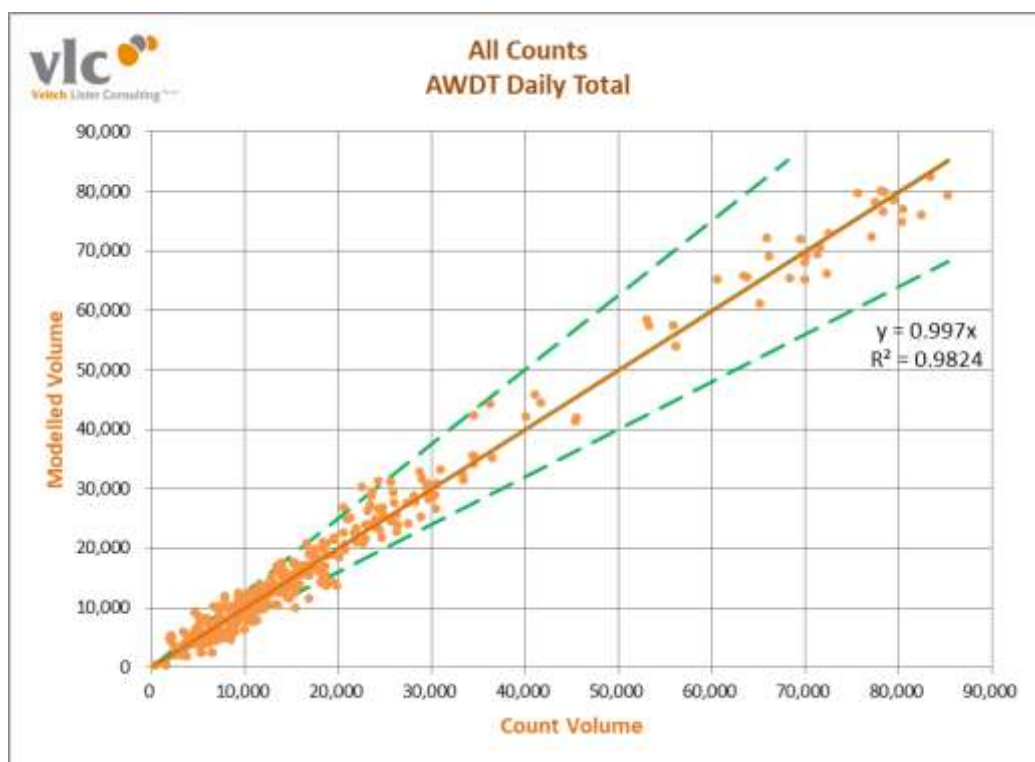
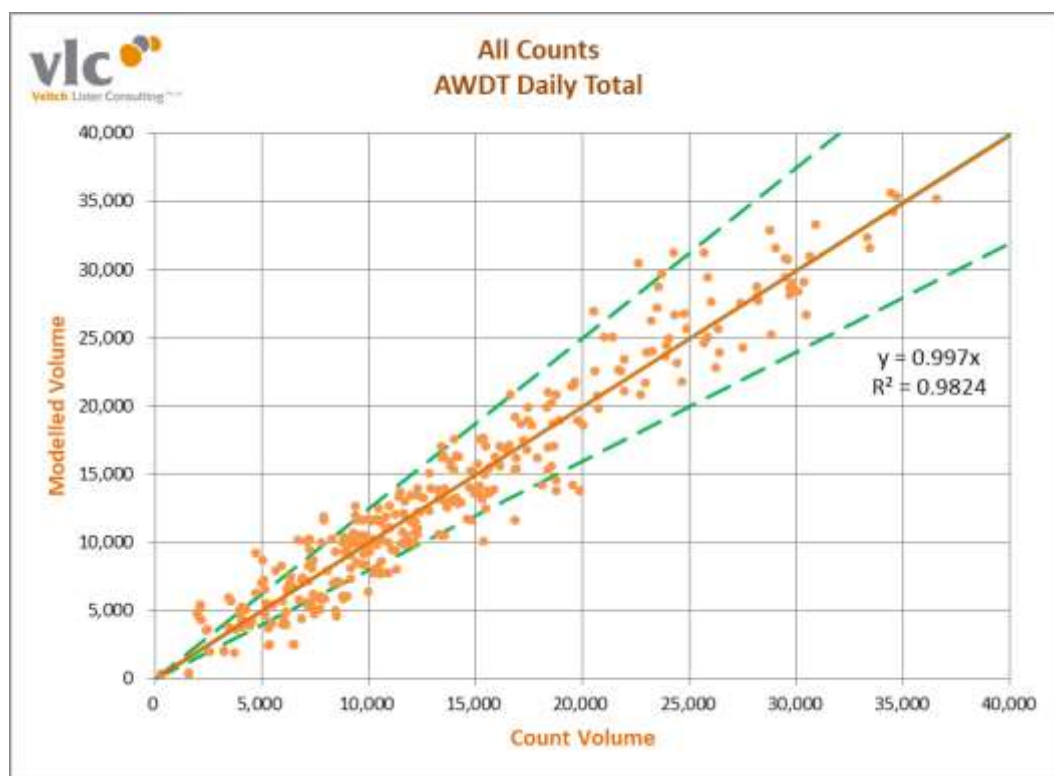


Figure 4.6 - Local Area Daily Individual Counts Scatter Chart (Zoomed In, zero to 40,000)





4.1.2 Traffic volumes summary

A summary of count validation results measured against the acceptance targets specified by VicRoads is shown in Table 4.3. The 2016 model achieves the VicRoads targets for all criteria shown below, including R-square, gradient and %RMSE.

Table 4.3 - Local Area Count Validation Results – Total Traffic

Statistics	VicRoads Targets	AWDT AM	AWDT PM	AWDT Total
R-square	>0.9	0.92	0.95	0.98
Gradient	Between 0.9 and 1.1	0.98	0.97	1.00
% RMSE	<30	24.88	20.92	12.65
All	as above	✓	✓	✓

4.1.3 Screenline analysis - summary

A comparison of observed and modelled screenline totals was plotted against the maximum desirable deviation derived from NCHRP255 (VicRoads, 2012), for each time period. Figure 4.7, Figure 4.8 and Figure 4.9 show the results of the screenline totals for the AM Peak, PM Peak and across the day.

At an individual traffic count level (discussed in Section 4.1.2), the model appears to slightly underestimate AM and PM Peak travel demand. The project traffic screenlines are within the bounds of the curves across the day, and the vast majority are for the PM Peak, the exception in the PM Peak is outbound screenline 1, which is northbound crossing Cooper St/Kurrak Rd. However, the model appears to overestimate the AM Peak travel demand across these screenlines, with outbound screenline 2, and inbound screenlines 1 and 6 falling outside the bounds of the curves.

Figure 4.7 – Daily Screenline Maximum Desirable Deviation Comparison

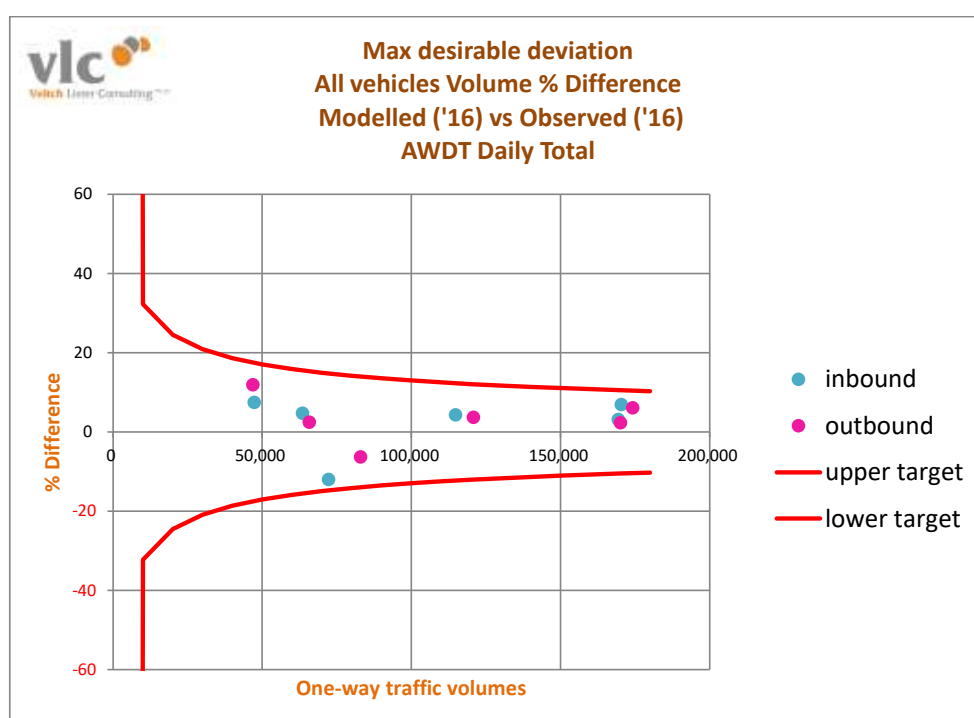




Figure 4.8 – AM Peak Screenline Maximum Desirable Deviation Comparison

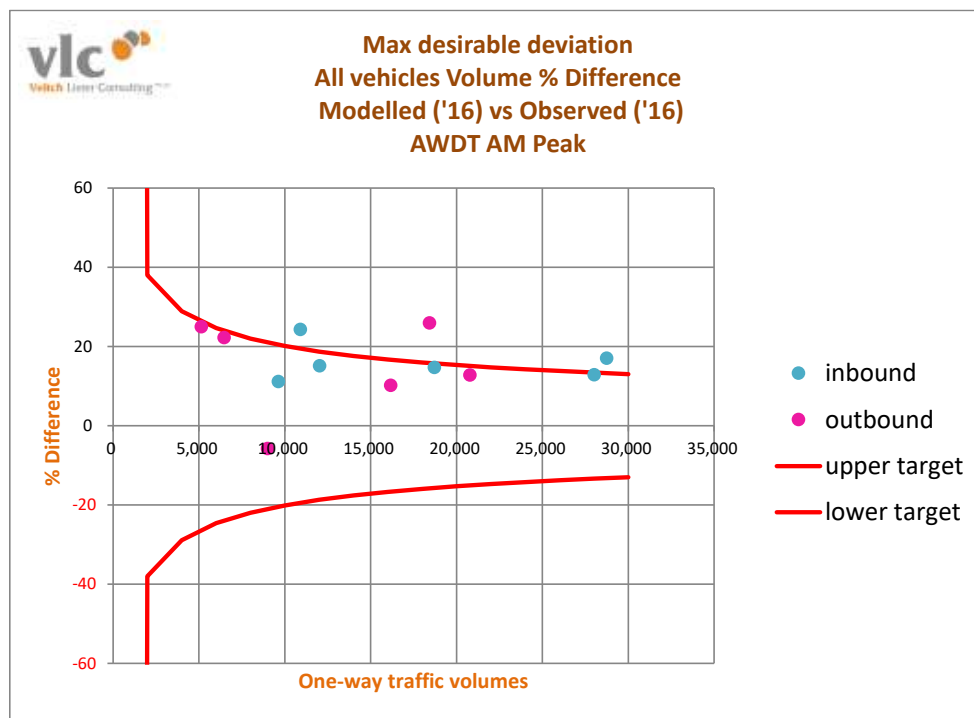
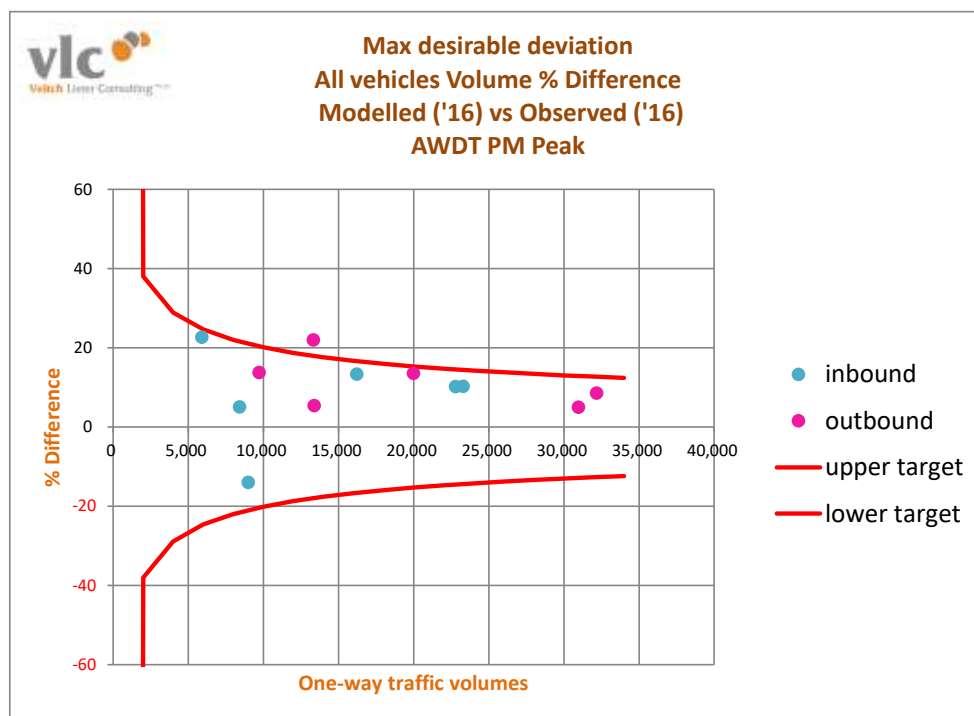


Figure 4.9 – PM Peak Screenline Maximum Desirable Deviation Comparison





4.1.4 Greensborough Road, Rosanna Road, Bulleen Road corridor analysis

Table 4.4 shows the average weekday two-way traffic volumes along the North East Link corridor, including Greensborough Road, Rosanna Road and Bulleen Road.

Table 4.5 and Table 4.6 show the AM and PM peak two-way traffic along the North East Link corridor.

The model is typically within 10% of the daily, AM peak and PM peak observed traffic counts along the corridor.

Table 4.4 – Daily Corridor observed and modelled traffic volumes (two-way, AWDT)

Road	Location	Count	Model	Difference	% Difference
Bulleen Road	Thompsons Road and Manningham Road	44,400	40,800	- 3,600	-8%
Banksia St	Yarra River	71,000	69,500	- 1,600	-2%
Rosanna Rd	Brown Street and Reid Street	45,200	47,400	2,200	5%
Lower Plenty Road	Rosanna Rd and Greensborough Rd	66,700	64,000	- 2,700	-4%
Greensborough Road	Ersking Road and Blamey Road	56,300	56,800	500	1%
Greensborough Road	Simpsons Barracks	60,400	57,600	- 2,800	-5%
Greensborough Road	South Of Watsonia Road	59,400	56,800	- 2,600	-4%
Greensborough Road	Grimshaw Street and M80 Interchange	69,100	71,000	1,900	3%
Total		472,500	463,900	- 8,700	-2%

Table 4.5 – AM peak Corridor observed and modelled traffic volumes (two-way, AWDT)

Road	Location	Count	Model	Difference	% Difference
Bulleen Road	Thompsons Road and Manningham Road	5,600	5,400	- 300	-5%
Banksia St	Yarra River	10,300	11,100	800	8%
Rosanna Rd	Brown Street and Reid Street	4,800	5,400	600	13%
Lower Plenty Road	Rosanna Rd and Greensborough Rd	9,100	8,300	- 800	-9%
Greensborough Road	Ersking Road and Blamey Road	6,700	7,600	900	13%
Greensborough Road	Simpsons Barracks	7,700	7,900	200	2%
Greensborough Road	South Of Watsonia Road	7,700	7,700	-	0%
Greensborough Road	Grimshaw Street and M80 Interchange	9,200	9,100	- 200	-2%
Total		61,100	62,500	1,100	2%

Table 4.6 – PM peak Corridor observed and modelled traffic volumes (two-way, AWDT)

Road	Location	Count	Model	Difference	% Difference
Bulleen Road	Thompsons Road and Manningham Road	5,900	5,200	- 700	-11%
Banksia St	Yarra River	10,400	11,500	1,100	10%
Rosanna Rd	Brown Street and Reid Street	6,100	5,800	- 200	-4%
Lower Plenty Road	Rosanna Rd and Greensborough Rd	9,500	9,000	- 500	-5%
Greensborough Road	Ersking Road and Blamey Road	7,800	8,200	300	4%
Greensborough Road	Simpsons Barracks	8,400	8,400	-	0%
Greensborough Road	South Of Watsonia Road	8,400	8,300	- 100	-1%
Greensborough Road	Grimshaw Street and M80 Interchange	10,200	9,400	- 800	-8%
Total		66,700	65,800	- 900	-1%

Table 4.9 shows the average weekday two-way commercial vehicle volumes along the North East Link corridor.



The model is typically within 10% of the daily commercial vehicle observed traffic counts along the corridor.

Table 4.7 – Daily Corridor observed and modelled commercial vehicle volumes (two-way, AWDT)

Road	Location	Count	Model	Difference	% Difference
Greensborough Road	Ersking Road and Blamey Road	3,300	4,000	700	20%
Lower Plenty Road	Rosanna Rd and Greensborough Rd	3,700	4,100	400	11%
Rosanna Road	Brown Street and Reid Street	3,300	3,400	200	6%
Manningham Road	Yarra River	8,600	8,300	-300	-3%
Bulleen Road	Thompsons Road and Manningham Road	5,200	5,700	500	10%
Total		24,100	25,500	1,500	6%

4.1.5 Eastern Freeway validation

Table 4.8 below compares the modelled and observed average weekday mid-block traffic volumes along the Eastern Freeway, between Springvale Road and Hoddle Street. The model typically falls within 10% of observed daily traffic volumes for each mid-block section of the Eastern Freeway.



Table 4.8 – Eastern Freeway observed and modelled traffic volumes (AWDT)

Count Location	Direction	2017 Observed	2016 Modelled	Difference	% Difference
Springvale Rd to Blackburn Rd	EB	70,000	68,100	- 1,800	-2.6%
Blackburn Rd to Middleborough Rd	EB	78,500	80,000	1,600	2.0%
Middleborough Rd to Tram Rd	EB	83,500	82,400	- 1,100	-1.3%
Tram Rd to Elgar Rd	EB	70,100	69,200	- 900	-1.3%
Elgar Rd to Doncaster Rd	EB	79,500	78,500	- 1,000	-1.2%
Doncaster Rd to Bulleen Rd	EB	78,400	76,700	- 1,700	-2.2%
Bulleen Rd to Burke Rd	EB	66,100	69,100	3,000	4.5%
Burke Rd to Chandler Hwy	EB	77,500	78,100	600	0.8%
Chandler Hwy to Hoddle St	EB	71,600	70,600	- 900	-1.3%
Eastbound Total	EB	675,100	672,800	- 2,300	-0.3%
Springvale Rd to Blackburn Rd	WB	70,000	65,300	- 4,700	-6.8%
Blackburn Rd to Middleborough Rd	WB	80,500	76,900	- 3,600	-4.4%
Middleborough Rd to Tram Rd	WB	85,300	79,400	- 5,900	-7.0%
Tram Rd to Elgar Rd	WB	72,300	66,200	- 6,100	-8.5%
Elgar Rd to Doncaster Rd	WB	82,500	76,000	- 6,500	-7.8%
Doncaster Rd to Bulleen Rd	WB	80,300	75,000	- 5,400	-6.7%
Bulleen Rd to Burke Rd	WB	68,300	65,400	- 2,900	-4.3%
Burke Rd to Chandler Hwy	WB	77,100	72,500	- 4,700	-6.0%
Chandler Hwy to Hoddle St	WB	65,100	61,100	- 4,000	-6.1%
Westbound Total	WB	681,600	637,800	- 43,800	-6.4%



4.1.6 Yarra River screenline analysis

Table 4.9 below shows the average weekday two-way traffic volumes crossing the eastern section of the Yarra River screenline. The 2016 model is around 4% higher compared the observed volume across the screenline.

Table 4.9 – Yarra river crossing observed and modelled traffic volumes (two-way, AWDT) –Screenline

Location	Count	Model	Difference	% Difference
Chandler Hwy	45,600	47,100	1,500	3%
Burke Rd	40,400	41,600	1,200	3%
Banksia St	71,000	69,500	- 1,600	-2%
Fitzsimons Ln	59,700	66,200	6,600	11%
Kangaroo Ground-Warrandyte Rd	19,000	20,600	1,700	9%
Total	235,700	245,000	9,400	4%

* note that this data was used for calibration purposes

Table 4.10 shows the average weekday two-way commercial vehicle volumes crossing the eastern section of the Yarra River screenline. The model is around 3% higher compared the observed commercial vehicle volume across the screenline.

Table 4.10 – Yarra River crossing observed and modelled traffic volumes (two-way, AWDT) – Commercial Vehicle Screenline

Location	Count	Model	Difference	% Difference
Chandler Hwy	3,800	4,400	600	16%
Burke Rd	2,200	1,900	- 300	-13%
Banksia St	8,600	8,300	- 300	-3%
Fitzsimons Ln	3,900	3,700	- 100	-3%
Kangaroo Ground-Warrandyte Rd	1,100	1,700	600	56%
Total	19,500	20,100	600	3%

4.1.7 Commercial vehicle volumes - individual traffic counts

In the Zenith model, commercial vehicles include both light commercial vehicles (LCVs) and heavy commercial vehicles (HCVs) which are each modelled separately. In reference to the Austroads Vehicle Classification System, the model defines Class 3 vehicles as LCVs, and Classes 4 to 12 as HCVs (with both definitions excluding buses and trams).



Figure 4.10 - Local Area Daily Commercial Vehicle Individual Counts Scatter Chart (Observed Vs 2016 Modelled)



Overall, commercial vehicle validation is approximately 15% high relative to observed data. The model generally overestimates commercial vehicle traffic on the Eastern Freeway and M80, as illustrated by the cluster circled in blue.

4.1.8 Travel times

The Bulleen Road / Banksia Street / Rosanna Road / Greensborough Highway corridor is a key travel time route amongst the 44 travel time routes used in validation. A series of cumulative time-distance plots (by direction and time period) along this corridor are shown in Figure C.3 to Figure C.8. A more extensive set of travel time validation results are presented in Appendix C - Travel time validation. Overall, the model validates well along this corridor. The model is slightly faster than the averaged observed travel time in the peak direction (AM Southbound, PM Northbound). The observed travel times experience significant intersection delays near the intersection of Banksia Street and Rosanna Road, which are difficult to replicate in a strategic model.



Figure 4.11 - Rosanna Rd Corridor AM Peak Southbound Travel Time Comparison

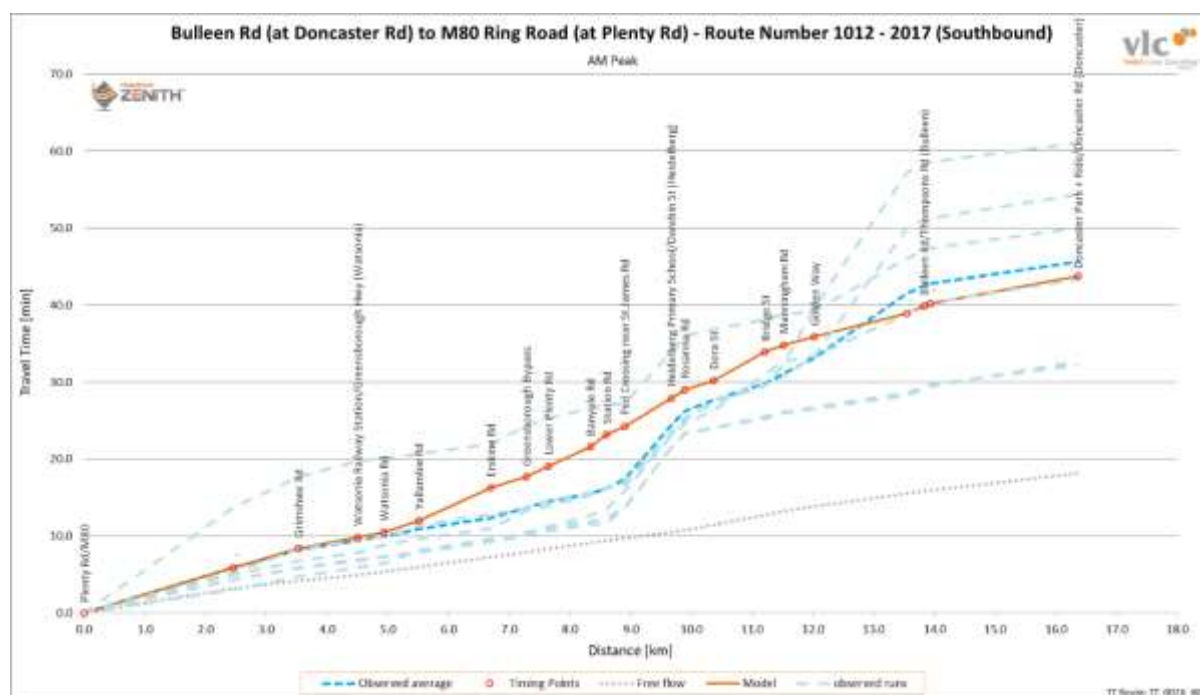


Figure 4.12 - Rosanna Rd Corridor PM Peak Northbound Travel Time Comparison

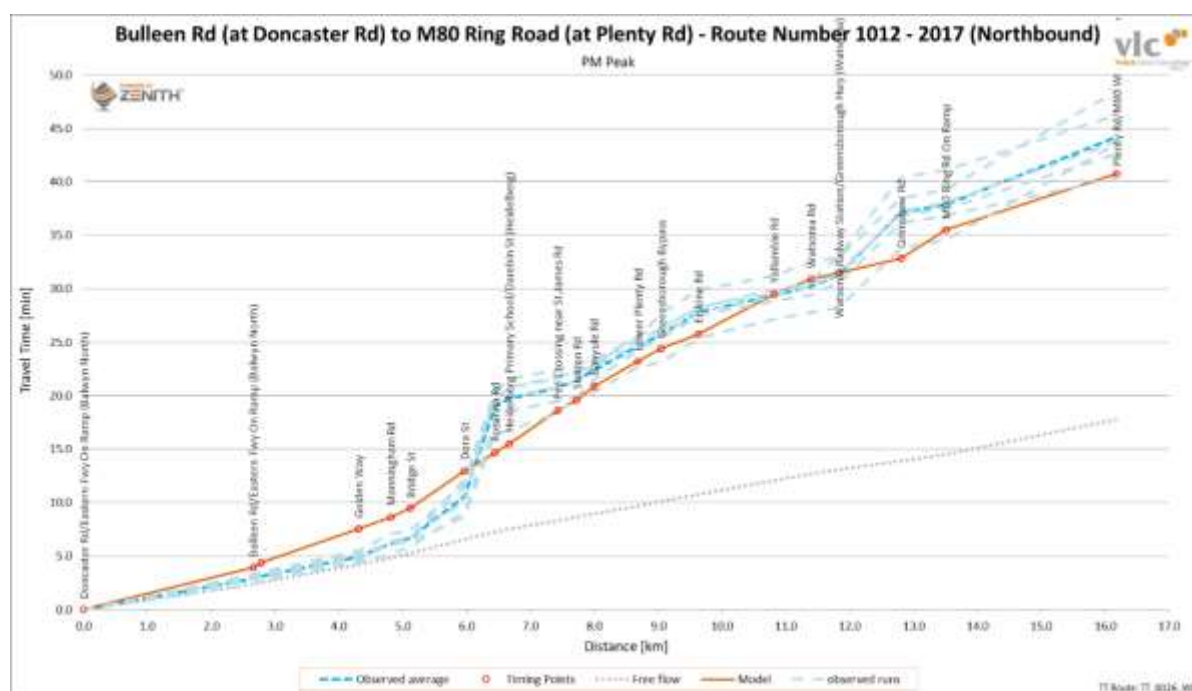


Table 4.11 additionally compares the 2016 modelled and observed cumulative travel times along the Bulleen Road / Banksia Street / Rosanna Road / Greensborough Highway corridor. In all instances, the model falls either within 1 minute or 15% of the observed travel time.



Table 4.11 – Modelled vs. Observed Travel Times – Bulleen Road / Banksia Street / Rosanna Road / Greensborough Highway corridor (M80 to Eastern Freeway)

	Direction	2017 Observed Travel Time (mins)	2016 Modelled Travel Time (mins)	Within 1 minute or 15%
AM Peak	Northbound	35.4	34.9	✓
	Southbound	45.6	43.8	✓
Inter Peak	Northbound	23.2	26.0	✓
	Southbound	25.6	25.6	✓
PM Peak	Northbound	44.2	40.8	✓
	Southbound	34.8	34.0	✓

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4.2.2 CityLink toll revenue estimation

The annual modelled CityLink revenues were compared to the annual estimates derived from Transurban Annual Reports.

Table 4.15 uses expansion factors sourced from the 2012 Linking Melbourne Authority report “Traffic Annualisation & Ramp-Up Factors”, that recommends an annualisation factor for all traffic of 330 (approximately: 340 for cars, 285 for LCV and 265 for HCV).

Using these factors for all traffic and an alternative approach using the factors by vehicle class, the 2016 modelled CityLink revenue estimates are within 3% to 5% of the observed equivalent.



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4.3 EastLink validation

4.3.1 Toll gantry validation

The 2016 model was compared to traffic counts at an EastLink gantry level. **This EastLink gantry data was provided by VicRoads for model validation purposes during the transport modelling. The data remains confidential and it should not be used for any other purposes without permission from VicRoads.**

Table 4.16, Table 4.17 and Table 4.18 summarise the observed and modelled volumes at each gantry for the daily, AM peak and PM peak periods respectively. Across the day, EastLink total gantry volumes are modelled to within 6%.

Scatter charts showing modelled and observed comparisons for the daily, AM and PM peak periods are shown in Figure 4.16 to Figure 4.18. These show that the EastLink gantries, when validated in isolation, cluster along the line of best fit, however they tend to fall just outside the VicRoads criteria surrounding either R-squares or gradients.



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5 Local area validation of public transport assignment

In this section, the validation of modelled public transport forecasts is discussed with respect to the data provided by TfV that is available for 2016 in the North East Link corridor.

5.1 North East Link corridor train validation

5.1.1 Rail passenger loads at the CBD cordon

Modelled AM peak inbound rail line passenger loads for the Clifton Hill group have been compared with 2016 TfV estimates at a cordon surrounding the CBD.

The Clifton Hill group passenger loads at the CBD rail cordon are less than 1% lower than the estimates. Additionally, for the individual line level for South Morang and Hurstbridge, the model is within 10% of observed estimates.

Table 5.1 – Passenger Load at CBD Cordon by Line (AM Peak) – Clifton Hill Group

Line Groups	Observed	Model	Difference	% Difference
Clifton Hill	20,568	20,563	- 5	0%
South Morang	9,985	9,041	- 944	-9%
Hurstbridge	10,583	11,521	938	9%

5.1.2 Rail station entries

AM peak rail station entries by line segment for stations in the NEL study area are shown in Table 5.2. Modelled AM Peak station entries within 12% of TfV estimates.

Table 5.2 –Rail Station Entries by Line Segment – AM Peak

Line Segment	Observed 2016	Modelled 2016	Difference	% Difference
Jolimont-Clifton Hill	2,767	2,762	- 6	0%
Rushall-South Morang	11,181	12,718	1,537	14%
Diamond Creek-Hurstbridge	693	1,647	954	138%
Montmorency-Eltham	1,619	2,579	959	59%
Westgarth-Greensborough	10,243	9,908	- 335	-3%
Total	26,504	29,614	3,110	12%

Daily rail station entries by line segment for stations in the NEL study area are shown in Table 5.3 below. The 2016 model generally over-predicts daily rail station entries, particularly on the inner-city rail stations between Jolimont and Clifton Hill. Overall the model is 23% above observed daily station entries. This suggests that the model may be over-predicting rail trips in the off-peak periods.

Table 5.3 –Rail Station Entries by Line Segment – Daily

Line Segment	Observed 2016	Modelled 2016	Difference	% Difference
Jolimont-Clifton Hill	11,165	17,394	6,228	56%
Rushall-South Morang	25,577	32,085	6,508	25%
Diamond Creek-Hurstbridge	1,848	2,521	673	36%
Montmorency-Eltham	3,813	4,875	1,063	28%
Westgarth-Greensborough	23,567	24,418	851	4%
Total	65,970	81,293	15,323	23%



5.1.3 Bus boardings by route

Modelled 2016 bus boardings by route for Eastern Freeway bus services are compared against observed 2016 bus patronage in Table 5.4 below. These include the Doncaster Area Rapid Transit (DART) smartbus services (corresponding to routes 905, 906, 907 and 908) and a number of local bus services. The smartbus services are within 10% of observed patronage estimates, while the bus boardings for the Eastern Freeway bus services are within 4% of observed patronage estimates.



Table 5.4 – Eastern Freeway bus services, boardings by Route – Daily

Route Number	Route Name	Observed 2016	Modelled 2016	Difference	% Difference
905	City to The Pines (via Templestowe)	3,706	4,865	1,159	31%
906	City to Warrandyte	4,893	4,937	44	1%
907	City to Mitcham	6,262	6,997	735	12%
908	City to The Pines (via King St)	2,577	2,296	- 281	-11%
	DART Total	17,438	19,094	1,657	9%
302	Box Hill to City (Queens Street)	2,779	1,846	- 933	-34%
303	North Ringwood to City (Queen Street) via	292	286	- 5	-2%
304	City to Doncaster	1,720	1,158	- 562	-33%
305	The Pines SC to City (Spencer/Lonsdale Sts) via	1,810	1,550	- 261	-14%
309	Bus The Pines to City (Queen Street) via	741	972	230	31%
318	Deep Creek to City via	350	400	50	14%
350	City to La Trobe	968	1,619	651	67%
684	Melbourne to Eildon	107	214	107	101%
	Non-Dart Total	8,767	8,044	- 723	-8%
	Total	26,205	27,139	934	4%



6 Summary of direct elasticity results

6.1 Direct elasticity results – international elasticity ranges

Table A1² of the DEDJTR's guidance summarises international guidelines for elasticity ranges, which have been sourced from the UK's WebTAG (2014) and NZ (Wallis 2004).

The following tables summarise the modelled elasticities of demand for transport against these international ranges, indicating that the modelled results are within the direct measure elasticity ranges provided for most attributes.

Table 6.1 presents the direct measure elasticities for private car travel, while Table 6.2 presents the direct measure elasticities for public transport travel.

Table 6.1: Direct Measure Elasticities of Demand for Car Travel – International Guidelines

Attribute	Change	Direct Measure	Source	Lower Range	Upper Range	Modelled
Increase in Fuel Cost	+10%	Daily Car Km Travelled	WebTAG 2014	-0.25	-0.35	-0.33
			RAND	-0.10	-0.50	
Increase CBD and Inner parking costs	+10%	Commuting (HBW) Car Trips to CBD and Inner	Wallis NZTA 2004	-0.10	-0.60	-0.46
Increase in Car In-Vehicle Time	+10%	Car Trips	WebTAG 2014	-0.00	-2.00	-0.14
			Wallis NZTA 2004	-0.15	-0.80	

Table 6.1 shows that the transport model responds correctly and is within international ranges for changes in fuel prices and car parking prices. While the model falls within the WebTAG (2014) guidelines for in-vehicle time, it falls just outside the NZTA (2004) range.

² Table A1: "National and Overseas Elasticity Range Guidelines" UK's WebTAG (2014) and NZ (Wallis 2004)



Table 6.2 shows that the transport model responds correctly to changes in public transport fares, changes in service levels and in-vehicle time. However, while the modelled results fall within the required range for changes in public transport fares and in-vehicle time, they fall outside the given ranges for changes in service levels. This could be at the lower end of the direct elasticity ranges for changes in public transport fares and service levels due to the coverage of the model, which includes areas poorly serviced by public transport such as regional areas.

Table 6.2: Direct Measure Elasticities of Demand for Public Transport Travel – International Guidelines

Attribute	Change	Direct Measure	Source	Lower Range	Upper Range	Modelled
Increase in Public Transport Fare	+10%	Public Transport Trips	WebTAG 2014	-0.20	-0.90	-0.20
			NGTSM 2006	-0.20	-0.60	
Increase in Public Transport Service Levels	+10%	Public Transport Trips	NGTSM 2006	+0.20	+0.50	+0.16
Increase in Public Transport In-Vehicle Time	+10%	Public Transport Trips	NGTSM 2006	-0.10	-0.70	-0.48



6.2 Direct elasticity results - DEDJTR elasticity ranges

The following tables summarise the modelled elasticities of demand for transport against a set of ranges published by DEDJTR in their “*Strategic Transport Model Elasticity Guidelines*”.

Table 6.3 presents the direct measure elasticities for private car travel, while Table 6.4 presents the direct measure elasticities for public transport travel.

Table 6.3: Direct Measure Elasticities of Demand for Car Travel – DEDJTR Guidelines

Attribute	Change	Direct Measure	Lower Range	Upper Range	Modelled
Increase in Fuel Cost	+10%	Daily Car Km Travelled	-0.15	-0.30	-0.33
Increase CBD and Inner parking costs	+10%	Commuting (HBW) Car Trips to CBD and Inner	-0.10	-0.40	-0.46
Increase in Car In Vehicle Time	+10%	Car Trips	-0.20	-0.80	-0.14

Note: local data is not used to determine ranges

Table 6.3 shows that the transport model responds correctly to a change in fuel prices, car parking prices and in-vehicle time. However, they all fall outside each of the DEDJTR ranges.



Table 6.4 shows that the transport model responds correctly to changes in public transport fares, changes in service levels and in-vehicle time. However, the measures fall within the ranges for changes in public transport fares and in-vehicle time, but changes in service levels fall outside the given ranges.

All direct and cross-elasticity results are provided in Appendix D - Assessment of realism.

Table 6.4: Direct Measure Elasticities of Demand for Public Transport Travel – DEDJTR Guidelines

Attribute	Change	Direct Measure	Lower Range	Upper Range	Modelled
Increase in Public Transport Fare	+10%	Public Transport Trips	-0.20	-0.60	-0.20
Increase in Public Transport Service Levels	+10%	Public Transport Trips	+0.20	+0.60	+0.16
Increase in Public Transport In-Vehicle Time	+10%	Public Transport Trips	-0.10	-0.50	-0.48

Note: local data is not used to determine ranges



7 Model convergence

Convergence refers to iterative methods reaching an equilibrium state, at which more iterations will only result in slight change of modelling results and that changes are within acceptance limits defined by a user. The convergent feedback process can relate to either the convergence of a complete four-step demand model or within a traffic assignment model.

In the North East Link project, the model was iterated through the four-step process (i.e. between assignment, mode choice and distribution), while the highway assignment was iterated 50 times and the public transport assignment was iterated five times both using a volume averaging technique.

In this section, the convergence of both the assignment model and the four-step demand model process are examined.

7.1 Assignment convergence

The RGAP values of the penultimate and final traffic assignment iteration for each time period are listed in Table 7.1. VicRoads has defined the RGAP Target for traffic assignment convergence, however, there is no guidance for public transport assignment convergence. The criteria are met for each time period.

Table 7.1 – Assignment Convergence Results (RGAP)

Time Period	RGAP Traffic Target	Total Traffic RGAP (Final Iteration)	Total Traffic RGAP (Penultimate Iteration)	PT RGAP (Final Iteration)
AM	< 0.01	0.00777	0.00785	0.00093
MD	< 0.01	0.00117	0.00119	0.00029
PM	< 0.01	0.00659	0.00674	-0.00321
OP	< 0.01	0.00045	0.00046	0.00041

The average absolute difference (AAD) values of the penultimate and final traffic assignment iteration for each time period are listed in Table 7.2. VicRoads has defined the AAD target for traffic assignment convergence at less than 1 veh/hr, and this is met for each modelled time period.

Table 7.2 – Assignment Convergence Results (AAD)

Time Period	AAD Traffic Target	Traffic AAD (Final Iteration)	Traffic AAD (Penultimate Iteration)
AM	< 1	0.887	0.913
MD	< 1	0.223	0.23
PM	< 1	0.794	0.793
OP	< 1	0.083	0.077



The relative average absolute difference (RAAD) values of the penultimate and final traffic assignment iteration for each time period are listed in Table 7.3. VicRoads has defined the RAAD Target for traffic assignment convergence at less than 1%, and this is met for each modelled time period.

Table 7.3 – Assignment Convergence Results (RAAD)

Time Period	RAAD Traffic Target	Traffic RAAD (Final Iteration)	Traffic RAAD (Penultimate Iteration)
AM	< 1%	0.216%	0.222%
MD	< 1%	0.086%	0.089%
PM	< 1%	0.201%	0.208%
OP	< 1%	0.046%	0.052%

The 'PDiff' statistic (percentage of links with a volume change of less than 5% between given iterations) of the last traffic assignment iteration for each time period are listed in Table 7.4. VicRoads has defined the PDiff Target for traffic assignment convergence as requiring more than 95% of links to have a change in volume of less than 5%, and this is met for each modelled time period.

Table 7.4 – Assignment Convergence Results (PDiff)

Time Period	PDiff Traffic Target	Total Traffic PDiff (Final Iteration)	Total Traffic PDiff (Penultimate Iteration)
AM	> 95%	99.838%	99.833%
MD	> 95%	99.928%	99.944%
PM	> 95%	99.877%	99.815%
OP	> 95%	99.981%	99.944%

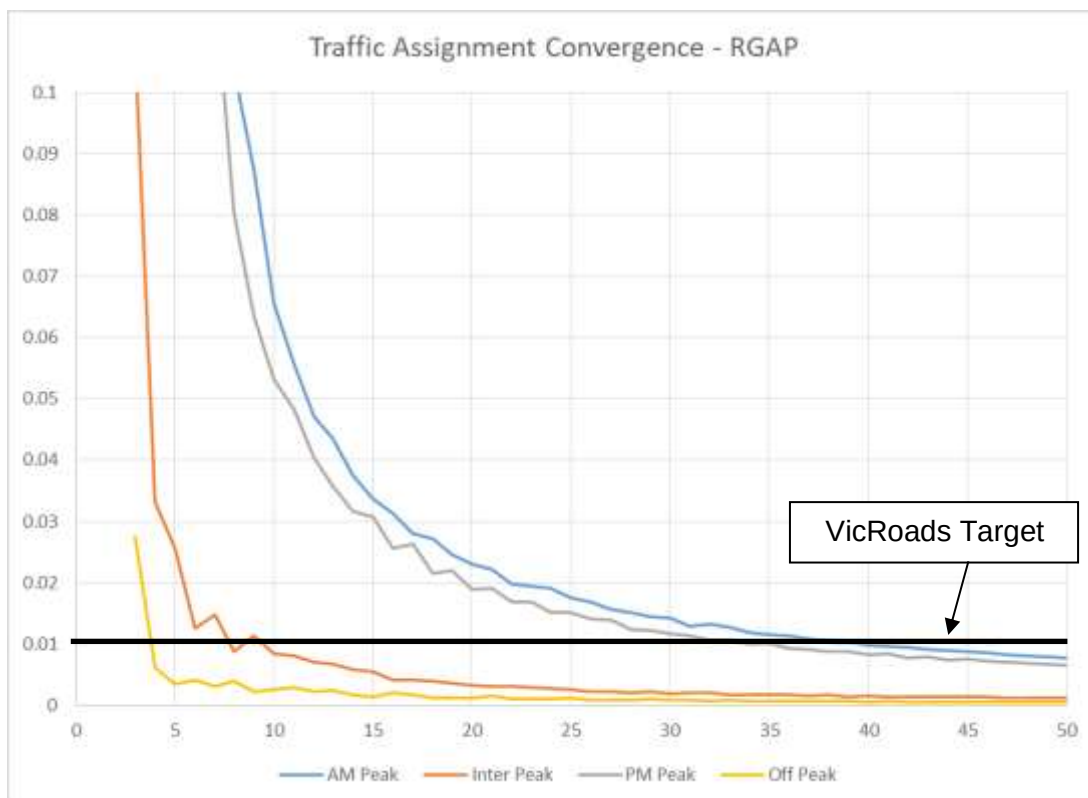


7.2 Assignment stability

Figure 7.1 below depicts the RGAP value for each of the 50 highway assignment iterations for the 2016 model. The VicRoads target of 0.01 is achieved for all four modelled time periods, in summary, the VicRoads target is achieved:

- By iteration 40 for the AM peak
- By iteration 10 for the inter peak
- By iteration 36 for the PM peak
- By iteration 4 for the evening off peak

Figure 7.1 - Traffic Assignment Convergence (RGAP)

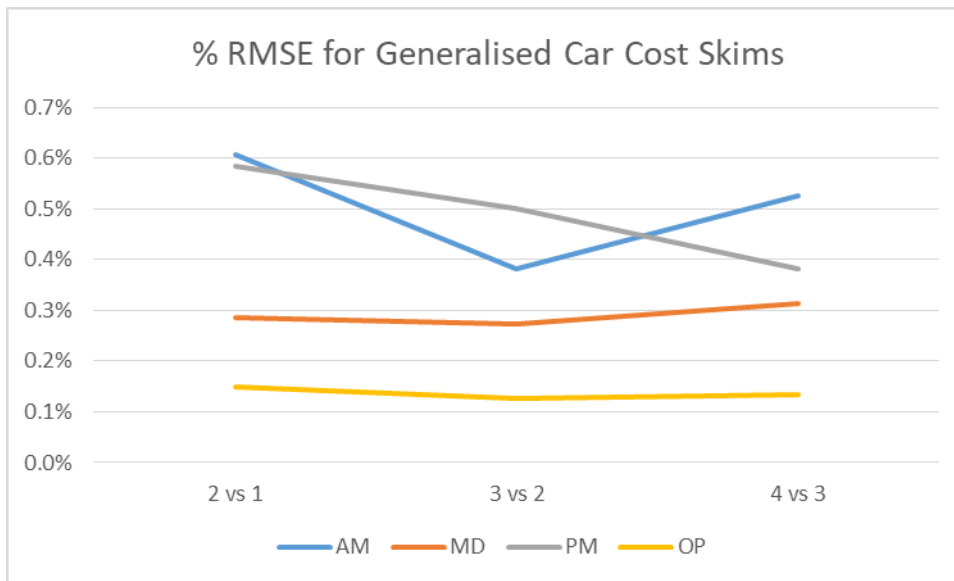


7.3 Demand model convergence and stability

Figure 7.2 charts the %RMSE for car generalised cost skims across the demand iterations, for each of the four modelled time periods. Note that there are no specific demand convergence targets required by VicRoads guidance.



Figure 7.2 - Demand Model Convergence (%RMSE, Car Cost Skims)



The demand cycle convergence results for each iteration are displayed in Table 7.5 and include the %RMSE for the change in AM peak car cost skims (as seen in Figure 7.2), as well as the %RMSE for change in daily link volumes and change in maximum daily GEH.

Table 7.5 – Demand Model Convergence Results

Demand Iteration	%RMSE for Car Cost Skims (AM Peak)	%RMSE for Daily Link Loads	Max. GEH for Daily Link Loads
2 vs 1	0.61%	0.59	0.90
3 vs 2	0.38%	0.38	1.05
4 vs 3	0.53%	0.44	1.57



8 Appendices



Appendix A - Model limitations

Land use inputs for long term forecasts

The modelling of a future planning scenario is enhanced if the urban fabric for the entire modelled area is fully defined. The urban fabric will comprise the future distribution of population (including socio-economic profiles) and employment (by type) for each travel zone. In addition, the locations of schools, higher education institutions and shopping centres are also needed. The location and scale of other special travel generators such as ports and airports are also important inputs to the model. On the supply side, all transport modes of the entire transport network envisaged for the scenario need to be identified and defined separately.

It is important to recognise that the model produces travel demand forecasts for a pre-defined land use and transport network structure that is specified exogenously (i.e. external to the model and based on the inputs provided by DEDJTR, on behalf of the Victorian State Government). Therefore, the DEDJTR land use forecasts do not account for the impact of new transport infrastructure on accessibility and travel demand patterns. This may lead to understatement of travel demands in areas of the city with substantially improved accessibility.

Some degree of incompatibility between the forecast land use and transport networks (and therefore exogenous modelling error) needs to be acknowledged; generally, understanding of the complex interactions of changes in transport networks, accessibility and land use are not well-understood. The inherent uncertainty associated with modelled forecasts depends upon the skills of land use planners and urban economists as much as it does the travel modeller.

Peak spreading and model time period

The model produces separate travel demand forecasts for the AM peak, PM peak, inter-peak and the evening off-peak. The daily demand modelled (i.e. number of journeys) is fixed for a given land use. Trips are separated into matrices for each trip purpose and these are then assigned to the time periods using factors derived from household travel surveys.

Distribution of trips into origins and destinations and the mode of choice depend on the spatial distribution of land use and the configuration and performance of the transport networks. Consequently, traffic congestion and associated delays impact choice of destination and mode of travel, but not the time period of travel.

The model therefore does not account for peak spreading, the shifting of trips to alternative departure times aimed at avoiding excessive travel times and delays. In reality, as our cities grow, the number of trips will increase and cost-effective options for improving transport network capacity diminish, peak demand will extend to increasingly longer periods. Peak spreading applies to the road and public transport networks.

Because the model cannot currently account for peak-spreading, it will generally overstate forecasts of peak travel demands and under-predict forecasts of inter-peak and off-peak travel demands.

Uncertainty in modelling intense traffic congestion

Strategic transport models are link-based models. In these models, travel speeds on road links (i.e. sections of road between intersections) are a function of the traffic volume on the links and



the capacity. On each link, travel speed reduces as traffic volume increases and this relationship is defined using a speed-flow curve.

Strategic transport models generally do not directly account for queuing delays at intersections and do not, therefore, represent travel in separate lanes for separate turning movements. Consequently, the model does not account for queueing back, where congested conditions prevent the smooth passage of vehicles from one link to another (through an intersection). Typically, in extremely congested networks, strategic transport models over-estimate traffic speeds and under-estimate traffic delays.

Unconstrained public transport network capacity

While the Zenith model has the capability to represent over-crowding on public transport and station parking constraints accessing public transport, it has not been used for this project. In effect, the public transport network is unconstrained. As a result, demand for public transport may be overstated during the peak periods.

Unconstrained parking capacity

The model includes parking charges, which are added to the perceived generalised cost of car travel to selected travel zones (including the CBD, inner suburbs and universities). The charge that is applied to individual zones is designed to not only reflect actual parking charges, but also any disincentive there may be for car travel resulting from a shortage of parking supply in a zone.

The component of the charge that represents capacity restraint is fairly arbitrary and is set to reflect the car parking demand/supply situation at the time the model was last validated. The model does not yet have a capability to balance parking demand and supply.

In the case of the Melbourne CBD, where the amount of parking in new developments is strictly controlled by the Melbourne City Council Planning Scheme, the parking demand/supply balance may change over time, making travel by car to the CBD more or less attractive. The model makes allowance for expected changes in CBD parking costs, but assumes that the demand/supply balance does not change in the future.

Paradigm shifts in travel behaviour

The model has been calibrated using the VISTA household travel survey data including VISTA 07 and VISTA 09. The model's behavioural relationships therefore reflect peoples' attitudes and preferences at the time the VISTA surveys were conducted (between 2007 and 2010),

Some key model parameters, such as how people value their time and make trade-offs when deciding whether, where and how to travel, may change over time. In the model these travel behaviour characteristics and preferences are assumed to remain constant over time. The model makes no attempt to predict "paradigm shifts" in travel behaviour that might occur in the future, and assumes that such changes will not occur.

It is not only plausible, but likely, that travel behaviour will change in the future in response to such issues as concern for the environment, younger people driving less and older people

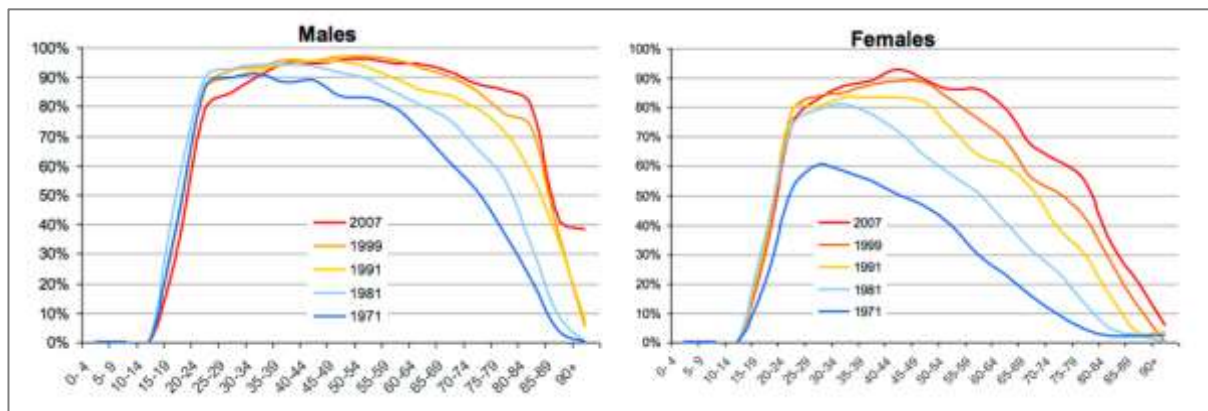


driving more than previous generations, emerging technologies, improvements in fuel efficiency etc.

An example of an emerging trend of this nature includes changes to licence-holding rates over time. Figure A.1 shows the rates of licence holders in Sydney by gender, for 1971 to 2007. Of note is the significant increase in licence-holding for older people – particularly males over 60 – as well as the overall increase in licence-holding for females since 1971.

Figure A.1 - Licence-holding rates in Sydney SD, by gender and age, 1971 to 2007.

Source: Raimond and Milthorpe, 2010



Average weekday traffic volumes

The Zenith model parameters are calibrated using VISTA house hold travel surveys collected for an average weekday during school term (AWDT). This excludes weekends, school holidays and public holidays. The model is then validated against traffic volumes collected for an average weekday (during school term), and non-typical surveys not included (e.g. outliers caused by incidents and faulty data collection). As a rule of thumb, VicRoads data indicates that average weekday (during school term) traffic volumes (AWDT) are approximately 5 to 10% higher than the average annual daily traffic (AADT).

Expected margins of uncertainty for strategic transport model forecasts

In 2011 the internationally-renowned toll road forecasting expert Dr Robert Bain published the results of a survey he conducted amongst transport modelling professionals across numerous countries, which gauged their expectations surrounding the uncertainty of model forecasts. Respondents were asked to nominate their expected error range for model forecasts for both new and existing roads, for a next day, one year, five year and 20 year forecast horizon. The results of this survey are shown in Table A.1.



Table A.1- Summary of survey results from transport modelling professionals (Source: Dr Robert Bain, “The Wisdom of Crowds: A Survey of Forecasting Accuracy”)

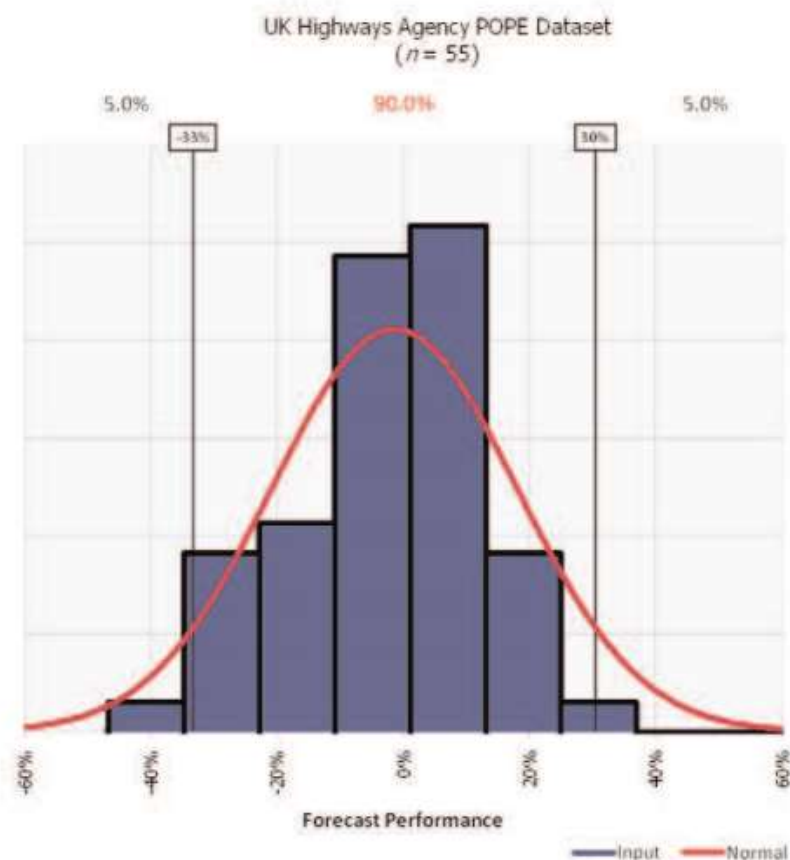
Table 1: Survey Results (n = 46)		
Forecast Horizon	Likely Error Range	
	Existing Road	New Road
The next day	± 7.5%	n/a
One-year ahead	± 10%	± 15%
Five-years ahead	± 15%	± 25%
20-years ahead	± 32.5%	± 42.5%
Notes: Respondents were not asked about 'next day' forecasts for new builds. Percentages have been rounded.		

The responses suggest that the industry’s general consensus is, that the forecast of a revenue or traffic volume in a five-year period, should be expected to be within approximately ±15% of the actual value, while a 20-year forecast was typically estimated to be within ±33%.

Bain compared this to a chart published by the UK Highways Agency in 2010, shown in Figure A.2, which compares modelled forecasts across 55 road projects compared to their actual, eventual traffic volumes. The 90% confidence interval across the sample was found to be within -33% and +30%, and on average the forecast horizon was five years. This compared to a ±15% expected error for an equivalent period from the survey responses shown in Figure A.2.



Figure A.2 - Variance in model forecast vs. actual values (Source: UK Highways Agency, 2010)



There are inherent uncertainties in forecasts because demographic, social, technological and economic conditions may change unexpectedly. For this reason, sensitivity testing of model inputs is often undertaken within the context of demand forecasting for an infrastructure project.

Describing the influence of a factor on a forecast is a matter of judgment. Realistically, for a 20-year forecast, any impact around 1% could be considered to be negligible, particularly when shorter range forecasts have been shown to only reliably fall within approximately $\pm 30\%$ of eventual actual values. In reality, even day to day, the travel demands on a given section of the network can fluctuate, with variations of around $\pm 10\%$ commonly observed.

Other changes in assumptions

There are numerous exogenous factors affecting travel demand forecasting which are difficult to predict or quantify. Changes in government policy, for example, occur on a regular basis and can affect modelled outcomes. Even during recent forecasting exercises, numerous policy changes were announced by the Victorian Government. For example, in January 2017, VicRoads modified the truck curfews in the north-east. Other major assumptions, in particular fuel costs, can also prove difficult to foresee. Various factors impact the petrol price paid by motorists at the pump, including the Australian dollar exchange rate and perceptions of potential oil supply (Gargett 2010).



Appendix B - Validation of traffic flows

Table B.2 – All local area traffic counts vs modelled volumes (total traffic)

Count ID	Road Name	Count Location	Year	AM Count	AM Model	Inter Peak Count	Inter Peak Model	PM Count	PM Model	Evening Off Peak Count	Evening Off Peak Model	Daily Count	Daily Model	Daily CV Count	Daily CV Model
108	Allendale Rd	At Diamond Creek	2017	168	47	589	-	381	269	446	93	1,584	409	115	118
109	Allendale Rd	At Diamond Creek	2017	362	339	539	-	261	38	414	90	1,575	466	111	106
293	Andersons Creek Road	North Of Reynolds Road	2017	434	1,312	1,883	3,534	1,071	2,257	1,317	2,158	4,704	9,261	339	288
294	Andersons Creek Road	North Of Reynolds Road	2017	1,293	2,148	2,019	3,286	631	1,332	1,097	1,928	5,041	8,694	468	264
295	Andersons Creek Road	South of Reynolds Road	2017	522	729	2,093	3,074	968	1,529	1,383	1,705	4,966	7,036	275	164
296	Andersons Creek Road	South of Reynolds Road	2017	1,171	1,489	2,182	2,799	637	789	1,160	1,445	5,150	6,522	272	158
193	Banksia St	At Yarra River	2017	4,773	5,247	14,343	13,397	5,664	5,979	9,721	9,680	34,501	34,303	5,331	3,928
194	Banksia St	At Yarra River	2017	5,514	5,833	15,073	14,013	4,769	5,535	11,193	9,812	36,548	35,192	3,223	4,363
68	Bell St	At Darebin Creek	2017	3,256	4,003	10,590	11,168	3,829	4,487	7,096	7,147	24,770	26,805	2,322	2,617
69	Bell St	At Darebin Creek	2017	3,902	4,363	11,159	11,522	3,641	4,203	7,322	7,513	26,024	27,602	1,941	2,916
422	Bell Street	Between Oriol Road And Waterdale Road	2017	3,062	4,232	10,018	10,597	3,456	4,324	6,662	7,101	23,198	26,255	1,953	2,595
428	Bell Street	Between Oriol Road And Waterdale Road	2017	3,497	4,207	9,991	11,168	3,314	4,344	6,668	7,495	23,469	27,214	2,056	2,897
297	Bell Street	Between Studley Road And Rosanna Road	2017	4,442	3,668	11,045	9,498	3,437	3,246	7,327	6,442	26,251	22,853	2,082	2,808
423	Bell Street	Between Upper Heidelberg Road and Waterdale Road	2017	4,181	4,310	11,671	11,551	3,818	4,050	7,727	7,681	27,398	27,592	2,073	2,819
420	Bell Street	Btwn Studley Road And Rosanna Road	2017	3,228	2,951	9,767	8,550	3,182	3,844	6,757	6,405	22,934	21,750	1,655	2,389
298	Bell Street (West Bound)	Between Upper Heidelberg Road And Waterdale Road	2017	4,368	3,768	11,830	11,761	3,887	4,410	8,111	7,834	28,195	27,772	2,709	3,106
126	Blackburn Rd	North of Eastern Fwy	2017	1,045	1,255	5,002	4,390	2,244	2,740	3,992	2,689	12,282	11,074	570	379
127	Blackburn Rd	North of Eastern Fwy	2017	2,248	2,574	5,303	4,342	1,498	1,366	3,223	2,321	12,272	10,603	790	396
299	Blackburn Road	Between Reynolds Road And Andersons Creek Road	2017	990	760	4,448	2,447	1,943	1,658	2,587	1,516	9,968	6,381	833	202
300	Blackburn Road	Between Reynolds Road And Andersons Creek Road	2017	1,552	1,601	4,217	2,382	1,260	877	1,979	1,173	9,008	6,034	775	204

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Count ID	Road Name	Count Location	Year	AM Count	AM Model	Inter Peak Count	Inter Peak Model	PM Count	PM Model	Evening Off Peak Count	Evening Off Peak Model	Daily Count	Daily Model	Daily CV Count	Daily CV Model
62	Bolton St	Between Bridge St And Main Rd	2017	1,340	1,253	4,194	4,304	1,928	2,189	3,174	2,412	10,636	10,160	761	561
63	Bolton St	Between Bridge St And Main Rd	2017	1,120	2,074	5,026	4,376	1,641	1,461	3,108	2,072	10,894	9,983	585	569
66	Bridge St	At Diamond Creek	2017	1,022	1,087	4,621	3,404	1,646	1,555	2,416	2,317	9,705	8,363	591	192
67	Bridge St	At Diamond Creek	2017	1,192	1,514	4,321	3,363	1,420	1,217	2,217	2,002	9,151	8,095	697	193
301	Bulleen Road	Between Doncaster Road And Eastern Freeway	2017	1,977	1,294	6,163	3,923	3,270	2,246	3,958	2,639	15,368	10,102	658	399
302	Bulleen Road	Between Doncaster Road And Eastern Freeway	2017	2,907	2,235	6,385	4,491	1,830	1,626	3,669	3,252	14,791	11,604	900	451
303	Bulleen Road	Between Thompsons Road And Manningham Road	2017	2,837	2,144	10,097	8,898	3,814	3,442	7,904	7,309	24,652	21,792	3,118	3,171
304	Bulleen Road	Between Thompsons Road And Manningham Road	2017	2,806	3,221	8,266	7,625	2,093	1,801	6,595	6,326	19,759	18,972	2,094	2,577
155	Burke Rd Bridge	At Yarra River	2017	2,700	2,858	7,615	8,512	3,043	3,648	6,262	6,747	19,620	21,766	1,211	1,010
156	Burke Rd Bridge	At Yarra River	2017	3,581	3,111	7,943	7,810	2,711	2,822	6,518	6,071	20,752	19,814	1,012	928
305	Burke Road	Between Doncaster Road And Eastern Freeway	2017	1,960	2,661	5,732	6,423	2,027	2,886	4,476	4,298	14,195	16,268	1,036	855
306	Burke Road	Between Doncaster Road And Eastern Freeway	2017	2,991	2,585	6,035	6,466	2,138	2,604	4,731	4,638	15,894	16,293	696	820
86	Bush Bvd	North of Plenty Rd	2017	835	824	3,254	2,514	1,061	852	2,362	1,805	7,511	5,995	499	269
87	Bush Bvd	North of Plenty Rd	2017	444	753	2,739	2,602	812	778	1,997	1,581	5,992	5,715	396	238
135	Cambridge Rd	Between Pembroke Rd And Hull Rd	2017	386	256	1,313	760	586	602	961	401	3,246	2,019	205	43
136	Cambridge Rd	Between Pembroke Rd And Hull Rd	2017	766	579	1,476	808	516	272	985	296	3,742	1,956	123	40
54	Chandler Hwy	At Yarra River	2017	3,060	3,618	9,972	10,280	3,573	4,029	7,329	6,515	23,934	24,442	2,181	2,167
55	Chandler Hwy	At Yarra River	2017	3,051	3,767	9,533	9,488	2,842	3,609	6,260	5,824	21,686	22,688	1,616	2,252
84	Childs Rd	At Darebin Creek	2017	1,016	1,708	6,019	5,704	3,510	3,013	4,671	3,706	15,216	14,130	363	520
85	Childs Rd	At Darebin Creek	2017	2,820	2,936	5,656	5,733	1,502	1,862	4,738	3,502	14,716	14,033	600	536
88	Civic Dr	At Railway Underpass	2017	1,249	737	3,925	3,692	2,240	2,440	3,160	1,767	10,573	8,635		
89	Civic Dr	At Railway Underpass	2017	1,963	2,258	3,620	3,731	1,303	1,012	2,532	1,518	9,418	8,519	388	328
307	Cooper Street	Between Edgars Road And High Street	2017	3,501	4,138	10,700	10,512	3,376	3,378	8,742	7,676	26,320	25,705	2,214	2,047

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Count ID	Road Name	Count Location	Year	AM Count	AM Model	Inter Peak Count	Inter Peak Model	PM Count	PM Model	Evening Off Peak Count	Evening Off Peak Model	Daily Count	Daily Model	Daily CV Count	Daily CV Model
308	Cooper Street	Between Edgars Road And High Street	2017	2,785	2,958	12,068	10,348	3,923	4,441	7,053	7,277	25,829	25,024	1,776	1,962
424	Cooper Street	Between Hume Fwy And Edgars Road	2017	2,969	4,308	10,303	12,424	3,047	5,441	6,263	8,289	22,583	30,463	2,890	2,628
309	Cooper Street (West Bound)	Between Hume Fwy And Edgars Road	2017	3,371	5,162	9,582	12,653	3,082	4,688	8,230	8,743	24,265	31,246	2,519	2,696
175	Dalton Rd	South of Cooper St	2017	1,550	1,817	4,920	4,944	2,091	2,164	3,811	3,358	12,372	12,283	630	603
220	Daltons Rd	North of Western Ring Rd	2017	2,042	2,888	9,536	10,192	4,555	4,992	7,921	6,876	24,054	24,948	811	1,436
221	Daltons Rd	North of Western Ring Rd	2017	4,724	4,751	9,843	9,864	2,843	2,992	8,246	7,041	25,656	24,648		
56	Darebin Rd	At Darebin Creek	2017	1,427	1,620	4,446	4,397	2,183	2,325	2,935	2,663	10,991	11,006	907	583
57	Darebin Rd	At Darebin Creek	2017	1,756	2,383	3,886	4,853	1,399	1,813	2,362	2,629	9,403	11,678	671	629
310	Diamond Creek Road	Between Civic Drive And Yan Yean Road	2017	1,762	2,974	9,465	12,300	5,283	5,713	7,200	8,683	23,710	29,671	1,877	1,602
311	Diamond Creek Road	Between Civic Drive And Yan Yean Road	2017	4,245	5,359	9,487	12,303	2,582	3,533	7,204	7,606	23,518	28,801	1,960	1,588
312	Diamond Creek Road	Between St Helena Road And Greensborough Bypass	2017	1,985	1,397	5,717	6,083	2,527	2,420	3,688	3,286	13,918	13,186	1,072	1,071
313	Diamond Creek Road	Between St Helena Road And Greensborough Bypass	2017	2,230	2,269	6,090	6,763	1,956	1,616	3,251	3,276	13,527	13,923	1,001	1,192
314	Diamond Creek Road	Between Yan Yean Road And Ryans Road	2017	1,349	1,296	7,627	5,740	3,871	2,814	5,233	4,383	18,080	14,233	1,125	909
315	Diamond Creek Road	Between Yan Yean Road And Ryans Road	2017	4,005	2,694	7,651	5,705	2,283	1,507	5,904	3,861	19,843	13,767	1,788	910
259	Doncaster Rd	Btw Middleborough Rd and Station St	2017	2,652	3,052	7,215	7,027	2,058	2,246	3,731	3,191	15,656	15,517	735	517
260	Doncaster Rd	Btw Middleborough Rd and Station St	2017	1,253	1,975	7,448	6,757	3,210	3,341	4,191	3,496	16,102	15,569	569	535
118	Doncaster Rd	East of Eastern Fwy	2017	1,128	1,757	5,029	4,677	1,950	2,006	2,882	2,652	10,989	11,093	426	504
119	Doncaster Rd	East of Eastern Fwy	2017	1,924	1,951	4,996	4,527	1,577	1,696	3,055	2,613	11,551	10,786	566	477
316	Doncaster Road	Between Balwyn Road And Eastern Freeway	2017	1,322	1,770	5,009	5,414	2,571	2,788	2,786	3,062	11,689	13,034	565	531
317	Doncaster Road	Between Balwyn Road And Eastern Freeway	2017	3,319	2,686	7,250	5,043	2,312	1,725	3,967	2,153	16,848	11,607	868	468
318	Doncaster Road	Between Blackburn Road And Springvale Road	2017	2,532	2,899	6,617	6,649	2,213	3,096	3,706	3,086	15,068	15,729	719	473
319	Doncaster Road	Between Blackburn Road And Springvale Road	2017	1,771	2,876	6,992	6,219	2,534	3,123	3,457	3,060	14,755	15,278	951	461

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320	Doncaster Road	Between Blackburn Road And Wetherby Road	2017	1,141	1,853	6,868	5,414	2,727	2,762	3,559	2,893	14,296	12,921	802	458
321	Doncaster Road	Between Blackburn Road And Wetherby Road	2017	2,425	2,664	6,204	5,750	1,748	1,933	3,247	2,639	13,625	12,987	729	447
58	Dorset Rd	At Railway Underpass	2017	1,457	1,836	4,896	5,756	1,945	2,404	3,185	3,688	11,482	13,685	677	623
59	Dorset Rd	At Railway Underpass	2017	1,688	2,171	4,862	5,504	1,823	1,986	3,050	3,739	11,423	13,401	602	643
171	Dorset Rd	Between Burwood Hwy And Boronia Rd	2017	2,585	3,380	6,705	8,885	2,515	3,019	4,807	5,542	16,612	20,826	1,648	1,434
172	Dorset Rd	Between Burwood Hwy And Boronia Rd	2017	2,448	2,718	6,949	8,336	2,884	3,460	5,156	5,404	17,437	19,917	1,437	1,385
137	Dublin Rd	At Railway Crossing	2017	551	1,103	2,165	2,540	832	1,219	1,149	1,417	4,697	6,280	297	245
138	Dublin Rd	At Railway Crossing	2017	801	1,357	2,287	2,873	766	1,230	1,236	1,774	5,090	7,234	309	256
76	Dunne St	At Darebin Creek	2017	827	449	2,196	876	830	565	1,464	549	5,317	2,439	447	132
77	Dunne St	At Darebin Creek	2017	612	622	2,200	986	1,036	442	1,497	507	5,345	2,557	342	141
394	Eastern Freeway	btwn Blackburn Rd to Middleborough Rd	2017	13,029	11,183	31,657	32,229	11,090	10,110	24,735	23,409	80,511	76,931	4,569	6,851
395	Eastern Freeway	btwn Blackburn Rd to Middleborough Rd	2017	9,823	9,481	32,054	32,323	12,428	11,945	24,150	26,268	78,455	80,016	4,769	6,877
404	Eastern Freeway	btwn Bulleen Rd to Burke Rd	2017	12,063	10,595	26,200	28,176	8,406	7,523	21,678	19,108	68,347	65,402	2,655	4,550
405	Eastern Freeway	btwn Bulleen Rd to Burke Rd	2017	7,078	6,866	25,796	27,848	10,177	11,454	23,080	22,931	66,131	69,100	2,658	4,847
406	Eastern Freeway	btwn Burke Rd to Chandler Hwy	2017	12,726	11,543	30,007	31,059	9,668	8,258	24,727	21,603	77,128	72,463	2,793	4,824
407	Eastern Freeway	btwn Burke Rd to Chandler Hwy	2017	8,238	7,467	30,781	31,477	11,852	12,733	26,632	26,442	77,503	78,119	2,849	5,168
408	Eastern Freeway	btwn Chandler Hwy to Hoddle St	2017	9,799	9,358	25,237	26,304	8,308	6,913	21,778	18,556	65,122	61,130	2,385	3,721
409	Eastern Freeway	btwn Chandler Hwy to Hoddle St	2017	7,570	6,439	26,496	28,285	12,126	11,845	25,373	24,070	71,565	70,639	2,515	4,119
402	Eastern Freeway	btwn Doncaster Rd to Bulleen Rd	2017	11,879	10,124	31,699	31,559	10,662	8,851	26,107	24,450	80,347	74,984	4,462	7,145
403	Eastern Freeway	btwn Doncaster Rd to Bulleen Rd	2017	9,521	8,427	31,262	30,934	10,963	10,753	26,631	26,556	78,377	76,671	4,481	6,913
400	Eastern Freeway	btwn Elgar Rd to Doncaster Rd	2017	12,136	10,027	32,213	32,072	11,637	9,708	26,489	24,205	82,475	76,012	4,500	7,123
401	Eastern Freeway	btwn Elgar Rd to Doncaster Rd	2017	10,478	9,215	31,992	32,200	11,536	10,730	25,466	26,363	79,472	78,508	4,541	6,976
396	Eastern Freeway	btwn Middleborough Rd to Tram Rd	2017	13,522	11,355	34,019	33,322	11,660	9,684	26,106	24,998	85,307	79,359	4,690	6,777

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397	Eastern Freeway	btwn Middleborough Rd to Tram Rd	2017	10,650	9,011	33,176	33,428	13,478	12,026	26,208	27,944	83,512	82,408	4,901	6,851
392	Eastern Freeway	btwn Springvale Rd to Blackburn Rd	2017	11,112	9,435	27,336	27,071	9,821	8,996	21,773	19,791	70,042	65,293	4,237	6,257
393	Eastern Freeway	btwn Springvale Rd to Blackburn Rd	2017	9,552	8,402	28,347	27,302	11,291	10,006	20,776	22,427	69,966	68,136	4,398	6,287
398	Eastern Freeway	btwn Tram Rd to Elgar Rd	2017	11,169	9,331	28,084	27,609	9,744	8,357	23,318	20,883	72,315	66,180	4,259	5,857
399	Eastern Freeway	btwn Tram Rd to Elgar Rd	2017	8,925	7,877	28,078	27,810	10,611	9,895	22,488	23,606	70,102	69,188	4,313	5,884
9430	Eastern Fwy	Bulleen Road West Inbound	2016	9,004	8,230	21,720	23,091	7,622	6,286	17,791	16,281	56,137	53,888		
258	Eastern Fwy	EB Entry Ramp At Chandler Hwy	2017	1,705	1,648	7,387	5,222	2,074	1,697	4,290	3,932	15,456	12,499	1,463	1,285
266	Eastern Fwy	EB Entry Ramp At Doncaster Rd	2017	1,487	1,909	4,072	5,151	1,685	1,641	2,126	3,243	9,370	11,943	716	533
270	Eastern Fwy	EB Entry Ramp At Thompsons Rd	2017	3,108	2,416	7,725	7,802	309	1,623	5,696	7,335	16,838	19,176	2,971	2,558
274	Eastern Fwy	EB Entry Ramp At Tram Rd	2017	1,916	1,134	6,590	5,618	3,106	2,131	3,716	4,337	15,328	13,220	963	967
276	Eastern Fwy	EB Entry Ramp At Wetherby Rd	2017	1,011	1,484	2,733	2,721	976	1,351	1,569	1,483	6,288	7,039	462	578
280	Eastern Fwy	EB Exit Ramp At Blackburn Rd	2017	1,103	1,079	4,370	5,021	1,868	1,939	3,458	3,842	10,800	11,880	724	590
271	Eastern Fwy	EB Exit Ramp At Bulleen Rd	2017	549	855	3,476	4,716	2,217	2,324	3,472	3,711	9,715	11,606	589	492
282	Eastern Fwy	EB Exit Ramp At Burke Rd	2017	853	601	3,683	3,629	1,167	1,279	3,455	3,510	9,158	9,019	463	321
263	Eastern Fwy	EB Exit Ramp At Chandler Hwy	2017	1,176	621	3,292	2,030	1,207	809	2,794	1,560	8,469	5,019	604	237
267	Eastern Fwy	EB Exit Ramp At Doncaster Rd	2017	644	1,121	2,959	3,885	943	1,664	2,509	3,435	7,055	10,106	506	470
284	Eastern Fwy	EB Exit Ramp At Elgar Rd	2017	1,665	1,338	4,124	4,390	1,032	835	3,209	2,756	10,029	9,320	654	1,092
286	Eastern Fwy	EB Exit Ramp At Springvale Rd	2017	3,259	2,364	10,299	9,971	3,757	2,439	9,080	9,166	26,396	23,941	2,623	1,193
277	Eastern Fwy	EB Exit Ramp At Wetherby Rd	2017	1,359	1,014	4,327	3,826	1,736	1,433	3,829	3,159	11,251	9,431	721	552
9406	Eastern Fwy	under Bulleen Rd	2016	6,492	6,011	22,344	23,133	9,220	9,130	17,832	19,221	55,887	57,495		
273	Eastern Fwy	WB Entry Ramp At Bulleen Rd	2017	2,299	2,365	3,704	5,085	968	1,237	3,133	2,827	10,103	11,514	593	511
264	Eastern Fwy	WB Entry Ramp At Chandler Hwy	2017	307	494	2,796	1,505	897	800	2,010	1,237	6,011	4,036	434	168
268	Eastern Fwy	WB Entry Ramp At Doncaster Rd	2017	1,027	1,583	3,216	4,000	925	1,132	2,063	2,788	7,230	9,502	611	483

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285	Eastern Fwy	WB Entry Ramp At Elgar Rd	2017	1,090	696	4,305	4,463	1,818	1,351	3,157	3,322	10,369	9,832	547	1,266
278	Eastern Fwy	WB Entry Ramp At Middleborough Rd	2017	1,710	1,373	4,849	4,235	1,666	1,179	3,489	3,154	11,715	9,940	603	597
287	Eastern Fwy	WB Entry Ramp At Springvale Rd	2017	3,158	2,359	9,682	10,134	3,428	2,539	8,157	8,156	24,425	23,188	1,229	1,203
281	Eastern Fwy	WB Entry Ramp At Surrey Rd	2017	1,920	1,748	4,367	5,158	1,373	1,114	2,906	3,618	10,567	11,638	495	594
283	Eastern Fwy	WB Entry Ramp At Burke Rd	2017	784	948	3,707	2,883	1,154	735	3,002	2,495	8,648	7,061	621	274
272	Eastern Fwy	WB Exit Ramp At Bulleen Rd	2017	2,672	1,894	9,124	8,468	3,146	2,565	7,001	8,170	21,943	21,097	2,745	3,105
265	Eastern Fwy	WB Exit Ramp At Chandler Hwy	2017	2,818	2,679	7,367	6,261	1,880	2,145	4,795	4,284	16,860	15,368	1,831	1,272
269	Eastern Fwy	WB Exit Ramp At Doncaster Rd	2017	1,538	1,486	3,867	4,512	1,587	1,989	2,356	2,542	9,348	10,529	530	461
279	Eastern Fwy	WB Exit Ramp At Middleborough Rd	2017	1,115	1,201	2,648	3,141	1,090	1,605	1,504	1,565	6,357	7,512	591	672
275	Eastern Fwy	WB Exit Ramp At Station Rd	2017	2,546	2,025	5,808	5,713	1,835	1,327	3,096	4,114	13,286	13,180	680	920
9401	Eastern Fwy	West of Hoddle Street OB	2016	6,495	6,125	23,669	26,512	10,903	10,452	22,331	22,700	63,398	65,788		
9424	Eastern Fwy	west of Middleborough Rd IB	2016	11,724	9,982	28,016	29,088	9,817	8,505	21,763	21,844	71,320	69,419		
9411	Eastern Fwy	west of Middleborough Rd OB	2016	9,341	7,997	29,621	29,602	12,546	10,594	21,044	24,785	72,552	72,977		
9421	Eastern Fwy	west of Springvale Rd	2016	6,816	7,076	16,210	16,937	5,969	6,457	11,140	11,635	40,135	42,105		
222	Edgars Rd	North of Western Ring Rd	2017	1,400	1,703	7,106	6,063	3,780	3,737	6,280	4,066	18,566	15,569	1,252	1,208
223	Edgars Rd	North of Western Ring Rd	2017	3,189	3,533	7,060	6,005	2,095	1,841	6,016	3,984	18,360	15,363	1,456	1,225
90	Edgars Rd	South of Cooper St	2017	1,204	1,181	3,628	2,276	1,064	1,365	2,856	1,206	8,752	6,029	562	722
91	Edgars Rd	South of Cooper St	2017	854	1,408	3,873	2,186	1,647	1,150	2,470	1,152	8,845	5,896	535	739
120	Elgar Rd	North of Eastern Fwy	2017	1,122	1,653	4,791	4,441	2,078	2,476	2,799	2,399	10,789	10,969	429	578
121	Elgar Rd	North of Eastern Fwy	2017	1,972	2,266	4,000	4,157	1,275	1,806	2,321	2,284	9,567	10,513	408	571
322	Elgar Road	Between Belmore Road And Eastern Freeway	2017	1,865	2,132	7,951	8,589	3,550	3,632	4,969	5,571	18,335	19,925	1,014	1,788
323	Elgar Road	Between Belmore Road And Eastern Freeway	2017	3,295	3,388	7,320	8,232	2,043	2,447	4,760	4,890	17,419	18,958	835	1,607
197	Eltham-Yarra Glen Rd	North of Donaldson Rd	2017	562	807	2,146	2,908	1,589	2,292	1,643	2,281	5,939	8,289	526	693
198	Eltham-Yarra Glen Rd	North of Donaldson Rd	2017	1,240	2,240	2,104	2,916	738	941	1,586	1,808	5,668	7,904	588	632

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Count ID	Road Name	Count Location	Year	AM Count	AM Model	Inter Peak Count	Inter Peak Model	PM Count	PM Model	Evening Off Peak Count	Evening Off Peak Model	Daily Count	Daily Model	Daily CV Count	Daily CV Model
104	Eltham-Yarra Glen Rd	North of Henley Rd	2017	279	588	966	1,650	418	935	539	1,194	2,202	4,367	236	424
105	Eltham-Yarra Glen Rd	North of Henley Rd	2017	339	929	854	1,649	342	594	588	1,120	2,122	4,292	259	417
324	Fitzsimons Lane	Between Main Road And Porter Street	2017	3,874	4,347	12,001	12,980	6,296	6,574	8,739	9,461	30,910	33,362	2,214	1,796
325	Fitzsimons Lane	Between Main Road And Porter Street	2017	5,327	6,444	11,865	13,254	3,748	4,697	7,805	8,455	28,746	32,850	1,637	1,931
326	Foote Street	West Of Fitzsimons Lane	2017	1,021	928	4,210	2,156	2,370	2,171	2,814	2,948	10,414	8,203	869	369
327	Foote Street	West Of Fitzsimons Lane	2017	1,987	2,100	3,521	2,750	1,087	1,199	2,302	3,262	8,896	9,311	642	487
328	Greensborough Bypass	Between M80 Interchange And Diamond Creek Rd	2017	2,482	3,390	10,342	12,760	5,434	5,983	7,436	9,101	25,693	31,234	1,256	2,398
329	Greensborough Bypass	Between M80 Interchange And Diamond Creek Rd	2017	5,272	5,737	9,825	12,089	2,788	3,798	7,950	7,847	25,835	29,471	2,018	2,265
250	Greensborough Hwy	btw Erskine Road and Blamey Road	2017	2,744	3,077	11,250	11,500	4,512	4,676	9,634	9,472	28,140	28,725	1,618	2,027
251	Greensborough Hwy	btw Erskine Road and Blamey Road	2017	3,954	4,475	12,046	11,291	3,322	3,486	8,830	8,847	28,152	28,099	1,691	1,959
161	Greensborough Rd	At Simpsons Barracks	2017	4,449	4,701	12,482	11,368	3,533	3,525	9,586	8,858	30,049	28,452		
213	Greensborough Rd	At Simpsons Barracks	2017	3,264	3,156	12,158	11,576	4,842	4,879	10,092	9,494	30,356	29,105		
288	Greensborough Rd	South Of Watsonia Rd	2017	3,259	3,346	11,942	11,406	4,843	4,643	9,667	9,279	29,711	28,675		
289	Greensborough Rd	South Of Watsonia Rd	2017	4,484	4,394	12,275	11,310	3,592	3,685	9,328	8,772	29,680	28,161		
425	Greensborough Road	Between Grimshaw Street And M80 Interchange	2017	4,939	5,187	14,243	14,246	4,798	4,346	10,699	11,592	34,678	35,371	2,583	2,159
80	Grimshaw St	Between Plenty Rd And Watsonia Rd	2017	1,912	1,875	5,764	5,493	2,082	2,897	3,552	3,051	13,310	13,316	914	577
81	Grimshaw St	Between Plenty Rd And Watsonia Rd	2017	1,947	2,782	5,382	5,731	1,632	2,127	3,318	2,817	12,279	13,456	545	627
52	Heidelberg Rd	At Darebin Creek	2017	1,038	1,665	4,508	5,559	2,645	2,787	3,765	3,477	11,955	13,487	409	622
53	Heidelberg Rd	At Darebin Creek	2017	2,887	2,916	4,946	6,090	1,513	1,936	3,522	2,989	12,869	13,931	777	653
116	Heidelberg-Kinglake Rd	North of Main Hurstbridge Rd	2017	215	372	1,079	1,801	163	1,267	482	1,420	1,939	4,861	131	134
117	Heidelberg-Kinglake Rd	North of Main Hurstbridge Rd	2017	264	1,202	739	1,850	81	462	949	1,169	2,033	4,683	164	132
60	Heidelberg-Warrandyte Rd	At Mullum Mullum Creek	2017	467	555	2,298	2,195	1,023	1,386	1,407	1,402	5,196	5,538	543	237
61	Heidelberg-Warrandyte Rd	At Mullum Mullum Creek	2017	1,188	1,384	2,424	2,254	590	621	1,353	1,184	5,555	5,443		

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Count ID	Road Name	Count Location	Year	AM Count	AM Model	Inter Peak Count	Inter Peak Model	PM Count	PM Model	Evening Off Peak Count	Evening Off Peak Model	Daily Count	Daily Model	Daily CV Count	Daily CV Model
224	High St	North of Settlement Rd	2017	1,383	1,712	6,200	5,637	2,715	3,754	4,865	3,057	15,162	14,159	736	768
225	High St	North of Settlement Rd	2017	2,749	3,864	5,831	5,435	1,811	1,789	4,657	2,907	15,048	13,996	663	740
177	High St	South of Cooper St	2017	1,761	1,138	8,555	6,218	3,060	3,503	5,394	3,698	18,769	14,556	961	643
178	High St	South of Cooper St	2017	3,107	3,403	8,764	6,145	2,094	1,533	5,550	3,182	19,515	14,262	1,104	605
331	High Street	Between Doncaster Road And Manningham Road	2017	918	1,247	4,148	4,347	2,256	3,164	3,065	2,957	10,387	11,715	501	380
332	High Street	Between Doncaster Road And Manningham Road	2017	2,194	3,220	4,226	4,759	1,237	1,411	2,319	2,329	9,976	11,719	376	431
141	Hull Rd	East Of Mooroolbark Rd	2017	694	346	2,620	743	1,379	921	1,784	486	6,478	2,495	281	105
142	Hull Rd	East Of Mooroolbark Rd	2017	1,290	891	2,578	777	924	381	1,706	487	6,498	2,537	306	99
416	Hume Freeway	btwn M80 Ring Rd and Cooper St	2017	5,455	3,776	17,413	17,272	7,587	7,180	15,096	13,845	45,551	42,073	7,121	6,482
417	Hume Freeway	btwn M80 Ring Rd and Cooper St	2017	6,445	6,691	17,673	16,945	6,702	4,497	14,612	13,187	45,432	41,319	6,847	6,491
151	Jika St	Between Rosanna Rd & Banksia St	2017	1,016	896	3,603	2,673	958	1,109	2,916	2,492	8,494	7,170	422	730
152	Jika St	Between Rosanna Rd & Banksia St	2017	2,379	1,819	5,946	4,504	2,041	1,585	4,199	3,856	14,566	11,765	898	1,209
98	Jumping Creek Rd	Between Ringwood-Warrandyte Rd And Yarra Rd	2017	495	721	1,716	1,418	960	1,157	1,073	826	4,243	4,122	440	177
99	Jumping Creek Rd	Between Ringwood-Warrandyte Rd And Yarra Rd	2017	989	1,061	1,604	1,468	638	801	1,315	889	4,545	4,220	424	187
106	Kangaroo Ground-St Andrews Rd	North of Kangaroo Ground-Wattleleglen Rd	2017	159	562	783	1,965	539	1,481	627	1,399	2,108	5,408	106	421
107	Kangaroo Ground-St Andrews Rd	North of Kangaroo Ground-Wattleleglen Rd	2017	494	1,440	813	1,931	241	636	595	1,167	2,143	5,174	187	372
183	Kangaroo Ground-Warrandyte Rd	At Yarra River	2017	1,018	1,162	3,476	3,799	2,313	2,915	3,004	2,648	9,810	10,525	468	903
184	Kangaroo Ground-Warrandyte Rd	At Yarra River	2017	1,968	2,886	3,482	3,601	1,255	1,280	2,442	2,320	9,146	10,087	649	843
96	Kangaroo Ground-Warrandyte Rd	Near Pigeon Bank Rd	2017	389	635	1,404	1,823	1,096	1,422	1,158	1,393	4,047	5,273	311	603
97	Kangaroo Ground-Warrandyte Rd	Near Pigeon Bank Rd	2017	810	1,354	1,441	1,760	566	716	1,150	1,208	3,967	5,038	247	558
333	Karingal Drive	East Of St Helena Road	2017	1,672	1,552	5,060	4,506	1,837	1,492	3,223	2,755	11,792	10,305	809	450
334	Karingal Drive	East Of St Helena Road	2017	1,791	1,401	4,644	4,324	2,128	1,656	3,173	2,467	11,735	9,847	833	433
339	King Street	East of Williamsons Road	2017	984	626	2,911	2,942	1,347	1,621	1,958	1,965	7,200	7,155	530	274

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Count ID	Road Name	Count Location	Year	AM Count	AM Model	Inter Peak Count	Inter Peak Model	PM Count	PM Model	Evening Off Peak Count	Evening Off Peak Model	Daily Count	Daily Model	Daily CV Count	Daily CV Model
340	King Street	East of Williamsons Road	2017	1,126	1,441	2,622	2,799	858	575	1,609	1,849	6,214	6,664	466	297
335	Kingsbury Drive	East of Waterdale Road	2017	1,513	1,369	3,456	1,917	835	485	1,652	994	7,457	4,765	531	134
336	Kingsbury Drive	East of Waterdale Road	2017	1,104	464	3,394	1,780	1,919	1,355	2,060	1,003	8,477	4,603	605	105
337	Kingsbury Drive	West of Waterdale Road	2017	1,830	1,895	6,886	5,976	2,207	2,015	4,009	3,766	14,932	13,651	1,095	1,199
338	Kingsbury Drive	West of Waterdale Road	2017	2,663	1,908	6,423	6,001	2,168	2,071	4,401	3,681	15,655	13,661	1,024	1,157
228	Kurrag Rd	West of Armstrong Rd	2017	1,085	1,514	2,877	3,522	1,382	1,380	1,989	2,148	7,334	8,563	698	337
229	Kurrag Rd	West of Armstrong Rd	2017	1,257	1,251	2,827	3,441	1,227	1,555	1,877	1,999	7,188	8,247	482	322
167	Loughnan Rd	East Of Eastern Fwy	2017	408	352	2,170	1,463	1,546	1,227	1,859	944	5,982	3,986	302	114
168	Loughnan Rd	East Of Eastern Fwy	2017	1,711	1,350	2,253	1,476	614	447	1,577	690	6,154	3,962	299	124
50	Lower Heidelberg Rd	Near Ivanhoe Park	2017	1,102	877	2,437	1,851	1,120	1,172	1,469	1,015	6,128	4,915	229	267
51	Lower Heidelberg Rd	Near Ivanhoe Park	2017	865	951	2,318	2,121	729	460	1,253	1,138	5,165	4,669	226	280
341	Lower Heidelberg Road	Between Burke Road And Banksia Street	2017	2,335	2,143	7,573	7,283	2,606	3,065	6,106	6,245	18,620	18,737	1,436	712
342	Lower Heidelberg Road	Between Burke Road And Banksia Street	2017	1,977	2,972	7,292	7,337	2,163	2,260	5,667	6,149	17,099	18,717	904	755
159	Lower Plenty Rd	Between Turnham Ave And Rosanna Rd	2017	802	993	3,624	4,317	2,021	2,446	2,464	2,550	8,911	10,306	489	432
160	Lower Plenty Rd	Between Turnham Ave And Rosanna Rd	2017	2,432	2,404	3,997	4,217	948	1,167	2,441	2,139	9,817	9,926	340	415
419	Lower Plenty Rd	btwn Rosanna Rd and Greensborough Rd	2017	6,112	5,513	13,342	12,815	3,647	3,290	10,308	9,976	33,409	31,594	1,893	2,024
343	Lower Plenty Road	Between Greensborough Road And Para Road	2017	1,432	1,928	6,077	6,763	3,457	4,359	4,219	4,491	15,185	17,540	983	751
344	Lower Plenty Road	Between Greensborough Road And Para Road	2017	3,693	4,429	6,269	6,748	1,615	2,151	3,909	3,731	15,486	17,059	676	729
345	Lower Plenty Road	Between Rail Line And Rosanna Road	2017	2,247	2,404	3,821	4,217	920	1,167	2,304	2,139	9,292	9,926	561	415
346	Lower Plenty Road	Between Rail Line And Rosanna Road	2017	818	993	3,499	4,317	1,786	2,446	2,154	2,550	8,256	10,306	772	432
418	Lower Plenty Road	btwn Rosanna Rd and Greensborough Rd	2017	2,942	2,763	12,946	12,881	5,840	5,709	11,558	11,057	33,286	32,411	1,837	2,111
410	M80	btwn Dalton Rd to Edgars Rd	2017	8,695	9,993	23,463	26,926	8,192	9,255	20,290	19,101	60,640	65,275	4,251	5,991
411	M80	btwn Dalton Rd to Edgars Rd	2017	8,215	8,532	25,773	27,304	11,146	10,617	18,727	19,211	63,861	65,664	4,506	5,943
412	M80	btwn Edgars Rd to Hume Fwy	2017	8,312	10,429	26,040	29,778	9,666	10,364	21,842	21,689	65,860	72,260	5,015	6,934

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Count ID	Road Name	Count Location	Year	AM Count	AM Model	Inter Peak Count	Inter Peak Model	PM Count	PM Model	Evening Off Peak Count	Evening Off Peak Model	Daily Count	Daily Model	Daily CV Count	Daily CV Model
413	M80	btwn Edgars Rd to Hume Fwy	2017	8,753	9,406	27,342	29,707	12,484	11,359	20,959	21,479	69,538	71,951	5,158	6,694
414	M80	btwn Hume Fwy to Sydney Rd	2017	10,127	12,963	29,630	32,631	10,145	10,113	25,809	23,988	75,711	79,696	7,904	9,550
415	M80	btwn Hume Fwy to Sydney Rd	2017	8,946	9,026	30,274	32,887	13,797	13,791	25,127	24,436	78,144	80,141	8,313	9,301
8135	M80	Dalton Rd Offramp	2015	1,698	1,422			1,154	1,270			9,900	9,746		
8136	M80	Dalton Rd Offramp	2015	2,642	2,648			3,077	2,950			18,400	16,958		
8134	M80	Dalton Rd Onramp	2015	943	1,075			1,731	1,502			9,600	9,764		
8137	M80	Dalton Rd Onramp	2015	2,453	2,744			2,692	3,121			17,200	17,457		
248	M80	Darebin Creek	2017	8,514	8,671	20,278	23,852	6,742	7,405	17,762	17,636	53,296	57,564	3,107	4,286
249	M80	Darebin Creek	2017	5,585	6,958	22,451	24,419	9,552	9,169	15,437	17,924	53,025	58,470	3,177	4,324
8144	M80	East of Plenty Rd	2015	7,547	6,581			5,000	5,674			41,700	44,417		
8145	M80	East of Plenty Rd	2015	4,340	5,555			7,692	7,149			41,100	45,891		
8129	M80	Edgars Rd Offramp	2015	943	983			962	628			7,200	5,278		
8130	M80	Edgars Rd Offramp	2015	943	1,577			2,115	1,609			12,000	11,500		
8128	M80	Edgars Rd Onramp	2015	943	703			1,346	867			7,400	5,213		
8131	M80	Edgars Rd Onramp	2015	1,698	1,420			2,308	1,737			12,300	12,263		
8124	M80	Hume to M80 EB	2015	1,698	2,658			3,077	1,924			16,100	17,060		
8127	M80	Hume to M80 WB	2015	4,717	4,033			3,462	2,573			27,500	24,260		
8126	M80	M80 EB to Hume NB	2015	3,585	2,277			4,038	4,356			28,800	25,249		
8125	M80	M80 WB to Hume NB	2015	2,264	1,499			3,269	2,824			17,400	16,824		
8141	M80	Plenty Rd Offramp	2015	943	1,287			1,731	1,415			11,100	9,451		
8142	M80	Plenty Rd Offramp	2015	2,453	2,988			4,231	3,451			21,800	22,584		
8140	M80	Plenty Rd Onramp	2015	1,132	1,584			2,308	1,431			12,100	10,006		
8143	M80	Plenty Rd Onramp	2015	2,830	3,378			2,692	3,145			20,600	22,598		
347	Main Hurstbridge Rd	Between Ryans Rd And Kangaroo Ground-Wattle Glen Rd	2017	1,423	2,096	3,246	4,903	1,164	1,307	2,065	3,366	7,898	11,672	956	811
348	Main Hurstbridge Rd	Between Ryans Rd And Kangaroo Ground-Wattle Glen Rd	2017	715	1,216	3,435	4,882	1,613	2,177	2,156	3,663	7,919	11,939	943	815
185	Main Rd	At Diamond Creek	2017	1,025	1,214	5,694	4,950	2,869	2,321	4,094	4,090	13,682	12,575	731	751

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186	Main Rd	At Diamond Creek	2017	2,034	2,230	5,511	4,932	1,663	1,473	3,649	3,723	12,858	12,357	674	762
94	Main Rd	East Of Ingrams Rd	2017	598	622	1,594	2,022	889	1,158	1,015	1,414	4,097	5,216	364	192
95	Main Rd	East Of Ingrams Rd	2017	817	1,100	1,806	2,115	651	706	1,020	1,139	4,294	5,060	421	185
147	Main Rd At Plenty River	At Plenty River	2017	1,396	1,777	5,801	4,832	3,062	3,525	3,747	2,862	14,006	12,996		
148	Main Rd At Plenty River	At Plenty River	2017	3,268	3,446	5,501	4,675	1,737	2,067	3,651	2,642	14,158	12,830	462	509
349	Main Road	Between Para Road And Bolton Street	2017	1,598	2,483	5,875	6,945	2,605	3,651	3,889	4,502	13,967	17,581	1,577	762
350	Main Road	Between Para Road And Bolton Street	2017	3,048	3,534	6,088	6,897	2,218	2,759	4,029	4,481	15,383	17,671	843	647
351	Main Road	Between Wattletree Road And Bridge Street	2017	1,046	1,127	5,311	5,961	2,302	2,302	3,644	4,557	12,304	13,947	572	310
352	Main Road	Between Wattletree Road And Bridge Street	2017	2,273	2,205	5,461	5,841	1,567	1,526	3,271	3,690	12,572	13,261	825	344
353	Main Road	East of Wattletree Road	2017	1,177	1,350	4,421	5,280	2,228	2,070	3,150	3,999	10,976	12,699	631	353
354	Main Road	East of Wattletree Road	2017	2,210	2,044	4,658	5,322	1,550	1,568	3,189	3,234	11,607	12,168	962	381
187	Main St	Maroondah Hwy At Railway Crossing	2017	1,561	1,437	5,304	4,611	1,632	1,318	3,227	3,139	11,724	10,506	1,479	707
188	Main St	Maroondah Hwy At Railway Crossing	2017	1,431	1,226	5,802	4,628	1,925	1,504	3,041	3,355	12,198	10,713	1,491	731
189	Manchester Rd	At Railway Crossing	2017	1,040	1,007	4,336	3,073	2,095	1,811	2,725	1,873	10,196	7,764	630	247
190	Manchester Rd	At Railway Crossing	2017	1,965	1,960	4,347	3,100	1,549	975	2,855	1,691	10,716	7,726	691	258
355	Manningham Road	Between High Street And Williamsons Road	2017	2,386	3,346	7,251	6,251	2,891	3,030	4,390	2,805	16,917	15,432	677	945
356	Manningham Road	Between High Street And Williamsons Road	2017	2,778	3,178	8,298	5,065	3,392	3,507	4,319	2,016	18,787	13,765	937	939
357	Manningham Road	Between Thompsons Road And High Street	2017	2,694	3,508	7,656	6,074	3,380	3,849	4,140	2,731	17,870	16,163	1,183	1,127
358	Manningham Road	Between Thompsons Road And High Street	2017	2,342	3,600	6,852	6,726	2,870	3,689	4,496	3,131	16,560	17,146	784	1,075
244	Maroondah Hwy	East of Eastern Freeway	2017	1,691	3,196	8,457	8,269	2,929	3,961	4,528	3,165	17,605	18,592	575	1,212
245	Maroondah Hwy	East of Eastern Freeway	2017	3,264	3,917	8,601	8,311	2,813	3,770	5,370	2,618	20,048	18,616	756	1,221
230	McDonalds Rd	West of Pindari Ave	2017	1,740	1,777	4,000	4,031	1,140	1,454	2,836	2,647	9,717	9,909	481	531
231	McDonalds Rd	West of Pindari Ave	2017	921	1,282	3,992	4,112	1,882	1,881	2,690	2,560	9,484	9,835	460	512
82	Mckimmies Rd	At Darebin Creek	2017	576	771	2,978	2,135	2,054	1,465	2,340	1,466	7,948	5,837	258	501
83	Mckimmies Rd	At Darebin Creek	2017	1,822	1,385	2,883	2,202	861	935	2,211	1,268	7,778	5,790	309	507

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Count ID	Road Name	Count Location	Year	AM Count	AM Model	Inter Peak Count	Inter Peak Model	PM Count	PM Model	Evening Off Peak Count	Evening Off Peak Model	Daily Count	Daily Model	Daily CV Count	Daily CV Model
102	Melba Hwy	At Yarra River	2017	618	576	2,892	2,600	1,330	1,669	1,619	1,869	6,460	6,714	847	629
103	Melba Hwy	At Yarra River	2017	1,108	1,704	2,763	2,521	855	620	1,470	1,588	6,196	6,433	820	637
124	Middleborough Rd	North of Eastern Fwy	2017	2,022	2,161	5,958	6,614	2,221	3,479	3,918	4,087	14,118	16,341	770	1,102
125	Middleborough Rd	North of Eastern Fwy	2017	1,916	3,410	5,691	6,476	2,133	2,521	4,074	3,573	13,814	15,980	582	1,002
359	Middleborough Road	Between Whitehorse Road And Eastern Freeway	2017	2,102	1,846	7,034	6,761	2,984	2,474	4,801	5,118	16,921	16,199	931	826
360	Middleborough Road	Between Whitehorse Road And Eastern Freeway	2017	2,637	2,454	6,752	6,634	2,235	2,022	4,454	4,691	16,078	15,802	945	774
128	Mitcham Rd At Eastern Fwy	At Eastern Fwy	2017	1,818	2,518	5,525	6,358	2,549	2,937	3,925	3,822	13,817	15,634	600	404
166	Mitcham Rd At Eastern Fwy	At Eastern Fwy	2017	2,257	2,829	4,969	6,106	1,984	2,624	3,611	3,538	12,821	15,097	532	398
139	Mooroolbark Rd	At Railway Bridge	2017	1,040	733	2,877	1,819	1,199	845	1,737	1,005	6,853	4,402	244	220
140	Mooroolbark Rd	At Railway Bridge	2017	838	811	2,515	1,721	998	815	1,658	1,083	6,009	4,429	533	166
191	Mt Dandenong Rd	At Railway Bridge	2017	3,296	3,504	7,490	8,740	2,444	3,421	5,157	5,373	18,387	21,038	1,070	1,258
192	Mt Dandenong Rd	At Railway Bridge	2017	2,082	3,139	8,317	8,772	3,869	3,694	5,195	5,802	19,462	21,407	1,449	1,254
157	Murray Rd At Darebin Creek	At Darebin Creek	2017	1,614	2,463	6,059	4,429	1,894	2,127	2,613	1,724	12,179	10,743	879	735
158	Murray Rd At Darebin Creek	At Darebin Creek	2017	1,365	1,948	6,173	4,272	2,463	2,515	3,280	1,840	13,281	10,575	810	733
361	Oriel Road	Between Bell Street And Darebin Road	2017	962	928	3,317	1,830	1,613	1,397	1,819	948	7,710	5,103	401	275
362	Oriel Road	Between Bell Street And Darebin Road	2017	1,490	1,392	2,956	2,095	1,063	1,203	1,608	889	7,116	5,579	450	274
64	Para Rd	Between Rattray Rd And Main Rd	2017	1,470	1,170	3,918	4,404	1,891	1,533	2,882	3,140	10,161	10,247	784	331
65	Para Rd	Between Rattray Rd And Main Rd	2017	1,479	1,505	3,484	4,333	1,225	1,284	2,595	2,913	8,783	10,035	500	434
129	Park Rd	East of Eastern Fwy	2017	1,021	303	1,555	1,450	489	1,519	965	1,187	4,029	4,460	171	95
130	Park Rd	East of Eastern Fwy	2017	504	1,510	1,450	1,478	898	403	1,212	874	4,064	4,265	233	97
256	Park Rd	West Of Knees Rd	2017	426	109	1,356	583	686	984	744	452	3,212	2,128	125	49
257	Park Rd	West Of Knees Rd	2017	553	994	1,064	586	379	132	584	302	2,579	2,014	106	49
199	Pindari Ave	At Railway Bypass	2017	409	665	1,272	1,347	598	863	1,167	945	3,446	3,821	88	123
200	Pindari Ave	At Railway Bypass	2017	701	965	1,346	1,369	577	578	1,139	771	3,763	3,682	141	127

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Count ID	Road Name	Count Location	Year	AM Count	AM Model	Inter Peak Count	Inter Peak Model	PM Count	PM Model	Evening Off Peak Count	Evening Off Peak Model	Daily Count	Daily Model	Daily CV Count	Daily CV Model
74	Plenty Rd	At Darebin Creek	2017	1,894	2,579	7,973	8,407	2,764	4,126	6,135	5,772	18,765	20,884	667	1,648
75	Plenty Rd	At Darebin Creek	2017	2,893	3,930	7,369	8,180	2,670	2,812	5,593	5,288	18,524	20,209	678	1,625
78	Plenty Rd	Between Main Dr And Greenwood Dr	2017	2,862	3,051	13,642	13,101	4,338	6,122	9,761	8,733	30,603	31,007	1,812	2,330
79	Plenty Rd	Between Main Dr And Greenwood Dr	2017	5,469	5,932	12,292	12,964	3,157	3,480	8,551	7,062	29,468	29,439	1,532	2,258
201	Plenty Rd	Between McDonalds Rd And Bush Bvd	2017	3,572	3,566	8,834	8,533	2,473	2,216	7,809	6,508	22,689	20,824	774	1,065
202	Plenty Rd	Between McDonalds Rd And Bush Bvd	2017	1,770	1,738	7,742	8,599	3,048	3,797	7,048	7,406	19,608	21,540	1,342	1,059
232	Plenty Rd	North of Mckimmies	2017	2,495	3,112	11,456	12,549	4,578	5,213	10,501	10,770	29,030	31,644		
233	Plenty Rd	North of Mckimmies	2017	4,123	5,022	11,689	12,497	3,070	3,539	10,571	9,770	29,454	30,827	2,048	1,712
426	Plenty Road	Between Settlement Road And M80 Ring Road	2017	3,207	3,144	13,260	11,166	4,784	5,202	9,187	7,154	30,438	26,667	1,585	1,901
363	Plenty Road (South Bound)	Between Settlement Road And M80 Ring Road	2017	3,689	4,969	8,761	10,582	2,585	3,554	5,951	5,922	20,987	25,027	1,112	1,804
203	Research-Warrandyte Rd	Between Main Rd And Kangaroo Ground-Warrandyte Rd	2017	781	710	1,578	1,355	804	997	1,290	803	4,453	3,864	168	224
204	Research-Warrandyte Rd	Between Main Rd And Kangaroo Ground-Warrandyte Rd	2017	591	990	1,567	1,272	724	675	1,171	887	4,053	3,824	179	209
164	Reynolds Rd	At Mullum Mullum Creek	2017	768	839	2,977	2,059	1,859	1,715	2,174	1,434	7,778	6,047	397	214
165	Reynolds Rd	At Mullum Mullum Creek	2017	1,926	1,717	2,673	2,213	862	943	1,911	1,309	7,372	6,182	394	235
114	Reynolds Rd	Between Kangaroo Ground-Wattle Glen Rd And Orme Rd	2017	32	61	118	32	97	242	87	27	334	361	24	18
115	Reynolds Rd	Between Kangaroo Ground-Wattle Glen Rd And Orme Rd	2017	75	272	107	23	43	55	77	29	301	379	20	16
364	Reynolds Road	Between Blackburn Road And Williamsons Road	2017	3,279	2,738	6,006	5,684	2,454	1,995	4,119	3,496	15,858	13,911	1,135	585
365	Reynolds Road	Between Blackburn Road And Williamsons Road	2017	1,856	1,846	6,268	5,542	2,984	2,762	4,064	3,322	15,173	13,472	961	565
242	Ringwood Bypass	East of Eastern Freeway	2017	3,731	5,399	14,362	17,253	8,102	7,382	10,039	14,271	36,234	44,305	1,749	3,973
243	Ringwood Bypass	East of Eastern Freeway	2017	6,277	6,556	13,445	16,626	4,405	5,762	10,450	13,390	34,577	42,333	1,520	3,821
133	Ringwood-Warrandyte Rd	South of Jumping Creek Rd	2017	754	920	2,847	3,522	1,783	2,000	1,988	2,302	7,372	8,743	627	678

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Count ID	Road Name	Count Location	Year	AM Count	AM Model	Inter Peak Count	Inter Peak Model	PM Count	PM Model	Evening Off Peak Count	Evening Off Peak Model	Daily Count	Daily Model	Daily CV Count	Daily CV Model
134	Ringwood-Warrandyte Rd	South of Jumping Creek Rd	2017	1,709	1,897	2,828	3,388	961	1,123	1,813	2,028	7,311	8,435	638	624
261	Rosanna Rd	Btwn Brown Street And Reid Street	2017	2,104	1,979	9,334	9,330	3,438	3,514	8,386	9,195	23,262	24,018	1,576	1,752
262	Rosanna Rd	Btwn Brown Street And Reid Street	2017	2,701	3,437	9,315	9,353	2,624	2,331	7,306	8,307	21,946	23,429	1,688	1,692
110	Ryans Rd	Between Diamond Creek Rd And Allendale Rd	2017	714	911	2,761	2,746	1,478	1,799	1,947	2,001	6,900	7,457	222	215
111	Ryans Rd	Between Diamond Creek Rd And Allendale Rd	2017	1,427	1,729	2,650	2,638	908	1,117	1,869	1,755	6,854	7,239	332	233
143	Scoresby Rd	Between Ferntree Gully Rd and Burwood Hwy	2017	889	1,693	3,175	2,903	1,334	1,771	1,919	1,760	7,317	8,127	656	647
144	Scoresby Rd	Between Ferntree Gully Rd and Burwood Hwy	2017	1,263	1,711	3,349	2,947	1,210	1,692	2,218	1,573	8,039	7,924	726	695
210	Settlement Rd	At Darebin Creek	2017	1,194	1,953	4,267	4,548	1,538	1,582	2,269	2,581	9,268	10,664	914	783
211	Settlement Rd	At Darebin Creek	2017	1,436	1,501	3,852	4,656	1,142	2,059	2,373	2,183	8,802	10,399	903	754
205	Springvale Rd	North of Eastern Fwy	2017	2,567	2,509	7,696	8,394	3,942	4,107	6,456	5,773	20,662	20,782	978	801
206	Springvale Rd	North of Eastern Fwy	2017	3,347	4,039	7,933	7,952	2,518	2,589	5,125	4,390	18,924	18,970	1,299	778
366	Springvale Road	Between Reynolds Road And Old Warrandyte Road	2017	1,530	1,169	4,285	3,245	2,273	1,400	3,184	2,172	11,271	7,986	724	287
367	Springvale Road	Between Reynolds Road And Old Warrandyte Road	2017	1,875	1,356	4,471	3,154	1,472	1,224	2,691	1,946	10,510	7,680	753	272
427	Springvale Road	Between Whitehorse Road And Eastern Freeway	2017	4,532	3,212	12,146	12,647	3,852	5,036	9,072	9,806	29,601	30,701	3,010	1,496
369	Springvale Road (South Bound)	Between Whitehorse Road And Eastern Freeway	2017	4,523	4,762	12,188	11,867	3,864	3,327	9,214	9,085	29,789	29,041	3,030	1,430
370	Station Street	Between Whitehorse Road And Eastern Freeway	2017	1,431	2,107	5,599	7,016	2,843	3,228	3,585	3,823	13,459	16,173	669	821
371	Station Street	Between Whitehorse Road And Eastern Freeway	2017	2,801	3,318	5,806	7,190	1,747	2,510	3,143	3,363	13,497	16,380	756	1,048
145	Stud Rd	Between Ferntree Gully Rd and High Street Rd	2017	3,572	3,431	9,678	9,587	3,793	3,396	6,833	7,263	23,877	23,677	1,194	1,119
146	Stud Rd	Between Ferntree Gully Rd and High Street Rd	2017	3,013	3,150	9,254	9,865	3,880	3,599	6,826	7,356	22,973	23,970	1,710	1,081

Transport Modelling for North East Link
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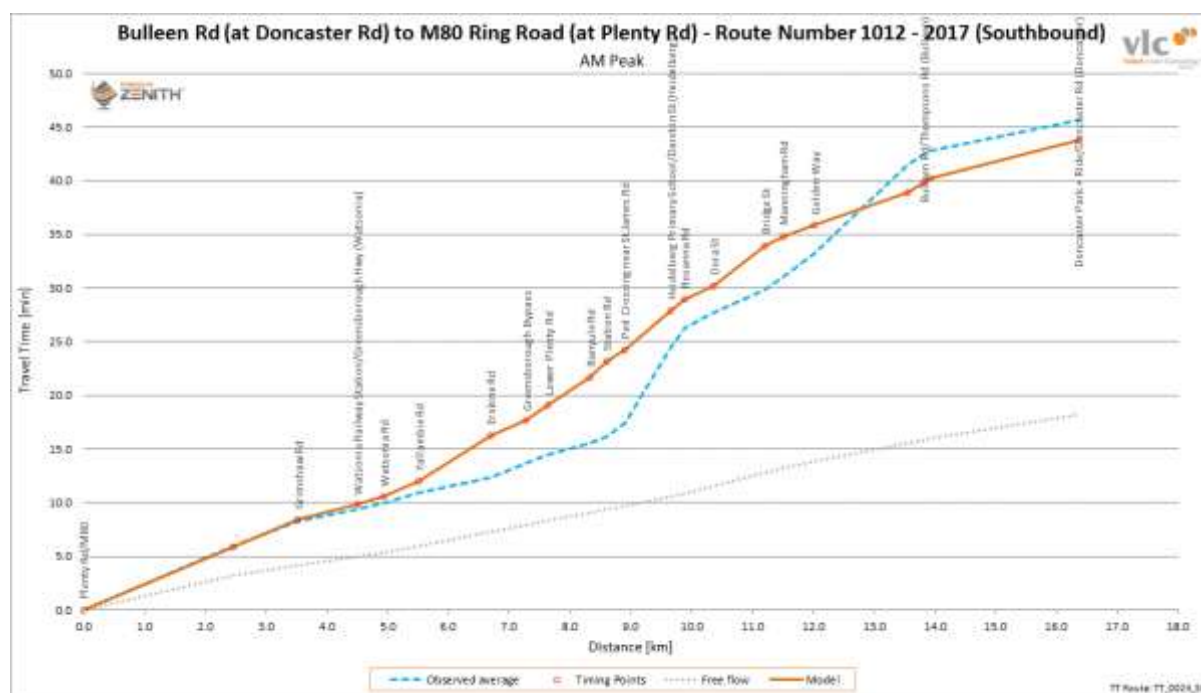
Count ID	Road Name	Count Location	Year	AM Count	AM Model	Inter Peak Count	Inter Peak Model	PM Count	PM Model	Evening Off Peak Count	Evening Off Peak Model	Daily Count	Daily Model	Daily CV Count	Daily CV Model
372	Surrey Road	Between Whitehorse Road And Eastern Freeway	2017	1,394	1,317	5,010	5,130	2,187	2,050	3,163	3,326	11,754	11,823	626	599
373	Surrey Road	Between Whitehorse Road And Eastern Freeway	2017	2,003	1,966	5,388	4,945	1,835	1,501	2,972	3,182	12,197	11,593	672	612
374	Templestowe Road	Between Bridge Street And Thompsons Road	2017	1,959	1,918	3,388	2,644	853	893	2,116	1,537	8,316	6,992	281	411
375	Templestowe Road	Between Bridge Street And Thompsons Road	2017	779	842	3,688	2,674	2,146	1,963	2,528	1,864	9,141	7,343	387	412
48	Thompsons Rd	Between Manningham Rd And Foote St	2017	510	871	2,398	4,199	1,454	1,852	2,322	3,245	6,684	10,167		
49	Thompsons Rd	Between Manningham Rd And Foote St	2017	1,576	1,844	2,631	4,623	746	1,151	2,283	2,684	7,237	10,301	399	412
46	Thompsons Rd	North East Of Eastern Fwy	2017	813	1,040	3,929	4,617	2,545	2,425	3,957	4,019	11,243	12,101	419	482
47	Thompsons Rd	North East Of Eastern Fwy	2017	2,881	2,881	5,330	7,392	1,355	1,993	3,803	4,755	13,369	17,020	925	742
131	Tindals Rd	Between Stintons Rd And Mullum Mullum Creek	2017	419	553	1,333	2,346	771	1,398	913	1,665	3,437	5,962	206	220
132	Tindals Rd	Between Stintons Rd And Mullum Mullum Creek	2017	934	1,351	1,379	2,367	399	677	863	1,313	3,574	5,708	214	225
122	Tram Rd	North of Eastern Fwy	2017	2,235	2,393	6,882	7,215	2,807	2,727	4,452	4,482	16,376	16,816	926	940
123	Tram Rd	North of Eastern Fwy	2017	3,049	2,712	7,796	7,293	2,993	2,813	4,820	4,246	18,658	17,064	1,440	1,215
376	Upper Heidelberg Road	Between Banksia Street And Studley Road	2017	843	1,509	3,043	4,241	1,477	2,031	2,409	2,226	7,772	10,006	614	408
377	Upper Heidelberg Road	Between Banksia Street And Studley Road	2017	1,932	1,951	3,173	4,286	1,137	1,653	2,190	1,449	8,431	9,340	844	397
378	Upper Heidelberg Road	Between Burgundy Street And Waiora Road	2017	1,575	1,788	5,854	6,607	2,541	2,979	4,012	3,929	13,983	15,303	908	741
379	Upper Heidelberg Road	Between Burgundy Street And Waiora Road	2017	2,788	2,881	6,622	6,364	2,153	1,958	4,004	2,627	15,567	13,830	1,039	680
100	Victoria Rd	Near Coldstream West Rd	2017	312	286	1,123	1,222	467	1,412	545	758	2,446	3,678	87	31
101	Victoria Rd	Near Coldstream West Rd	2017	347	1,359	1,101	1,181	384	329	544	676	2,376	3,545	178	61
72	Waiora Rd	Between Southern Rd And Dougharty Rd	2017	1,163	1,359	4,299	3,309	1,823	2,001	2,589	1,744	9,874	8,412	463	384
73	Waiora Rd	Between Southern Rd And Dougharty Rd	2017	2,136	2,000	4,631	3,159	1,604	1,527	2,526	1,114	10,897	7,799	442	362
169	Wantirna Rd	South Of Maroondah Hwy	2017	1,330	1,207	4,385	4,003	1,584	1,305	2,486	2,630	9,785	9,144	266	305

Transport Modelling for North East Link
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Count ID	Road Name	Count Location	Year	AM Count	AM Model	Inter Peak Count	Inter Peak Model	PM Count	PM Model	Evening Off Peak Count	Evening Off Peak Model	Daily Count	Daily Model	Daily CV Count	Daily CV Model
170	Wantirna Rd	South Of Maroondah Hwy	2017	1,014	1,262	3,874	4,008	1,487	1,378	2,591	2,879	8,965	9,527	478	313
380	Warrandyte Road	Between Fitzsimons Lane And Blackburn Road	2017	968	918	2,333	1,126	760	1,051	1,261	617	5,322	3,711	326	206
381	Warrandyte Road	Between Fitzsimons Lane And Blackburn Road	2017	885	1,128	2,343	1,349	935	1,063	1,296	515	5,459	4,055	439	225
70	Waterdale Rd	Between Southern Rd And Dougharty Rd	2017	1,478	1,584	4,886	5,107	1,538	1,798	2,682	3,015	10,584	11,504	671	1,141
71	Waterdale Rd	Between Southern Rd And Dougharty Rd	2017	1,566	1,736	4,640	5,203	1,508	1,664	2,639	3,041	10,353	11,645	972	1,107
92	Wattletree Rd	At Diamond Creek	2017	1,252	1,861	3,716	5,146	1,437	2,116	2,983	3,514	9,388	12,638	811	404
93	Wattletree Rd	At Diamond Creek	2017	1,474	2,042	4,246	5,055	1,667	2,049	3,089	3,388	10,475	12,534	742	414
382	Williamsons Road	Between Doncaster Road And Manningham Road	2017	2,527	3,146	10,467	11,265	4,634	5,368	6,669	6,910	24,297	26,689	1,544	1,407
383	Williamsons Road	Between Doncaster Road And Manningham Road	2017	4,098	5,259	11,559	10,908	3,473	3,604	5,702	5,903	24,832	25,674	1,345	1,666
384	Williamsons Road	Between Foote Street And Warrandyte Road	2017	2,916	2,627	8,802	10,209	3,670	3,545	5,981	8,704	21,370	25,086	1,798	1,263
385	Williamsons Road	Between Foote Street And Warrandyte Road	2017	2,935	3,879	9,193	11,066	2,742	3,206	5,674	8,824	20,543	26,975	1,359	1,540
386	Williamsons Road	Between King Street And Foote Street	2017	1,562	1,136	6,516	5,601	2,139	1,904	3,853	4,604	14,071	13,246	1,648	657
387	Williamsons Road	Between King Street And Foote Street	2017	2,915	2,367	7,069	6,599	1,703	1,436	3,750	4,629	15,437	15,030	2,247	913
388	Williamsons Road	Between Manningham Road And King Street	2017	1,295	984	6,097	5,251	2,594	2,575	3,604	4,148	13,590	12,958	1,343	536
389	Williamsons Road	Between Manningham Road And King Street	2017	2,470	2,658	6,266	6,015	1,425	1,130	3,067	4,039	13,228	13,842	845	803
238	Yan Yean Rd	North of Diamond Creek Rd	2017	2,027	2,134	5,007	4,280	1,348	1,307	3,678	2,209	12,060	9,930		
239	Yan Yean Rd	North of Diamond Creek Rd	2017	1,240	1,143	5,132	4,359	2,985	2,250	4,213	2,753	13,570	10,506	1,177	366
390	Yan Yean Road	Near Hockey Club	2017	1,361	1,143	5,189	4,359	2,868	2,250	3,959	2,753	13,377	10,506	1,029	366
391	Yan Yean Road	Near Hockey Club	2017	1,936	2,144	4,879	4,280	1,307	1,307	3,396	2,209	11,517	9,940	1,407	349
173	Yarra Rd	North of Plymouth Rd	2017	634	460	2,428	2,196	1,543	1,403	2,112	1,711	6,716	5,770	390	175
174	Yarra Rd	North of Plymouth Rd	2017	1,709	1,442	2,828	2,142	961	479	1,813	1,449	7,311	5,511	638	174

Figure C.3 - Rosanna Rd Corridor AM Peak Northbound Travel Time Comparison



Bulleen Rd (at Doncaster Rd) to M80 Ring Road (at Plenty Rd) - Route Number 1012 - 2017 (Northbound)

MD Peak

Travel Time [min]

Distance [km]

Observed average Timing Points Free flow Model

Doncaster Rd, Bulleen Rd, Golden Way, Murrumbidgee Rd, Dora St, Rosemead, Plenty School, Redoubt Rd, Station Rd, Lower Plenty Rd, Greenborough Way, Oakvale Rd, Wallan Rd, Wiggins Rd, Western Highway, M80 Ring Rd

[illegible]

[illegible]



Figure C.9 – Greensborough Bypass to Main Hurstbridge Rd AM Peak Eastbound Travel Time Comparison

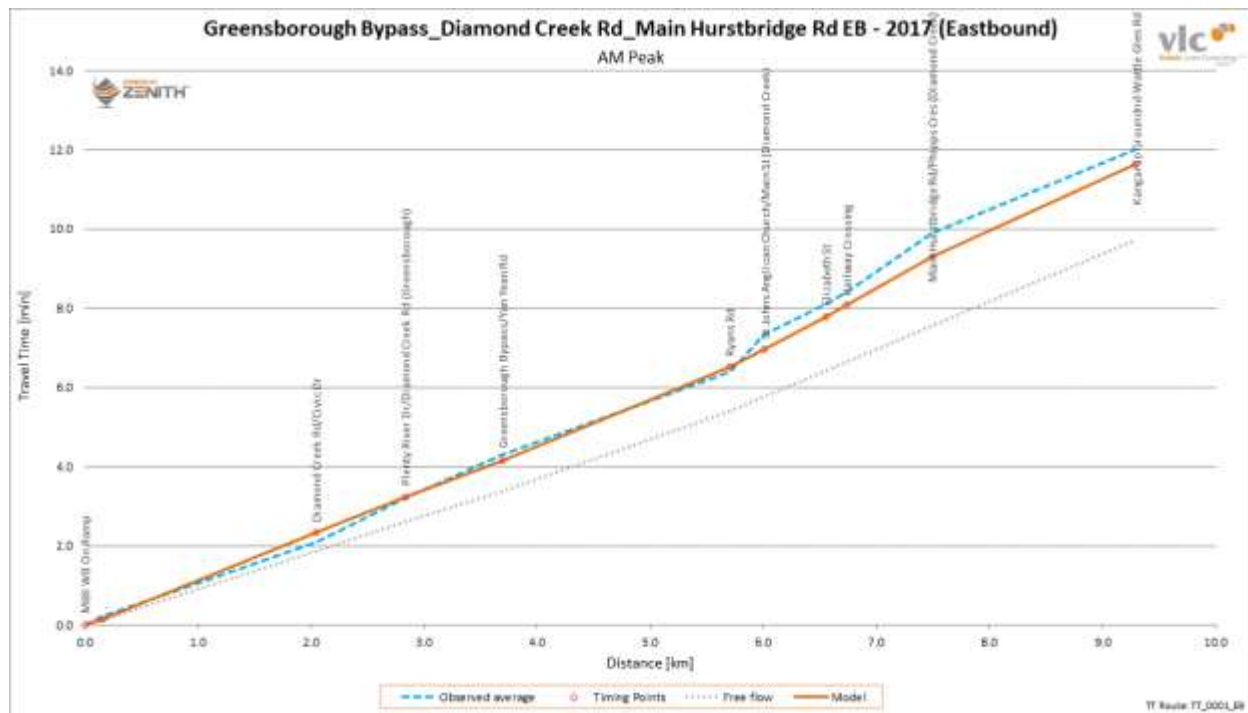


Figure C.10 – Greensborough Bypass to Main Hurstbridge Rd AM Peak Westbound Travel Time Comparison

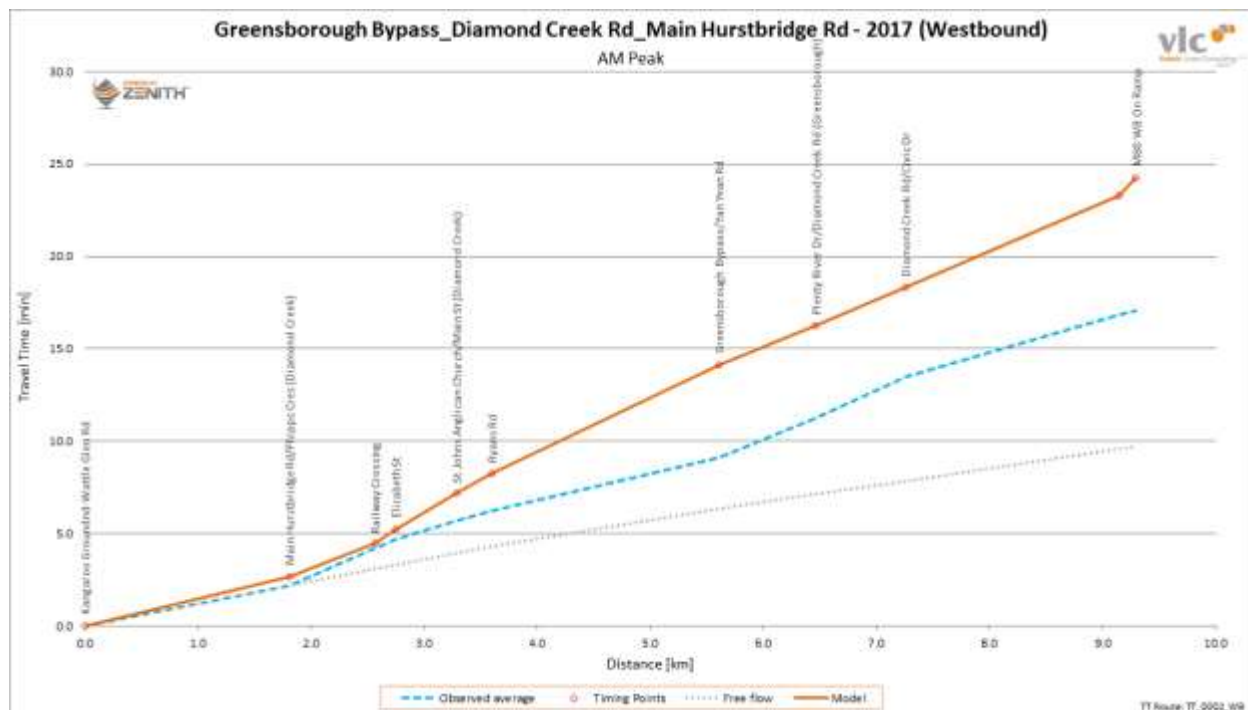
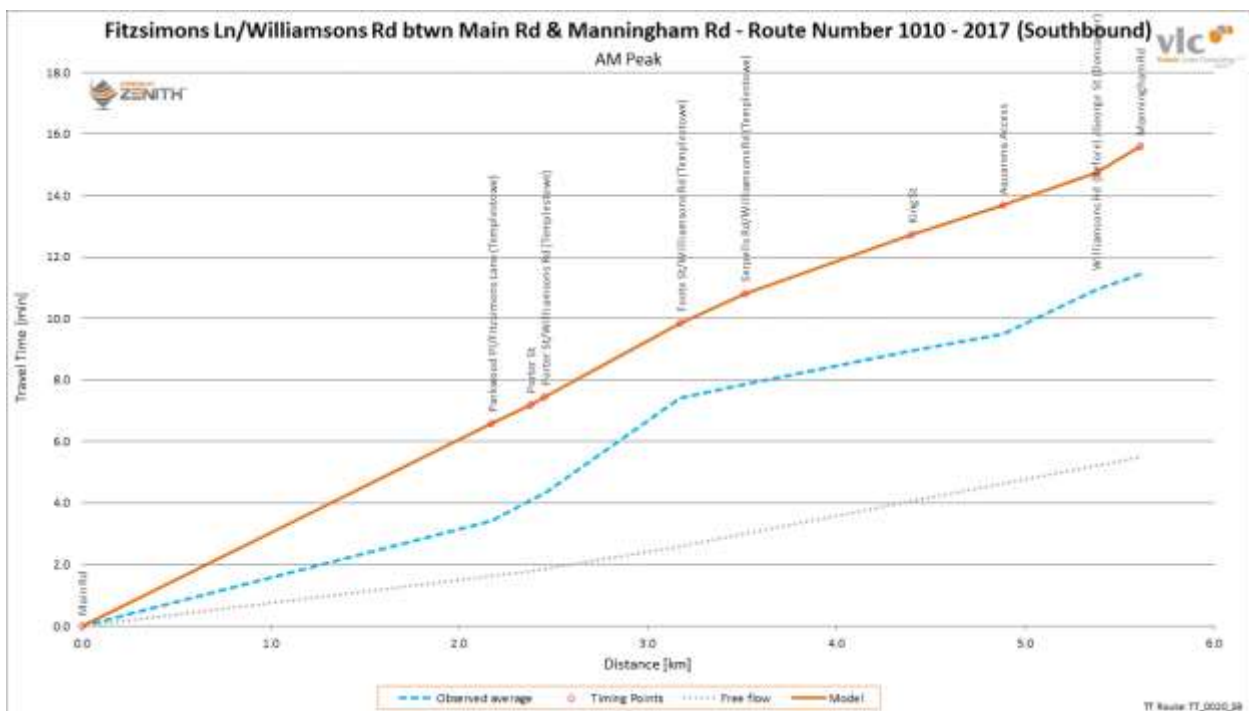




Figure C.11 – Fitzsimons Ln AM Peak Northbound Travel Time Comparison



Figure C.12 – Fitzsimons Ln AM Peak Southbound Travel Time Comparison



Eastern Freeway btwn Springvale Rd & Alexandra Pde - Route Number 1011 - 2017 (Eastbound)

AM Peak

Travel Time (min)

Distance (km)

Observed average Timing Points Free flow Model

Alexandra Pde
Chandler Hwy
Barker Rd
Bullock Rd
Derrimut Rd
Elgar Rd
Traralgon Rd
Mulwinesough Rd
Blackburn Rd
Springvale Rd

TT Route TT_00231

Eastern Freeway btwn Springvale Rd & Alexandra Pde - Route Number 1011 - 2017 (Westbound)

AM Peak

Logos: ZENITH, vlcc

Y-axis: Travel Time (min)

X-axis: Distance (km)

Legend:

- Observed average (dashed blue line)
- Timing Points (pink circles)
- Free flow (dotted grey line)
- Model (solid orange line)

Distance (km)	Observed average (min)	Timing Points (min)	Free flow (min)	Model (min)
0.0	0.0	0.0	0.0	0.0
1.5	1.5	1.5	1.5	1.5
3.0	3.0	3.0	3.0	3.0
3.5	5.0	5.0	4.0	5.0
5.0	6.0	6.0	4.5	6.0
7.0	8.0	8.0	5.0	8.0
9.0	10.0	10.0	5.5	10.0
11.0	11.0	11.0	6.0	11.0
14.5	15.0	15.0	8.0	19.0
17.0	28.0	28.0	10.0	28.0
17.5	30.0	30.0	11.0	30.0

TT Route: TT_2023_V01



Figure C.15 - Diamond Creek Rd Inter Peak Eastbound Travel Time Comparison

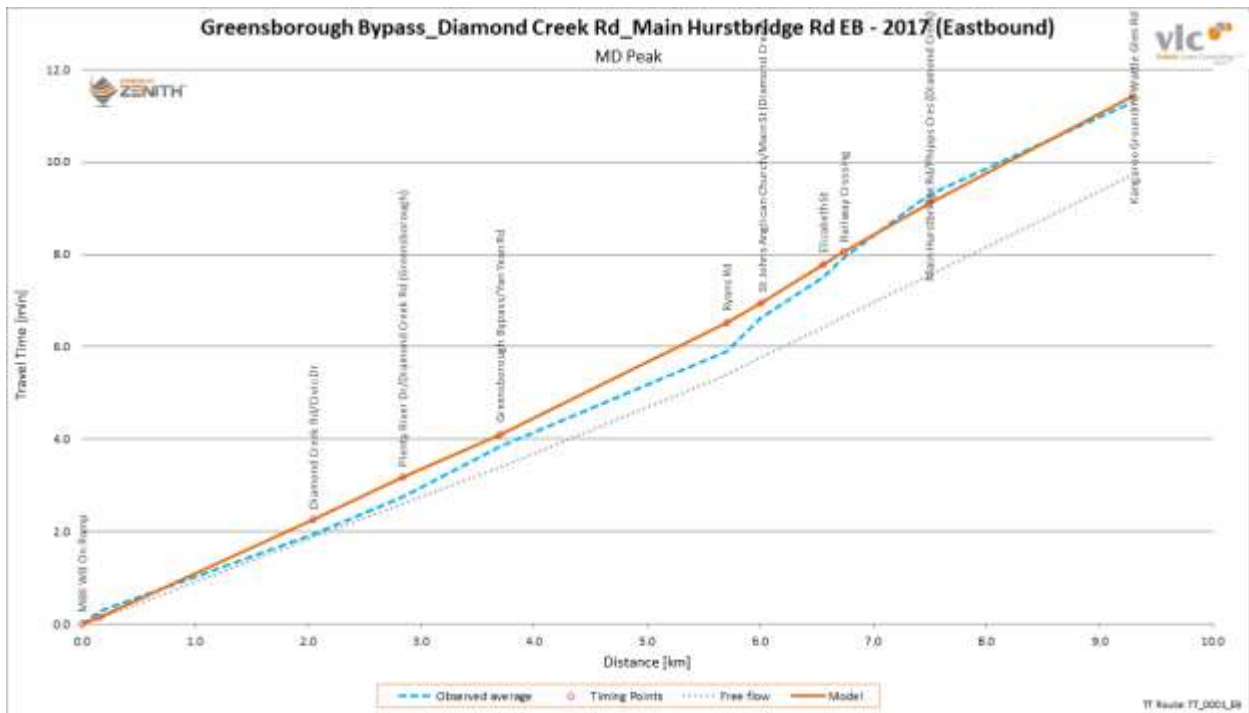


Figure C.16 - Diamond Creek Rd Inter Peak Westbound Travel Time Comparison

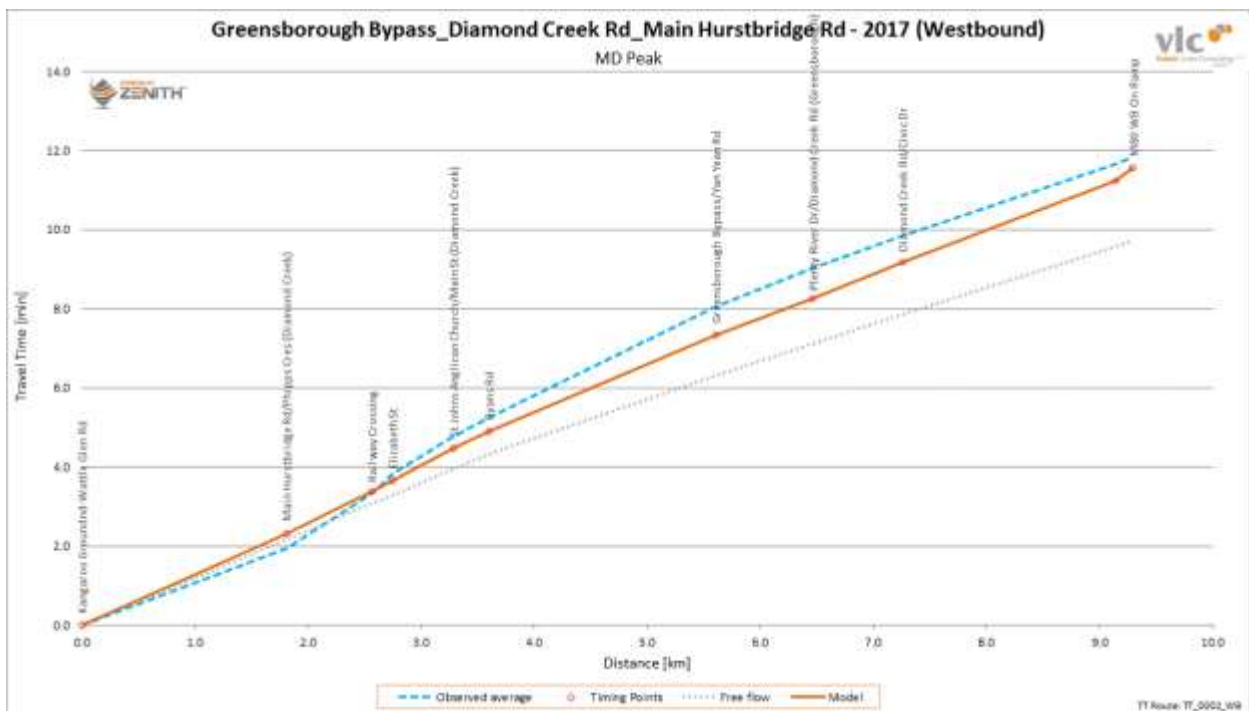




Figure C.17 – Fitzsimons Ln Inter Peak Northbound Travel Time Comparison

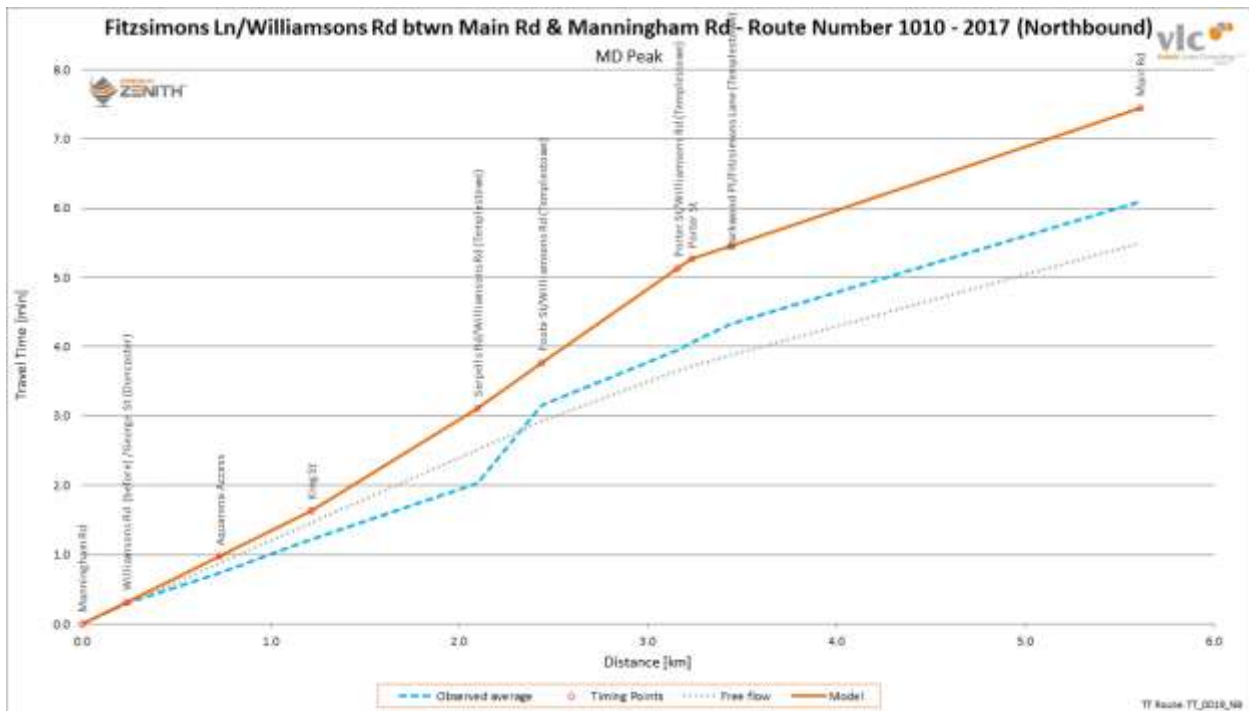


Figure C.18 – Fitzsimons Ln Inter Peak Southbound Travel Time Comparison

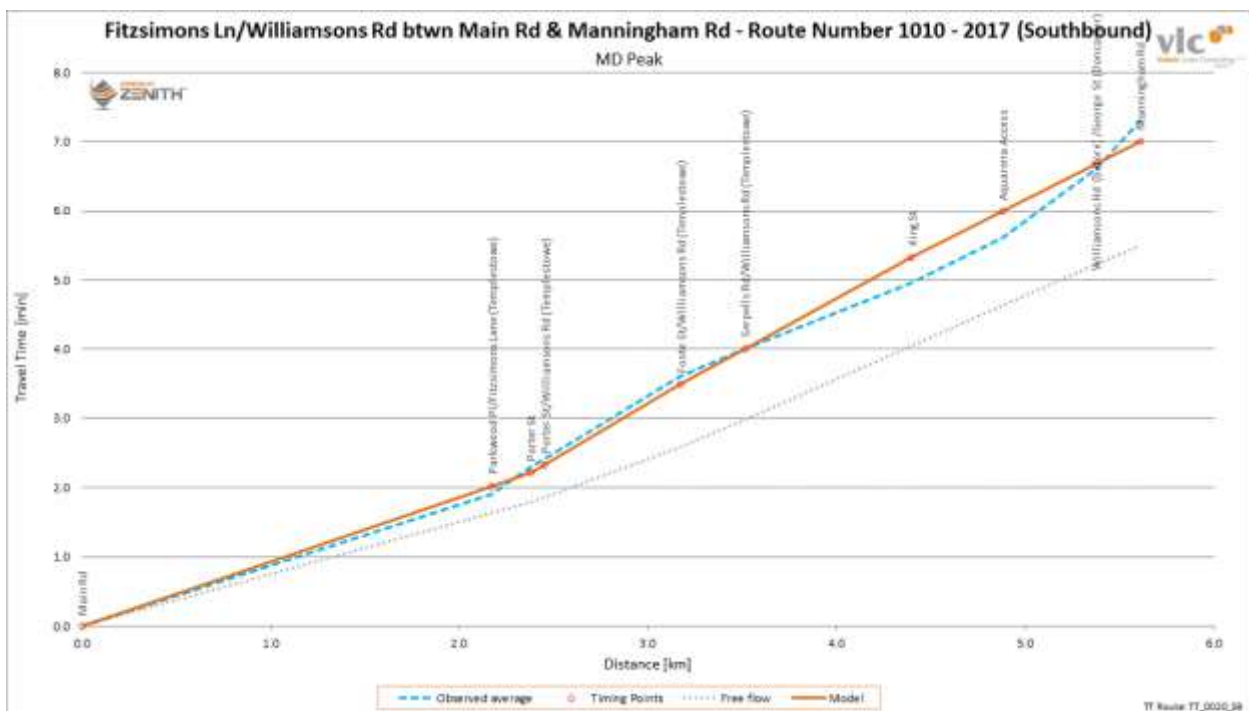




Figure C.19 – Eastern Fwy Inter Peak Eastbound Travel Time Comparison

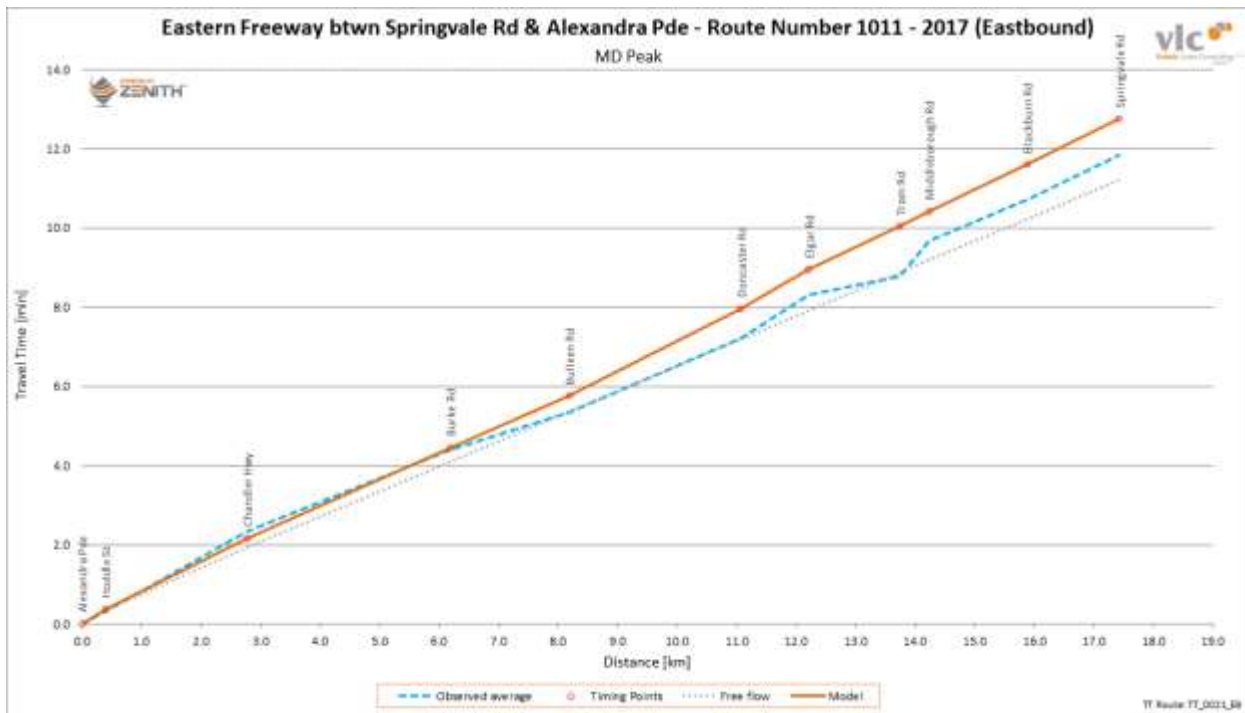


Figure C.20 – Eastern Fwy Inter Peak Westbound Travel Time Comparison

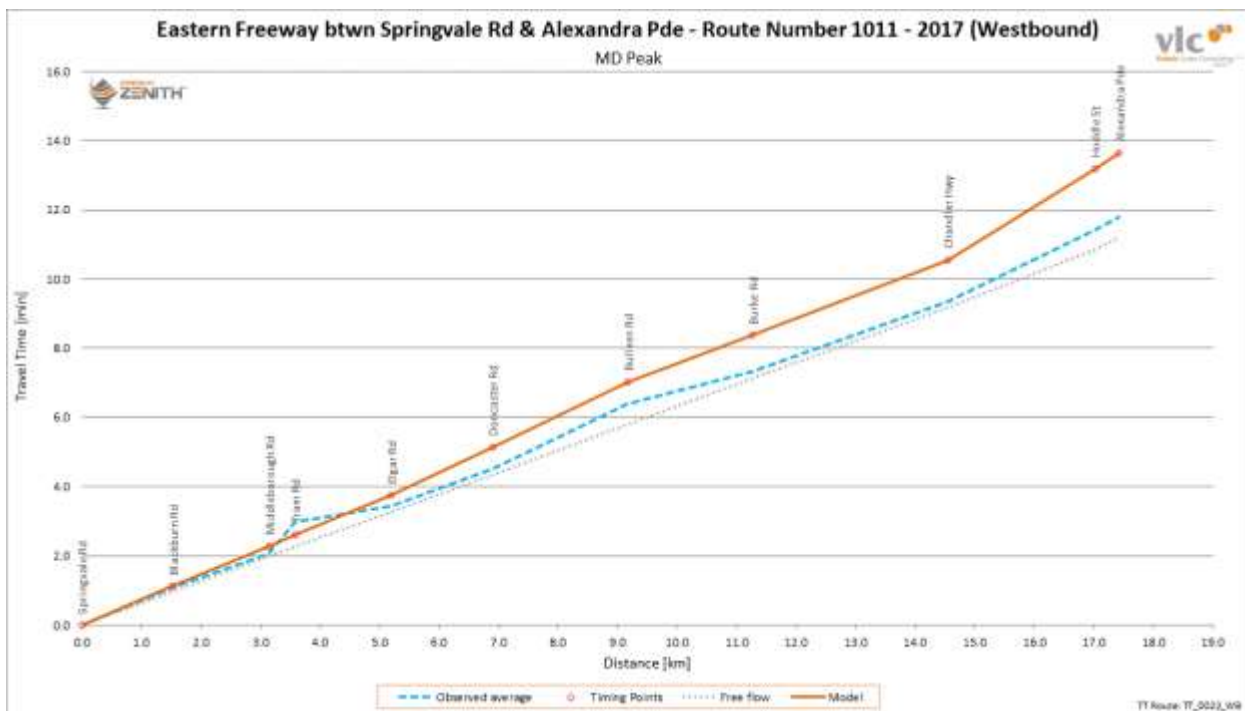




Figure C.21 - Diamond Creek Rd PM Peak Eastbound Travel Time Comparison

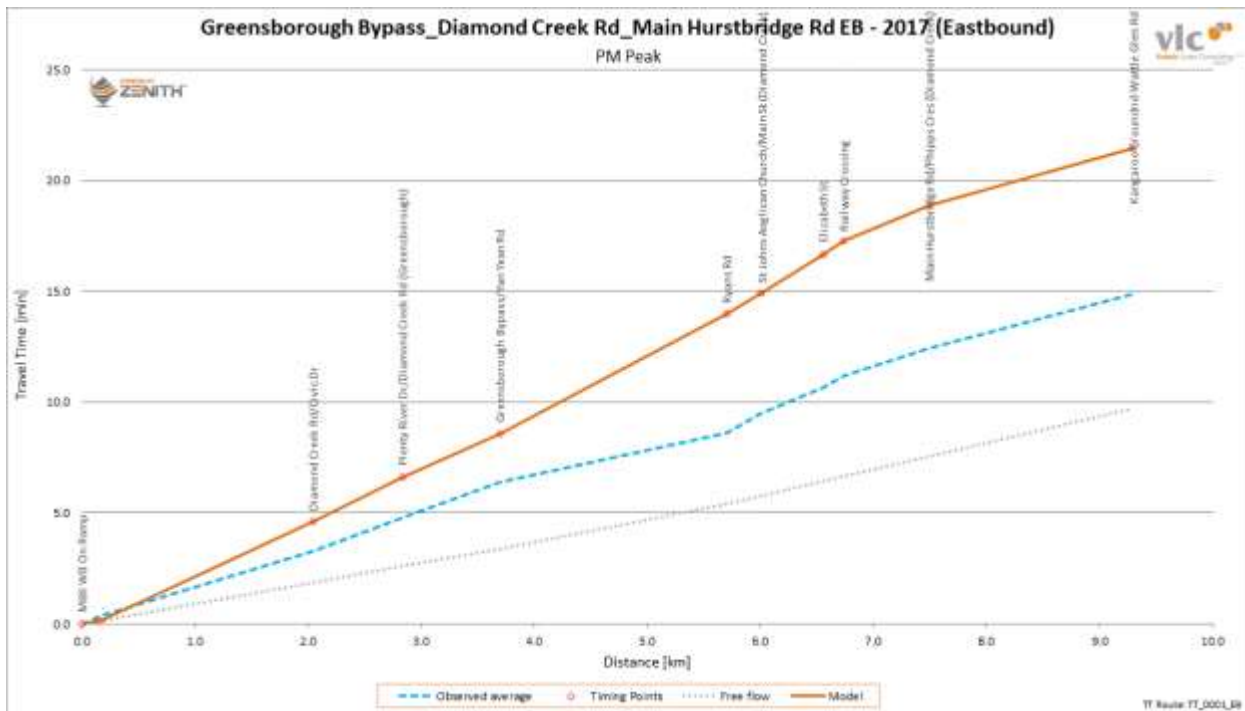


Figure C.22 - Diamond Creek Rd PM Peak Westbound Travel Time Comparison

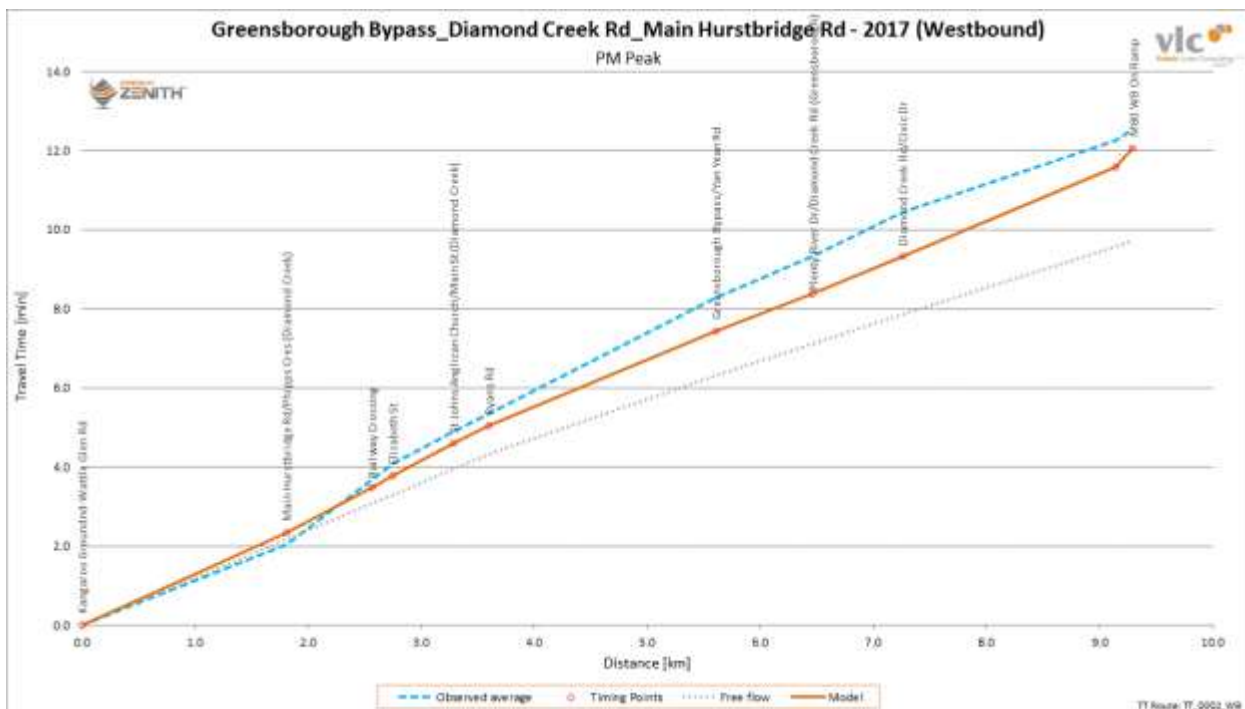




Figure C.23 - Fitzsimons Ln PM Peak Northbound Travel Time Comparison

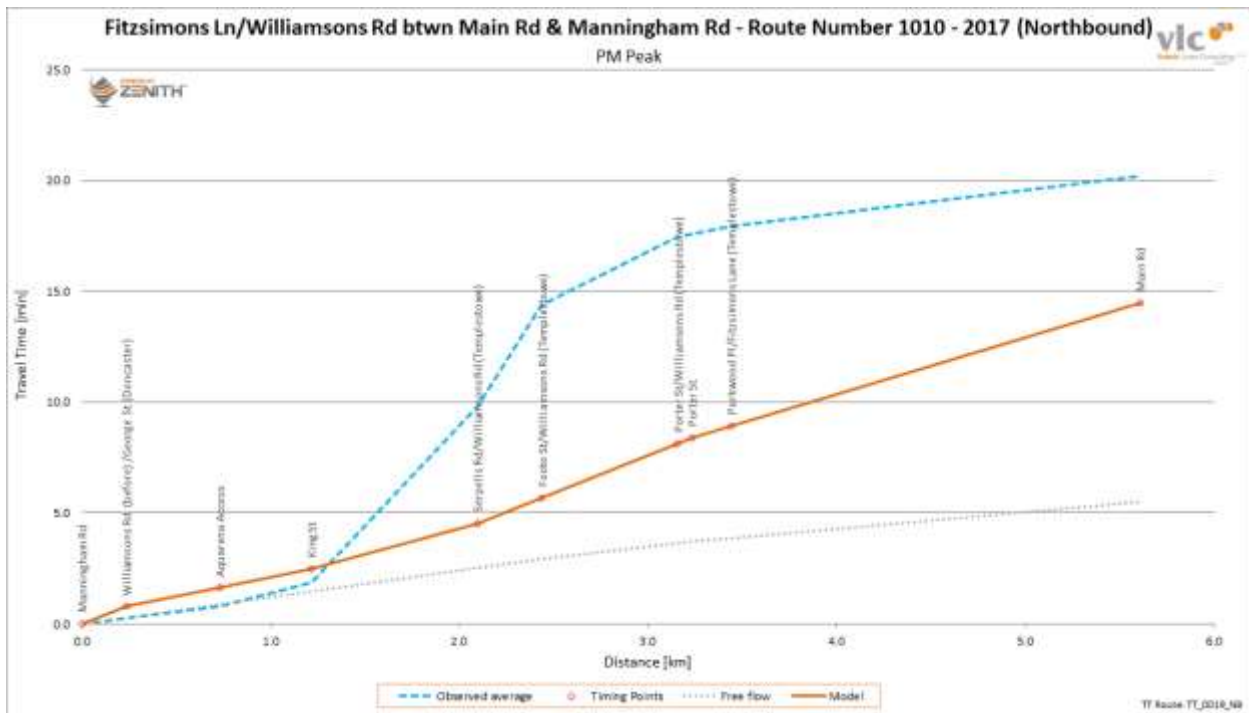
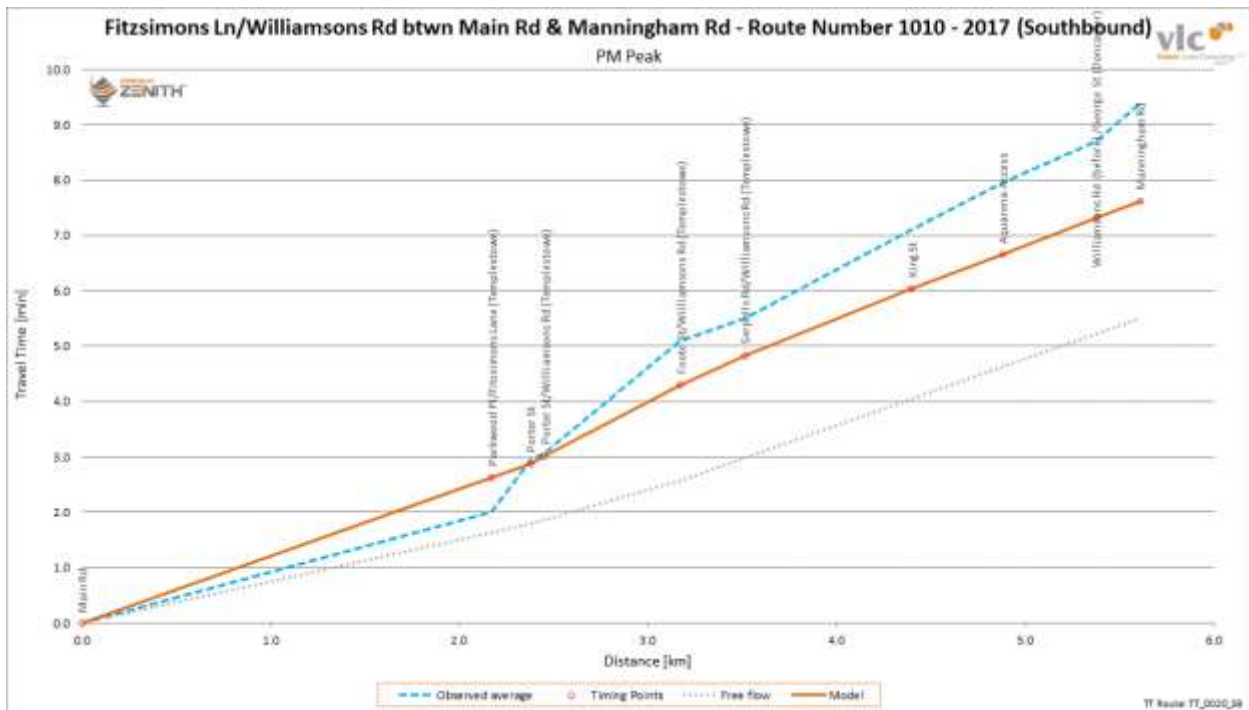


Figure C.24 - Fitzsimons Ln PM Peak Southbound Travel Time Comparison



Eastern Freeway btwn Springvale Rd & Alexandra Pde - Route Number 1011 - 2017 (Eastbound)

PM Peak

Travel Time [min]

Distance [km]

Legend:

- Observed average
- Timing Points
- Free flow
- Model

Travel time model - 2017

Distance [km]	Observed average [min]	Timing Points [min]	Free flow [min]	Model [min]
0.0	0.0	0.0	0.0	0.0
2.8	2.5	5.8	2.0	5.8
6.2	7.0	10.8	4.0	10.8
8.2	10.0	13.0	5.0	13.0
11.0	15.0	17.0	7.0	17.0
12.2	17.0	18.5	8.0	18.5
13.8	18.0	20.5	9.0	20.5
14.5	19.0	21.0	9.5	21.0
16.0	22.0	23.0	10.0	23.0
17.5	23.0	25.5	11.0	25.5

Eastern Freeway btwn Springvale Rd & Alexandra Pde - Route Number 1011 - 2017 (Westbound)
PM Peak

Logos: ZENITH, vlcc

Y-axis: Travel Time [min]
X-axis: Distance [km]

Legend:
 - Observed average (dashed blue line)
 - Timing Points (pink circles)
 - Free flow (dotted blue line)
 - Model (solid orange line)

Distance [km]	Observed average [min]	Timing Points [min]	Free flow [min]	Model [min]
0.0	0.0	0.0	0.0	0.0
1.5	1.0	1.5	1.0	1.5
3.0	2.0	3.0	2.0	3.0
4.5	3.0	4.5	3.0	4.5
6.0	4.0	6.0	4.0	6.0
7.5	5.0	7.5	5.0	7.5
9.0	6.0	9.0	6.0	9.0
10.5	7.0	10.5	7.0	10.5
12.0	8.0	12.0	8.0	12.0
13.5	9.0	13.5	9.0	13.5
15.0	10.0	15.0	10.0	15.0
16.5	11.0	16.5	11.0	16.5
18.0	12.0	18.0	12.0	18.0

TT Route: TT_2023_V01



Appendix D - Assessment of realism

To assess the level of realism of the model, its response to change in input values has been tested using sensitivity tests of the model. This process is described in the National Guidelines for Transport System Management in Australia (Transport and Infrastructure Council (TIC), 2015) and more recently in the DEDJTR “*Strategic Transport Model Elasticity Guidelines*”.

Following the approach recommended in these guidelines, the sensitivity is measured in terms of elasticity.

The elasticity approach for travel characteristics

Elasticity is a useful measure of the sensitivity of a model to changes in key variables, such as pricing and policy inputs. Elasticity relates the percentage change of an output in response to a percentage change in a key input. As an example, a fuel price increase of 10% is expected to have the effect of reducing traffic trips. The ratio of the corresponding percentage reduction in traffic trips against the 10% fuel price increase represents the elasticity. The sign of the elasticity represents a directional change, where a negative elasticity, for example, represents the relationship between an input that increases and results in a reduction in the output. A higher elasticity indicates the model is more sensitive to small changes in pricing and policy inputs, while a lower elasticity indicates the model is less sensitive.

There are some difficulties with the use of elasticity though. While it is a useful measure of the sensitivity of an output to an input, its traditional mathematical form is not constant or even consistent from one study to another nor one community to another. Its definition includes a measure of the separation of two states, and also includes a measure of the initial state. As a result, the elasticity of a peak period value may differ radically from the same measure over a day or weekend and the elasticity on an individual public transport route may differ from a model wide impact.

An alternative measure, which is a ratio of the log differences of the initial and final states, provides a measure that is constant across the full range of the independent variables. We have thus used the alternative method to calculate elasticities. The form of this calculation is:

$$\epsilon = \frac{\log(D_2) - \log(D_1)}{\log(P_2) - \log(P_1)}$$

Where:

ϵ is the elasticity of demand (the dependent variable)

D_2 is the demand for the changed situation

D_1 is the demand in the original situation

P_2 is the value of the independent variable (such as Fuel Price) in the changed situation

P_1 is the value of the independent variable (such as Fuel Price) in the original situation

In 2015 DEDJTR published a series of recommended ranges for direct elasticities, using the alternative measure, as shown in Table 2 of their “*Strategic Transport Model Elasticity Guidelines*”.



DEDJTR Implied Cross-Elasticity Approach

While the DEDJTR guidelines “...*treat cross-elasticities as a by-product, and consider the primary validation should be based in the direct elasticities*”, Table 3 of the elasticity guidelines document provides a series of recommended ranges for implied cross-elasticities to describe the expected range of impact on the alternative modes. The approach recommended by the department to calculate implied cross-elasticities from the direct elasticities involves assuming a 100% diversion rate between cars and public transport, as well as the following mode share assumptions (based on VISTA 07 and 09 data):

- All purpose trips: 10% Public Transport / 90% Car,
- All purpose kilometres travelled: 16% Public Transport / 84% Car,
- Commuting trips to the CBD & Inner: 43% Public Transport / 57% Car.

Cross-elasticities based on the DEDJTR method above have been calculated for each required sensitivity test.

As the Zenith model also includes the active transport modes of walking and cycling, along with private car and public transport, the DEDJTR's assumption of a 100% diversion rate between cars and public transport for the calculation of cross-elasticities will not accurately represent the actual model's response to the changed inputs. Using the example from the previous section, a fuel price increase of 10% is expected to reduce car trips (used for direct elasticity), and also increase trips in public transport and active transport modes (used for cross-elasticity).

Therefore, for reference, VLC has also included the elasticity for the alternative mode (as calculated using the Department's direct elasticity method outlined in Section 0) using modelled output data directly.



Transport model scenarios

The sensitivity of the Zenith transport model was analysed for the 2016 validated model. All results relate to an average weekday during school term (AWDT). Key variables tested included:

Private Vehicle (Car)

1. Fuel prices (increased by 10%)
2. Parking Charges (increased by 10% in CBD and inner areas)
3. Car In-Vehicle Time (increased by 10%)

Public Transport

4. Public Transport fares (increased by 10%)
5. Public Transport Service Levels (increased by 10%)
6. Public Transport In-Vehicle Time (increased by 10%)

Other (no elasticity measure provided)

7. Value of time (Car) (increased by 10%)
8. Value of time (Public Transport) (increased by 10%)
9. Zonal Trip Generation (increased by 10%)
10. Volume Delay Function Free Flow Speed on freeways (decreased by 10%)
11. Toll prices (increased by 20%)



Assessment of Realism Results

Private Vehicle (Car)

Fuel Cost

An increase of 10% in fuel cost was tested in the model. The resultant elasticities for this change are shown in Table D.3. Cross-elasticities for public transport passenger kilometres as calculated by the method suggested by DEDJTR have also been included, while the actual modelled cross-elasticities for this measure (including private cars, public transport, walking and cycling), as calculated using Zenith model outputs, are also shown for reference.

Table D.3: Fuel Price Elasticities of Demand for Car and Public Transport Travel - DEDJTR's elasticity ranges

	Lower Range	Upper Range	Transport Model Elasticity
Daily Car Km Travelled	-0.15	-0.30	-0.33
Daily PT Passenger Kms *	0.79	1.58	1.73 / 0.31
Daily Car Trips	For additional information		-0.06

Note - * DEDJTR implied cross-elasticity / Zenith actual cross-elasticity

The sensitivities show that the transport model responds as expected to a change in fuel prices, although it is about 10% outside the given range in the DEDJTR draft guidance.

However, the modelled results are within the direct measure elasticity ranges provided in “Table A1: National and Overseas Elasticity Range Guidelines” of the DEDJTR draft guidance³, where the range provided is -0.25 to -0.35 for daily car kilometres travelled.

While the implied cross-elasticity of public transport passenger kilometres (using the DEDJTR method) indicate a movement in the correct direction, they are also outside the given range.

The actual modelled cross-elasticity for public transport kilometres (+0.31) is much lower than the value calculated using the DEDJTR method (+1.79), because the model responds to this test by increasing public transport, walking and cycling trips.

Parking Charges

An increase of 10% on parking charges (which are primarily applied to the Melbourne CBD and surrounds) was tested in the model.

The resultant elasticities for car commuting trips (home based work trips) to the CBD and Inner regions (Melbourne, Yarra and Port Phillip LGAs, and Stonnington-Prahran SLA) as well as cross-elasticities for the corresponding public transport trips are shown in Table D.4.

³ Sourced from the UK WebTAG (2014)



Table D.4: Parking Charge Price Elasticities of Demand for Car and Public Transport Travel - DEDJTR's elasticity ranges

	Lower Range	Upper Range	Transport Model Elasticity
Car Commuting Trips to the CBD and Inner	-0.10	-0.40	-0.46
PT Commuting Trips to the CBD and Inner (Based on DEDJTR Method)	0.13	0.53	0.61 / 0.39

Note - * DEDJTR implied cross-elasticity / Zenith actual cross-elasticity

The sensitivities show that the transport model responds correctly to a change in parking charge prices, although the elasticity falls outside the given range.

However, the modelled results are within the internationally recognised direct measure elasticity ranges of -0.10 to -0.60 for car commuting trips which were provided in the DEDJTR draft guidance.

The implied cross-elasticity of public transport commuting trips to the CBD change as expected, although it is also outside the ranges given.

However, the actual modelled cross-elasticity for public transport commuting trips to the CBD and inner suburbs is +0.39 which is within DEDJTR's ranges.

Car In-Vehicle Time

An increase of 10% of the car in-vehicle time was tested in the model, which was applied to the generalised cost calculations. The resultant elasticities for daily car trips as well as cross-elasticities for the corresponding daily public transport trips are shown in Table D.5.

Table D.5: Car In-Vehicle Time Elasticities of Demand for Car and Public Transport Travel - DEDJTR's elasticity ranges

	Lower Range	Upper Range	Transport Model Elasticity
Daily Car Trips	-0.2	-0.8	-0.14
Daily PT Trips *	1.8	7.2	1.3 / 0.33
Daily Car Km Travelled	For additional information		-0.48

Note - * DEDJTR implied cross-elasticity / Zenith actual cross-elasticity

The elasticities shown are outside the published DEDJTR ranges, though they move in the correct direction.

However, the modelled results are within the UK's WebTAG (2014) direct measure elasticity ranges (0.00 to -2.00), and just outside the equivalent Wallis (2004) direct measure elasticity ranges of -0.15 to -0.80.



Public Transport

Fares

An increase of 10% in public transport fares (including metropolitan, regional and airport services) was tested in the model. The calculated elasticities for this increase are shown in Table D.6.

Table D.6: Public Transport Fare Elasticities of Demand for Car and Public Transport Travel - DEDJTR's elasticity ranges

	Lower Range	Upper Range	Transport Model Elasticity
Daily PT Trips	-0.2	-0.6	-0.20
Daily Car Trips *	0.02	0.07	0.02 / 0.02

Note - * DEDJTR implied cross-elasticity / Zenith actual cross-elasticity

The table shows the transport model responds as expected (i.e. public transport trips reduce) in response to an increase in public transport fares, and it is within the given ranges.

Daily car trips are also shown to increase as a result of the fare increase, and the elasticities fall within the guideline's ranges. This is at the lower end of the direct elasticity ranges, which could be due to the coverage of the model, which includes areas poorly serviced by public transport such as regional areas.

Service Level

The impact of public transport service improvements was tested with a 10% increase in service frequencies (or a reduction of 9% in headways), resulting in a 10% increase in service-kilometres for all public transport services, including metropolitan services (trains, trams, buses) and regional services (V/Line rail, coaches and buses).

The overall service elasticity of public transport demand calculated from the model is shown in Table D.7, which appears to be slightly low compared to the published range. Once again, this is at the lower end of the direct elasticity ranges due to the coverage of the model, which includes areas poorly serviced by public transport such as regional areas.

Table D.7: Public Transport Service Level Elasticities of Demand for Car and Public Transport Travel - DEDJTR's elasticity ranges

	Lower Range	Upper Range	Transport Model Elasticity
Daily PT Trips	0.2	0.6	0.16
Daily Car Trips *	-0.02	-0.07	-0.02 / -0.01

Note - * DEDJTR implied cross-elasticity / Zenith actual cross-elasticity

Many of the public transport services in Melbourne operate at low frequencies of one or two services per hour, especially in off peak periods. With frequencies of one or two per hour, the headways reduce by only three to six minutes, from 30 or 60-minute headways. At the other extreme, a service with a frequency of six services per hour, the headways reduce by only one minute, from 10-minute headways. These changes are not expected to be big enough to have a significant impact on patronage.



Consequently, the model's elasticity of demand for public transport for service level changes is at the lower end of the range.

The cross-elasticity for daily car trips falls just within the lower end of the guideline's published ranges.

Public Transport In-Vehicle Time

An increase of 10% on the public transport in-vehicle time was tested in the model, which was applied uniformly across all public transport modes (including metropolitan trains, trams, buses, and airport buses, as well as regional trains, coaches and buses). The resultant elasticities for daily public transport trips as well as cross-elasticities for the corresponding daily car trips are shown in Table D.8.

Table D.8: Public Transport In-Vehicle Time Elasticities of Demand for Car and Public Transport Travel - DEDJTR's elasticity ranges

	Lower Range	Upper Range	Transport Model Elasticity
Daily PT Trips	-0.1	-0.5	-0.48
Daily Car Trips *	0.01	0.06	0.05 / 0.04
Daily PT Passenger Km	For additional information		-0.97

Note - * DEDJTR implied cross-elasticity / Zenith actual cross-elasticity

Table D.8 suggests that the transport model responds sensibly to changes in public transport in-vehicle time, with the resultant elasticities for trips falling within the DEDJTR draft published ranges. In addition, the implied cross-elasticity of car trips shows a movement in the correct direction and expected scale.



Other

Several further measures were tested although there are no formal targets for this realism test in the DEDJTR's draft guidelines. These are discussed below.

Value of Time (Car)

An increase of 10% of the value of time for car was tested in the model, which was applied to both the path-building and the generalised cost calculations. Table D.9 presents the car mode share (as a proportion of car, public transport, walking and cycling) in both the base case and +10% value of time for cars, indicating a shift away from car usage when its value of time is increased.

Table D.9: Value of Time Mode Share Impacts – Car

	Assessment Measure	Transport Model Result
Car mode share	Shift Away from cars	Base Case: 77.55%, Test Case: 76.78%

Value of Time (Public Transport)

An increase of 10% of the value of time for public transport was tested in the model, which was also applied to both the path-building and the generalised cost calculations. Table D.10 presents the public transport mode share in both the base and test cases.

Table D.10: Value of Time Mode Share Impacts – Public Transport

	Assessment Measure	Transport Model Result
PT mode share	Shift Away from PT	Base Case: 9.07%, Test Case: 7.65%

Table D.10 indicates that a shift away from public transport is observed when its value of time is increased.

Zonal Trip Generation

An increase of 10% to the population, employment and enrolment assumptions was tested, with a range of resultant global modelled statistics shown in Table D.11.

Table D.11: Zonal Trip Generation Global Transport Impacts

	Lower Range	Upper Range	Transport Model Result
Daily Car Trips	Increased Car Trips		964,000 (9%)
Daily PT Trips	Increase PT Trips		186,000 (11%)
Length of Congested Road	Increase congestion (V/C > 1)		1,130,000 (22%)
Metropolitan rail service km crowded	Increased crowding (Load > 1000 passengers per train)		1,450,000 (45%)



Car trips are shown to increase by approximately 9%, while public transport trips increase by approximately 11%. The number of car kilometres travelled in congested conditions (where the Volume / Capacity Ratio is greater than 1.0) and metropolitan rail kilometres travelled in crowded conditions (i.e. exceeding 1,000 passengers per train) are also shown to increase substantially.

Volume Delay Function (Speed-flow curves on Freeways)

The speed-flow curves on freeway links were reduced by 10% across the model to gauge the model's sensitivity to changes in the volume delay function. This was applied to the entire speed flow curve.

The DEDJTR guidelines recommend that this test be performed for a traffic assignment only. As there are no specific metrics required for reporting, VLC has prepared the change in total daily vehicle kilometres travelled on both freeway and non-freeway links in Table D.12. This indicates a diversion away from links with reduced free flow speeds on freeways.

Table D.12: Freeway Volume Delay Function Transport Impacts – Traffic Assignment Only

	Assessment Measure	Transport Model Result
Daily Total Vehicle Km Travelled on Freeway Links	Shift away from Freeway Links	-2,899,000 (-7%)
Daily Total Vehicle Km Travelled on Non-Freeway Links	Shift to Non-Freeway Links	2,274,000 (2%)

Toll Prices

Table D.13 shows the toll demand elasticity calculated when comparing the base demand and the demand when tolls are increased by 20%. These results show that the modelled demand on CityLink is more sensitive to toll prices than that on EastLink. It also shows that heavy commercial vehicles are effectively inelastic to changes in toll prices than other vehicles.

Table D.13: Toll demand elasticities

	CityLink			EastLink		
	Base Demand	Demand with 20% Increased Tolls	Calculated Elasticity	Base Demand	Demand with 20% Increased Tolls	Calculated Elasticity
Total	754,184	730,997	-0.2	1,193,934	1,168,602	-0.1
HCV	99,311	99,854	0.0	100,376	99,652	0.0



Summary of Elasticities by time-period

The following tables present the direct and cross-elasticities by time of day.

Table D.14: Fuel Price Elasticities of Demand for Car and Public Transport Travel by Time of Day

Fuel Price (+10%) Elasticity	Car Km Travelled	PT Passenger Kms*	Car Trips
AM Peak (7am - 9am)	-0.34	1.79 / 0.19	-0.05
Inter Peak (9am - 4pm)	-0.34	1.79 / 0.31	-0.06
PM Peak (4pm - 6pm)	-0.33	1.73 / 0.17	-0.05
Evening Off Peak (6pm - 7am)	-0.32	1.68 / 0.38	-0.06
Daily (24hr)	-0.33	1.73 / 0.26	-0.06

Note - * DEDJTR implied cross-elasticity / Zenith actual cross-elasticity

Table D.15: Parking Charge Price Elasticities of Demand for Car and Public Transport Travel by Time of Day

Parking Charges (+10%) Elasticity	Car Commuting Trips to the CBD and Inner	PT Commuting Trips to the CBD and Inner*
AM Peak (7am - 9am)	-0.52	0.69 / 0.31
Inter Peak (9am - 4pm)	-0.49	0.64 / 0.53
PM Peak (4pm - 6pm)	-0.36	0.47 / 0.29
Evening Off Peak (6pm - 7am)	-0.41	0.54 / 0.56
Daily (24hr)	-0.46	0.61 / 0.39

Note - * DEDJTR implied cross-elasticity / Zenith actual cross-elasticity

Table D.16: Car In-Vehicle Time Elasticities of Demand for Car and Public Transport Travel by Time of Day

Car In-Vehicle Time (+10%) Elasticity	Car Trips	PT Trips *	Car Km Travelled
AM Peak (7am - 9am)	-0.14	1.28 / 0.33	-0.50
Inter Peak (9am - 4pm)	-0.14	1.3 / 0.29	-0.49
PM Peak (4pm - 6pm)	-0.14	1.25 / 0.31	-0.50
Evening Off Peak (6pm - 7am)	-0.15	1.35 / 0.41	-0.45
Daily (24hr)	-0.14	1.3 / 0.33	-0.48

Note - * DEDJTR implied cross-elasticity / Zenith actual cross-elasticity



Table D.17: Public Transport Fare Elasticities of Demand for Car and Public Transport Travel by Time of Day

PT Fares (+10%) Elasticity	PT Trips	Car Trips *	Car Trips (Based on Zenith Data)
AM Peak (7am - 9am)	-0.19	0.02 / 0.02	0.02
Inter Peak (9am - 4pm)	-0.19	0.02 / 0.01	0.01
PM Peak (4pm - 6pm)	-0.19	0.02 / 0.02	0.02
Evening Off Peak (6pm - 7am)	-0.21	0.02 / 0.02	0.02
Daily (24hr)	-0.20	0.02 / 0.02	0.02

Note - * DEDJTR implied cross-elasticity / Zenith actual cross-elasticity

Table D.18: Public Transport Service Level Elasticities of Demand for Car and Public Transport Travel by Time of Day

PT Service Levels (+10%) Elasticity	PT Trips	Car Trips *	Car Trips (Based on Zenith Data)
AM Peak (7am - 9am)	0.15	-0.02 / -0.02	-0.02
Inter Peak (9am - 4pm)	0.16	-0.02 / -0.01	-0.01
PM Peak (4pm - 6pm)	0.13	-0.01 / -0.02	-0.02
Evening Off Peak (6pm - 7am)	0.18	-0.02 / -0.02	-0.02
Daily (24hr)	0.16	-0.02 / -0.01	-0.01

Note - * DEDJTR implied cross-elasticity / Zenith actual cross-elasticity

Table D.19: Public Transport In-Vehicle Time Elasticities of Demand for Car and Public Transport Travel by Time of Day

PT In-Vehicle Time (+10%) Elasticity	PT Trips	Car Trips *	PT Passenger Km
AM Peak (7am - 9am)	-0.48	0.05 / 0.07	-0.93
Inter Peak (9am - 4pm)	-0.42	0.05 / 0.03	-0.98
PM Peak (4pm - 6pm)	-0.50	0.06 / 0.07	-0.93
Evening Off Peak (6pm - 7am)	-0.53	0.06 / 0.04	-1.06
Daily (24hr)	-0.48	0.05 / 0.04	-0.97

Note - * DEDJTR implied cross-elasticity / Zenith actual cross-elasticity



Comments on Draft DEDJTR guidance

VLC was invited by DEDJTR to provide comments on their draft strategic transport model elasticity guidelines, which are listed below:

VLC Question 1

DEDJTR cross-elasticity calculation assumes 100% diversion rate between car and public transport trips, and it makes no allowance for active transport modes (walking and cycling). Also, cross-elasticity is less transferable than direct elasticities – *Recommendation: cross-elasticity should be output for added information only, therefore remove upper and lower bounds for cross-elasticity criteria*

DEDJTR Response: As the guidelines state, the primary validation of elasticities should be based on direct elasticities. Reporting of cross-elasticities is for added information only. The cross-elasticity ranges provided are noted as indicative and the assumptions behind their derivation is stated. We will add commentary to reflect that models including non-motorised mode choice could be expected, *ceteris paribus*, to have lower cross-elasticities.

VLC Question 2

Direct elasticity upper and lower bounds for Melbourne do not always reflect the ranges provided in Table A1 of the Draft guidance (referencing Wallis (2004), NGTSM (2006) and WebTAG (2014)) – *Recommendation: provide evidence for variation from Table A1 in the development of elasticity ranges for Melbourne*

DEDJTR Response: In developing the guideline ranges, in addition to referencing the national and overseas guidelines in Table A1, a literature review has also been undertaken. It is intended that evidence for variation to the ranges in Table A1 will be published in a second document.

VLC Question 3

DEDJTR guidance should address all strategic transport models, now and into the future, that is, it should be appropriate for all strategic transport models, not just VITM. – *Recommendation: remove specific reference to VITM, especially in table notes*

DEDJTR Response: The guidelines are intended to apply to all strategic models. Reference to VITM is provided for example only - this will be made more clear.

VLC Question 4

It is not clear in the tables whether Cars refers to Cars or the number of persons in Cars. E.g. car trips or person car trips – *Recommendation: clarify whether Car trips and Car kilometres travelled are person Car trips and person Car kilometres or not*

DEDJTR Response: Reference to 'cars' relates to car trips, not person car trips - this will be clarified.

VLC Question 5 & 6

The 'volume delay function' realism test is to be run as a traffic assignment only. However this does not evaluate the impact of mode choice, where public transport is a viable option. – *Recommendation: change the volume delay function' realism test to be a full model run*



The 'volume delay function' realism test does not provide a specific metric to measure the impact. – *Recommendation: use VKTs*

DEDJTR Response: The 'volume delay function' realism test is intended to test traffic assignment in isolation, in line with the 2015 NGTSM guidelines validation approach. How to report the impact will be specified in more detail.

VLC Question 7

No specific definition has been provided for "Service km crowded by PT mode" for the Zonal Trip Generation test, e.g. $V/C > 1$ where C = seating capacity, load standard, crush capacity or an alternative. – *Recommendation: define measure for a crowded PT situation, possibly seating capacity*

DEDJTR Response: A specific measure of PT crowding will be defined.

VLC Question 8

There is no mention of the Transport Modelling steering committee. – *Recommendation: In the preamble, it would be worth confirming whether or not this draft guidance has been approved for use by the Transport Modelling Steering Committee.*

DEDJTR Response: Guidelines will be discussed at the next transport modelling steering committee meeting. Outcomes will be reflected in guideline documentation.

VLC Question 9

Overall there is a need for DEDJTR to collect and collate local advice on elasticity ranges for Melbourne and Victoria. There is probably a role for Universities in Melbourne to play (e.g. Professor Graham Currie at Monash University has done a lot of work on public transport direct and cross-elasticities specifically for Melbourne).

DEDJTR Response: Agree this is a desirable long term initiative.



Attachment C – Model development assumptions



Prepared For



Transport Modelling for North East Link

Base Case Model Development – Business Case

December 2017



Transport Modelling for North East Link

Base Case Model Development – Business Case

Project 16-081

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1. Introduction

The primary focus of this report is the documentation of the 2026, 2036 and 2051 future base case transport modelling assumptions for the North East Link project.

1.1 Report structure

The balance of this report is structured as follows:

Section 2: A background on the Zenith Transport Model and the transport modelling process

Section 3: A summary of the future year demographic, land use and network assumptions

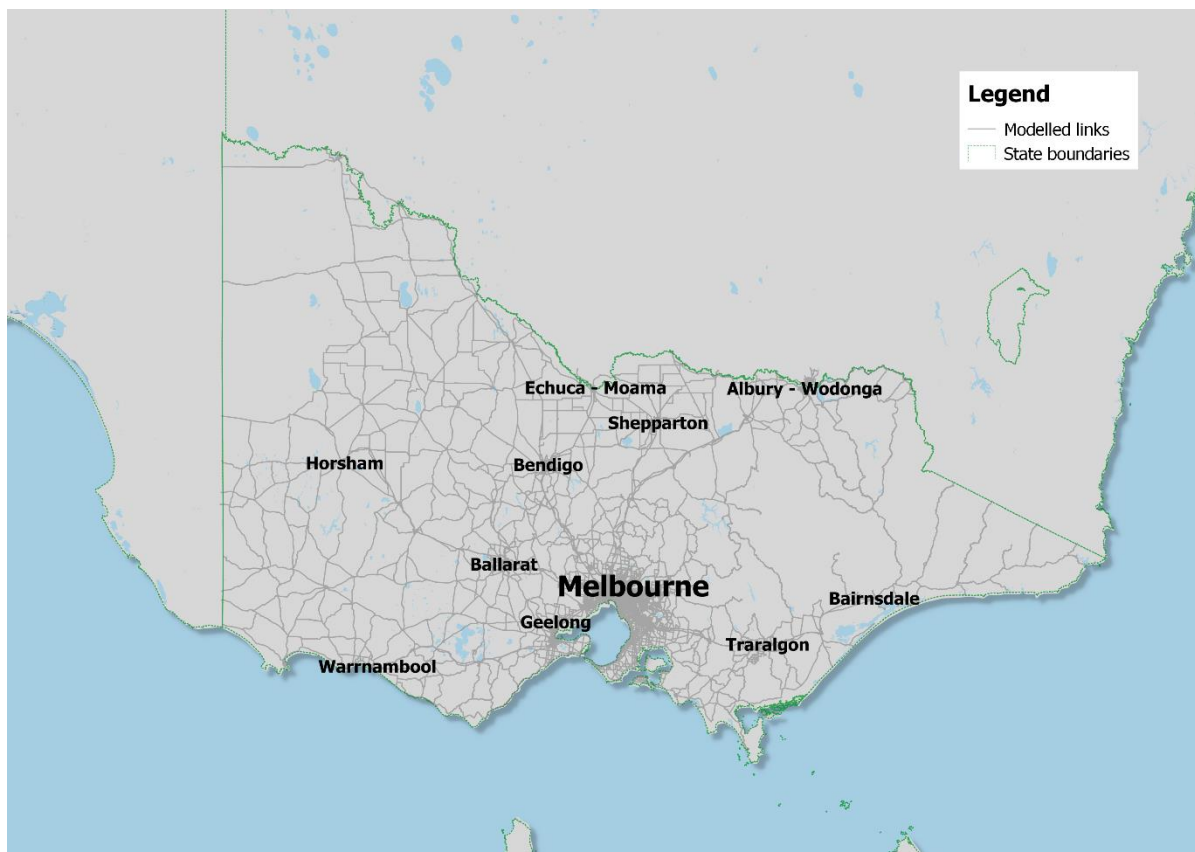


2. The Zenith transport model

2.1 Geographical coverage of the Zenith model

The Zenith model covers the whole of Victoria, as shown in Figure 2.1.

Figure 2.1 - The Zenith Model Coverage





2.2 The travel zone system

2.2.1 Standard travel zone system

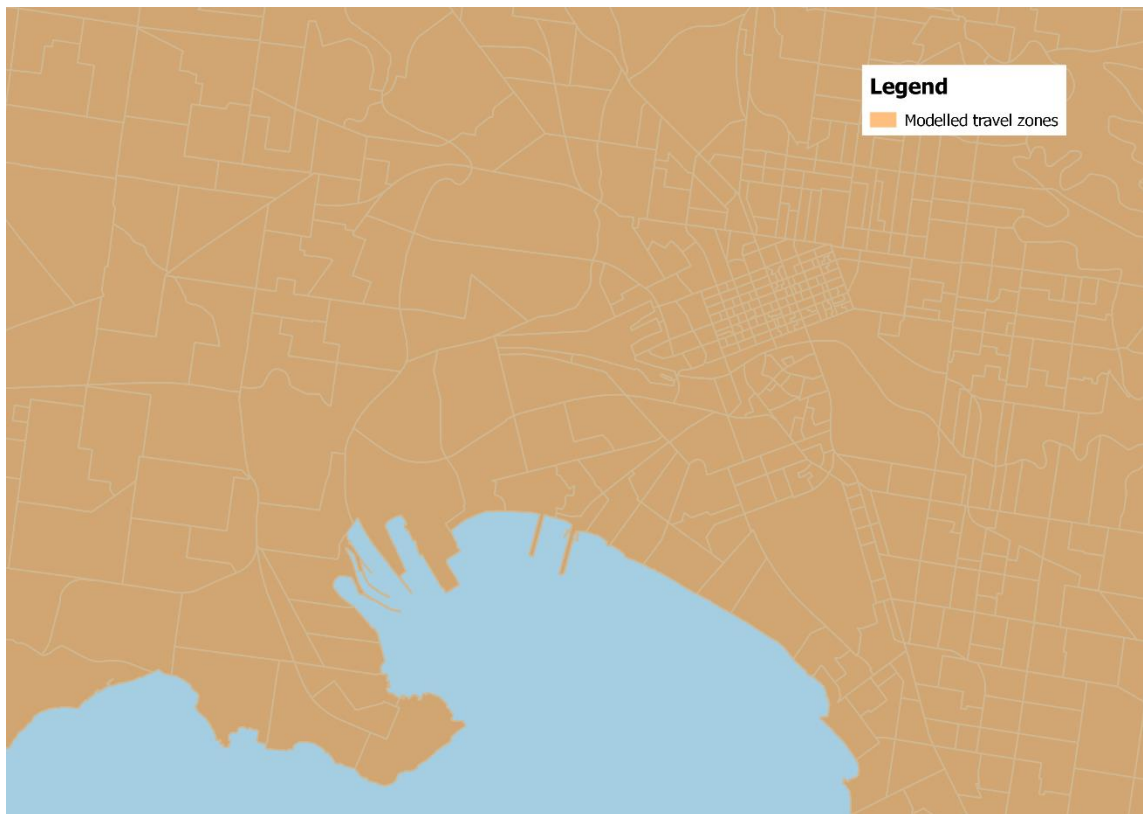
The model utilises a travel zone system which was originally developed specifically for large infrastructure projects in Victoria. It is based on an aggregation of the Zenith Small Area Travel Zone System. This results in 3,477 zones across the entire modelled area, as seen in Figure 2.2. The level of zone disaggregation in the MSD and CBD can be seen in Figure 2.3.

Figure 2.2 - The Standard Zenith Travel Zone System – Model Wide





Figure 2.3 - The Standard Zenith Travel Zone System – MSD



The demographic, land use and enrolment data were supplied at the MITM 3,098 (Melbourne-wide only) travel zone system. These were then converted into the Zenith 3,477 zone system, which has a larger spatial coverage (including areas of regional Victoria).

As the geographic coverage is different, those areas without data provided, including regional cities (such as Geelong, Ballarat and Bendigo) were derived from Victoria in Future (VIF) 2015 forecasts at LGA and SA4 levels.



2.3 Model calibration

The Zenith model was recalibrated in 2014 using model parameters generated from the latest available Victorian Integrated Survey of Travel and Activity (VISTA07 and VISTA09 - the combined database is referred to as VISTA in this report), and validated to 2011 traffic estimates and 2011 public transport patronage estimates.

Details of the VISTA calibration process is described and reported on in the Zenith model Framework working papers and Zenith Victorian working papers which were produced as part of the Zenith Model Licensing Agreement, as listed below.

The recalibration reports are available on the Veitch Lister Consulting website at:
<http://www.veitchlister.com.au/zenith/documentation/victoria>

Zenith Framework Working Papers

- Zenith Framework Working Paper A: Model Design and Architecture
- Zenith Framework Working Paper B: Household Segmentation
- Zenith Framework Working Paper C: Trip Productions
- Zenith Framework Working Paper D: Travel Market Segmentation
- Zenith Framework Working Paper E: Destination Choice
- Zenith Framework Working Paper F: Period Allocation
- Zenith Framework Working Paper G: Mode Choice
- Zenith Framework Working Paper H: Static Traffic Assignment
- Zenith Framework Working Paper I: Static Transit Assignment

Zenith Victorian Working Papers

- Working Paper 2 – Review of VISTA
- Working Paper 3 – Household Segmentation Model
- Working Paper 4a – Home Based Trip Production Model
- Working Paper 4b – Non Home Based Trip Productions
- Working Paper 5 – Travel Market Segmentation Model
- Working Paper 6 – Destination Choice Model
- Working Paper 7 – Period Allocation Model
- Working Paper 8 – Mode Choice Model
- Working Paper 9 – Model Validation



3. Future year assumptions

This section identifies the transport model assumptions used in the future base case scenarios.

The forecast year 2036 was determined to be the core evaluation year for the detailed appraisal phase of the NEL project options assessment, as it coincides with State Government reference case forecasts. 2026 and 2051 forecast years were additionally developed to assist the technical and business case advisors in analysing expected traffic growth, and long-term project functionality.

The TfV and PTV reference cases were used for the majority of the future base case assumptions. These are listed in detail in the following documents:

1. TfV Reference Case v1.09, Interim Road Networks (170710) & VIF2015 Land Use, by TfV, received 12 July 2017
2. 20150417 - Copy of (DOC-15-101558) -- MM Demand Forecast Spec Ver A1, 17 April 2015, PTV

The TfV Transport Modelling Reference Cases which underpinned the modelling assumptions are contained in Appendix A – TfV transport modelling reference case assumptions. However, in some cases these assumptions were modified by the project team and the reasons for these changes are described in the following sections.

3.1 Demographics

3.1.1 Demographic information used

TfV provided demographic, land use and enrolment forecasts as part of its v1.09 reference case, based on Victoria In Future 2015 forecasts. These were provided at the MITM travel zone level, representing 3,908 travel zones in the MSD. VLC then converted this information to its standard travel zone system, which was outlined in Section 2.2.1.

The population and employment assumptions for each Local Government Area are detailed in Table B.1 and Table B.2 of Appendix B – Demographic and land use assumptions. The TfV reference numbers for each dataset are listed in Table 3-1 below.

Table 3-1 - Received Reference Case v1.09 Demographic and Land Use Data, Representing VIF2015

Input Data Files	File Name	Date Received	Details / WorkSheet
Population & Employment	Demographic_w_ICSplit_2026_Z3098.dbf, Demographic_w_ICSplit_2036_Z3098.dbf, Demographic_w_ICSplit_2051_Z3098.dbf	12/07/2017	VIF2015



3.1.2 Adjustments to the demographic information used

The majority of demographic and land use projection variables supplied were directly translated into the model. However, a small number of adjustments to the data provided were essential in order to be fully concordant with the variable definitions required and larger model zone system utilised. These are discussed in the following sections.

Total Cars

As car ownership is required for each travel zone, the decision was made to take the car ownership levels from the Australian Bureau of Statistics (ABS) Census of Population and Housing. This was then grown to forecast levels using forecasted driving age population figures, thus maintaining the number of cars per driving population within each zone.

This enables the use of varying car ownership levels that exist due to geographic and transportation differences and to apply it to the new demographic data to determine the average number of cars per household for each travel zone.

Enrolments

Tertiary enrolment data provided by TfV (which has historically been produced by SGS Economics & Planning) has not been directly concordant for use in the Zenith model due to a difference between definitions of tertiary enrolments.

It is understood that the SGS tertiary enrolments include students with at least one hour per week over the year. For example, if someone had completed a one week training course they would be included as a single tertiary enrolment. Over a year, if 30 people had completed 30 consecutive one week training courses, they would equate to 30 tertiary enrolments. At any time, only one person would be travelling to the training course per day, so (for transport modelling purposes) a total of 30 tertiary enrolments would not reflect the number of students utilising the tertiary institution on a typical weekday, which is what the model results represent.

For the base year, suitable figures were obtained from 2016 Australian Curriculum, Assessment and Reporting Authority (ACARA) tertiary enrolments. The population growth rates for the 18-64 aged dependents cohort (from VIF2015) to each forecast year was used to estimate the growth in tertiary enrolments. In terms of primary and secondary school enrolments, VLC also used 2016 ACARA enrolments, and applied population growth rates from the 0-17 aged dependents from VIF2015. This dataset includes enrolments in government and non-government primary and secondary schools, and their respective addresses.

Employment blue / white collar categories by individual industry

The Zenith model requires the employment categories to be split into blue and white collar professionals by individual industry and the occupation that individual has within that industry. For example, an agricultural worker can be either a white collar or blue collar worker, depending on their occupation. Blue and white collar employment ratios were obtained from ABS Census for each industry category, and applied respectively to forecast employment totals by industry.



3.2 Transport network

The Zenith model's transport network contains freeways, arterial and collector roads, railway lines and road infrastructure dedicated to the use of trams and buses. It also includes details of all public transport routes, stop locations, service frequencies and stopping patterns by time of day, along with some key shared paths (bicycle and walking only routes). The transport network assumptions in the future base cases are described in the following sections.

3.2.1 Road network

VLC was provided with future year road assumptions in TfV's transport modelling reference cases. The future road network assumption documents provided to VLC included:

- **TfV Reference Case v1.09 interim road networks (170710)** – an interim version of road project assumptions corresponding to reference case v1.09. This update included road project assumptions for each of 2026, 2036 and 2051. This was the primary document used to inform the road network assumptions.

The TfV road list is included in Table A.2 of Appendix A – TfV transport modelling reference case assumptions.

These assumptions were reviewed and in consultation with the NEL project team, TfV and VicRoads, a series of minor amendments were made. In addition, the VicRoads *Melbourne road projects* page on the VicRoads website was consulted and contained some shorter term projects not captured within the Reference Case. These additional projects are listed in Appendix C – VicRoads Melbourne road projects road list. Lists of the adopted future year road projects in the NEL model are listed in Table D.1, Table D.2 and Table D.3 of Appendix D – Future road network for modelling purposes only.

Figure 3.1 to Figure 3.3 highlight the road network changes between each of the 2016, 2026, 2036 and 2051 modelled years. These road network assumptions include many road upgrades that could be expected under a “business as usual” regime, however they have been created for transport modelling and planning purposes, and do not necessarily represent future commitments regarding capital spending or infrastructure works.

Key projects in the base case include:

- CTW (M1 to Melbourne Airport) in 2026
- M80 Upgrade (M1 to Greensborough Hwy) in 2026
- West Gate Tunnel in 2026
- Monash Freeway upgrade in 2026
- Aitken Boulevard (E14) in 2036
- Outer Metropolitan Ring (OMR) Road in 2051

Key projects excluded from the future base cases are:

- North East Link (i.e. the Project)
- Craigieburn Bypass widening
- EastLink widening
- Williamsons Road / Fitzsimons Lane widening
- East West Link – Western Section (WestLink) and Eastern Section

Figure 3.1 - Key Road Network Improvements 2016 to 2026

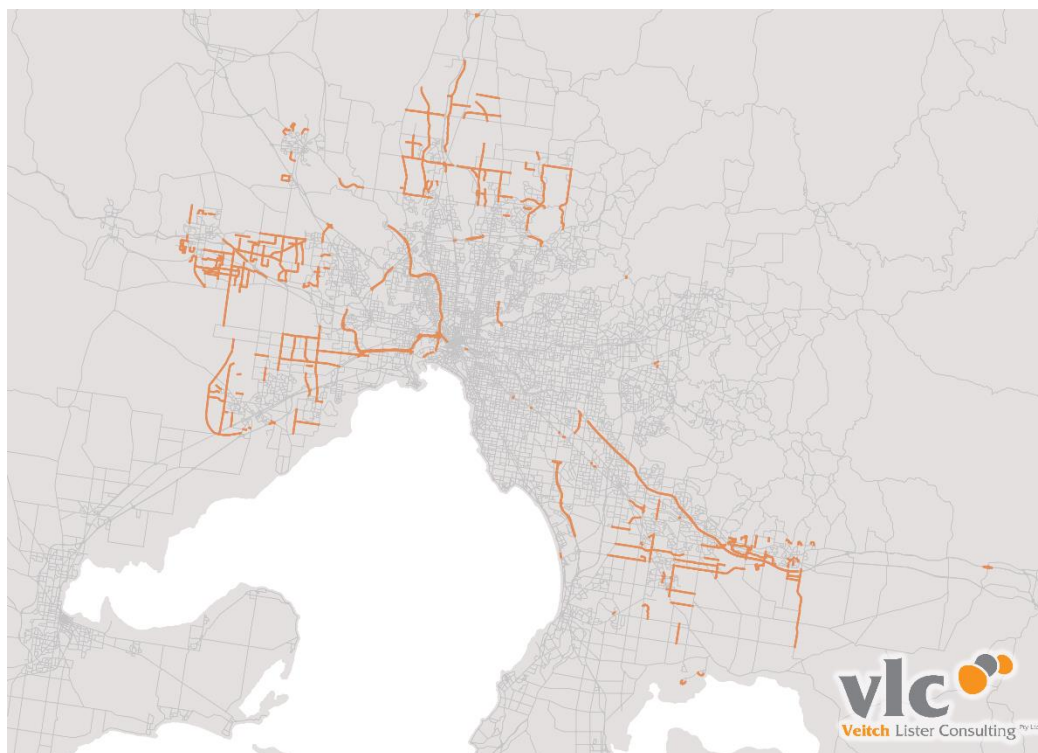
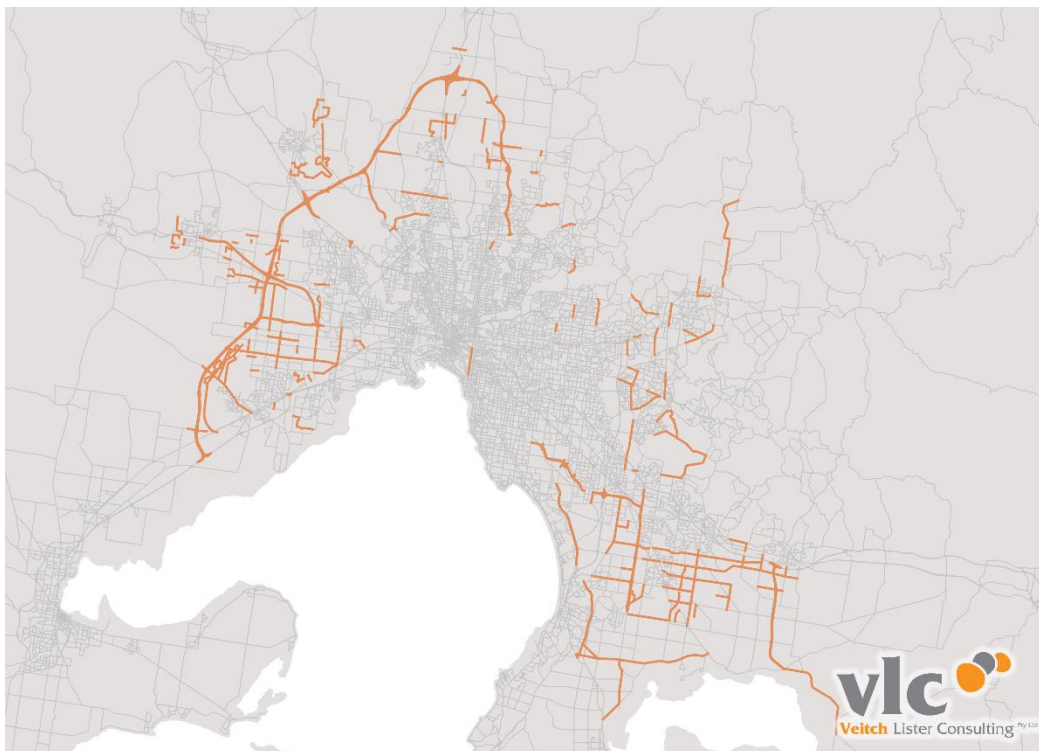


Figure 3.2 - Key Road Network Improvements 2026 to 2036

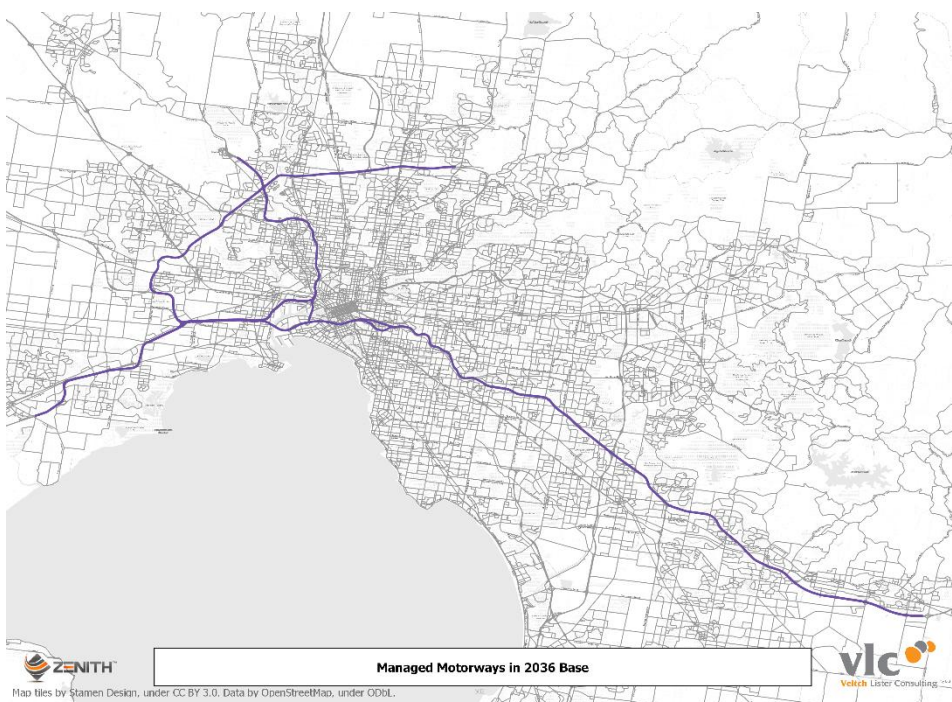
Figure 3.3 - Key Road Network Improvements 2036 to 2051



Freeway management system

VLC was provided with future year freeway management system assumptions by VicRoads and can be seen in Figure 3.4. These included committed upgrades along the M1 corridor, CityLink-Tulla Widening, Western and Metropolitan Ring Road and the West Gate Tunnel.

Figure 3.4 - Extent of the Freeway Management System Improvements

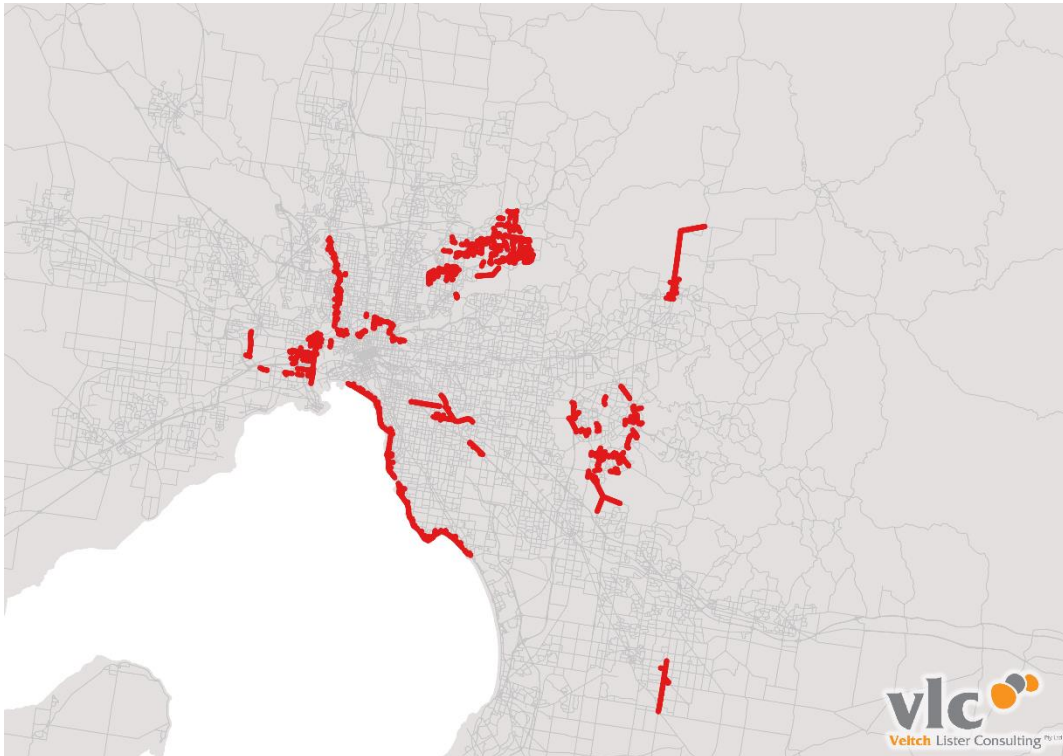




Commercial vehicle bans

The Zenith model's transport network also contains commercial vehicle bans, reflecting curfews and infrastructure constraints. Figure 3.5 depicts the bans assumed beyond the base year. These bans are outlined in detail in Appendix E – Commercial vehicle bans.

Figure 3.5 - Modelled Commercial Vehicles Bans and Curfews





3.2.2 Public transport

The public transport rail specifications were provided by PTV and are consistent with the Metro Tunnel Business Case, detailing a listing of the proposed upgrades to the public transport system; including – as of 2026 – the Melbourne Metro (MM) project. These have been incorporated into the Zenith model base cases. The public transport service plans details are outlined in Table 3-2.

Table 3-2 - Source of Public Transport Service Plans

Input Data Files	File Name	Date Received	Details / WorkSheet
Public Transport Projects	Rail (2026, 2036 & 2051): 20150810 - MM-Train Service Specifications-STAGE B-2015-07-17 v11.XLSX TFV Ref Case v109_NELA.pdf	17/07/2015 02/06/2017	"STAGEB_MM-1C_2031" used for 2026 "STAGEB_MM-2B_2031" used for 2036 "STAGEB_MM-2B_2031" + MARL, Rowville, Wallan and Clyde extensions was used for 2051
	Tram (2026, 2036 & 2051): Melbourne Rail Link (MRL) Stage B - Tram Service Specifications - MRL Parkville ~ 14/10/17 TFV Ref Case v109_NELA.pdf	14/10/2014 17/07/2015	As used in the MRL project with modifications as specified by the TFV Reference Case v109_NELA
	Bus (2026, 2036 & 2051): Bus Changes MRL Stage B and NORTHERN GROWTH AREA ADDITIONS and WALAN_BUS_CHANGES	14/10/2014	As used in the MRL project, buses from MRL stage A except as outlined in the document 2021Bus used for 2026 2031Bus used for 2036 2046 Bus used for 2051 (with removal of SkyBus)

Table F.1 and Table F.2 of Appendix F – Public transport service plans contain the source PTV rail service plans (metropolitan and regional) for 2026 and 2036 respectively. These plans include assumptions surrounding route extensions, city loop direction and average headway for each time period, along with seating and crush capacities. In consultation with the NELA project team, it was determined that the 2051 rail network would be based on the 2036 Melbourne Metro rail service plan, with the addition of Melbourne Airport Rail Link (MARL) and the Rowville and Clyde rail extensions. All other lines retained their service frequencies and stopping patterns from the 2036 assumed service plans.

Key projects **included** in the base case rail service plans are:

- Fare Zone change to remove Zone 2 (by extending the Zone 1 / 2 overlap)
- Regional Rail Link – 2016
- Mernda Extension – 2026
- Melbourne Metro – 2026
- Baxter extension – 2026
- Wallan electrification – 2036
- Melton electrification – 2036
- Melbourne Airport Rail Link – 2051
- Rowville Rail – 2051
- Clyde electrification and extension – 2051

The following projects have been **excluded** from the base cases:

- Avalon Airport Rail Link
- Clifton Hill Metro, Melbourne Metro 2 from Clifton Hill to Newport
- Doncaster Rail
- Geelong electrification
- Pakenham East electrification and extension
- Wollert Extension

Rail service plan

Figure 3.6 to Figure 3.8 depict the 2026, 2036 and 2051 modelled base case metropolitan rail networks, with key upgrades and projects labelled.

Figure 3.6 - Metropolitan Rail Network Configuration in 2026 Base Case

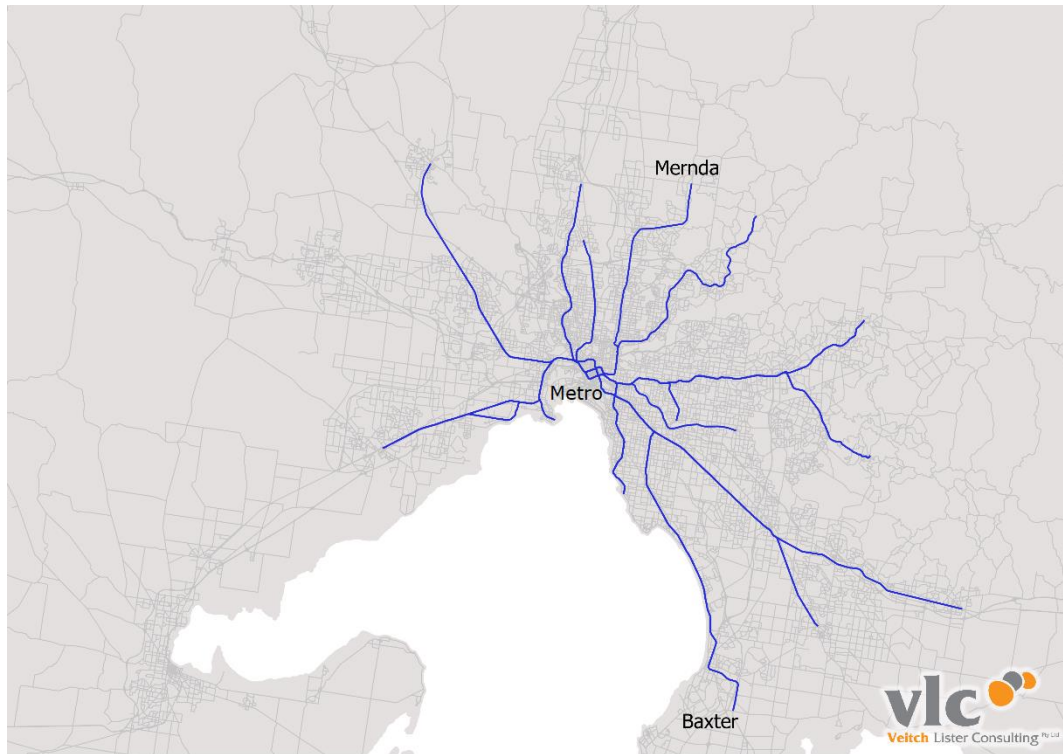


Figure 3.7 - Metropolitan Rail Network Configuration in 2036 Base Case

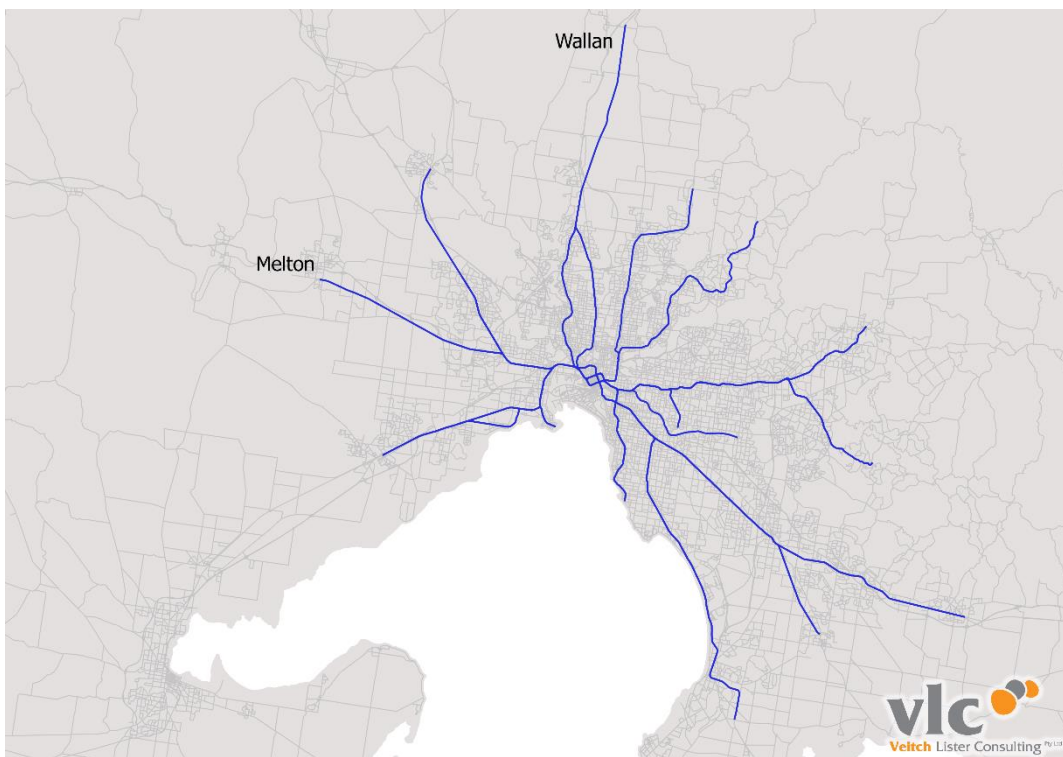
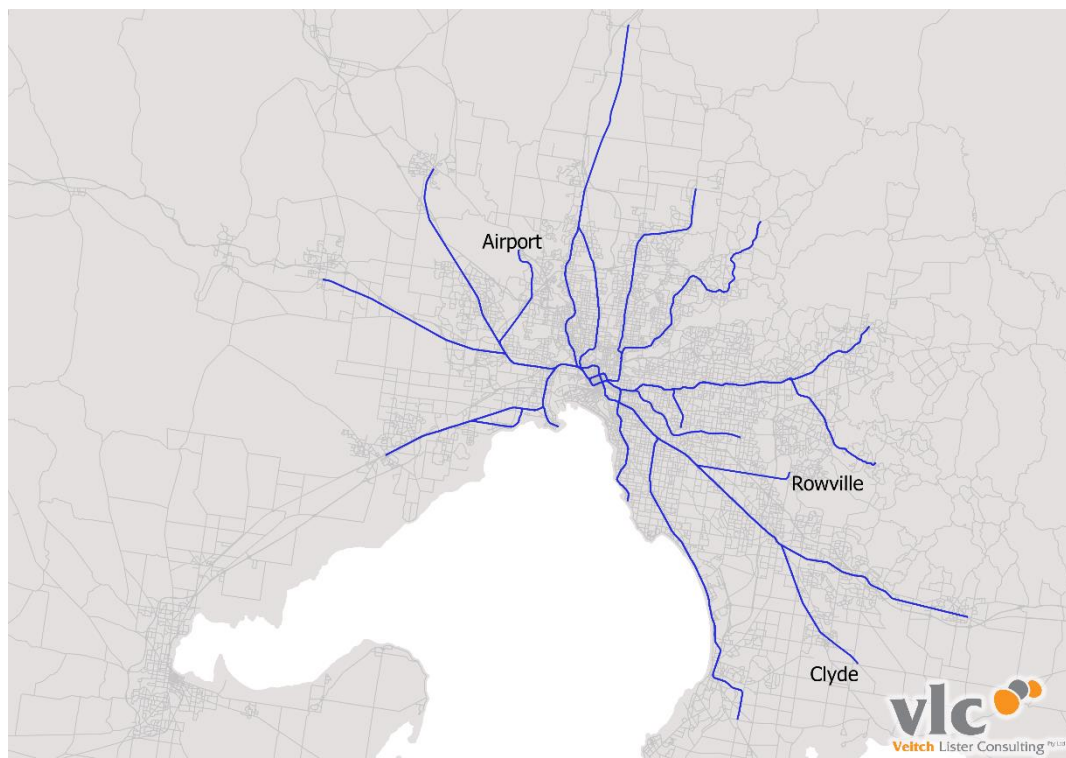




Figure 3.8 - Metropolitan Rail Network Configuration in 2051 Base Cases



These service plans have been created for transport modelling and planning purposes, and do not necessarily represent future commitments regarding capital spending or infrastructure works.



New metropolitan rail stations

New or upgraded train stations included by the 2051 future base case are listed below:

Recently Completed

- South Morang
- Williams Landing
- Cardinia Road
- Lynbrook
- Epsom

Mernda Extension

- Mernda (2026)
- Williamsons Road (2026)

Melbourne Metro

- Parkville (2026)
- Arden (2026)
- CBD North (2026)
- CBD South (2026)
- Domain (2026)

Wallan

- Donnybrook (2036)
- Lockerbie (2036)
- Beveridge (2036)
- Wallan (2036)

Rowville

- Monash University (2051)
- Mulgrave (2051)
- Waverley Park (2051)
- Rowville (2051)

Clyde

- Cranbourne East (2051)
- Clyde (2051)

Airport

- Melbourne Airport (2051)

Other

- Southland Shopping Centre (2017)
- Caroline Springs (2017)
- Calder Park (2026)
- Werribee East (2026)
- Campbellfield (2026)

Tram

Figure 3.9 and Figure 3.9 show the tram networks assumed for the 2026, 2036 and 2051 base cases.

The tram networks were based on the PTV Tram service plan (Table F.4 of Appendix F – Public transport service plans). These networks were then adapted to follow the assumptions detailed in the TfV Reference Case (Appendix A – TfV transport modelling reference case assumptions v1.09).

Key projects included in the future base case scenario tram service plans include:

- Fare Zone change to incorporate the free trams in the CBD
- Parkville package – 2026
- Route 68 becomes Glenferrie Rd Shuttle (Malvern to Caulfield) – 2026
- Extension of Route 11 to Fishermans Bend – 2026
- Extension of Routes 70 and 75 to E-Gate – 2026
- Extension of Route 48 to Doncaster Park and Ride – 2036
- Extension of Route 3 to East Malvern Station – 2036
- Extension of Route 5 to Footscray via Dynon Rd – 2036

Please note, as the reference case specifies no changes to the tram network beyond 2036, the 2036 tram network was adopted for the 2051 tram network.

Figure 3.9 - Modelled Tram Network in 2026

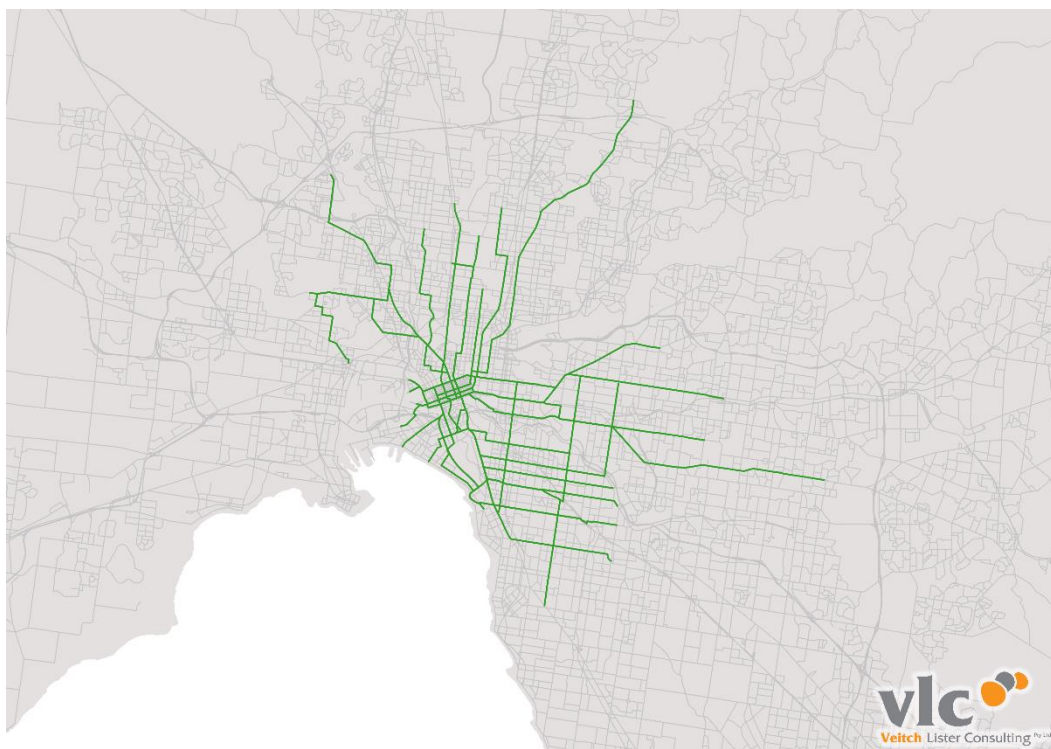
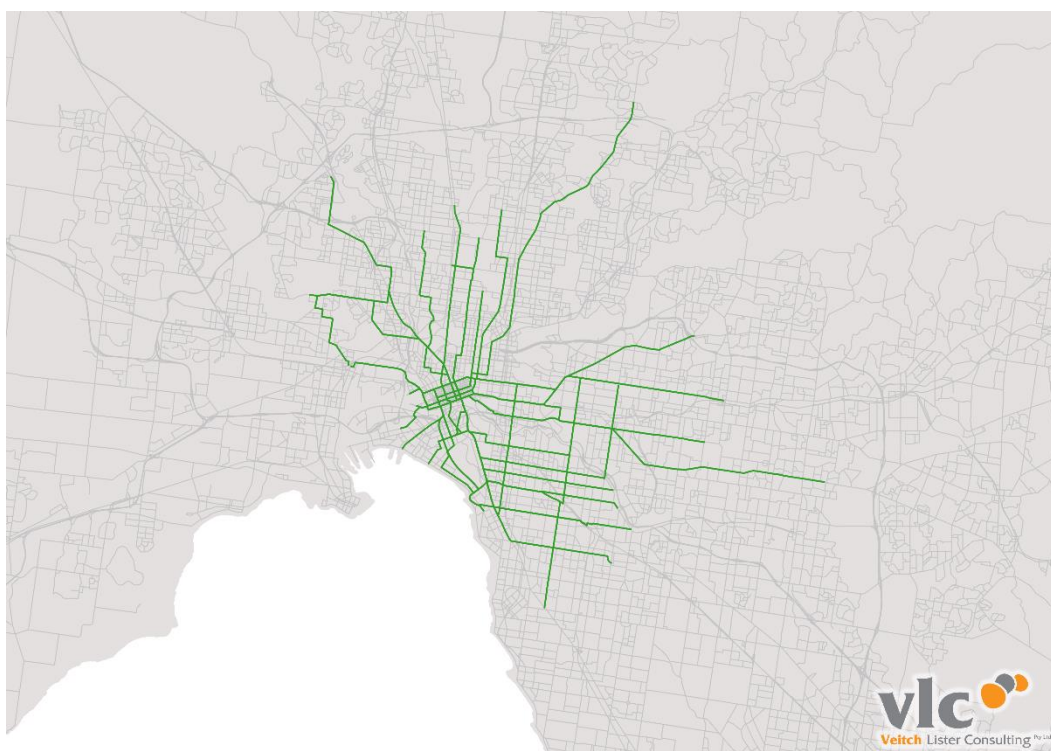


Figure 3.9 - Modelled Tram Network in 2036 and 2051





Bus

Figure 3.10, Figure 3.11 and Figure 3.12 show the metropolitan bus (including SmartBus) networks assumed for 2026, 2036 and 2051. Figure 3.13 shows the regional bus and coach networks (as used in all future base cases).

It should be noted that SkyBus has been removed from the 2051 network in line with the guidance in the Reference Case v1.09.

Table F.5, Table F.6 and Table F.7 list the Base Case bus category assumptions for 2026, 2036 and 2051.

For transport modelling purposes, the crush capacity for metropolitan buses has been assumed as 60 seated and 15 standing, while regional bus and coach capacities have been assumed to be 50 seated and 25 standing.

Bus services in the Metropolitan area have been categorised by PTV as follows:

- **SmartBus:** Premium bus services with high frequencies, extended operating hours, on-road priority, and high quality passenger information which provide direct links to major destinations and operate on major arterial roads. All services that are currently operating on SmartBus routes are to remain in future years.
- **Coverage Bus:** Services which provide local connections and ensure that all Melbourne residents are within an easy walk of the public transport network. Coverage services may operate on connector roads.

Note that no service improvements have been included for all other bus services including regional buses and regional coaches.

Figure 3.10 - Modelled Metropolitan Bus Network in 2026

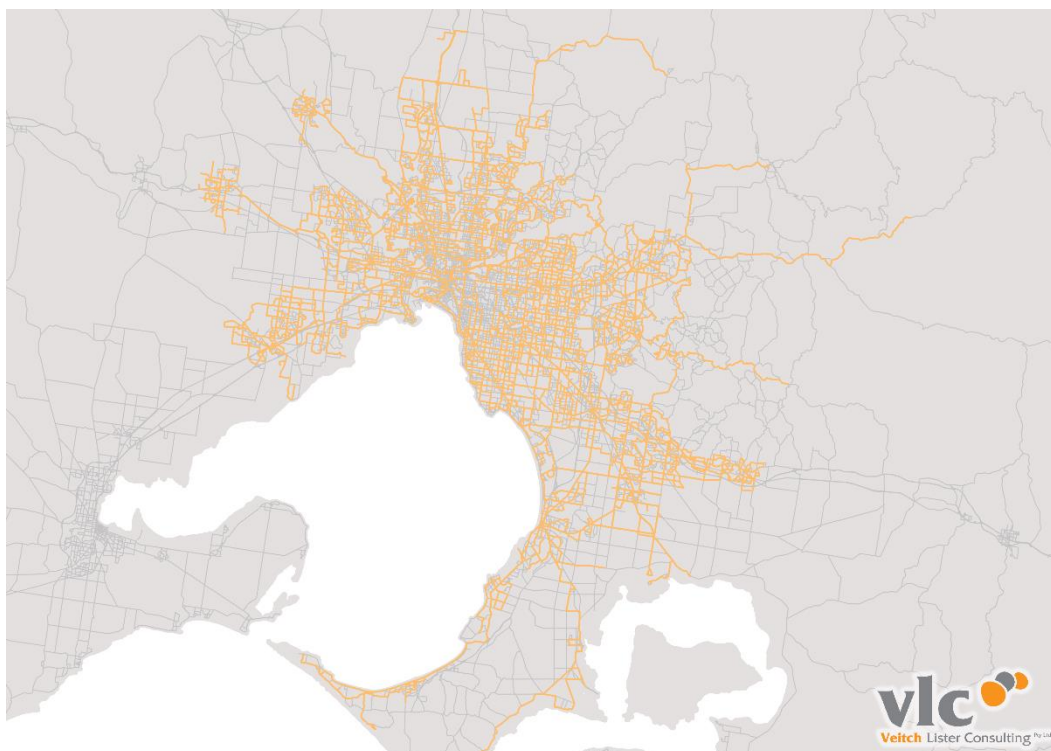


Figure 3.11 - Modelled Metropolitan Bus Network in 2036

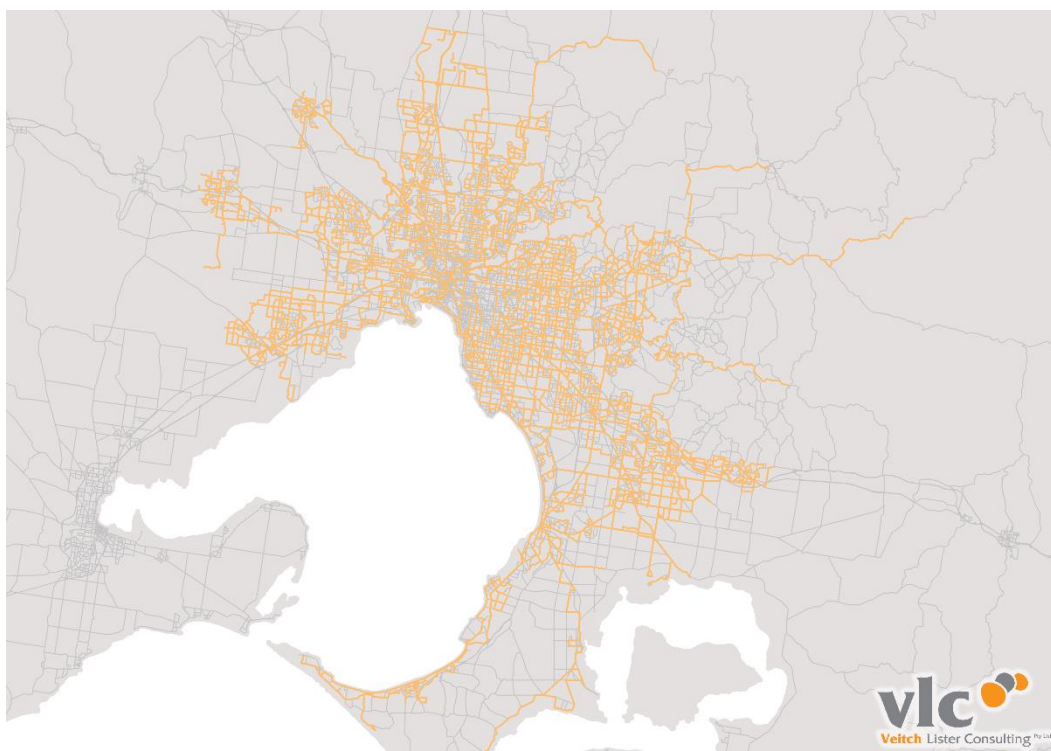




Figure 3.12 - Modelled Metropolitan Bus Network in 2051

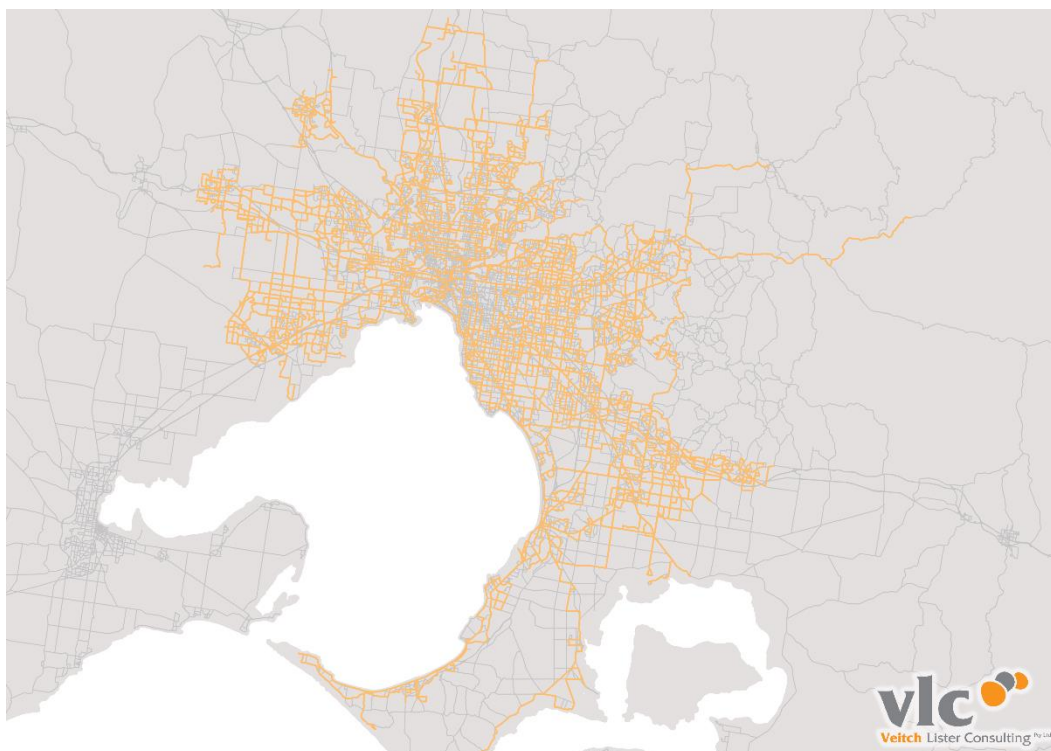
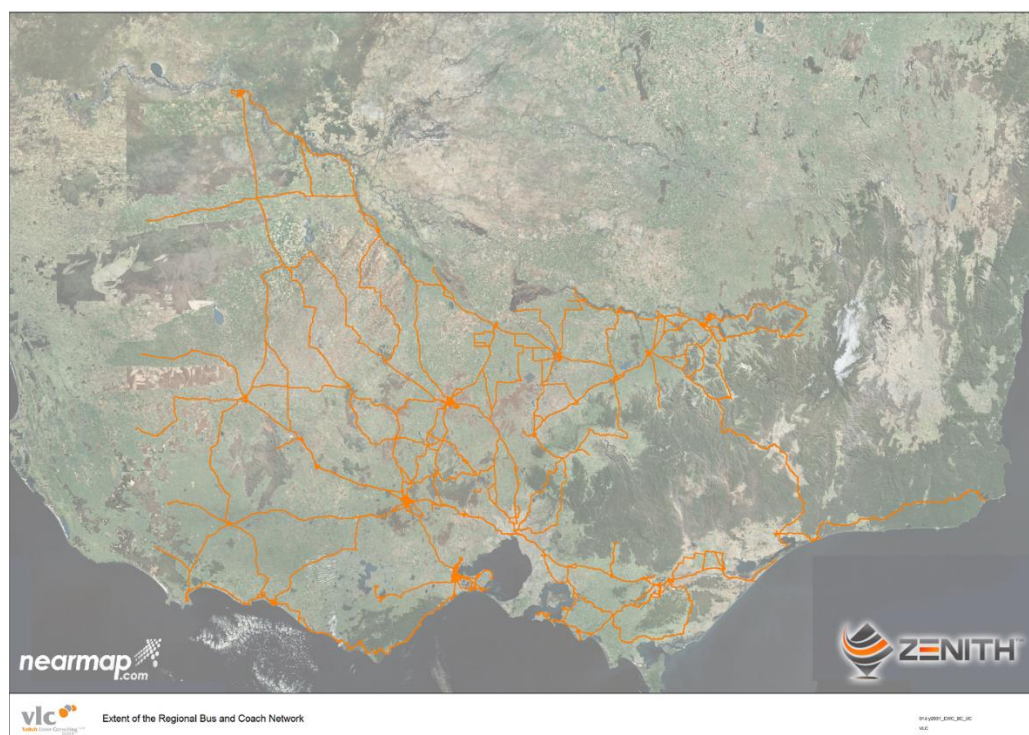


Figure 3.13 - Modelled Regional Bus and Coach Network in 2026, 2036 and 2051





3.3 Commercial vehicle demand

The Zenith model separately forecasts light commercial vehicle (LCV) and medium/heavy commercial vehicle (HCV) flows for each of its four modelled time periods. LCVs are defined as Austroads Vehicle Classification 3, while HCVs are defined as Classifications 4 to 12.

In the generation of commercial vehicle trips the model uses vehicle trip generation rates based on blue and white collar workers for different types of employment (2 x 13 employment types). For trip distribution it uses separate deterrence functions within a gravity model for light and heavy commercial vehicles within metropolitan Melbourne and across regional Victoria. The model also utilises Passenger Car Unit (PCU) factors of 1.3 for LCVs and 2.3 for HCVs.

3.3.1 Port and rail terminals

For port related freight, the Zenith model sets the terminal as the 'production' end of the trip, and employment locations such as manufacturing, trucking & transport and agriculture, as the 'attraction' end of the trip. This allows the actual HCV movements forecast to be replicated at all horizons (i.e. independent of modelled population, employment, etc.).

The additional HCV trips for each port terminal are consistent with the average weekday HCV trips detailed in the Reference Case, however on advice from the Manager - Transport Modelling Transport Policy, Planning & Reform Division, they have been adjusted for the following:

- Port of Melbourne (PoM) remains the only container port in Victoria through to 2051, resulting in previous growth attributed to Port of Hastings (PoH) in earlier reference cases shifted to PoM
- Assume no Metropolitan Intermodal System (MIS)

Additional freight data was supplied for Caltex-Newport and CC Container Yard by the WGT project team. The resultant port commercial vehicle productions and attractions are summarised in Table 3-3 below.

Table 3-3 - Assumed number of HCV productions and attractions at port and rail terminals

Freight Area	TZ_3477	2016	2026	2036	2051
PoM- Swanson Dock West	163	3,105	4,394	5,984	9,064
PoM- Swanson Dock East	162	3,088	4,394	5,984	9,064
PoM- Appleton Dock	162	211	301	409	620
PoM- Victoria Dock	162	53	76	103	156
PoM- Swanson Dock Precinct Sub-Total		6,457	9,164	12,480	18,903
PoM- Webb Dock	167	2,251	4,299	6,578	10,080
Dynon Rail Terminal North	161	1,888	1,701	1,324	1,583
Dynon Rail Terminal South	161	1,888	1,701	1,324	1,583
Dynon Rail Terminal Sub-Total		3,776	3,402	2,649	3,167
PoM- Mobil Dock Yarraville*	472	1,660	1,660	1,660	1,660
PoM- CC Container Yard**	451	120	120	120	120
Caltex - Newport	472	170	170	170	170
Port of Hastings	1,936	210	210	215	215
WIFT / Truganina Terminal	2,713	1,198	4,447	7,732	11,398
Lyndhurst Terminal	2,018	-	-	-	-
Somerton Terminal	2,527	289	289	289	289

Source: DEDJTR Reference Case 2014/2015 + adjustments for No MIS and No PoH as instructed by DEDJTR, and consistent with TfV Reference case v1.09

* Derived using traffic counts at the precinct entrance obtained from VicRoads



** Derived using traffic counts obtained from: Port of Melbourne Traffic Surveys 2012 - Report Volume 2: Port and Dynon Rail Terminal Gate Data

3.4 Melbourne airport demand

3.4.1 Travel markets

The basic methodology for modelling the 'Air Travel' markets is fully integrated in the Zenith model. It was developed in 2001 to improve validation of vehicle demands on roads in the general area of the Airport. Since then, eight airport travel markets have been adopted in the Zenith model to model behaviour of the different market segments. These are based on:

- sub-divisions of the two primary travel markets ('leisure' and 'business')
- split between the airport terminals ('domestic' and 'international')
- air passenger's residence ('local' and 'visitor')

The resultant travel markets are summarised in Table 3-4 below.

Table 3-4 - Zenith Airport Travel Markets

Airport Travel Market	Description
air_pax_dom_bus_local	Domestic outbound (local residents) business passenger movements
air_pax_dom_bus_vis	Domestic inbound (visitors) business passenger movements
air_pax_dom_leisure_local	Domestic outbound (local residents) leisure passenger movements
air_pax_dom_leisure_vis	Domestic inbound (visitors) leisure passenger movements
air_pax_int_bus_local	International outbound (local residents) business passenger movements
air_pax_int_bus_vis	International inbound (visitors) business passenger movements
air_pax_int_leisure_local	International outbound (local residents) leisure passenger movements
air_pax_int_leisure_vis	International inbound (visitors) leisure passenger movements

The total numbers for forecast 'business' and 'leisure' passenger movements at Melbourne Airport were sourced from the TfV v1.09 Transport Modelling Reference Case. The assumptions for Melbourne and Laverton Airport are summarised in Table 3-5.

Table 3-5 - Airport Passenger Demands (Average Weekday during School Term)

Melbourne Airport Specific Parameters		Zenith
Melbourne Airport Air Passenger Demand*	2016	79,245
pass / ave. weekday	2026	109,724
	2036	137,310
	2051	204,576
Avalon Airport Air Passenger Demand*	2016	4,768
pass / ave. weekday	2026	13,508
	2036	23,085
	2051	32,666



3.5 Generalised transport cost parameters

In addition to the infrastructure and operational changes described above, the models are sensitive to transport cost parameters such as:

- fuel price fluctuations,
- parking supply and pricing,
- road user charging and toll levels,
- real movements in public transport fares.

There are furthermore external influences beyond the powers of policy-makers, which would directly impact transport decision-making and strategic planning. This includes, for example, the increase in real income levels (reflected in transport models by value-of-time (VOT)), which would affect travel patterns and mode choice. Fuel price levels are also by and large market-driven.

The TfV reference case provided revised generalised transport cost parameters assumptions, which included updates to the cost of fuel, parking, public transport fares, public transport travel perception (reliability) and toll levels in real terms that is over and above the expected CPI increases. All other policy / pricing input assumptions remain unchanged and no real increase/decrease is included in the base case assumptions.

The following section details those assumptions.

3.5.1 Vehicle operating costs (VOC) – fuel price

VOC's are made up of the total actual costs of operating a vehicle, including fuel prices, vehicle efficiency, vehicle maintenance, insurance and registration costs. Of these, fuel costs form the majority of the perceived costs of travel, and as a result are a key Zenith transport model variable.

While the reference case provides forecasts for vehicle operating costs, the fuel price forecasts were sourced from a submission from the Business Case advisors to the Transport Modelling and Economics Steering Committee. It is understood that the revised forecasts were developed using historical fuel prices and vehicle efficiency and other international forecasts (e.g. forecasts by World Bank and EIA). Appendix Q1 – Economic Appraisal of the North East Link Business Case presents these findings in greater detail. These assumptions are summarised in Table 3-6 below.

Table 3-6 - Adopted fuel price Growth Rates (CAGR)

Period	Fuel price growth rates
2011-2021	-2.94%
2021-2031	0.03%
2031-2041	0.03%
2041-2051	0.03%



3.5.2 Parking costs

Frontier Economics provided advice to DEDJTR on parking cost parameters for the transport modelling reference cases.

Frontier Economics used historical parking price changes since 2005 to generate the DEDJTR forecasts for the growth rate in parking prices in the base case, as seen in Table 3-7.

Table 3-7 - Car parking cost Growth Rates

Road Cost Parameters		Zenith
Parking cost change (CAGR)	2011 - 2016	2.4%
Applied to trips arriving in the AM peak & other periods	2016-2021	1.8%
	2021-2026	1.6%
	2026-2031	1.5%
	2031-2036	1.4%
	2036-2041	1.3%
	2041-2046	1.2%
	2046-2051	1.2%

Source: Frontier Economics (Parking cost_2014Review FE.xlsx)

3.5.3 Public transport fares

According to DEDJTR in their reference case document, the State Government has increased public transport fares by 5.0% CAGR greater than CPI for 2012 and 2013, and by 2.5% CAGR for four years between 2015 and 2018. No growth in real terms (i.e. over and above CPI) beyond 2018 has been assumed for the base cases.

Note that in 2015, a change to the public transport Fare Zone structure saw the removal of Zone 2, by extending the Zone 1 / 2 overlap.

3.5.4 Public transport travel reliability

Earlier versions of the DEDJTR reference case document make reference to public transport perception surveys that identify public transport reliability as a major consideration in the level of customer satisfaction, which in turn affects their mode choice.

Key initiatives to improve public transport reliability could include a reduction of delays and dwell time through additional maintenance, simplification of the network and new rolling stock, improvements in priority and better co-ordination of public transport modes.

As instructed by DEDJTR in their reference case document, the public transport value of time has been reduced by 0.2% CAGR to 2026 in real terms for the future Base Cases.



3.5.5 Toll levels

New and existing toll roads

Table 3-8 summarises existing toll road assumptions, noting that these assumptions have been created for transport modelling and planning purposes, and do not represent future commitments regarding toll road infrastructure.

Table 3-8 - New and Existing Toll Road assumptions

Road Cost Parameters	Zenith
TOLLS	
Tolls/Road Charges + Toll Caps, Existing Roads, 2011 (AUD 2008)	Actual
Beyond concession periods	Tolls assumed to operate beyond concession periods
Tolls/Road Changes	
CityLink	As per WGT EES
EastLink	cpi
Future Tolls/ Road Charges	
West Gate Tunnel	As per EES
Toll change	As per EES
North East Link	Project - N/A
Toll change	Project - N/A
OMR	Untolled
Toll change	N/A

* Note - CPI 2.5% as recommended by DTF, the NEL commercial and NEL business case team

Changes in the Value of Travel Time Savings (VTTS)

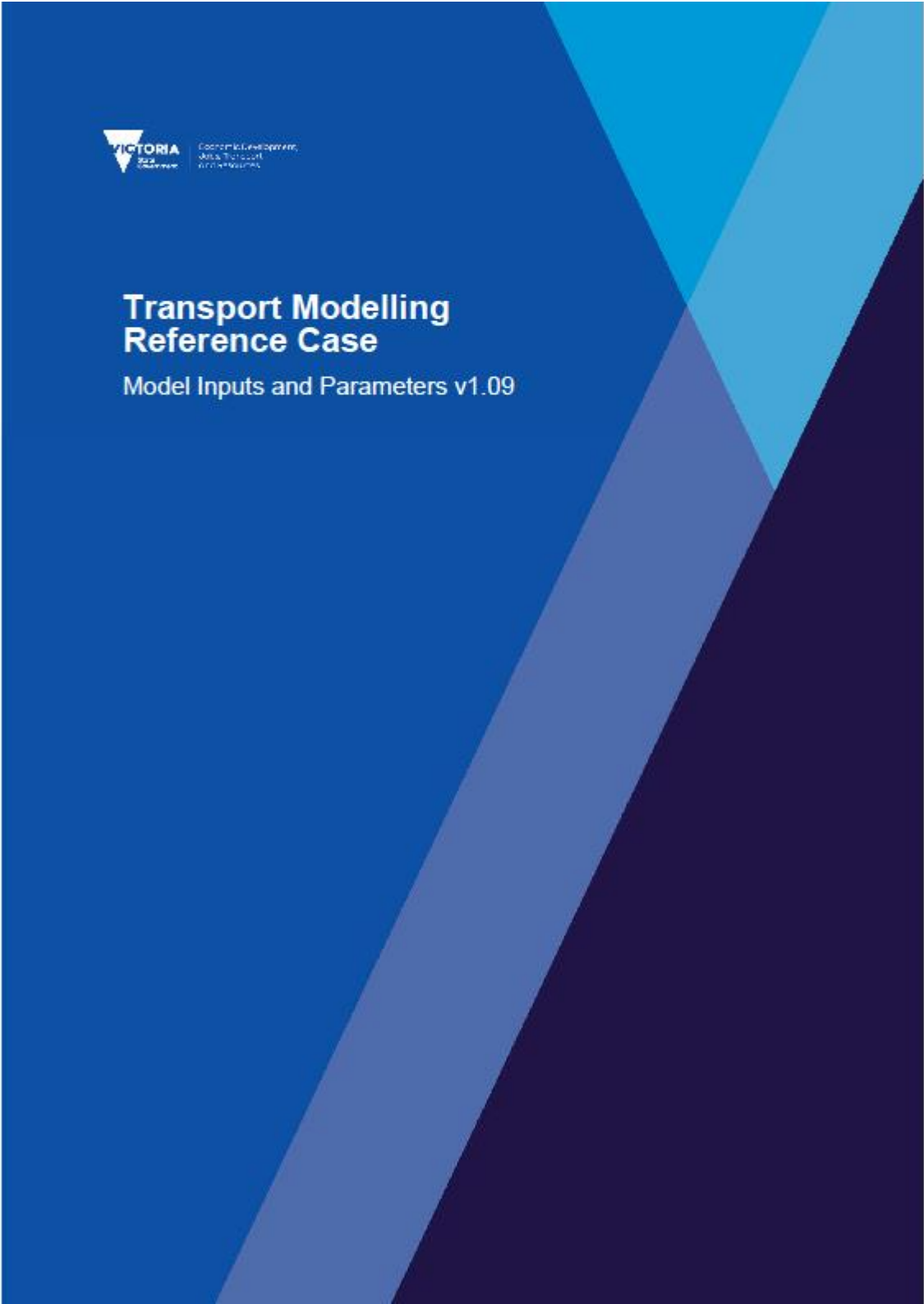
For the base case scenarios, VTTS increases by 1.55% CAGR to 2051 in real terms (i.e. over and above CPI) for cars and commercial vehicles.



Appendix A – TfV transport modelling reference case assumptions v1.09



Table A.1 - Transport Modelling Reference Case, Model Inputs and Parameters V1.09, by TfV





1 Introduction

This document summarises the TFV Reference Case assumptions for the 2018/19 business case cycle. The information relates to public transport, road, land use, cost parameters, freight and Melbourne Airport.



2 Public Transport Investment Timing and Sequence

The following section contains an outline of the service specification for each mode (Train, Tram and Bus). In the case of Bus and train, the specification is an update to existing scenarios developed for use in the Melbourne Metro Rail Project (MMRP). The tram specification is new.

2.1 Rail

The Rail Reference Case is based on existing MM scenario specifications, but has changes that reflect internal discussions on the timing of projects, rolling stock investment and network reconfigurations to get better utilisation of the rail existing network.

Table 1 below is a summary Melbourne Metro rail service plans that form the basis of the Reference Case at each year plus any adjustments that need to be made to the plans.

Table 1: Summary of Rail Investment Sequence

Year	Project
2021	Melbourne Metro service plan: STAGEB_MM-0_2021
2026	Melbourne Metro service plan: STAGEB_MM-1C_2031 (MM Project / Melbourne Metro Day 1)¹²
2031	Melbourne Metro service plan: STAGEB_MM-2_2031_P
2036	Melbourne Metro service plan: STAGEB_MM-2B_2031 (MM Ext Project (with full rollout of extended trains on S'shine-D'nong, with Wallan Ext))¹²
2051	Melbourne Metro service plan: STAGEB_MM Design 2

¹ Mernda services to stop at both stations b/w South Morang and Mernda

² Service Frequency on Mernda and Hurstbridge lines reduced from 2031 MM Service Plan levels to service frequency that will be offered by Hurstbridge Stage 2 project (i.e. service frequency aligning to 20 tph at Clifton Hill in 2026 and 2036 service frequency aligning to 24tph at Clifton Hill station).



2.2 Tram

Service specifications developed for the E-Class Tram roll-out and MMRP have been used as a basis to develop a new Tram Reference Case specification. By 2021 the diversion of services near Melbourne Metro construction works are included (i.e. the recently introduced Route 58), and track upgrades associated with the MMRP (i.e. Elizabeth Street) allow changes to existing routes at 2026.

Table 2: Summary of Tram Investment Sequence

Year	Project
2021	- Route 58 (Toorak-West Coburg introduced in 2017 to replace route 55 and Route 8). Route 6 extended to Moreland (top end of Route 8) and Route 55 extended to Toorak (bottom end of Route 8) - Glenferrie Rd Shuttle (68 Malvern to Caulfield), taken from Routes 16 & 64 - Route 12 via La Trobe St - E Class Tranche 2-3 (80-110) and Route 3 extension beyond Melbourne University to Brunswick Road - Route 2 discontinued
2026	- Route 86 runs to Port Melbourne - Route 109 runs to Victoria Harbour - Route 5 runs north to the Remand Centre on Spencer St via Park St link and south to Darling Station - Route 64 runs to Waterfront City via Park St Link to Malvern Station - Elizabeth St curves mean Route 19 runs to Jolimont, Route 57 to Melbourne Park, Route 59 to Jolimont - Route 12 via La Trobe St - Route 11 extension to Fishermans Bend - E-Gate extensions – Route 70, 75 - Route 30 discontinued - Next Generation Tram upgrades
2031	- Route 82 extension to Maribyrnong Defence Site - Route 48 extension to Doncaster - Route 3 extension to Malvern East Station - Route 5 extended to Footscray via Dynon Rd
2036+	No further changes



2.3 Bus

The bus specification is based on the PTV timetable (Post RRL / Nov 2015) for 2015 and MMRP project files associated with the rail service plan (outlined above) for Future years.

2021

As part of the On-Road Network Development Plan (NDP) developed by Public Transport Victoria (PTV) in 2014, a new bus network was proposed for Metropolitan Melbourne that was anticipated to be implemented by 2021, however the timing for the On-Road NDP is now assumed to be delayed and the revised Reference Case assumes it will not be delivered until 2026.

To reflect the above, the 2021 Bus Reference Case now includes all projects delivered as at August 2017 including:

- **Updated Skybus frequencies** - The Skybus frequencies were uplifted from once every ten minutes across the day to once every five minutes across the day.
- **Increased DART frequencies** – Improvements to DART frequencies as made in 2016.
- **New University Shuttle Routes** - The 403 bus route (Footscray Station to University of Melbourne via Royal Melbourne Hospital) and the 301 bus route (trial route from Reservoir Station to La Trobe University).

Plus additional projects to be delivered between 2016 and 2021 which include:

- **Caroline Springs Area Bus Network Upgrade:** Refer attached 'Draft Service Specification Caroline springs Bus Network Upgrade – Phase Three'
- **New Routes in Growth Areas:** In line with Melbourne's population growth forecasts between 2016 and 2021, new bus lines have been introduced along the growth corridors. These routes are located in the south-east growth corridor, the northern growth corridor, Sunbury, Melton, Mernda and in the Werribee region. The routes are listed in Table 6: Assumed bus projects for 2021/26/36 Reference Case years in the attached Appendices.

2026

The 2026 Bus Reference Case assumes the On-Road Network Development Plan (NDP) developed by Public Transport Victoria (PTV) in 2014. Hence it is built off the Melbourne Metro 'MM Base 2021' metropolitan bus service plan. Key features of the on-road bus network are:

- **Direct routes** – operating along direct alignments with minimal deviation from the shortest route between key destinations
- **Frequent routes** – including the provision of "turn up and go services" with real-time information
- **Strong connection between modes** – through refined route alignment and clear signage



- Improved coverage of growth areas – via route extensions and linkages to stations and activity centres
- A three tiered bus network - consisting of premium (which contains but is not limited to the current SmartBus network), connector, neighbourhood (and special) bus routes

A number of changes are assumed from the 'MM Base 2021' service plan, these are set-out in Table 6 of the Appendix. The changes relate to either replacing routes in the 'MM Base 2021' service plan with routes from the 'MM Project 2031' service plan or simply adding routes from the 2031 plan.

2031

The 2031 Bus Reference Case network builds on the 2026 network describe above and is consistent with the Melbourne Metro 2031 bus network (MM Project 2031). The network assumes the On-Road Network Development Plan (NDP) but with the following modifications.

Reduction of 401 bus and removal of 403 bus

The high frequency shuttles between the University of Melbourne and North Melbourne and Footscray train stations are not forecast to have the same importance after the introduction of Melbourne Metro (which includes a station at Parkville).

The 401 has been reduced to a ten minute frequency, while the 403 has been removed entirely.

Services around Mernda Station

New services have been introduced around Mernda Station as a result of the Mernda heavy rail extension.

Additional services in Melbourne's North

The increased rate of forecast growth in Melbourne's North has led to an upgrade in service frequencies along some routes in this area

High patronage routes

Routes were upgraded during the Melbourne Metro modelling for 2031 due to high demand. Routes that were upgraded are shown in table below with frequency upgrades shown in blue.

Table 3: Updated bus frequencies for 2031 Bus Reference Case

Service Name	2031 NDP				2031 Reference Case			
	AM	IP	PM	OP	AM	IP	PM	OP
Merrifield Express (Beveridge-Upfield via Roxburgh Park)	20	20	20	20	10	20	10	20
Beveridge - Epping via Craigieburn & Lockerbie	20	20	20	40	10	20	10	40
Craigieburn Central - South Morang via Epping Station	20	20	20	20	10	20	10	20
West Craigieburn to Craigieburn	20	40	20	40	10	20	10	40



West Craigieburn - Craigieburn via Brookfield Bvd	20	40	20	40	10	20	10	40
Donnybrook - Craigieburn North	20	20	20	40	10	20	10	40
Craigieburn - Roxburgh Park	20	40	20	40	10	20	10	40
Lockerbie - Epping via Lockerbie	20	40	20	40	10	20	10	40
Mandalay - Beveridge	60	60	60	60	20	40	20	60
Melton - Exford Rd	20	40	20	40	10	20	10	40
Werribee - Wyndham Vale (existing 449 modified)	20	40	20	40	10	20	10	40
Fishermans Bend - City	5	20	5	20	4	10	4	20
Werribee to Hoppers Crossing	40	40	40	60	20	40	20	60
Melton - Melton North (existing 455)	20	20	20	40	10	20	10	40
Melton - Kurunjang (existing 459)	20	20	20	40	10	20	10	40
Watergardens - Rockbank	60	60	60	0	20	40	20	0
Sunbury - Sunbury East	40	60	40	60	20	40	20	60
William's Landing - Point Cook Sth	20	20	20	40	10	20	10	40
Williams Landing - Saltwater Coast	20	20	20	40	10	20	10	40

Doncaster Area Bus Rapid Transit (DABRT) 2031

The Doncaster Area Bus Rapid Transit (DABRT) is introduced at 2031. The specification is set-out in Table 4.

Table 4: Doncaster Area Bus Rapid Transit

Route Structure	The routes will consist of the four existing DART routes 905, 906, 907, 908, plus the existing Route 305. Any other Doncaster routes that currently operate peak specials to the CBD will terminate at Doncaster Park & Ride.
Stations	Eastern Freeway Section: - Doncaster Park and Ride – Major Station and Interchange - Bulleen Road – Minor Station and Interchange - Burke Road – Local Interchange - Chandler Highway – Minor Station and Interchange - Victoria Park – Major Station and Interchange Other Sections: Other route sections will use existing bus stops
Service Frequency	Peak: 8 services per hour. 12 services per hour on Route 906 and 907 Non-peak:



	• 6 services per hour. • 8 services per hour on Route 906 and 907																																																																										
Travel Time	DABRT travel times to be achieved – AM Peak Inbound 35km/h average speed <table><tr><th rowspan="2">Section</th><th colspan="3">Modified Travel Times – AM Peak Inbound</th></tr><tr><th>Length (km)</th><th>Travel Time (min)</th><th>Average Speed (km/h)</th></tr><tr><td>Eastern Freeway</td><td>10.76</td><td>9.3</td><td>69.5</td></tr><tr><td>Hoddle Street</td><td>1.54</td><td>4.4</td><td>20.8</td></tr><tr><td>Victoria Parade</td><td>1.83</td><td>5.9</td><td>18.5</td></tr><tr><td>Lonsdale Street</td><td>1.62</td><td>7.5</td><td>13.0</td></tr><tr><td>TOTAL</td><td>15.75</td><td>27.2</td><td>34.8</td></tr></table> DABRT travel times to be achieved – PM Peak Outbound 35km/h average speed <table><tr><th rowspan="2">Section</th><th colspan="3">Modified Travel Times – PM Peak Outbound</th></tr><tr><th>Length (km)</th><th>Travel Time (min)</th><th>Average Speed (km/h)</th></tr><tr><td>Lonsdale Street</td><td>1.48</td><td>7.1</td><td>12.5</td></tr><tr><td>Victoria Parade</td><td>2</td><td>6.7</td><td>18.0</td></tr><tr><td>Hoddle Street</td><td>1.25</td><td>3.9</td><td>19.3</td></tr><tr><td>Eastern Freeway</td><td>11.46</td><td>10.0</td><td>68.8</td></tr><tr><td>TOTAL</td><td>16.19</td><td>27.7</td><td>35.1</td></tr></table> Travel times along Eastern Freeway section <table><tr><th>Station</th><th>Distance to Vic Park (km)</th><th>No. of Stops</th><th>Travel Time (mins)</th></tr><tr><td>Doncaster Park & Ride</td><td>10.7</td><td>3</td><td>10.7</td></tr><tr><td>Bulleen Road</td><td>8.4</td><td>2</td><td>8.4</td></tr><tr><td>Burke Road</td><td>6.5</td><td>1</td><td>6.5</td></tr><tr><td>Chandler Highway</td><td>3.2</td><td>-</td><td>N/A</td></tr></table> •	Section	Modified Travel Times – AM Peak Inbound			Length (km)	Travel Time (min)	Average Speed (km/h)	Eastern Freeway	10.76	9.3	69.5	Hoddle Street	1.54	4.4	20.8	Victoria Parade	1.83	5.9	18.5	Lonsdale Street	1.62	7.5	13.0	TOTAL	15.75	27.2	34.8	Section	Modified Travel Times – PM Peak Outbound			Length (km)	Travel Time (min)	Average Speed (km/h)	Lonsdale Street	1.48	7.1	12.5	Victoria Parade	2	6.7	18.0	Hoddle Street	1.25	3.9	19.3	Eastern Freeway	11.46	10.0	68.8	TOTAL	16.19	27.7	35.1	Station	Distance to Vic Park (km)	No. of Stops	Travel Time (mins)	Doncaster Park & Ride	10.7	3	10.7	Bulleen Road	8.4	2	8.4	Burke Road	6.5	1	6.5	Chandler Highway	3.2	-	N/A
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Burke Road	6.5	1	6.5																																																																								
Chandler Highway	3.2	-	N/A																																																																								
Vehicle Capacity	Double decker buses: 90 seated 10 standing 100 capacity																																																																										

New rail stations

Bus connectivity to be provided for new railway stations listed in the rail section.



2036

The 2036 Bus Reference Case builds on the 2031 network describe above and is similar to the Melbourne Metro 2031 project bus network (MM Project 2031). The network assumes the On-Road Network Development Plan (NDP) but with the following modifications:

- A number of changes are assumed from the MM Project 2031 service plan, these are set-out in Table 6 of the Appendix. The changes relate to either replacing routes in the MM Project 2031 service plan with routes from the MM Project 2046 service plan or simply adding routes from the 2046 plan. Predominately the changes involve the addition of bus services in the Growth Areas to provide coverage for areas experiencing development between 2031 and 2036.

New rail stations

Bus connectivity to be provided for new railway stations.

2041

The 2041 Bus Reference Case is assumed to align to the Melbourne Metro 2046 project bus service plan (MM Project 2046), except for the changes as set-out below.

New rail stations

Bus connectivity to be provided for new railway stations listed in the rail section.

2051

The 2051 Bus Reference Case is assumed to align to the Melbourne Metro 2046 project bus service plan (MM Project 2046), except for the changes as set-out below.

Removal of Skybus

With the inclusion of the Melbourne Airport Rail Link in the Rail Reference Case, Skybus is removed from the bus network.

Removal of the 603 bus

The 603 provides a shuttle between Huntingdale Station and Monash University. The Rowville Rail extension, included in the 2051 Rail Reference Case, will provide a rail link between Monash University and Huntingdale Station, along an identical route at faster speeds than the 603 bus.

New rail stations

Bus connectivity to be provided for new railway stations.



3 Road Networks

As per project list supplied to NELA on 12 July 2017 (TFV Ref Case v1.09 Road Networks (170710)_NELA.xlsx)

4 Land use

Demographics & Land Use
VIF2015 Based Population, Employment and Enrolments
SALUP - Update 2016 (Final)
Reference # 20160051 - Final Version
Refer files provided to NELA 12.07.2017
-> Land Use Ref Case - 160729 VITMb TZN 3098 16-51 DBFs.zip
-> Demographic_w_ICSplit_20xx_Z3098.dbf

5 Freight

Freight Assumptions							
Freight assumptions:							
Port of Melbourne remains the only container port in Victoria through to 2051							
Interstate rail freight shifts from Dynon to WIFT in 2032, therefore WIFT first appears in the 2036 scenario							
Port Rail Shuttle (PRS) is assumed to begin operation in 2032, therefore PRC first appears in the 2036 scenario							
- PRS formerly Melbourne Intermodal System (MIS)							
International Container Movements from PoM							
Year	TEU (million)						
2011	2.2						
2016	2.5						
2021	2.8						
2026	3.3						
2031	3.9						
2036	4.7						
2041	5.6						
2051	8.0						



6 Road Cost Parameters

Road Cost Parameter Values		
Road Cost Parameters		
Value/Assumption		
Values used in Generalised Cost		
Car Value of Time (VOT)	Private	As per model calibration
	Business	As per model calibration
Car VOT change		unchanged
Vehicle Occupancy		As per model calibration
Vehicle Occupancy change		unchanged
Car Vehicle Operating Costs (VOC)*	Private	As per model calibration
	Business	As per model calibration
Car VOC** change	2011-2021	1.4% CAGR
	2021-2031	1.2% CAGR
	2031-2041	0.5% CAGR
	2041-2051	unchanged
Parking Cost/trip,		
Work purpose, 2011	CBD/Docklands	As per model calibration
	Other CoM	As per model calibration
	Other Inner	As per model calibration
Non-work purpose, 2011	CBD/Docklands	As per model calibration
	Other CoM	As per model calibration
	Other Inner	As per model calibration
Parking Cost change,		
Work and Non-work purpose**	2008-2014	4.0% CAGR
	2014-2051	1.5% CAGR
Airport Parking Cost		As per model calibration
Airport Parking Cost change***	2011-2021	0.8% CAGR
	2021-2031	0.7% CAGR
	2031-2051	0.1% CAGR



Road Cost Parameters		Value/Assumption
Tolls / Road Charges, Existing Roads		Actual
Tolls assumed to operate beyond concession periods		
Tolls / Road Charge change		
City Link		As per concession
EastLink		unchanged
Future Tolls / Road Charges		
Western Distributor		assume for models:
		as per project announcements
North East Link		assume for models:
Tolls assumed to rise by cpi		per km charge matching EastLink
OMR		assume for models:
Tolls assumed to rise by cpi		per km charge matching half EastLink

7 Public Transport Parameters

Public Transport Cost Modelling Parameters		
Public Transport Cost Parameters		Value/Assumption
Public Transport VOT		As per model calibration
Public Transport Fares, 2011	Zone 1	As per model calibration
	Zone 2	As per model calibration
	Zone 1-2	As per model calibration
Public Transport Fare change	2012	5.00%
	2013	5.00%
	2014	cpi
	2015-2018	2.50%
	Beyond 2018	
Zone 1+2 fare to equal Zone 1 fare	2015 & beyond	unchanged
Free tram travel in CBD & Docklands	2015 & beyond	
Improved public transport reliability factor (reduction in PT generalised cost)	2011-2026	-0.2% CAGR per annum (3% total)
	beyond 2026	unchanged
SkyBus/ Airport Rail Fare		As per model calibration
SkyBus/ Airport Rail Fare change		As per standard public transport fare change



8 Airport Parameters

Airport Parameters											
Melbourne Airport Specific Parameters			Value/Assumption								
SkyBus/ Airport Rail Fare			As per model calibration								
SkyBus/ Airport Rail Fare change			As per standard public transport fare change								
Airport Parking Cost			As per model calibration								
Airport Parking Cost change			2011-2021	0.8% CAGR							
			2021-2031	0.7% CAGR							
			2031-2051	0.1% CAGR							
Melbourne Airport Employment			Refer Demand Forecasting Specifications – MRL Project vB.1.4								
Melbourne Airport Air Passenger Demand ^a			Refer Demand Forecasting Specifications – MRL Project vB.1.4								
Further breakdown of the air passenger data by purpose and direction is provided below											
Avalon Airport Air Passenger Demand ^a			Refer Demand Forecasting Specifications – MRL Project vB.1.4								
Melbourne Airport Air Passenger Demand Forecasts by Purpose and Direction											
Air market	Imp type	Residence	Imp production/attraction	2011	2016	2021	2026	2031	2036	2051	
International	Business	Resident	Production	737	1027	1,431	1,621	1,836	2,105	3,174	
International	Business	Resident	Attraction	737	1027	1,431	1,621	1,836	2,105	3,174	
International	Business	Non Resident	Production	522	638	779	892	1,022	1,187	1,858	
International	Business	Non Resident	Attraction	522	638	779	892	1,022	1,187	1,858	
International	Non Business	Resident	Production	3,552	4,948	6,892	7,808	8,846	10,142	15,287	
International	Non Business	Resident	Attraction	3,552	4,948	6,892	7,808	8,846	10,142	15,287	
International	Non Business	Non Resident	Production	1,799	2,218	2,735	3,131	3,584	4,164	6,532	
International	Non Business	Non Resident	Attraction	1,799	2,218	2,735	3,131	3,584	4,164	6,532	
Domestic	Business	Resident	Production	4,813	5,434	6,136	6,672	7,255	8,286	12,347	
Domestic	Business	Resident	Attraction	4,813	5,434	6,136	6,672	7,255	8,286	12,347	
Domestic	Business	Non Resident	Production	4,822	6,008	7,486	8,107	8,779	9,965	14,575	
Domestic	Business	Non Resident	Attraction	4,822	6,008	7,486	8,107	8,779	9,965	14,575	
Domestic	Non Business	Resident	Production	10,804	12,199	13,773	14,976	16,285	18,600	27,716	
Domestic	Non Business	Resident	Attraction	10,804	12,199	13,773	14,976	16,285	18,600	27,716	
Domestic	Non Business	Non Resident	Production	6,875	8,640	10,857	11,655	12,511	14,206	20,799	
Domestic	Non Business	Non Resident	Attraction	6,875	8,640	10,857	11,655	12,511	14,206	20,799	
TOTAL				67,848	82,444	100,179	109,750	120,236	137,320	204,568	



9 Appendix

9.1 Network Development Plan Bus Route Hierarchy

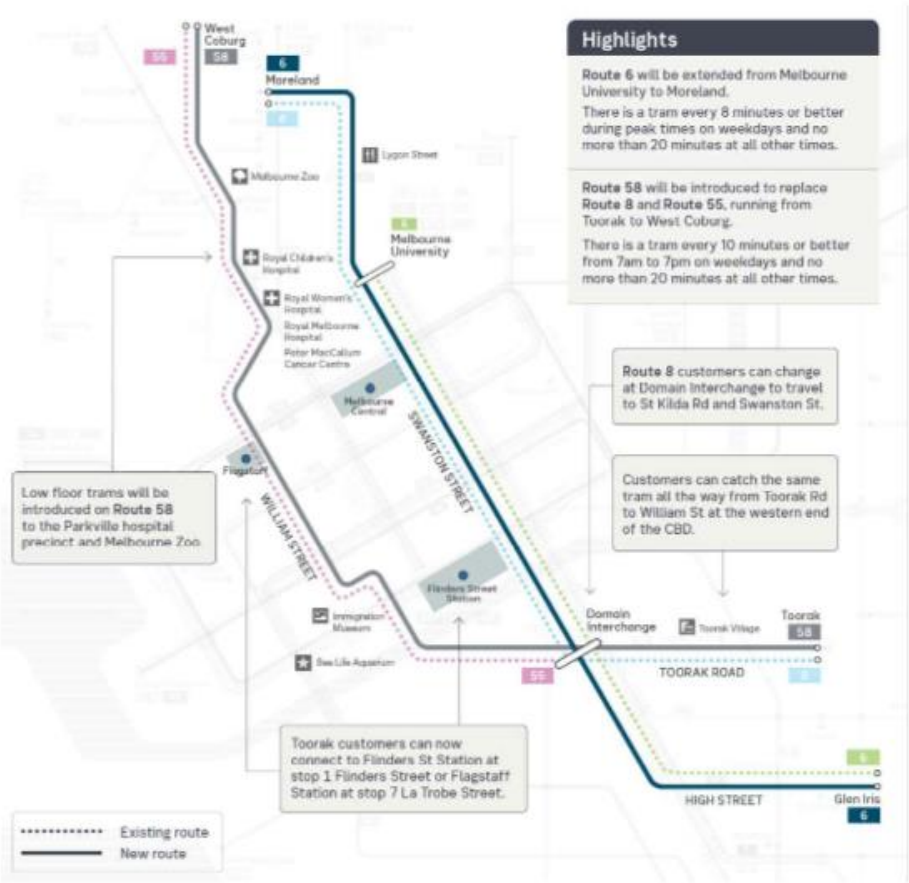
Table 5: Network Development Plan Bus Route Hierarchy

Route Type	Description
Premium	These will operate along arterial roads serving high demand corridors, offering fast and direct routes to major activity centres and train stations. Service frequency will be a minimum of 10 minutes during peaks and during the day, with similar operating hours to trains. These services will cater primarily for longer trips across metropolitan Melbourne, although they may also be used for local/feeder trips to nearby activity centres and train stations. Due to the high service levels, it is anticipated that passengers will be willing to walk further to access Premium routes.
Connector	These will operate along lower demand (or secondary) corridors relative to premium routes. They will provide fast and direct services between major destinations, such as train stations or shopping centres. They will also operate similar hours to trains, with peak service frequency of 20 minutes or better. Connector routes will operate mostly on arterial roads, with only minor running in local streets, and may be upgraded to premium status if the demand warrants it. As for premium routes, it is expected that passengers will be willing to walk further to access connector routes.
Neighbourhood	These have been designed to support premium and connector routes by providing a service designed to maximise accessibility and coverage. As such, they have been designed to appeal to those users with limited mobility or tolerance for long walking distances. Neighbourhood routes offer a localised service, focusing on connections to local destinations such as shopping strips, medical precincts and nearby train stations. They will be less direct with low frequencies and slower journey times compared to connector or premium services, but provide much greater penetration into residential neighbourhoods. In some areas where the operation of a fixed route by a standard bus is not feasible or viable, taxis may be used to provide a public transport service, with Myki fares applying. This would free up buses to run higher frequency services on other busier routes.



9.2 Tram Route 58 Alignment

Figure 1: Tram Route 58 Alignment





9.3 Assumed bus projects for 2021/26/36 Reference Case years

Table 6: Assumed bus projects for 2021/26/36 Reference Case years

Year	Project
2021	Starting point for modifications is the 2016 bus network with adjustments as per section Section 2.3 Bus 2021 above. Additions • E011 - Add MM Base 2021 route • E011R - Add MM Base 2021 route • E014 - Add MM Base 2021 route • E014R - Add MM Base 2021 route • E016 - Add MM Base 2021 route • E016R - Add MM Base 2021 route • E019 - Add MM Base 2021 route • E019R - Add MM Base 2021 route • E02 - Add MM Base 2021 route • E024 - Add MM Base 2021 route • E024R - Add MM Base 2021 route • E02R - Add MM Base 2021 route • E04 - Add MM Base 2021 route • E04R - Add MM Base 2021 route • E07 - Add MM Base 2021 route • E07R - Add MM Base 2021 route • E09 - Add MM Base 2021 route • E09R - Add MM Base 2021 route • E105 - Add MM Base 2021 route • E105R - Add MM Base 2021 route • E118 - Add MM Base 2021 route • E118R - Add MM Base 2021 route • E119 - Add MM Base 2021 route • E119R - Add MM Base 2021 route • E367 - Add MM Base 2021 route • E367R - Add MM Base 2021 route • E677 - Add MM Base 2021 route • E677R - Add MM Base 2021 route • E680 - Add MM Base 2021 route • E680R - Add MM Base 2021 route • E681 - Add MM Base 2021 route • E681R - Add MM Base 2021 route • E682 - Add MM Base 2021 route • E682R - Add MM Base 2021 route



	• E684 - Add MM Base 2021 route • E684R - Add MM Base 2021 route • E687 - Add MM Base 2021 route • E687R - Add MM Base 2021 route • E697 - Add MM Base 2021 route • E697R - Add MM Base 2021 route • E707 - Add MM Base 2021 route • E707R - Add MM Base 2021 route • E746 - Add MM Base 2021 route • E746R - Add MM Base 2021 route • E747 - Add MM Base 2021 route • E747R - Add MM Base 2021 route • E757 - Add MM Base 2021 route • E757R - Add MM Base 2021 route • E772 - Add MM Base 2021 route • E772R - Add MM Base 2021 route • E776 - Add MM Base 2021 route • E776R - Add MM Base 2021 route • E778 - Add MM Base 2021 route • E778R - Add MM Base 2021 route • E779 - Add MM Base 2021 route • E779R - Add MM Base 2021 route • E780 - Add MM Base 2021 route • E780R - Add MM Base 2021 route • E786 - Add MM Base 2021 route • E786R - Add MM Base 2021 route • E790 - Add MM Base 2021 route • E790R - Add MM Base 2021 route • E792 - Add MM Base 2021 route • E792R - Add MM Base 2021 route • E795 - Add MM Base 2021 route • E795R - Add MM Base 2021 route • E797 - Add MM Base 2021 route • E797R - Add MM Base 2021 route • E798 - Add MM Base 2021 route • E798R - Add MM Base 2021 route • E799 - Add MM Base 2021 route • E799R - Add MM Base 2021 route • E813 - Add MM Base 2021 route • E813R - Add MM Base 2021 route • E814 - Add MM Base 2021 route • E814R - Add MM Base 2021 route • E816 - Add MM Base 2021 route • E816R - Add MM Base 2021 route
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	• E827 - Add MM Base 2021 route • E827R - Add MM Base 2021 route • E833 - Add MM Base 2021 route • E833R - Add MM Base 2021 route • E834 - Add MM Base 2021 route • E834R - Add MM Base 2021 route • E836 - Add MM Base 2021 route • E836R - Add MM Base 2021 route • E837 - Add MM Base 2021 route • E837R - Add MM Base 2021 route • E839 - Add MM Base 2021 route • E839R - Add MM Base 2021 route • E845 - Add MM Base 2021 route • E845R - Add MM Base 2021 route • E846 - Add MM Base 2021 route • E846R - Add MM Base 2021 route • E858 - Add MM Base 2021 route • E858R - Add MM Base 2021 route • E893 - Add MM Base 2021 route • E893R - Add MM Base 2021 route • E894 - Add MM Base 2021 route • E894R - Add MM Base 2021 route • E897 - Add MM Base 2021 route • E897R - Add MM Base 2021 route • E920 - Add MM Base 2021 route • E920R - Add MM Base 2021 route • E921 - Add MM Base 2021 route • E921R - Add MM Base 2021 route • E922 - Add MM Base 2021 route • E922R - Add MM Base 2021 route • E923 - Add MM Base 2021 route • E923R - Add MM Base 2021 route • E924 - Add MM Base 2021 route • E924R - Add MM Base 2021 route • E925 - Add MM Base 2021 route • E925R - Add MM Base 2021 route • E926 - Add MM Base 2021 route • E926R - Add MM Base 2021 route • E928 - Add MM Base 2021 route • E928R - Add MM Base 2021 route • E929 - Add MM Base 2021 route • E929R - Add MM Base 2021 route • E931 - Add MM Base 2021 route • E931R - Add MM Base 2021 route
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	• N001_TB - Add MM Base 2021 route • N001_TBR - Add MM Base 2021 route • N002_TB - Add MM Base 2021 route • N002_TBR - Add MM Base 2021 route • N003_TB - Add MM Base 2021 route • N003_TBR - Add MM Base 2021 route • N004_TB - Add MM Base 2021 route • N004_TBR - Add MM Base 2021 route • N311 - Add MM Base 2021 route • N311R - Add MM Base 2021 route • N312 - Add MM Base 2021 route • N312R - Add MM Base 2021 route • N313 - Add MM Base 2021 route • N313R - Add MM Base 2021 route • N322 - Add MM Base 2021 route • N322R - Add MM Base 2021 route • N323 - Add MM Base 2021 route • N323R - Add MM Base 2021 route • N351 - Add MM Base 2021 route • N351R - Add MM Base 2021 route • N357 - Add MM Base 2021 route • N357R - Add MM Base 2021 route • N358 - Add MM Base 2021 route • N358R - Add MM Base 2021 route • N361 - Add MM Base 2021 route • N361R - Add MM Base 2021 route • N398 - Add MM Base 2021 route • N398R - Add MM Base 2021 route • N511 - Add MM Base 2021 route • N511R - Add MM Base 2021 route • N528 - Add MM Base 2021 route • N528R - Add MM Base 2021 route • N529 - Add MM Base 2021 route • N529R - Add MM Base 2021 route • N533 - Add MM Base 2021 route • N533R - Add MM Base 2021 route • N537 - Add MM Base 2021 route • N537R - Add MM Base 2021 route • N538 - Add MM Base 2021 route • N538R - Add MM Base 2021 route • W101 - Add MM Base 2021 route • W101R - Add MM Base 2021 route • W105 - Add MM Base 2021 route • W105R - Add MM Base 2021 route
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	• W113 - Add MM Base 2021 route • W113R - Add MM Base 2021 route • W116 - Add MM Base 2021 route • W116R - Add MM Base 2021 route • W117 - Add MM Base 2021 route • W117R - Add MM Base 2021 route • W119 - Add MM Base 2021 route • W119R - Add MM Base 2021 route • W121 - Add MM Base 2021 route • W121R - Add MM Base 2021 route • W400a - Add MM Base 2021 route • W400aR - Add MM Base 2021 route • W441 - Add MM Base 2021 route • W441R - Add MM Base 2021 route • W443 - Add MM Base 2021 route • W443R - Add MM Base 2021 route • W445 - Add MM Base 2021 route • W445R - Add MM Base 2021 route • W446 - Add MM Base 2021 route • W446R - Add MM Base 2021 route • W448 - Add MM Base 2021 route • W448R - Add MM Base 2021 route • W449 - Add MM Base 2021 route • W449R - Add MM Base 2021 route • W453 - Add MM Base 2021 route • W453R - Add MM Base 2021 route • W459 - Add MM Base 2021 route • W459R - Add MM Base 2021 route • W479a - Add MM Base 2021 route • W479aR - Add MM Base 2021 route • W481 - Add MM Base 2021 route • W481R - Add MM Base 2021 route • W483 - Add MM Base 2021 route • W483R - Add MM Base 2021 route • WDohertys - Add MM Base 2021 route • WDohertysR - Add MM Base 2021 route • WForsythRd - Add MM Base 2021 route • WForsythRdR - Add MM Base 2021 route • WMeltTax2 - Add MM Base 2021 route • WMeltTax2R - Add MM Base 2021 route
2026	Starting point for modifications is the 'MM Base 2021' bus network Modifications



	• N357 - Adopt MM Project 2031 route • N357R - Adopt MM Project 2031 route • N361 - Adopt MM Project 2031 route • N361R - Adopt MM Project 2031 route • N526 - Adopt MM Project 2031 route • N526R - Adopt MM Project 2031 route • N533 - Adopt MM Project 2031 route • N533R - Adopt MM Project 2031 route • W107 - Adopt MM Project 2031 route • W107R - Adopt MM Project 2031 route • W113 - Adopt MM Project 2031 route • W113R - Adopt MM Project 2031 route • W116 - Adopt MM Project 2031 route • W116R - Adopt MM Project 2031 route • W117 - Adopt MM Project 2031 route • W117R - Adopt MM Project 2031 route • W444 - Adopt MM Project 2031 route • W444R - Adopt MM Project 2031 route • W445 - Adopt MM Project 2031 route • W445R - Adopt MM Project 2031 route • W448 - Adopt MM Project 2031 route • W448R - Adopt MM Project 2031 route • W456 - Adopt MM Project 2031 route • W456R - Adopt MM Project 2031 route • W461 - Adopt MM Project 2031 route • W461R - Adopt MM Project 2031 route • W498 - Adopt MM Project 2031 route • W498R - Adopt MM Project 2031 route • W401 - Adopt MM Project 2031 Headways • W401R - Adopt MM Project 2031 Headways Additions • N583 - Add to MM Base 2021 network • N583R - Add to MM Base 2021 network • N584 - Add to MM Base 2021 network • N584R - Add to MM Base 2021 network • N585 - Add to MM Base 2021 network • N585R - Add to MM Base 2021 network • N589 - Add to MM Base 2021 network • N589R - Add to MM Base 2021 network • N590 - Add to MM Base 2021 network • W115 - Add to MM Base 2021 network • W115R - Add to MM Base 2021 network • N590R - Add to MM Base 2021 network
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	• W135 - Add to MM Base 2021 network • W135R - Add to MM Base 2021 network • W144 - Add to MM Base 2021 network • W144R - Add to MM Base 2021 network • W179 - Add to MM Base 2021 network • W179R - Add to MM Base 2021 network • W183 - Add to MM Base 2021 network • W183R - Add to MM Base 2021 network • W185 - Add to MM Base 2021 network • W185R - Add to MM Base 2021 network • W466 - Add to MM Base 2021 network • W466R - Add to MM Base 2021 network • WHighSt - Add to MM Base 2021 network • WHighStR - Add to MM Base 2021 network •
2036	Starting point for modifications is the 'MM Project 2031' bus network. Modifications • E792 - Adopt MM Project 2046 route • E792R - Adopt MM Project 2046 route • E801 - Adopt MM Project 2046 route • E801R - Adopt MM Project 2046 route • E835 - Adopt MM Project 2046 route • E835R - Adopt MM Project 2046 route • W107 - Adopt MM Project 2046 route • W107R - Adopt MM Project 2046 route • W115 - Adopt MM Project 2046 route • W115R - Adopt MM Project 2046 route • W116 - Adopt MM Project 2046 route • W116R - Adopt MM Project 2046 route • W117 - Adopt MM Project 2046 route • W117R - Adopt MM Project 2046 route • W119 - Adopt MM Project 2046 route • W119R - Adopt MM Project 2046 route • W121 - Adopt MM Project 2046 route • W121R - Adopt MM Project 2046 route • W185 - Adopt MM Project 2046 route • W185R - Adopt MM Project 2046 route • W418 - Adopt MM Project 2046 route • W418R - Adopt MM Project 2046 route • W442 - Adopt MM Project 2046 route • W442R - Adopt MM Project 2046 route • W446 - Adopt MM Project 2046 route



	• W446R - Adopt MM Project 2046 route • W453 - Adopt MM Project 2046 route • W453R - Adopt MM Project 2046 route • W456 - Adopt MM Project 2046 route • W456R - Adopt MM Project 2046 route • W461 - Adopt MM Project 2046 route • W461R - Adopt MM Project 2046 route • W466 - Adopt MM Project 2046 route • W466R - Adopt MM Project 2046 route • W498 - Adopt MM Project 2046 route • W498R - Adopt MM Project 2046 route • WDohertys - Adopt MM Project 2046 route • WDohertysR - Adopt MM Project 2046 route Additions • E941 - Add to MM Project 2031 network • E941R - Add to MM Project 2031 network • E942 - Add to MM Project 2031 network • E942R - Add to MM Project 2031 network • N586 - Add to MM Project 2031 network • N586R - Add to MM Project 2031 network • W114 - Add to MM Project 2031 network • W114R - Add to MM Project 2031 network • W120 - Add to MM Project 2031 network • W120R - Add to MM Project 2031 network • W122 - Add to MM Project 2031 network • W122R - Add to MM Project 2031 network • W123 - Add to MM Project 2031 network • W123R - Add to MM Project 2031 network • W124 - Add to MM Project 2031 network • W124R - Add to MM Project 2031 network • W125 - Add to MM Project 2031 network • W125R - Add to MM Project 2031 network • W128 - Add to MM Project 2031 network • W128R - Add to MM Project 2031 network • W184 - Add to MM Project 2031 network • W184R - Add to MM Project 2031 network • W186 - Add to MM Project 2031 network • W186R - Add to MM Project 2031 network • W187 - Add to MM Project 2031 network • W187R - Add to MM Project 2031 network • W492 - Add to MM Project 2031 network • W492R - Add to MM Project 2031 network • W499 - Add to MM Project 2031 network
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	• W499R - Add to MM Project 2031 network • WRockbankN - Add to MM Project 2031 network • WRockbankNR - Add to MM Project 2031 network • WRockbanks - Add to MM Project 2031 network • WRockbanksR - Add to MM Project 2031 network
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TfV reference case v1.09, interim road networks (170710), by TfV

Table A.2 - TfV Reference Case v1.09, Road Networks (170710)

No	Project	Scope	Year
2198	APAC Drive Extension - Melrose Dr to Tullamarine Fwy	New overpass (2 lane, 1-way)	2015
2164	Bridgewater Road - James Mirams Drive to Donald Cameron Drive	Duplication (4 lanes divided)	2015
2166	Brookfield Boulevard - Vantage Boulevard to Aitken Boulevard	New route (2 lanes)	2015
2154	Calder Freeway/Kings Rd Interchange, and Kings Rd duplication Calder Fwy - Melton Hwy	Interchange (full diamond) and duplication (4 lanes divided)	2015
2106	Clyde Road - Kangan Dr to High St (Princes Hwy)	Duplication (4 lanes divided), no grade separation	2015
2107	Cooper St - Hume Fwy to Edgars Rd	Widening (6 lanes divided)	2015
2151	Dandenong Valley Hwy (Stud Road) - Boronia Rd to Mountain Highway	Duplication (4 lanes divided)	2015
2001	Dingley Arterial East - Springvale Rd to Perry Rd	New route (6 lanes divided)	2015
2147	Hallam South Rd - Pound Rd to Ormond Rd	Duplication (4 lanes divided)	2015
2180	Harvest Home Road - Scanlon Dr to Edgars Rd	New route (2 lanes)	2015
2124	Koo Wee Rup Bypass - Manks Rd to South Gippsland Hwy	New route (2 lanes)	2015
2156	Kororoit Creek Rd - Grieve Pde to Millers Rd (4 lanes divided, includes grade separation)	Duplication (4 lanes divided) and grade separation	2015
2173	Linsell Blvd - Narre Warren-Cranbourne Rd to Berwick-Cranbourne Rd	New route (2 lanes)	2015
2008	M80 - Calder Fwy to Sydney Rd	Widening (to 6 or 8 lanes)	2015
2010	M80 - Edgars Rd to Plenty Rd	Widening (to 6 or 8 lanes)	2015
2203	M80 - Tullamarine Fwy to Pascoe Vale Rd	New exit ramp to Pascoe Vale Rd (2 lanes)	2015
2006	M80 - Western Hwy to Sunshine Av	Widening (to 6 or 8 lanes)	2015
1104	Marathon Bvd - Aitken Bvd to Windrock Av	New route (2 lanes)	2015
2201	Melrose Dr - Centre Rd to APAC Dr	Duplication (4 lanes divided)	2015
2199	Mercer Dr - Tullamarine Fwy to Melrose Dr	Widening (2 lanes)	2015
2153	Mitcham Rd - Whitehorse Rd to Brunswick Rd, and Rooks Rd - Whitehorse Rd to Station St	Rail grade separation	2015
2149	Palmer's Rd - Connectors to new Williams Landing railway station	New PT connectors	2015
2157	Palmer's Road - Extension beyond Princes Fwy across the Werribee rail line	New route (2 lanes)	2015
2004	Peninsula Link - Dandenong-Frankston Rd to Morn Pen Fwy	New route (4 lane freeway)	2015
2002	Peninsula Link (Frankston Bypass) - EastLink to Dandenong-Frankston Rd	New route (4 lane freeway)	2015
2155	Plenty Road - Gordons Rd to Riverdale Bvd	Duplication (4 lanes divided)	2015
2152	Springvale Rd - Virginia St to Balmoral Av	Rail grade separation	2015
2202	Tullamarine Fwy/M80 interchange - Tullamarine Fwy (S bd) to M80 (SW bd)	New elevated ramp (2 lanes) to replace current ramp	2015
2169	William Thwaites Boulevard - Glasscocks Rd to Thompsons Rd	New route (2 lanes)	2015
2158	Windrock Av/Main St - Marathon Bvd to Craigieburn Rd	New route (2 lanes)	2015
2200	Airport Dr Extension - Sharps Rd to Melrose Dr	New link (4 lane divided)	2016
3301	Burke Rd, Glen Iris	Grade separation	2016
2105	Cardinia Rd - Princes Hwy to Shearwater Dr	Duplication (4 lanes divided)	2016
2170	Casey Fields Boulevard - Linsell Av to Patterson Rd	New route (2 lanes)	2016
2172	Claret Ash Boulevard - Harkness Rd to Panorama Dr	New route (2 lanes)	2016
2999	Dingley Arterial West - Warrigal Rd to Westall Rd	New route (6 lanes divided); includes duplication of South Rd extension	2016
2192	Forsyth Road - Sayers Rd to Leakes Rd	New route (2 lanes)	2016



No	Project	Scope	Year
2196	Grassland Drive - Hacketts Rd to Point Cook Rd	New route (2 lanes)	2016
2159	Henry Rd - McCubbin Av to Cardinia Rd	New route (2 lanes)	2016
2123	High Street Rd - Stud Rd to Burwood Hwy	Duplication (4 lanes divided)	2016
2165	Marathon Bvd - Vantage Boulevard to Aitken Boulevard	New route (4 lanes divided)	2016
2311	McGregors Road - Henry Rd to Henty St	Duplication	2016
2312	McGregors Road - Level Crossing to Princes Hwy	Duplication (with exception of level crossing)	2016
2126	Narre Warren-Cranbourne Rd - Pound Rd to Thompsons Rd	Duplication (4 lanes divided)	2016
2168	Scanlon Drive Extension - Cooper St to Craigieburn Road	New route (2 lanes)	2016
2183	Shogaki Drive - Ferris Rd to Mount Cottrell Rd	New route (2 lanes)	2016
3099	2021 PT access		2021
3334	Abbotts Rd, Lyndhurst	Grade separation	2021
4183	Amaroo Road - Summerhill Rd to Donnybrook Rd	New route (2 lanes)	2021
2193	Armstrong Road - Black Forest Rd to Ballan Rd	New route (2 lanes)	2021
3206	Armstrong Road - Westbrook Dr to Black Forest Rd	New route (2 lanes)	2021
3362	Aviation Rd, Laverton	Grade separation	2021
3342	Balcombe Rd, Mentone	Grade separation	2021
2174	Ballarto Road - South Gippsland Hwy to Clyde-Five Ways Rd	Sealing (2 lanes)	2021
3354	Bell St, Coburg	Grade separation	2021
3358	Bell St, Preston	Grade separation	2021
3300	Blackburn Rd, Blackburn	Grade separation	2021
4166	Boundary Rd - Derrimut to Palmers Rd	Sealing (2 lanes)	2021
2162	Bridge Road - Ferris Road to Exford Road	Sealing (2 lanes)	2021
3351	Buckley St, Essendon	Grade separation	2021
3355	Camp Rd, Campbellfield	Grade separation	2021
3302	Cardinia Rd, Shearwater Dr to Pakenham Bypass	Duplication	2021
3340	Centre Rd, Bentleigh	Grade separation	2021
3370	Centre Rd, Clayton	Grade separation	2021
9270	Chandler Highway - Eastern Fwy Off Ramp to Heidelberg Rd	Widening (6 lanes divided)	2021
3333	Chandler Rd, Noble Park	Grade separation	2021
3341	Charman Rd, Cheltenham	Grade separation	2021
3363	Cherry St, Werribee	Grade separation	2021
3309	Clayton Rd, Clayton	Grade separation	2021
3338	Clyde Rd, Berwick	Grade separation	2021
2184	Coburns Rd - Hume Av to Exford Rd	New route (2 lanes)	2021
3332	Corrigan Rd, Noble Park	Grade separation	2021
7994	Derrimut Road - Leakes Road to Dohertys Road	Duplication (4 lanes divided)	2021
3182	Derrimut Road - Sayers Rd to Leakes Rd	Duplication (4 lanes divided)	2021
8341	Dohertys Rd - Cherry La to Westgate Dr freeway overpass	Widening (4 lanes)	2021
2111	Dohertys Rd - Fitzgerald Rd to Grieve Pde	Duplication (4 lanes, divided except on freeway overpass)	2021
3379	Dohertys Rd - Foundation Rd to Fitzgerald Rd	Widening (4 lanes divided)	2021
3378	Dohertys Rd - Palmers Rd to Foundation Rd	Widening (4 lanes divided)	2021
3186	Donald Cameron Drive - Bridgewater Road to Southern Cross Drive	Duplication (4 lanes divided)	2021
6127	Dunnings Rd - Pt Cook Rd to Palmers Rd	Duplication (4 lanes divided)	2021
8316	E14 - Somerton Rd to Mt Ridley Rd	Widening (4 lanes divided)	2021



No	Project	Scope	Year
3179	E14 (Aitken Bvd) - Craigieburn Rd to Central Arterial	New route (2 lanes)	2021
3120	E14 (Aitken Bvd) - Mt Ridley Rd to Gunns Gully Rd	New route (2 lanes)	2021
3178	E14 (Aitken Bvd) - Somerton Rd to Craigieburn Rd	New route (2 lanes)	2021
2163	Edgars Rd - O'Herns Rd to Craigieburn Rd East	New route (2 lanes)	2021
3343	Edithvale Rd, Edithvale	Grade separation	2021
2197	Evans Road - Prichard Av to Thompsons Rd	Sealing (2 lanes)	2021
3368	Ferguson St, Williamstown	Grade separation	2021
2187	Ferris Rd - Abey Rd to Iramoo Rd	New route (2 lanes)	2021
6126	Forsyth Rd - Old Geelong Rd to Sayers Rd	Duplication (4 lanes divided)	2021
3184	Forsyth Road - K-Mart Entrance to Wallace Ave	Duplication (4 lanes divided)	2021
4185	Forsyth Road/Christies Road - Leakes Rd to Boundary Rd	New route (2 lanes)	2021
2114	Forsyth Road/Old Geelong Rd - Intersection improvements	Duplication (4 lanes divided)	2021
3360	Furlong Rd, St Albans	Grade separation	2021
2177	Glasscocks Road - South Gippsland Hwy to Berwick-Cranbourne Rd	New route (2 lanes)	2021
3352	Glenroy Rd, Glenroy	Grade separation	2021
3330	Grange Rd, Caulfield East	Grade separation	2021
3356	Grange Rd, Fairfield	Grade separation	2021
2175	Greenhills Road - McGregors Rd to Koo Wee Rup Rd	Sealing (2 lanes)	2021
2194	Greens Rd - Armstrong Rd to Ison Rd	Sealing (2 lanes)	2021
4138	Grices Rd - Berwick-Cranbourne Rd to Soldiers Rd	Sealing (2 lanes)	2021
2195	Hacketts Rd - Sneydes Rd to Aviation Rd	Sealing (2 lanes)	2021
2117	Hallam South Rd - Ormond Rd to South Gippsland Hwy	Duplication (4 lanes divided)	2021
3337	Hallam South Road, Hallam	Grade separation	2021
3350	Heatherdale Rd, Ringwood	Grade separation	2021
3310	Heatherton Rd	Grade separation	2021
3359	High St, Reservoir	Grade separation	2021
3308	Koornang Rd	Grade separation	2021
3367	Kororoit Creek Rd, Altona	Grade separation	2021
2191	Leakes Rd - Davis Rd to Tarneit Rd	Sealing (2 lanes)	2021
5184	Leakes Rd - Derrimut Rd to Palmers Rd	Duplication (4 lanes divided)	2021
2150	Leakes Rd - Palmers Rd to Fitzgerald Rd	Duplication (4 lanes divided)	2021
3357	Lower Plenty Rd, Rosanna	Grade separation	2021
2011	M80 - Plenty Rd to Greensborough Hwy	Widening (6 lane freeway)	2021
1006	M80 - South bound, Deer Park Bypass to Boundary Rd	Widening (4 lanes S bd)	2021
2009	M80 - Sydney Rd to Edgars Rd	Widening (8 to 10 lane freeway)	2021
2005	M80 - WestGate Fwy to Western Hwy	Widening (8 to 10 lane freeway)	2021
3303	Main Rd, St Albans	Grade separation	2021
3365	Manchester Rd, Mooroolbark	Grade separation	2021
2161	Manor Lakes Bvd, Extension to Westbrook Dr	New route (2 lanes)	2021
3373	Maroondah Highway - Ringwood St to Warrandyte Rd	Speed reduction (40 kph)	2021
3366	Maroondah Hwy, Lilydale	Grade separation	2021
2176	McGregors Rd - Pakenham Bypass to Thompsons Rd Extension	Sealing (2 lanes)	2021
3339	McKinnon Rd, McKinnon	Grade separation	2021
3361	Melton Hwy, Taylors Lakes	Grade separation	2021
3014	Monash Freeway - Eastlink to South Gippsland Fwy	Widening (10 lane freeway)	2021



No	Project	Scope	Year
3015	Monash Freeway - Springvale Rd to Eastlink	Widening (10 lane freeway)	2021
3013	Monash Freeway - South Gippsland Fwy to Clyde Rd	Widening (6 lanes freeway)	2021
3377	Mordialloc Bypass - Springvale Road to Dingley Freeway	New route (4 lanes divided)	2021
3353	Moreland Rd, Brunswick	Grade separation	2021
4184	Morris Rd - Leakes Rd to Boundary Rd	New route (2 lanes)	2021
3371	Mountain Hwy, Bayswater	Grade separation	2021
2181	Mt Cottrell Rd - Greigs Rd to Western Fwy	Sealing (2 lanes)	2021
3305	Murrumbeena Rd	Grade separation	2021
3209	Nicholson St - Blyth St to Holmes St	Speed reduction (40 kph)	2021
3306	North Rd	Grade separation	2021
2179	Officer South Rd - Railway line to Pakenham Bypass	Sealing (2 lanes)	2021
9233	O'Herns Rd - Edgars Road to Epping Road	Duplication (4 lanes divided)	2021
4163	O'Herns Rd - Hume Fwy interchange	Interchange (full diamond)	2021
3348	Overton Rd (Skye Rd), Seaford	Grade separation	2021
6130	Palmers Rd - Dohertys Rd to Boundary Rd	Widening (4 lanes divided)	2021
4161	Palmers Rd - Dunnings Rd to Princes Fwy	Duplication (4 lanes divided)	2021
4165	Palmers Rd - Princes Fwy to Sayers Rd	Duplication (4 lanes divided)	2021
4162	Palmers Rd - Sayers Rd to Dohertys Rd	Duplication (4 lanes divided)	2021
9395	Plenty Road - Development Bvd to Gordons Rd	Widening (6 lanes divided)	2021
9271	Plenty Road - Gordons Rd to Riverdale Bvd	Widening (6 lanes divided)	2021
2132	Plenty Road - McKimmies Rd to Development Bvd	Widening (6 lanes divided)	2021
5185	Plenty Road - Riverdale Bvd to Bridge Inn Rd	Duplication (4 lanes divided)	2021
3331	Poath Rd, Hughesdale	Grade separation	2021
5186	Princes Freeway West, Interchange - Duncans Rd	Interchange (westerly oriented ramps)	2021
9236	Princes Freeway West, Interchange - Sneydes Road	Interchange (full diamond)	2021
8434	Princes Fwy West - Forsyth Rd	Ramp widening	2021
6131	Robinsons Rd - Boundary Rd to Deer Park Bypass	Duplication (4 lanes divided)	2021
3191	Scanlon Drive Extension - Craigieburn Rd to Summerhill Rd	New route (2 lanes)	2021
3304	Scoresby Rd, Bayswater	Grade separation	2021
3347	Seaford Rd, Seaford	Grade separation	2021
3312	Sladen St - Narre Warren-Cranbourne Rd to South Gippsland Hwy	Duplication (4 lanes, not divided)	2021
4181	Soldiers Rd - Grices Rd to Pound Rd	New route (2 lanes)	2021
3336	South Gippsland Hwy, Dandenong South	Grade separation	2021
3344	Station St, Bonbeach	Grade separation	2021
3376	Swan St Bridge	Widening (3 lanes east bound)	2021
9206	Tarneit Rd - Hogans Rd to Sayers Rd	Duplication (4 lanes divided)	2021
3176	Thompsons Rd - Dandenong Valley Hwy to Western Port Hwy	Duplication (4 lanes divided)	2021
6139	Thompsons Rd - Narre Warren - Cranbourne Rd to Berwick-Cranbourne Rd	Duplication (4 lanes divided)	2021
3197	Thompsons Rd Extension - Berwick-Cranbourne Rd to Soldiers Rd	New route (2 lanes)	2021
3335	Thompsons Rd, Cranbourne West	Grade separation	2021
3349	Toorak Rd, Kooyong	Grade separation	2021
3177	Tullamarine Freeway - Mickleham Rd to Melbourne Airport	Widening (6 lanes)	2021
3158	Tullamarine Freeway - Western Ring Rd to Mickleham Road	Widening (6 lanes)	2021
4187	Tullamarine Freeway - WRR to Melbourne Airport (North bound only)	Widening (4 lanes one-way)	2021



No	Project	Scope	Year
8388	Tullamarine Fwy - Bulla Rd to Western Ring Rd	Widening (6 lane freeway)	2021
9016	Tullamarine Fwy - Calder Fwy to Western Ring Rd southerly ramps	Widening (8 lane freeway)	2021
1202	Tullamarine Fwy/Calder Fwy interchange - Calder Fwy east-bound ramp	Widening to 3 lanes	2021
1205	Tullamarine Fwy/Calder Fwy interchange - Tullamarine Fwy south-bound ramp	Widening to 3 lanes	2021
1201	Tullamarine Fwy/Citylink - Calder Fwy to Westgate Fwy	Widening (10 lanes Calder Fwy to Flemington Rd, 8 lanes to Westgate Fwy) and free speed decrease to 80 kph	2021
3364	Werribee St, Werribee	Grade separation	2021
8998	West Gate Distributor Shepherds Bridge and Moreland St Widening	Widening (4 lanes outbound)	2021
333	Western Distributor - West Gate Fwy to Citylink / North Melbourne	New freeway (4 lanes)	2021
7308	Western Freeway - Mt Cottrell Rd	Remove direct freeway access	2021
9211	Yan Yean Rd - Kurrag Road to Diamond Creek Road	Duplication (4 lanes divided)	2021
2310	ZEBRA West Gate Freeway - Western Link to Burnley Tunnel	Widening (4 lanes east bound only)	2021
3320	ZEBRA Western Link - Brunswick Rd to Bulla Rd	Widening (10/12 lane freeway)	2021
4156	Berwick-Cranbourne Rd - Pattersons Rd to Narre Warren-Cranbourne Rd	Duplication (4 lanes, not divided)	2026
9164	Bridge Inn Rd - Plenty Rd to Yan Yean Rd	Duplication (4 lanes divided)	2026
8162	Bulla Bypass - Sunbury Rd to Somerton Rd	New route (4 lanes)	2026
8137	Calder Freeway, Interchange - Calder Park Dve	Interchange (full diamond)	2026
8138	Calder Park Dr - Calder Fwy to Melton Hwy	Duplication (4 lanes divided)	2026
5188	Craigieburn Rd - Dorchester St to Waterview Bvd	Duplication (4 lanes divided)	2026
4160	Craigieburn Rd - Hanson Rd to Dorchester St	Duplication (4 lanes divided)	2026
7996	Craigieburn Rd - Hanson Road to Hume Freeway	Duplication (4 lanes divided)	2026
8163	Craigieburn Rd - Mickleham Rd to E14	Duplication (4 lanes divided)	2026
8442	Craigieburn Road East - Hume Freeway to Epping Rd	Duplication (4 lanes divided)	2026
5006	Dandenong Bypass - South Gippsland Hwy to South Gippsland Fwy	New route (6 lanes divided)	2026
7995	Derrimut Road - Dohertys Road to Boundary Road	Duplication (4 lanes divided)	2026
4003	Eastern Freeway - Bulleen Rd to Doncaster Rd	Widening (10 lanes)	2026
4004	Eastern Freeway - Doncaster Rd to Springvale Rd	Widening (8 lanes)	2026
8385	Eastern Fwy - Chandler Hwy to Bulleen Rd	Widening (10 lane freeway)	2026
9450	Edgars Rd - Cooper St to O'Herns Rd	Widening (6 lanes divided)	2026
8168	Epping Rd - Findon Rd to Craigieburn Rd	Duplication (4 lanes divided)	2026
2146	Epping Rd - Memorial Av to Findon Rd	Duplication (4 lanes divided)	2026
8436	Glasscocks Road - Dandenong Valley Hwy to Western Port Hwy	Duplication (4 lanes divided)	2026
8204	Glasscocks Road - Evans Rd to South Gippsland Hwy	Duplication (4 lanes divided)	2026
8188	Glasscocks Road - Western Port Hwy to Evans Rd	Duplication (4 lanes divided)	2026
9168	Grange Rd - Heidelberg Rd to Darebin Rd	Duplication (4 lanes divided)	2026
3173	Hallam South Rd - Princes Hwy to Pound Rd	Duplication (4 lanes divided) and grade separation	2026
4188	Hallam South Rd - At railway crossing	Duplication (4 lanes divided)	2026
3204	Hopkins Rd Extension - Neale Rd to Melton Hwy	New route (2 lanes)	2026
5130	Koo-Wee-Rup Rd - Ballarto Rd to Manks Rd	Duplication (4 lanes divided)	2026
5131	Koo-Wee-Rup Rd - Hall Rd to Ballarto Rd	Duplication (4 lanes divided)	2026
5132	Koo-Wee-Rup Rd - Pakenham Bypass to Hall Rd	Duplication (4 lanes divided)	2026
5308	M80 - Plenty Rd to Greensborough Hwy	Widening (8 lane freeway)	2026
4119	Mickleham Road - Somerton Road to Craigieburn Road	Duplication (4 lanes divided)	2026



No	Project	Scope	Year
4157	Narre Warren - Cranbourne Rd - Thompsons Rd to South Gippsland Hwy	Duplication (4 lanes divided)	2026
4010	NEL / Manningham Rd interchange	Full interchange	2026
4008	North-East Link -connection between Metropolitan Ring Road and Eastern Freeway at Bulleen	New route (6-8 lane freeway)	2026
3375	O'Shea Rd - Soldiers Rd to Princes Fwy including South-East facing ramps and bridge widening	New route (4 lanes)	2026
2182	Paynes Road - Western Fwy to Harrison Rd	New route (2 lanes)	2026
5183	Pound Rd - West to Remington Drive Extension	New route (4 lanes divided) and grade separation	2026
8152	Pound Rd/Greaves Rd/o'Shea Rd route - Berwick-Cranbourne Rd to Princes Freeway	Duplication (4 lanes divided)	2026
2135	Somerton Road - Mickleham Rd to Roxburgh Park Dr	Duplication (4 lanes divided)	2026
1991	Taylors Rd - Kurung Dr (west) to west of Shire boundary	Duplication (4 lanes divided)	2026
4180	Thompsons Rd Extension - Soldiers Rd to Officer South Rd	New route (2 lanes)	2026
2167	Vantage Boulevard - Craigieburn Rd to Mt Ridley Rd	New route (2 lanes)	2026
4158	Westall Road (Nothern Extension) - Princes Hwy East to Monash Fwy	New route (4 laned divided)	2026
7309	Western Freeway - Paynes Rd	Remove direct freeway access	2026
7310	Western Freeway - Troupes Rd North	Remove direct freeway access	2026
3101	Armstrong Road - Ballan Rd to Sayers Rd	New route (2 lanes)	2031
4175	Bells Road - Pound Rd to Ballarto Rd	New route (2 lanes)	2031
4173	Bells Road/Yallambie Road - Ballarto Rd to Manks Rd	New route (2 lanes)	2031
4155	Berwick-Cranbourne Rd - Thompsons Rd to Pattersons Rd	Duplication (4 lanes not divided)	2031
5197	Beveridge-Darraweit Road Extension - Old Sydney Rd to Scanlon Drive Extension	New route (2 lanes)	2031
3199	Bodycoats Road - Craigieburn Rd to Summerhill Rd	New route (2 lanes)	2031
7302	Boundary Rd - Davis Rd to Derrimut Rd	Duplication (4 lanes divided)	2031
8338	Boundary Rd - Fitzgerald Rd to Western Ring Rd	Widening (6 lanes divided)	2031
3200	Boundary Road - Scanlon Dr to Epping Rd	New route (2 lanes)	2031
8143	Broadmeadows Rd - Mickleham Rd to Ripplebrook Dr	Duplication (4 lanes divided)	2031
4134	C21 North South Boulevard - Princes Fwy to Grices Rd	New route (4 lanes divided)	2031
6008	Calder Freeway - Vineyard Rd to Melton Hwy	Widening (6 lanes)	2031
7172	Calder Park Dr - Melton Hwy to Taylors Rd	Duplication (4 lanes divided)	2031
2206	Casey Fields Boulevard - Patterson Rd to South Gippsland Hwy	New route (2 lanes)	2031
2205	Casey Fields Boulevard - Thompsons Rd to Linsell Av	New route (2 lanes)	2031
7171	Childs Road - High St to Dalton Rd	Duplication (4 lanes divided)	2031
7169	Childs Road - High St to Edgars Rd	New route (4 lanes divided)	2031
9289	Christies Rd - Western Highway to Western Freeway	Duplication (4 lanes divided)	2031
5187	Cooper St - Hume Hwy to Hume Freeway	Widening (6 lanes divided)	2031
2190	Davis Rd - Boundary Rd to Dohertys Rd	Sealing (2 lanes)	2031
2160	Davis Rd - Dohertys Rd to Hogans Rd	New route (2 lanes)	2031
9294	Derrimut Road - Hogans Rd to Sayers Rd	Widening (6 lanes divided)	2031
4159	Dorset Rd - Burwood Hwy to Lysterfield Rd	New route (2 lanes)	2031
3122	E14 (Aitken Bvd) - Broadmeadows Rd Deviation to Somerton Rd	New route (4 lanes divided)	2031
5195	E14 (Mandalay Road) - Camerons Lane to north of boundary	New route (2 lanes)	2031
5191	E14 (Mandalay Road) - Gunns Gully Rd to Camerons Lane	New route (2 lanes)	2031
8315	Epping Rd - Bridge Inn Rd to Craigieburn Rd	Widening (4 lanes divided)	2031
6110	Evans Road - South Gippsland Hwy to Hall Rd	Duplication (4 lanes divided) and railway grade separation	2031
7173	Fitzsimons La - Main Rd to Porter St	Widening (6 lanes divided)	2031



No	Project	Scope	Year
3190	Gunns Gully Road - Hume Fwy to Scanlon Drive Extension	New route (2 lanes)	2031
9114	Hall Rd - Western Port Hwy to Sladen St	Duplication (4 lanes divided)	2031
4178	Hardys Road - Pound Rd to Muddy Gates La	New route (2 lanes)	2031
6140	Harrison Rd - Downing St to Hopkins Rd	New route (2 lanes)	2031
2189	Harrison Rd - Mount Cottrell Rd to Downing St	New route (2 lanes)	2031
3180	Heaths Rd - Shaws Rd to Tarneit Rd	Duplication (4 lanes divided)	2031
3181	Heaths Rd/Bolton Rd - Ballan Rd to Shaws Rd	Duplication (4 lanes divided) and bridge widening	2031
8317	Hopkins Rd - Greigs Rd to Plumpton Rd	Widening (4 lanes divided)	2031
3202	Hume Drive - Plumpton Road to Gourlay Road	New route (2 lanes)	2031
8432	Hume Freeway - Western Ring Rd to Cooper St	Widening (6 lanes)	2031
2185	Iramoo Rd - Exford Rd to Ferris Rd	New route (2 lanes)	2031
2186	Iramoo Rd - Ferris Rd to Greigs Rd	New route (2 lanes)	2031
8193	McGregor Rd - South of Henty St to Pakenham Bypass	Duplication (4 lanes divided)	2031
8439	Melbourne Airport - New elevated ring road connecting to Tullamarine Fwy	New link (1-way, 1-3 lanes)	2031
9453	Melton Hwy - Banchory Av toThe Regency	Widening (6 lanes divided)	2031
8135	Melton Hwy - The Regency to Ryans Lane	Widening (6 lanes divided)	2031
6116	Mickleham Road - Craigieburn Road to Donnybrook Road	Duplication (4 lanes divided)	2031
4174	Moores Road - South Gippsland Hwy to Bells Rd	New route (2 lanes)	2031
9216	Mornington-Tyabb Road - Nepean Hwy to Moorooduc Hwy	Duplication (4 lanes divided)	2031
5204	Mt Cottrell Rd - Western Fwy to Melton Hwy	New route (2 lanes)	2031
9010	Mt Cottrell Rd/Western Freeway Interchange	New interchange (half diamond, easterly ramps)	2031
4177	Muddy Gates Lane - Ballarto Rd to Hardys Rd	New route (2 lanes)	2031
5179	Narre Warren North Rd - Ernst Wanke Rd to Heatherton Rd	Duplication (4 lanes divided)	2031
5196	New east-west arterial north of Camerons Lane - Old Sydney Rd to Stewart St	New route (2 lanes)	2031
4170	New east-west arterial south of Camerons Lane (Rankin St?) - Old Sydney Rd to Stewart St	New route (2 lanes)	2031
4171	New east-west route north of OMR - Mandalay Rd to Patterson St	New route (2 lanes)	2031
4172	New north-south route in Donnybrook - Gunns Gully Rd to Scanlon Dr Extension	New route (2 lanes)	2031
5192	Patterson Street - Beveridge to north of Beveridge	New route (2 lanes)	2031
3196	Pattersons Road - Berwick-Cranbourne Rd to Tuckers Rd	New route (2 lanes)	2031
4179	Pattersons Road - Tuckers Rd to Pound Rd	New route (2 lanes)	2031
5205	Paynes Road - Melton Hwy to Western Fwy	New route (2 lanes)	2031
8431	Plumpton Road - Hopkins Road Extension to Calder Freeway	Widening (4 lanes divided)	2031
6124	Point Cook Road - Pt Cook Homestead Road to Dunnings Road	Duplication (4 lanes divided)	2031
8335	Princes Fwy - Kororoit Creek Rd to Dohertys Rd	Widening (10 lanes freeway)	2031
4122	Racecourse Road - Princes Hwy to Princes Fwy	Duplication (4 lanes divided) and grade separation	2031
3098	Road adjustment around Melbourne Metro Stations		2031
7170	Robinsons Rd/Westwood Dve - Deer Park Bypass to Western Hwy	Duplication (4 lanes divided) and grade separation	2031
3203	Saric Road - Melton Highway to Taylors Rd	New route (2 lanes)	2031
9378	Scanlon Drive - O'Herns Rd to Craigieburn Rd	Duplication	2031
5194	Scanlon Drive Extension - Beveridge Rd to Wallan	New route (2 lanes)	2031
9228	Shrives/Centre/Fullard Rds - Pound Rd to Narre Warren-Cranbourne Rd	Widening (4 lanes not divided)	2031
8308	Soldiers Rd - Grices Rd to Pound Rd	Duplication (4 lanes divided)	2031



No	Project	Scope	Year
8355	Somerton Rd - Tullamarine Fwy extension to Oaklands Rd	Widening (4 lanes divided)	2031
8124	Somerton Road - Mickleham Rd to Oaklands Rd	Duplication (4 lanes divided)	2031
8440	Somerton Road - Wildwood Rd to Tullamarine Fwy extension	Widening (4 lanes divided)	2031
5193	Stewart Street - Beveridge to Northern Highway at Hume Interchange	New route (2 lanes)	2031
3201	Summerhill Rd/Masons Rd - Scanlon Dr to E6	New route (2 lanes)	2031
8139	Sunbury Rd - Melbourne-Lancefield Road to Powlett Street	Duplication (4 lanes divided)	2031
5201	Tarletons Road - Leakes Rd to Plumpton Rd	New route (2 lanes)	2031
8144	Taylors Rd - Calder Park Dve to Plumpton Rd	Duplication (4 lanes divided)	2031
7167	Taylors Rd - Kings Rd to Kurung Dr	Duplication (4 lanes divided)	2031
8305	Taylors Road Extension - Melton Hwy to Plumpton Rd	Duplication (4 lanes divided)	2031
3157	Templestowe Rd - Bridge St to Thompsons Rd	Duplication (4 lanes divided)	2031
5198	Thompsons Rd Extension - Officer South Rd to Cardinia Rd	New route (2 lanes)	2031
3195	Tuckers Road - Pound Rd to Ballarto Rd	New route (2 lanes)	2031
4176	Tuckers Road/Derricks Rd - Ballarto Rd to Manks Rd	New route (2 lanes)	2031
5306	Tullamarine Freeway Extension - Melbourne Airport to Somerton Rd	New route (4 lane freeway)	2031
5176	Western Port Hwy - North Rd to Baxter Tooradin Rd	Duplication (4 lanes divided)	2031
6128	Westwood Drive - Western Hwy to Rockbank Middle Rd	Widening (4 lanes divided)	2031
8180	Boundary Rd- Derrimut Rd to Palmers Rd	Widening (6 lanes divided)	2036
8426	Boundary Rd- Palmers Rd to Fitzgerald Rd	Widening (6 lanes divided)	2036
9163	Bridge Inn Rd - Cravens Rd to Plenty Rd	Duplication (4 lanes divided)	2036
9161	Bridge Inn Rd - E6 to Cravens Rd	Duplication (4 lanes divided)	2036
9162	Bridge Inn Rd - Epping Rd to E6	Duplication (4 lanes divided)	2036
9005	Calder Freeway - M80 Ring Road to Melton Hwy	Widening (8 lanes divided)	2036
3185	Canterbury Avenue - Bundanoon Avenue to Albert Road	New route (2 lanes)	2036
3113	Canterbury Rd - Dorset Rd to Liverpool Rd	Widening (6 lanes divided)	2036
2171	Craig Road - new connection to South Gippsland Hwy	New route (2 lanes)	2036
7306	Dandenong Bypass - Perry Rd to South Gippsland Hwy	Widening (6 lanes divided)	2036
7311	Dohertys Rd - Derrimut Rd to Palmers Rd	Widening (4 lanes divided)	2036
2188	Downing Street - Greigs Rd to Harrison Rd	Sealing (2 lanes)	2036
8307	Duncans Rd - Princes Highway to Princes Freeway	Duplication (4 lanes divided)	2036
5008	Eastern Freeway - Doncaster Rd to Springvale Rd	Widening (8 lanes; and 10 lanes btn Tram Rd and Blackburn Rd)	2036
8345	Federation Dr - Centenary Av to Melton Hwy	Widening (4 lanes)	2036
3207	Greens Rd - Ison Rd to OMR	Sealing (2 lanes)	2036
8198	Hall Rd - McCormicks Rd to Western Port Hwy	Duplication (4 lanes divided)	2036
3194	Hardys Road - Berwick-Cranbourne Rd to Pound Rd	New route (2 lanes)	2036
8429	Hopkins Rd - Boundary Rd to Greigs Rd	Widening (6 lanes divided)	2036
8017	Hume Freeway - Cooper St to Craigieburn Rd	Widening (6 lanes)	2036
8414	Hume Fwy - Hume Hwy to Craigieburn Rd	Widening (6 lane freeway)	2036
8179	Leakes Rd - Davis Rd to Derrimut Rd	Duplication (4 lanes)	2036
8320	Leakes Rd - Davis Rd to Shanahans Rd	Widening (4 lanes divided)	2036
8344	Leakes Rd - Iramoo Rd to Taylors Rd	Widening (4 lanes)	2036
4167	Merrifield Road - north of Donnybrook Rd to Beveridge	New route (2 lanes)	2036
8430	Mt Cottrell Rd - Leakes Rd to Melton Hwy	Widening (4 lanes divided)	2036
9259	Narre Warren-Cranbourne Rd - Centre Rd to Pound Rd	Widening (6 lanes divided)	2036



No	Project	Scope	Year
9258	Narre Warren-Cranbourne Rd - Pound Rd to Thompsons Rd	Widening (6 lanes divided)	2036
5200	Officer South Rd - Pakenham Bypass to Patterson Rd	Sealing (2 lanes)	2036
4145	Officer South Rd - Rix Rd to Pakenham Bypass	Interchange (full diamond), duplication (4 lanes divided) and grade separation	2036
8153	Pound Rd/Greaves Rd/O'Shea Rd route - Hallam South Rd to Narre Warren-Cranbourne Rd	Duplication (4 lanes divided)	2036
4137	Pound Rd/Greaves Rd/O'Shea Rd route - Narre Warren-Cranbourne Rd to Berwick-Cranbourne Rd	Duplication (4 lanes divided)	2036
3193	Pound Road - Soldiers Rd Extension to Bells Rd	New route (2 lanes)	2036
2302	Princes Freeway East, Interchange - McGregor Rd	Interchange (easterly oriented ramps)	2036
3314	Princes Fwy / Clyde Road Interchange	Interchange Upgrade - improve capacity	2036
6143	Riding Boundary Rd - Mt Atkinson Rd to Hopkins Rd	New route (2 lanes)	2036
8334	Sayers Rd - Derrimut Rd to Palmers Rd	Widening (4 lanes)	2036
3192	Scanlon Drive Extension - Gunns Gully Rd to Beveridge Rd	New route (2 lanes)	2036
8330	Sneydes Rd - Hoppers La to Boardwalk Bvd	Widening (4 lanes)	2036
8378	South Gippsland Hwy - South Gippsland Fwy to Thompsons Rd	Widening (6 lanes divided)	2036
9286	Sunbury Rd - OMR to Melbourne-Lancefield Rd	Widening (6 lanes divided)	2036
8410	Thompsons Rd - Eastlink to McCormicks Rd	Widening (6 lanes divided)	2036
6141	Troups Road South - Greigs Rd to Harrison Rd	New route (2 lanes)	2036
7305	Westall Rd - Dingley Arterial to Springvale Rd	Widening (6 lanes divided)	2036
9438	William Thwaites Boulevard - Glasscocks Rd to Thompsons Rd	Duplication (4 lanes divided)	2036
9244	Yan Yean Road -Kurra Road to Bridge Inn Road	Duplication (4 lanes divided)	2036
8318	Ballan Rd - OMR to Bulban Rd	Widening (4 lanes divided)	2041
9213	Ballarto Road - South Gippsland Hwy to Casey Fields Bvd	Duplication (4 lanes divided)	2041
8420	Barry Road - Malmsbury Dr to E14	New route (2 lanes)	2041
9253	Berwick-Cranbourne Rd - Pound Rd to Thompsons Rd	Widening (6 lanes divided)	2041
9254	Berwick-Cranbourne Rd - Thompsons Rd to Pattersons Rd	Widening (6 lanes divided)	2041
8339	Boundary Rd - WRR to Fairbairn Rd	Widening (6 lanes divided)	2041
8419	Brookville Dr - Amaroo Rd to Donnybrook Rd	Widening (4 lanes divided)	2041
6134	Burwood Highway - Scoresby Rd to Ferntree Gully Rd	Widening (6 lanes divided)	2041
8136	Calder Freeway, Interchange - Sunshine Ave	Interchange (1/2 diamond, westerly oriented)	2041
6137	Canterbury Rd - Liverpool Rd to Mount Dandenong Tourist Rd	Widening (6 lanes divided)	2041
9440	Casey Fields Bvd/Craig Road - Ballarto Rd to Browns Rd	Duplication (4 lanes divided)	2041
6123	Childs Rd - Bowman Dr to Proposed E6	Duplication (4 lanes divided)	2041
8370	Clyde Road - Grices Rd to Moondarra Dr	Widening (6 lanes divided)	2041
6135	Clyde-Five Ways Rd - Pattersons Rd to South Gippsland Hwy	Duplication (4 lanes divided)	2041
9104	Cranbourne Local Bypass/Linsell Blvd/Hardys Road - South Gippsland Hwy to Muddy Gates La	Duplication (4 lanes divided)	2041
9265	Cranbourne-Frankston Rd - Western Port Hwy to Hall Rd	Widening (6 lanes divided)	2041
8380	Dandenong-Frankston Rd - Thompsons Rd to Greens Rd	Widening (6 lanes divided)	2041
8358	Diamond Creek Rd - Greensborough Bypass to Yan Yean Rd	Widening (6 lanes divided)	2041
7001	E6 - Findon Rd to Bridge Inn Rd (includes sealing of Craigieburn Rd East from OMR to Epping Rd)	New route (4 lane freeway)	2041
8309	E6 - Hume Fwy to Scanlon Dr	New route (4 lane freeway)	2041
8014	E6 - Metropolitan Ring Rd to Findon Rd	New route (4 lane freeway)	2041
8012	E6 - Scanlon Dr to Bridge Inn Rd	New route (4 lane freeway)	2041
4005	Eastlink - Maroondah Hwy to Dingley Arterial	Widening (8 lanes)	2041



No	Project	Scope	Year
6138	Ferntree Gully Rd - Scoresby Rd to Burwood Hwy	Widening (6 lanes divided)	2041
9110	Glasscocks Road - South Gippsland Hwy to Berwick-Cranbourne Rd	Duplication (4 lanes divided)	2041
9226	Gorge Rd/ Kurrak Rd - Plenty Rd to Yan Yean Rd	Duplication (4 lanes divided)	2041
8343	Greigs Road - Troups Rd Sth to Hopkins Rd	Widening (4 lanes)	2041
9111	Grices Rd - Berwick-Cranbourne Rd to Soldiers Rd	Duplication (4 lanes divided)	2041
7159	Heatherton Rd - Hallam North Rd to Belgrave-Hallam Rd	Duplication (4 lanes divided)	2041
8408	Heatherton Rd - Monash Fwy to Power Rd	Widening (6 lanes divided)	2041
8415	Hume Fwy - Gunns Gully Rd to south of Donnybrook Rd	Widening (6 lane freeway)	2041
9514	Hume Fwy - south of Donnybrook Rd to Hume Hwy	Widening (8 lane freeway)	2041
8342	Iramoo Rd - Mt Cottrell Rd to Greigs Rd	Widening (4 lanes)	2041
6132	Leakes Rd - Palmers Rd to Fitzgerald Rd	Widening (6 lanes divided)	2041
8340	Little Boundary Rd - Fairbairn Rd to Princes Hwy	Widening (6 lanes divided)	2041
8185	Lysterfield Rd -Napoleon Rd to Wellington Rd	Duplication (4 lanes divided)	2041
8421	M80 - E6 to Greensborough Hwy	Widening (10 lane freeway)	2041
8192	McGregor Rd - Pakenham Bypass to Thompsons Rd Extension	Duplication (4 lanes divided)	2041
8381	Mornington Peninsula Fwy - Lower Dandenong Rd to Springvale Rd	Widening (6 lane freeway)	2041
8382	Mornington Peninsula Fwy - Springvale Rd to Eastlink	Widening (8 lane freeway)	2041
9130	Mount Dandenong Road - Liverpool Rd to Canterbury Rd	Duplication (4 lanes divided)	2041
6142	Mt Atkinson Rd - Boundary Rd to Greigs Rd	New route (2 lanes)	2041
9232	Officer South Rd - Princes Hwy to Rix Rd	Widening (4 lanes divided)	2041
8007	OMR - Princes Fwy to Ballan Rd	New route (4 lane freeway)	2041
8368	Princes Hwy - Old Princes Hwy to Officer South Rd	Widening (6 lanes divided)	2041
8016	Punt Road - Swan Street to St Kilda junction	Widening (6 lanes)	2041
9137	Remington Dve to Bangholme Rd (via Colemans and Taylors Rds)	New route (4 lanes divided)	2041
9522	Robinsons Rd - through Deer Park Bypass interchange	Widening (6 lanes divided)	2041
5994	Sayers Road/ Old Geelong Road - Palmers Road to Kororoit Creek Road	Duplication (4 lanes divided)	2041
9280	Somerton Road - Hume Hwy to Roxburgh Park Drive	Widening (6 lanes divided)	2041
9018	South Gippsland Freeway - Monash Fwy to South Gippsland Hwy	Widening (6 lanes)	2041
5182	Springvale Rd - Mitcham Rd to Old Warrandyte Rd	Duplication (4 lanes divided)	2041
4129	Springvale Rd - Old Warrandyte Rd to Reynolds Rd	Duplication (4 lanes divided)	2041
4108	Stud Road Extension (Bayswater Bypass) - Mountain Highway to Dorset Road	New route (4 lanes)	2041
8424	Surrey Rd - Eastern Fwy to Springfield Rd	Widening (4 lanes divided)	2041
8409	Swansea Rd - York Rd to Mt Dandenong Rd	Widening (6 lanes divided)	2041
8311	Thompsons Rd - Berwick-Cranbourne Rd to Officer South Rd	Widening (4 lanes divided)	2041
9145	Thompsons Rd - McCormicks Rd to Clyde Rd	Widening (6 lanes divided)	2041
3198	Thompsons Rd Extension - Cardinia Rd to McGregors Rd	New route (2 lanes)	2041
8190	Thompsons Rd Extension - Officer South Rd to McGregors Rd	Widening (4 lanes not divided)	2041
2140	Thompsons Rd/Western Port Hwy Interchange	Interchange (full diamond) and grade separation	2041
7175	Wantirna Road - Canterbury Road to Maroondah Hwy	Duplication (4 lanes divided)	2041
7176	Wellington Rd - Napoleon Rd to Kelletts Rd	Duplication (4 lanes divided)	2041
8993	Wellington Road- Kellets Road to Lysterfield Road	Duplication (4 lanes divided)	2041
6125	Westbrook Dr - Ballan Rd to Leakes Rd	Duplication (4 lanes)	2041
9007	Western Freeway - Deer Park Bypass	Widening (6 lane freeway)	2041
6007	Western Fwy - Hopkins Rd to Leakes Rd	Widening (6 lanes)	2041



No	Project	Scope	Year
5174	Western Port Hwy - Baxter Tooradin Rd to Frankston Flinders Rd	Duplication (4 lanes divided)	2041
5206	Western Port Hwy - South Gippsland Hwy to Cranbourne-Frankston Rd	Widening (6 lanes divided)	2041
8372	Ballarto Road - Casey Fields Bvd to Clyde-Five Ways Rd	Widening (4 lanes divided)	2051
8376	Baxter-Tooradin Rd - Western Port Hwy to South Gippsland Hwy	Widening (4 lanes divided)	2051
5180	Bayswater Rd - Canterbury Rd to Mt Dandenong Rd	Widening (4 lanes)	2051
8187	Belgrave Hallam Road - New Wellington Road connection to Heatherton Rd	Duplication (4 lanes divided)	2051
9256	Berwick-Cranbourne Rd/Sladen St - Pattersons Rd to South Gippsland Hwy	Widening (6 lanes divided)	2051
4131	Boronia Rd - Mountain Hwy to Stud Rd	Widening (6 lanes divided)	2051
8375	Browns Rd - Western Port Hwy to Craig Rd	Widening (4 lanes divided)	2051
5181	Burwood Highway - Cathies Lane to Stud Road	Widening (6 lanes divided)	2051
9444	Cardinia Road - Henry Rd to Lecky Rd	Widening (6 lanes divided)	2051
9439	Casey Fields Boulevard - Thompsons Rd to Ballarto Rd	Duplication (4 lanes divided)	2051
8371	Clyde-Five Ways Rd - Ballarto Rd to Berwick-Cranbourne Rd	Widening (6 lanes divided)	2051
8412	Craigieburn Rd - Hanson Rd to Hardy Av	Widening (6 lanes divided)	2051
7178	Croydon Road/Wonga Road/Warranwood Road/Plymouth Road - Yarra Road to Ringwood-Warrandyte	Duplication (4 lanes divided)	2051
8147	Dandenong Valley Hwy (Stud Road) - High Street to Burwood Highway	Widening (3 lanes north bound)	2051
8146	Dandenong Valley Hwy (Stud Road) - Burwood Hwy to Boronia Rd	Widening (3 lanes north bound)	2051
8150	Dandenong Valley Hwy (Stud Road) - Ferntree Gully Road to High St Road	Widening (6 lanes divided)	2051
8148	Dandenong Valley Hwy (Stud Road) - Monash Fwy to Heatherton Road	Widening (3 lanes south bound)	2051
8149	Dandenong Valley Hwy (Stud Road) - Wellington Road to Kellets Road Rowville	Widening (6 lanes divided)	2051
8151	Dandenong Valley Hwy (Stud Road) - Wellington Road to Monash Freeway (Widen 4 to 6 Lanes Divided)	Widening (6 lanes divided)	2051
8435	Dandenong-Frankston Rd - Greens Rd to Dandenong Bypass	Widening (6 lanes divided)	2051
8427	Derrimut Road - Dohertys Road to Boundary Road	Widening (6 lanes divided)	2051
8428	Derrimut Road - Leakes Road to Dohertys Road	Widening (6 lanes divided)	2051
9293	Derrimut Road - Sayers Rd to Leakes Rd	Widening (6 lanes divided)	2051
7993	Diamond Creek Road- Aqueduct Road to Ryans Road	Duplication (4 lanes divided)	2051
9516	Dingley Freeway - Perry Rd to South Gippsland Fwy	Conversion to freeway (6 lanes)	2051
9524	Dingley Freeway - South Road to Cheltenham Rd	Conversion to freeway (6 lanes)	2051
9107	Dorset Rd - Boronia Rd to Burwood Hwy	Widening (6 lanes divided)	2051
8157	Dorset Rd - Hull Rd to Maroondah Highway	Duplication (4 lanes divided)	2051
8184	Dorset Road - Olive Grove to Rosella Grove	Duplication (4 lanes divided)	2051
4007	East-West Freeway - OMR to Deer Park Bypass	New route (4 lane freeway)	2051
8422	Elgar Rd - Eastern Fwy to Woodhouse Gr	Widening (6 lanes divided)	2051
5178	Ferntree Gully Rd - Stud Rd to Scoresby Rd	Widening (6 lanes divided)	2051
9503	Fitzgerald Road - Kororoit Creek Rd to Western Fwy ramp	Widening (6 lanes divided)	2051
9109	Glasscocks Road - Dandenong Valley Hwy to Evans Rd	Widening (6 lanes divided)	2051
4190	Golf Links Rd - Peninsula Link to Baxter-Tooradin Rd	Duplication (4 lanes divided)	2051
8312	Greenhills Rd - McGregor Rd to Koo Wee Rup Rd	Widening (4 lanes divided)	2051
9113	Hall Rd - Dandenong-Frankston Rd to Western Port Hwy	Widening (6 lanes divided)	2051
9298	Hobbs Rd/Sewells Rd - Ballan Rd to Sayers Rd	Duplication (4 lanes divided)	2051
8418	Hume Highway - Craigieburn Rd to Hume Freeway	Widening (6 lanes divided)	2051
6004	Koo Wee Rup Rd, new freeway - Princes Freeway at Pakenham to South Gippsland Highway at Koo Wee Rup	Conversion to freeway (4 lanes)	2051
9185	Leakes Rd - Mt Cottrell Rd to Palmers Rd	Widening (6 lanes divided)	2051



No	Project	Scope	Year
7174	Main Rd - Fitzsimons La to Bridge St	Widening (4 lanes not divided)	2051
9123	Maroondah Highway - Warburton Highway to Melba Highway	Duplication (4 lanes divided)	2051
8155	Maroondah Hwy Deviation at Lilydale - Maroondah Hwy to Anderson Rd	New route (4 lanes divided)	2051
9127	Melba Highway - Coldstream to north of Yarra Glen	Duplication and deviation (4 lanes divided)	2051
8353	Melbourne-Lancefield Rd - Sunbury Rd to north of Raes Rd	Widening (4 lanes divided)	2051
6002	Mornington Peninsula Fwy - Eastlink to Springvale Rd	Widening (6 lanes)	2051
8366	Mt Dandenong Rd - Whitehorse Rd to Dublin Rd	Widening (6 lanes divided)	2051
9432	Muddy Gates Lane - Ballarto Rd to Hardys Rd	Duplication (4 lanes divided)	2051
7177	Napoleon Rd - Kelletts Rd to Lysterfield Rd	Duplication (4 lanes divided)	2051
9389	New east-west arterial south of Donnybrook Road (includes half interchange with Hume Fwy) - Aitken Bvd to Brookville Dr	Duplication (4 lanes divided) + 1/2 diamond interchange, south facing ramps	2051
9134	Officer South Rd - Lecky Rd to Thompsons Rd	Widening (4 lanes not divided)	2051
8154	Officer South Rd - Pakenham Bypass to Lecky Rd	Widening (4 lanes not divided)	2051
4006	OMR - Ballan Rd to East-West Freeway	New route (4 lane freeway)	2051
7304	OMR - Calder Fwy to Sunbury Rd	New route (4 lane freeway)	2051
6014	OMR - Easterly oriented ramps at Sunbury Rd	New freeway ramps (1 lane)	2051
8008	OMR - East-West Freeway to Calder Fwy	New route (4 lane freeway)	2051
6009	OMR - Sunbury Rd to Hume Fwy	New route (4 lane freeway)	2051
8336	Palmer's Rd - Leakes Rd to Middle Rd	Widening (6 lanes divided)	2051
9428	Pattersons Road - Bells Rd to Pound Rd	Duplication (4 lanes divided)	2051
8407	Peninsula Link (Frankston Bypass) - EastLink to Frankston-Flinders Rd	Widening (6 lane freeway)	2051
8433	Princes Fwy West - Heath's Rd	New interchange	2051
4169	Scanlon Drive Extension - Summerhill Rd to Gunns Gully Rd	New route (2 lanes)	2051
9199	Somerton Road - Mickleham Rd to Roxburgh Park Dr	Widening (6 lanes divided)	2051
6010	Tullamarine Freeway Extension - Melbourne Airport to Somerton Rd	New route (6 lane freeway)	2051
5300	Tullamarine Freeway Extension - Somerton Rd to OMR	New route (4 lane freeway)	2051
9418	Victoria Road - Maroondah Hwy to Paynes Rd Extension	Duplication (4 lanes divided)	2051
8995	Victoria St - Doncaster Road to King St	Widening (4 lanes not divided)	2051
8186	Wellington Rd - Lysterfield Rd to Belgrave-Hallam Rd	Duplication (4 lanes divided)	2051
9009	Western Freeway - Leakes Rd to Coburns Rd	Widening (6 lanes)	2051
9011	Western Freeway - Western Highway to Hopkins Rd	Widening (6 lanes)	2051
6001	Western Port Hwy - South Gippsland Hwy to Cranbourne-Frankston Rd (excludes Wedge Rd interchange)	Conversion to freeway (4 lanes)	2051
8363	Williamsons Rd - Eucalypt Av to Foote St	Widening (6 lanes divided)	2051
8364	Williamsons Rd/Fitzsimons La - Foote St to Main Rd	Widening (8 lanes divided)	2051

Source: TfV v1.09 Reference Case



New projects

Provisional No	Project	Scope	Year	Comment
NW006	Abey Road - New bridge - Ferris Rd to Station Rd	New route 2 lanes	2021	
NW055	Arena Boulevard (James Mirriams Drive to Silvester Parade)	New route (2 lanes)	2021	
NW028	Armstrong Road - Ballan Road to 1.2km north of Ballan Road	Sealing (2 lanes)	2021	Replaces part of 3101
NW083	Auxiliary lane from Craigieburn Bypass to Edgars Rd	New Link (2 lanes)	2021	
NW044	Blosson Boulevard	New route (2 lanes)	2021	
SE007	Bridge Road Duplication from Cardinia Road to west of Viridian Way	Duplication (4 lanes divided)	2021	
SE008	Bridge Road Duplication from Shaw Road to east of Gum Scrub Creek	Duplication (4 lanes divided)	2021	
NW036	Brookfield Boulevard (Highlander Blv to Craigieburn West PSP connector road)	New route (2 lanes)	2021	
NW025	Bulban Road deviation to intersect with Ison Road (Existing road for 1.7km west from McGrath Road is deviated off the current alignment)	New route (2 lanes)	2021	
SE012	Cardinia Road South of Princes Freeway to western arterial (Glasscocks Rd extension)	Extension	2021	Replaces part of 6136
NW007	City Vista - Aspire Blvd - Taylors Rd to Beattys Rd	New route 2 lanes	2021	
NW058	Civic Drive - Bush Bld to Morang Drive	New route (2 lanes)	2021	
NW030	Cloverton Boulevard (south of Cameron Street)	New route (2 lanes)	2021	Replaces part of 3188
NW106	Davis Rd - Hogans Rd to Leakes Rd	Sealing (2 lanes)	2021	
NW056	East - West Connector - Edgars Road to Epping Central	New route (2 lanes)	2021	
SE002	Eel Race Road, Carrum	Closing/truncating road	2021	Replaces 3346
NW039	Elevation Boulevard (Waterview Blv to Vantage Blv)	New route (2 lanes)	2021	
NW050	Elizabeth Drive (Mitchells Lane to Vineyard Rd)	New route (2 lanes)	2021	
NW051	Elizabeth Drive (Racecourse to Dunrossil Drive)	New route (2 lanes)	2021	Part of 8167
NW049	Elizabeth Drive (Racecourse to Jacksons Creek)	New route (2 lanes)	2021	Part of 8167
NW015	Foundation Road - Dohertys Road to Leakes Road	New route (4 lanes)	2021	
NW035	Grand Boulevard (Highlander Blv to Craigieburn West PSP connector road)	New route (2 lanes)	2021	
NW072	Hayes Hill Blvd- Donnybrook Road to Merriang Road	New route (2 lanes)	2021	
NW046	Hillview Road	New route (2 lanes)	2021	
NW019	Hogans Road - Davis Creek to Davis Road	Sealing (2 lanes)	2021	
NW042	Horizon Boulevard	New route (2 lanes)	2021	
NW005	Hume Drive - Calder Park Drive to Overton Lea Bvd	Duplication to 4 lanes	2021	
NW110	Ison Road (Westbrook Dr) - Armstrong Rd to Ballan Rd	New route (2 lanes)	2021	
NW024	Ison Road (Westbrook Dr) - Ballan Road to 1km north of Ballan Road	New route (2 lanes)	2021	Replaces part of 4186
NW109	Ison Road (Westbrook Dr) - Princes Fwy to Armstrong Rd	New route (4 lanes)	2021	
NW074	Lehmans Road - Bindts Road to North South Connector	New route (2 lanes)	2021	
NW082	M80 - South of EJ Whitten Bridge to Calder Fwy	Widening (10 lane freeway)	2021	Replaces part of 2007
NW081	M80 - Sunshine Av to south of EJ Whitten Bridge	Widening (8 lane freeway)	2021	Replaces part of 2007
NW037	Marathon Boulevard (Waterview Boulevard to Whites Lane)	New route (2 lanes)	2021	
SE003	Mascot Avenue, Carrum	Closing/truncating road	2021	
SE004	McLeod Road, Carrum	Extension with Grade Separation	2021	
SE021	Monash Freeway - Clyde Rd to Cardinia Road	Widening (6 lanes freeway)	2021	Replaces part of 3016



Provisional No	Project	Scope	Year	Comment
				(together with SE22)
NW016	Morris Rd - Dohertys Rd to 800m north of Dohertys Road	New route (2 lanes)	2021	
NW004	Mt Cottrell Rd - Greigs Rd to Boundary Road	Sealing 2 lanes	2021	
NW057	North- South Connector - Cooper Street to Deveny Road	New route (2 lanes)	2021	
NW107	O'Herns Rd - Hume Fwy to Edgars Rd	Duplication (4 lanes divided)	2021	
SE006	Park Road, Cheltenham	Grade Separation	2021	
NW069	Pattersons Drive- Donnybrook Road to Merri Creek	New route (2 lanes) (interim)	2021	
NW062	Regent Street- west of Cravens Road	New route (2 lanes)	2021	
NW061	Riversdale Boulevard - Berry Lane to Bridge Inn Road	New route (2 lanes)	2021	
NW008	Rockbank Middle Road - Caroline Springs Blvd to Westwood Dr	Duplication to 4 lanes	2021	
NW047	Roxburgh Park Drive	Upgrade (4 lanes) divided	2021	
NW066	Salt Lake Boulevard- Lehmans Road - Edgars Road	New route (2 lanes)	2021	
NW045	Section Road	New route (2 lanes)	2021	
SE001	Station Street, Carrum	Closing/truncating road	2021	Replaces 3345
SE005	Station Street, Carrum	Extension across Patterson River	2021	
SE011	Thewlis Road extension from Princes Highway to Kenneth Road	Extension	2021	
SE018	Thompsons Rd, Marriott Boulevard to South Gippsland Hwy	Widening (6 lanes)	2021	Replaces part of 3174
SE019	Thompsons Rd, Western Port Hwy to Marriott Boulevard	Duplication (4 lanes divided)	2021	Replaces part of 3174.
NW075	Vearings Road- Cooper Street to O'Herns	New route (2 lanes)	2021	
SE013	Western Arterial road (Cardinia Rd to Gum Scrum Creek)	Extension	2021	Replaces part of 5199
NW003	Westwood Drive - Rockbank Middle Rd to Taylors Rd	New route 2 lanes	2021	
NW013	Beattys Road - Melton Hwy to Hopkins Rd extension	New route 2 lanes	2026	
NW012	Boundary Road - Mt Cottrell Rd to Davis Rd	Sealing 2 lanes	2026	
NW032	Cameron Street (east of Cloverton Boulevard)	New route (2 lanes)	2026	Replaces part of 4168
NW077	Childs Road - Beaumont Cr to west of Prince of Wales Ave (existing duplicated section)	Duplication (4 land divided)	2026	
NW100	Craigieburn Road, Overpass - Craigieburn Road East to Craigieburn Road West	New route (4 lanes)	2026	
NW043	Craigieburn West PSP connector road	New route (2 lanes)	2026	
NW101	Donnybrook Rd - OMR to Hume Fwy	Widening (4 lanes)	2026	
NW040	Elevation Boulevard (Vantage Blv to Mickleham Rd)	New route (2 lanes)	2026	
NW079	Findon Road - Williamsons Rd to Plenty Rd	New route (4 lane divided)	2026	Part of 9179
NW059	Grange Drive Extension	New route (2 lanes)	2026	
NW084	Gunns Gully Road Southern Half Connection to Hume Freeway	Interchange (1/2 diamond, southerly oriented)	2026	Replaces part of 3183
NW108	Ison Road (Westbrook Dr) - 1km north of Ballan Road to Dohertys Rd	New route (2 lanes)	2026	
NW052	Jacksons Hill Link	New route (2 lanes)	2026	
NW070	Kokoura Drive- Donnybrook Road to Gunns Gully Road	New route (2 lanes) (interim)	2026	Part of 4169
NW041	Marathon Boulevard (Craigieburn West PSP connector road to Mickleham Rd)	New route (2 lanes)	2026	
NW038	Marathon Boulevard (Whites Lane to Craigieburn West PSP connector road)	New route (2 lanes)	2026	
SE063	McGregors Rd - at Level Crossing	Duplication (4 lanes without grade separation)	2026	
NW103	Melton Hwy - The Regency to Leakes Rd	Duplication (4 lanes divided)	2026	
NW053	Polaris Road (Donnybrook Rd to English St)	New route (2 lanes)	2026	



Provisional No	Project	Scope	Year	Comment
NW010	Taylor's Road - Plumpton Rd to Leakes Rd	New route 2 lanes	2026	
NW002	Wallan-Whittlesea Rd (Watson St) - Hume Fwy Interchange	Southerly ramps and duplication of overpass	2026	
NW065	Andrew Road - Craigieburn Road to Summerhill Road	New route (2 lanes)	2031	
SE027	Brunt Rd - Rix Rd to Princes Hwy	Duplication (4 lanes)	2031	
NW033	Cameron Street (west of Hume Fwy)	New route (2 lanes)	2031	Replaces 3189 but alignment is straight continuation of Cameron St to Aitken Bvd
NW068	Cameron Street- Sydney Melb railway overpass to Merriang Road	New route (2 lanes) (interim)	2031	Replaces and realigns part of 4168
SE028	Cardinia Rd - South of Western Arterial to Thompsons Rd	upgrade to 2 lane	2031	
NW105	Christies Rd - Western Fwy to Caroline Springs Station	Duplication (4 lanes divided)	2031	
NW031	Cloverton Boulevard (north of Cameron Street)	New route (2 lanes)	2031	Replaces part of 3188
SE035	East west road (north of Princes Freeway) - O Neill Road to Timbertop Blvd	New route (2 lane bvd)	2031	
NW064	Edgars Road- Craigieburn Road to Summerhill Road	New route (2 lanes)	2031	
SE032	Grices Rd - Soldiers Rd to west of Cardinia Creek	New route (2 lanes)	2031	Replaces part of 5199
NW085	Gunns Gully Road Northern Half Connection to Hume Freeway	Interchange (1/2 diamond, northerly oriented)	2031	Replaces part of 3183
NW071	Gunns Gully Road- Sydney Melb railway overpass to E6	New route (2 lanes) (interim)	2031	Connects to interchange at E6
NW073	Harvest Home Road - Epping Road to Bindts Road	New route (2 lanes)	2031	
NW001	Kilmore Wallan Bypass, Northern Hwy at Boundary Road to Hume Fwy at Wandong	New Link	2031	
NW104	Melton Hwy - Leakes Rd to Federation Dr	Duplication (4 lanes divided)	2031	
SE022	Monash Freeway - Cardinia Road to Koo Wee Rup Rd	Widening (6 lanes freeway)	2031	Replaces part of 3016 (together with SE21)
SE024	Monash Freeway - Warrigal Rd to Springvale Rd (outbound)	Widening (5 lanes outbound, no change to inbound)	2031	Replaces 3017 (partially)
SE048	New East-West road (north of Princes Freeway) - Timbertop Bvd to Gum Scrub Creek	New route (2 lane bvd)	2031	
SE037	North South Collector	New route (2 lanes)	2031	
SE034	northern east west road (west of Cardinia Road extension)	upgrade to final 2 lane boulevard standard	2031	
SE036	Rix Rd - Officer South Rd to Brunt Rd	Duplication (4 lanes)	2031	
SE030	Southern Collector Rd - Ryan Rd to Princes Hwy	4 lane boulevard	2031	
NW011	Taylor's Road - Leakes Rd to Melton Hwy (Federation Dr)	New route 2 lanes	2031	
SE031	Western Arterial Rd - Gum Scrub Creek to east of Cardinia Creek	New route (2 lanes)	2031	Replaces part of 5199
NW102	Donnybrook Rd - Hume Fwy to E6	Widening (4 lanes)	2036	
SE023	Monash Freeway - South Gippsland Fwy Interchange	New ramp (south to east) and additional lane on Monash Fwy E bd to Tinks Rd	2036	Replaces 5007 with extension of freeway widening from Belgrave-Hallam Rd to Tinks Rd



Provisional No	Project	Scope	Year	Comment
SE050	Cardinia Road South of Princes Freeway to western arterial	Widening (6 lanes)	2041	Overlaps partially with 9251 and 9444
SE051	Cardinia Road South of western arterial to Thompsons Rd	Duplication (4 lanes)	2041	Replaces part of 6136
NW111	Ison Road (Westbrook Dr) - Armstrong Rd to Ballan Rd	Duplication (4 lanes divided)	2041	
NW009	Tarletons Road - Leakes Rd to Mt Cottrell Rd	New route 2 lanes	2041	
SE064	Healesville Freeway - Stud Rd to Canterbury Rd	New route (4 lane freeway)	2051	
SE049	Western Arterial road (Cardinia Road to Soldiers Road)	Duplication (4 lanes)	2051	Replaces 9215 with slightly different route

Source: TfV v1.09 Reference Case



Appendix B – Demographic and land use assumptions

Table B.1 - Population Assumptions by LGA (MSD)

LGA	2016 Population	2026 Population	2036 Population	2051 Population
Banyule (C)	127,430	137,092	149,958	180,475
Bayside (C)	101,852	109,248	116,642	136,963
Boroondara (C)	177,915	189,445	203,824	237,830
Brimbank (C)	200,144	215,030	230,753	267,354
Cardinia (S)	95,604	142,790	171,955	204,862
Casey (C)	300,169	388,686	468,013	531,007
Darebin (C)	153,638	176,960	202,924	258,336
Frankston (C)	137,554	148,137	161,947	188,921
Glen Eira (C)	148,050	158,499	171,142	204,297
Greater Dandenong (C)	155,913	178,895	202,771	251,146
Hobsons Bay (C)	93,377	103,374	113,291	136,037
Hume (C)	199,220	258,923	321,242	383,421
Kingston (C)	155,995	171,706	190,451	226,305
Knox (C)	158,017	171,791	187,238	222,445
Manningham (C)	121,184	133,192	145,194	170,365
Maribyrnong (C)	86,877	113,093	131,367	164,278
Maroondah (C)	112,971	122,778	138,558	167,477
Melbourne (C)	137,340	197,995	245,937	300,308
Melton (S)	136,539	211,632	307,228	403,667
Monash (C)	189,236	201,721	218,903	267,843
Moonee Valley (C)	121,382	136,792	156,982	197,939
Moreland (C)	170,178	200,457	228,115	288,415
Mornington Peninsula (S)	157,787	179,726	199,340	241,490
Nillumbik (S)	63,090	66,289	70,548	79,996
Port Phillip (C)	108,049	130,396	159,086	231,409
Stonnington (C)	112,119	128,031	140,956	167,118
Whitehorse (C)	168,949	183,692	199,179	239,439
Whittlesea (C)	200,894	279,315	342,821	392,618
Wyndham (C)	218,553	314,047	402,725	533,141
Yarra (C)	92,225	111,357	126,481	154,909
Grand Total	4,402,248	5,261,091	6,105,569	7,429,811

Source: TfV v1.09 Reference Case, based on VIF2015



Table B.2 - Employment Assumptions by LGA (MSD)

LGA	2016 Employment	2026 Employment	2036 Employment	2051 Employment
Banyule (C)	49,243	59,214	71,104	90,769
Bayside (C)	33,742	38,787	45,174	55,545
Boroondara (C)	81,762	94,793	111,663	139,211
Brimbank (C)	73,414	95,754	110,587	135,277
Cardinia (S)	24,866	32,643	37,804	46,218
Casey (C)	69,730	88,229	102,220	125,520
Darebin (C)	55,025	67,105	76,848	93,134
Frankston (C)	53,150	66,915	78,614	98,120
Glen Eira (C)	45,216	50,876	58,351	70,656
Greater Dandenong (C)	101,296	122,941	144,183	176,602
Hobsons Bay (C)	39,168	41,134	46,680	55,909
Hume (C)	99,013	119,523	139,646	170,612
Kingston (C)	88,797	105,083	121,517	148,895
Knox (C)	72,770	80,131	90,369	107,713
Manningham (C)	34,329	41,192	47,716	58,469
Maribyrnong (C)	41,154	52,689	60,528	73,684
Maroondah (C)	49,654	62,141	72,908	90,788
Melbourne (C)	503,672	632,255	782,116	1,008,533
Melton (S)	26,449	37,793	43,970	54,048
Monash (C)	123,554	148,812	172,150	210,111
Moonee Valley (C)	42,009	45,414	53,415	66,570
Moreland (C)	44,179	54,651	63,877	79,053
Mornington Peninsula (S)	58,236	65,894	74,707	89,433
Nillumbik (S)	15,739	19,156	22,262	27,311
Port Phillip (C)	85,220	94,872	112,963	141,452
Stonnington (C)	62,871	71,573	84,517	105,445
Whitehorse (C)	84,944	102,924	120,703	149,847
Whittlesea (C)	57,676	77,806	89,973	110,108
Wyndham (C)	65,118	84,826	97,114	117,379
Yarra (C)	93,960	114,107	131,775	160,309
Grand Total	2,275,955	2,769,231	3,265,457	4,056,721

Source: TfV v1.09 Reference Case, based on VIF2015



Appendix C – VicRoads Melbourne road projects road list

Table C.1 - Road Project Assumptions – VicRoads Melbourne road projects road list

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Project location

Project name

Name	Location	Type	Status
Beach Road & Beaconsfield Parade truck curfews	Port Melbourne, Black Rock, Elwood, St Kilda	Road	Underway
Bolton Street upgrade, Eltham	Eltham	Road	Underway
Box Hill to Ringwood shared use path	Box Hill, Blackburn, Nunawading, Mitcham, Ringwood	Bike path	Underway
Bridge Road, Richmond tram stop improvements	Richmond	Road	Complete
Bulla bypass & Melbourne Airport link planning study	Bulla, Tullamarine	Planning Study	Underway
Canterbury Road upgrade	Montrose	Road	Planned



Cardinia Road upgrade, Officer	Cardinia, Officer	Road	Complete
Carrum to Warburton trail, Bayswater to Lilydale link	Bayswater, Carrum, Lilydale	Bike path	Underway
Chandler Highway upgrade	Kew, Alphington	Road, Highway, Bridge	Underway
Chute Street Diamond Creek	Diamond Creek	Road	Planned
City of Whittlesea Road Safety Review	Whittlesea	Road	Planned
CityLink Tulla Widening	Tullamarine, Flemington, Port Melbourne	Freeway	Underway
Dalton Road and Childs Road intersection upgrade	Lalor	Road	Underway
Dandenong to Warrigal Road initiative	Dandenong, Clayton, Oakleigh South, Springvale, Noble Park	Road, Planning Study	Underway
Darebin Yarra Trail link	Alphington, Kew East	Bike path	Underway
Derrimut Road and Leakes Road intersection upgrade	Tarneit	Road	Underway
Dingley Bypass - Warrigal Road to Westall Road	Moorabbin, Clarinda, Heatherton, Dingley Village, Springvale South	Road	Complete
East Werribee Transport Improvement project	Werribee	Road	Complete
Eltham-Yarra Glen Road upgrade	Eltham, Yarra Glen	Road	Underway
Ferrars Street City Road intersection upgrade	South Melbourne	Road	Underway
Footscray Road upgrade	West Melbourne	Road	Underway
Forsyth Road exit ramp widening at Point Cook	Point Cook	Road	Planned
Gowanbrae and Glenroy noise walls	Glenroy	Road	Planned
Grimshaw & Flintoff streets intersection upgrade	Greensborough	Road	Underway
Hallam Road upgrade, Hampton Park	Hampton Park	Road	Complete
Heatherdale Road, Mitcham level crossing removal	Mitcham	Level crossing	Underway
High Street Road upgrade, Wantima South	Wantirna South	Road	Complete
Hoddle Street - Punt Road investigations	Clifton Hill, St Kilda, Richmond, Abbotsford, Collingwood, East Melbourne	Planning Study, Road	Underway
Improving Arterial Roads in Melbourne's outer west	Point Cook, Truganina, Tarneit, Laverton North, Hoppers Crossing, Werribee	Road	Planned



Improving road safety in Coburg	Coburg	Road	Underway
Kangaroo Ground - St Andrews Road upgrade	Kangaroo Ground, St Andrews	Road	Underway
Keilor Road Grange Road Newman Street intersection Niddrie	Niddrie	Road	Planned
Kings Road and Taylors Road intersection upgrade, Delahey	Delahey	Road	Underway
M80 Ring Road upgrade	Laverton North, Greensborough	Freeway	Underway
Maroondah Highway, Croydon intersection upgrade	Croydon	Highway	Planned
Mickleham Road Safety Improvements	Mickleham, Greenvale, Donnybrook	Road	Underway
Mitcham level crossing removal	Mitcham	Level crossing	Complete
Monash Freeway bridge strengthening	Mulgrave, Dandenong North	Bridge	Complete
Monash Freeway upgrade	Chadstone, Berwick, Dandenong North, Endeavour Hills, Hallam, Mulgrave, Narre Warren, Noble Park North, Officer, Pakenham	Freeway	Underway
Monash speed trial	Mount Waverley, Noble Park	Freeway, Road	Underway
Mordialloc Bypass	Aspendale Gardens, Braeside, Dingley Village	Road	Planned

Mornington Peninsula Freeway, Mount Martha to Rosebud	Mount Martha, Rosebud	Road	Planned
Motorcycle trial on Hoddle Street	Collingwood, Abbotsford	Road	Complete
Narre Warren North Road intersection upgrades, Narre Warren North	Narre Warren North	Road	Underway
Narre Warren-Cranbourne Road Upgrade, Cranbourne	Cranbourne	Road	Complete
Nepean corridor improvements	Frankston, St Kilda	Planning Study	Underway
Nicholson Street speed limit change	Carlton	Road	Planned
North east truck curfew trial	Eltham, Montmorency, Viewbank	Road	Complete
O'Herns Road, Epping upgrade	Epping	Road	Planned
Outer metropolitan ring/E6 transport corridor	Melbourne	Road	Planned
Palmers Road and Robinsons Road Truganina	Deer Park, Ravenhall, Derrimut, Truganina	Planning Study	Planned
Palmers Road Corridor (Western Freeway to Calder Freeway)	Calder Park, Taylors Hill, Sydenham, Hillside, Caroline Springs, Burnside, Burnside Heights, Deer Park, Ravenhall, Derrimut	Planning Study	Planned
Palmers Road upgrade at Point Cook	Hoppers Crossing	Road	Planned



Plenty Road, Mill Park upgrade	Mill Park	Road	Planned
Princes Highway & Robinson Street, Dandenong intersection upgrade	Dandenong	Road	Planned
Rosanna Road Safety Improvement Project	Heidelberg, Greensborough, Rosanna	Road	Complete
Route 96 Upgrade Project – Nicholson Street	Brunswick East, Fitzroy North	Road	Planned
Sladen Street upgrade, Cranbourne	Cranbourne	Road	Complete
Smith Street part-time tram lane improvements trial	Fitzroy	Road, Planning Study	Underway
South Gippsland Highway Road Safety Review	Cranbourne	Road, Highway	Planned
South Road traffic study	Moorabbin, Bentleigh, Bentleigh East, Hampton East	Planning Study	Underway
Springvale Junction improvement project	Springvale	Planning Study	Underway
Springvale level crossing removal	Springvale	Level crossing	Complete
St George's Road, Northcote median opening review	Northcote, Thornbury	Road	Underway
St Kilda Rd Safety Improvement Study	St Kilda, St Kilda East, St Kilda Road	Road	Planned
Strategic Cycling Corridors Melbourne's East and South East	Box Hill, Nunawading, Glen Waverley, Clayton, Chadstone	Bike path, Road	Planned
Stud Road upgrade, Wantirna	Wantirna	Road	Complete
Swan Street Bridge upgrade	Melbourne	Bridge	Underway
Sydney Road safety improvements	Brunswick	Road	Underway
Thompsons Road Upgrade, Cranbourne	Cranbourne	Road	Underway
Victoria Parade Bus Upgrade Project	Melbourne	Road	Complete
Victoria Street Richmond Easy Access Stop tram upgrades	Richmond, Richmond North	Road	Complete
Wantirna Road bridge over Dandenong Creek	Ringwood	Bridge	Complete
Warrandyte Bridge upgrade	Warrandyte	Bridge	Planned
Wedge Road intersection upgrade, Carrum Downs	Carrum Downs, Carrum	Road	Complete
West Gate Distributor - Stage 1	Footscray	Road, Bridge, Bike path	Underway



	West Gate Freeway managed motorway project	Spotswood, Yarraville, South Kingsville, Altona North, Brooklyn, Laverton North	Freeway	Complete
	Westall Road Extension	Clayton, Mulgrave, Clayton South, Springvale, Springvale South, Notting Hill, Glen Waverley, Wheelers Hill, Mount Waverley, Dingley Village	Road	Planned
	Western Port Highway - Lynbrook to Langwarrin	Dandenong South, Lynbrook, Lyndhurst, Skye, Cranbourne West, Cranbourne South, Langwarrin	Planning Study	Complete
	Western Port Highway & Robinsons Road, Langwarrin intersection upgrade	Langwarrin	Highway, Road	Planned
	Williamsons Road & Porter Street, Templestowe	Templestowe	Road	Complete
	Yan Yean Road - Plenty	Plenty	Road	Planned
	Young St improvements project, Frankston	Frankston	Road	Underway

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Page Updated 27 July 2017

Source: VicRoads, <https://www.vicroads.vic.gov.au/planning-and-projects/melbourne-road-projects?active=name>, accessed 22 September 2017



Appendix D – Future road network for modelling purposes only

Please note that the future road network assumptions outlined below have been created for transport modelling and planning purposes, and do not necessarily represent future commitments regarding capital spending or infrastructure works:

- Table D.1 - Road Project Assumptions – Unchanged from Reference Case,
- Table D.2 - Road Project Assumptions – Edited Road Projects
- Table D.3 - Road Project Assumptions – Additional Road Projects, and
- Table D.4 - Road Project Assumptions – Excluded Road Projects



Table D.1 - Road Project Assumptions – Unchanged from Reference Case

VLC Ref #	Project #	Project	Scope	Reference Case Year
215	2151	Dandenong Valley Hwy (Stud Road) - Boronia Rd to Mountain Highway	Duplication (4 lanes divided)	2015
017	2147	Hallam South Rd - Pound Rd to Ormond Rd	Duplication (4 lanes divided)	2015
066	2124	Koo Wee Rup Bypass - Manks Rd to South Gippsland Hwy	New route (2 lanes)	2015
051	2107	Cooper St - Hume Fwy to Edgars Rd	Widening (6 lanes divided)	2015
440	2200	Airport Dr Extension - Sharps Rd to Melrose Dr	New link (4 lane divided)	2016
445	2172	Claret Ash Boulevard - Harkness Rd to Panorama Dr	New route (2 lanes)	2016
127	2192	Forsyth Road - Sayers Rd to Leakes Rd	New route (2 lanes)	2016
444	2165	Marathon Bvd - Vantage Boulevard to Aitken Boulevard	New route (4 lanes divided)	2016
665	2999	Dingley Arterial West - Warrigal Rd to Westall Rd	New route (6 lanes divided); includes duplication	2016
065	2123	High Street Rd - Stud Rd to Burwood Hwy	Duplication (4 lanes divided)	2016
068	2126	Narre Warren-Cranbourne Rd - Pound Rd to Thompsons Rd	Duplication (4 lanes divided)	2016
659	4181	Soldiers Rd - Grices Rd to Pound Rd	New route (2 lanes)	2021
243	3377	Mordialloc Bypass - Springvale Road to Dingley Freeway	New route (4 lanes divided)	2021
493	7308	Western Freeway - Mt Cottrell Rd	Remove direct freeway access	2021
770	3378	Dohertys Rd - Palmers Rd to Foundation Rd	Widening (4 lanes divided)	2021
743	3013	Monash Freeway - South Gippsland Fwy to Clyde Rd	Widening (6 lanes freeway)	2021
743	3014	Monash Freeway - Eastlink to South Gippsland Fwy	Widening (10 lane freeway)	2021
727	1202	Tullamarine Fwy/Calder Fwy interchange - Calder Fwy east-bound ramp	Widening to 3 lanes	2021
727	1205	Tullamarine Fwy/Calder Fwy interchange - Tullamarine Fwy south-bound ramp	Widening to 3 lanes	2021
727	2310	ZEBRA West Gate Freeway - Western Link to Burnley Tunnel	Widening (4 lanes east bound only)	2021
727	3158	Tullamarine Freeway - Western Ring Rd to Mickleham Road	Widening (6 lanes)	2021
727	3177	Tullamarine Freeway - Mickleham Rd to Melbourne Airport	Widening (6 lanes)	2021
727	3320	ZEBRA Western Link - Brunswick Rd to Bulla Rd	Widening (10/12 lane freeway)	2021
727	4187	Tullamarine Freeway - WRR to Melbourne Airport (North bound only)	Widening (4 lanes one-way)	2021
727	8388	Tullamarine Fwy - Bulla Rd to Western Ring Rd	Widening (6 lane freeway)	2021
727	9016	Tullamarine Fwy - Calder Fwy to Western Ring Rd southerly ramps	Widening (8 lane freeway)	2021
153	4183	Amaroo Road - Summerhill Rd to Donnybrook Rd	New route (2 lanes)	2021
448	2193	Armstrong Road - Black Forest Rd to Ballan Rd	New route (2 lanes)	2021
494	2174	Ballarto Road - South Gippsland Hwy to Clyde-Five Ways Rd	Sealing (2 lanes)	2021
656	4166	Boundary Rd - Derrimut to Palmers Rd	Sealing (2 lanes)	2021
496	2162	Bridge Road - Ferris Road to Exford Road	Sealing (2 lanes)	2021
664	2184	Coburns Rd - Hume Av to Exford Rd	New route (2 lanes)	2021
222	3120	E14 (Aitken Bvd) - Mt Ridley Rd to Gunns Gully Rd	New route (2 lanes)	2021
058	3178	E14 (Aitken Bvd) - Somerton Rd to Craigieburn Rd	New route (2 lanes)	2021



VLC Ref #	Project #	Project	Scope	Reference Case Year
161	2163	Edgars Rd - O'Herns Rd to Craigieburn Rd East	New route (2 lanes)	2021
417	2175	Greenhills Road - McGregors Rd to Koo Wee Rup Rd	Sealing (2 lanes)	2021
457	2194	Greens Rd - Armstrong Rd to Ison Rd	Sealing (2 lanes)	2021
492	2195	Hacketts Rd - Sneydes Rd to Aviation Rd	Sealing (2 lanes)	2021
495	2191	Leakes Rd - Davis Rd to Tarneit Rd	Sealing (2 lanes)	2021
449	2161	Manor Lakes Bvd, Extension to Westbrook Dr	New route (2 lanes)	2021
493	2181	Mt Cottrell Rd - Greigs Rd to Western Fwy	Sealing (2 lanes)	2021
137	2179	Officer South Rd - Railway line to Pakenham Bypass	Sealing (2 lanes)	2021
356	9270	Chandler Highway - Eastern Fwy Off Ramp to Heidelberg Rd	Widening (6 lanes divided)	2021
498	7994	Derrimut Road - Leakes Road to Dohertys Road	Duplication (4 lanes divided)	2021
054	3182	Derrimut Road - Sayers Rd to Leakes Rd	Duplication (4 lanes divided)	2021
538	8341	Dohertys Rd - Cherry La to Westgate Dr freeway overpass	Widening (4 lanes)	2021
056	2111	Dohertys Rd - Fitzgerald Rd to Grieve Pde	Duplication (4 lanes, divided except on freeway)	2021
770	3379	Dohertys Rd - Foundation Rd to Fitzgerald Rd	Widening (4 lanes divided)	2021
503	3186	Donald Cameron Drive - Bridgewater Road to Southern Cross Drive	Duplication (4 lanes divided)	2021
118	6127	Dunnings Rd - Pt Cook Rd to Palmers Rd	Duplication (4 lanes divided)	2021
121	8316	E14 - Somerton Rd to Mt Ridley Rd	Widening (4 lanes divided)	2021
164	6126	Forsyth Rd - Old Geelong Rd to Sayers Rd	Duplication (4 lanes divided)	2021
059	3184	Forsyth Road - K-Mart Entrance to Wallace Ave	Duplication (4 lanes divided)	2021
649	2114	Forsyth Road/Old Geelong Rd - Intersection improvements	Duplication (4 lanes divided)	2021
497	5184	Leakes Rd - Derrimut Rd to Palmers Rd	Duplication (4 lanes divided)	2021
132	2150	Leakes Rd - Palmers Rd to Fitzgerald Rd	Duplication (4 lanes divided)	2021
072	6130	Palmers Rd - Dohertys Rd to Boundary Rd	Widening (4 lanes divided)	2021
070	4161	Palmers Rd - Dunnings Rd to Princes Fwy	Duplication (4 lanes divided)	2021
653	4165	Palmers Rd - Princes Fwy to Sayers Rd	Duplication (4 lanes divided)	2021
071	4162	Palmers Rd - Sayers Rd to Dohertys Rd	Duplication (4 lanes divided)	2021
652	8434	Princes Fwy West - Forsyth Rd	Ramp widening	2021
690	6131	Robinsons Rd - Boundary Rd to Deer Park Bypass	Duplication (4 lanes divided)	2021
360	NW051	Elizabeth Drive (Racecourse to Dunrossil Drive)	New route (2 lanes)	2021
771	3376	Swan St Bridge	Widening (3 lanes east bound)	2021
078	3176	Thompsons Rd - Dandenong Valley Hwy to Western Port Hwy	Duplication (4 lanes divided)	2021
150	6139	Thompsons Rd - Narre Warren - Cranbourne Rd to Berwick-Cranbourne Rd	Duplication (4 lanes divided)	2021
645	3309	Clayton Rd, Clayton	Grade separation	2021
646	3310	Heatherton Rd	Grade separation	2021
743	333	Western Distributor - West Gate Fwy to Citylink / North Melbourne	New freeway (4 lanes)	2021



VLC Ref #	Project #	Project	Scope	Reference Case Year
044	2005	M80 - WestGate Fwy to Western Hwy	Widening (8 to 10 lane freeway)	2021
44	1006	M80 - South bound, Deer Park Bypass to Boundary Rd	Widening (4 lanes S bd)	2021
727	1201	Tullamarine Fwy/Citylink - Calder Fwy to Westgate Fwy	Widening (10 lanes Calder Fwy to Flemington)	2021
075	5186	Princes Freeway West, Interchange - Duncans Rd	Interchange (westerly oriented ramps)	2021
407	2177	Glasscocks Rd from South Gippsland Hwy to Berwick-Cranbourne Rd	New	2021
447	2187	Ferris Rd from Abey Rd to Iramoo Rd	New	2021
308	2197	Evans Road - Prichard Av to Thompsons Rd	Sealing (2 lanes)	2021
362	4185	Forsyth Road/Christies Road - Leakes Rd to Boundary Rd	New route (2 lanes)	2021
478	4184	Morris Rd - Leakes Rd to Boundary Rd	New route (2 lanes)	2021
613	3015	Monash Freeway - Springvale Rd to Eastlink	Widening (10 lane freeway)	2021
047	2011	M80 - Plenty Rd to Greensborough Hwy	Widening (6 lane freeway)	2021
PT037	NW006	Abey Road - New bridge - Ferris Rd to Station Rd	New route 2 lanes	2021
780	NW036	Brookfield Boulevard (Highlander Blv to Craigieburn West PSP connector road)	New route (2 lanes)	2021
PT037	NW007	City Vista - Aspire Blvd - Taylors Rd to Beattys Rd	New route 2 lanes	2021
046	2009	M80 - Sydney Rd to Edgars Rd	Widening (8 to 10 lane freeway)	2021
PT035	NW039	Elevation Boulevard (Waterview Blv to Vantage Blv)	New route (2 lanes)	2021
PT060	NW050	Elizabeth Drive (Mitchells Lane to Vineyard Rd)	New route (2 lanes)	2021
073	2132	Plenty Road - McKimmies Rd to Development Bvd	Widening (6 lanes divided)	2021
260	9211	Yan Yean Rd - Kurrak Road to Diamond Creek Road	Duplication (4 lanes divided)	2021
139	NW107	O'Herns Rd - Hume Fwy to Edgars Rd	Duplication (4 lanes divided)	2021
139	4163	O'Herns Rd - Hume Fwy interchange	Interchange (full diamond)	2021
501	9395	Plenty Road - Development Bvd to Gordons Rd	Widening (6 lanes divided)	2021
170	5185	Plenty Road - Riverdale Bvd to Bridge Inn Rd	Duplication (4 lanes divided)	2021
PT035	NW035	Grand Boulevard (Highlander Blv to Craigieburn West PSP connector road)	New route (2 lanes)	2021
PT061	NW046	Hillview Road	New route (2 lanes)	2021
PT036	NW069	Pattersons Drive- Donnybrook Road to Merri Creek	New route (2 lanes) (interim)	2021
045	NW082	M80 - South of EJ Whitten Bridge to Calder Fwy	Widening (10 lane freeway)	2021
042	NW081	M80 - Sunshine Av to south of EJ Whitten Bridge	Widening (8 lane freeway)	2021
773	9271	Plenty Rd - Gordon Rd to Riversdale Bvd	Widening (6 lanes divided)	2021
708	3332	Corrigan Rd, Noble Park	Grade separation	2021
709	3330	Grange Rd, Caulfield East	Grade separation	2021
710	3331	Poath Rd, Hughesdale	Grade separation	2021
784	3355	Camp Rd, Campbellfield	Grade separation	2021
801	NW047	Roxburgh Park Drive	Upgrade (4 lanes) divided	2021
597	3206	Armstrong Road - Westbrook Dr to Black Forest Rd	New route (2 lanes)	2021



VLC Ref #	Project #	Project	Scope	Reference Case Year
060	4138	Grices Rd - Berwick-Cranbourne Rd to Soldiers Rd	Sealing (2 lanes)	2021
240	2176	McGregors Rd - Pakenham Bypass to Thompsons Rd Extension	Sealing (2 lanes)	2021
077	SE019	Thompsons Rd, Western Port Hwy to Marriott Boulevard	Duplication (4 lanes divided)	2021
444, PT035	NW037	Marathon Boulevard (Waterview Boulevard to Whites Lane)	New route (2 lanes)	2021
478	NW016	Morris Rd - Dohertys Rd to 800m north of Dohertys Road	New route (2 lanes)	2021
547	SE021	Monash Freeway - Clyde Rd to Cardinia Road	Widening (6 lanes freeway)	2021
466	NW028	Armstrong Road - Ballan Road to 1.2km north of Ballan Road	Sealing (2 lanes)	2021
829	NW003	Westwood Drive - Rockbank Middle Rd to Taylors Rd	New route 2 lanes	2021
833	NW055	Arena Boulevard (James Mirriams Drive to Silvester Parade)	New route (2 lanes)	2021
797	SE007	Bridge Road Duplication from Cardinia Road to west of Viridian Way	Duplication (4 lanes divided)	2021
841	NW058	Civic Drive - Bush Bld to Morang Drive	New route (2 lanes)	2021
842	NW072	Hayes Hill Blvd- Donnybrook Road to Merriang Road	New route (2 lanes)	2021
843	NW005	Hume Drive - Calder Park Drive to Overton Lea Bvd	Duplication to 4 lanes	2021
834	NW004	Mt Cottrell Rd - Greigs Rd to Boundary Road	Sealing 2 lanes	2021
845	NW008	Rockbank Middle Road - Caroline Springs Blvd to Westwood Dr	Duplication to 4 lanes	2021
844	SE005	Station Street, Carrum	Extension across Patterson River	2021
830	9206	Tarneit Rd - Hogans Rd to Sayers Rd	Duplication (4 lanes divided)	2021
797	SE008	Bridge Road Duplication from Shaw Road to east of Gum Scrub Creek	Duplication (4 lanes divided)	2021
793	NW109	Ison Road (Westbrook Dr) - Princes Fwy to Armstrong Rd	New route (4 lanes)	2021
592	NW110	Ison Road (Westbrook Dr) - Armstrong Rd to Ballan Rd	New route (2 lanes)	2021
792	NW062	Regent Street- west of Cravens Road	New route (2 lanes)	2021
529	3191	Scanlon Drive Extension - Craigieburn Rd to Summerhill Rd	New route (2 lanes)	2021
672	3204	Hopkins Rd Extension - Neale Rd to Melton Hwy	New route (2 lanes)	2026
357	9168	Grange Rd - Heidelberg Rd to Darebin Rd	Duplication (4 lanes divided)	2026
606	7309	Western Freeway - Paynes Rd	Remove direct freeway access	2026
642	7310	Western Freeway - Troupes Rd North	Remove direct freeway access	2026
540	8162	Bulla Bypass - Sunbury Rd to Somerton Rd	New route (4 lanes)	2026
458	2167	Vantage Boulevard - Craigieburn Rd to Mt Ridley Rd	New route (2 lanes)	2026
306	8138	Calder Park Dr - Calder Fwy to Melton Hwy	Duplication (4 lanes divided)	2026
148	1991	Taylors Rd - Kurung Dr (west) to west of Shire boundary	Duplication (4 lanes divided)	2026
203	4158	Westall Road (Nothern Extension) - Princes Hwy East to Monash Fwy	New route (4 lanes divided)	2026
697	8137	Calder Freeway, Interchange - Calder Park Dve	Interchange (full diamond)	2026
530	NW108	Ison Road (Westbrook Dr) - 1km north of Ballan Road to Dohertys Rd	New route (2 lanes)	2026
305	9164	Bridge Inn Rd - Plenty Rd to Yan Yean Rd	Duplication (4 lanes divided)	2026
052	5188	Craigieburn Rd - Dorchester St to Waterview Bvd	Duplication (4 lanes divided)	2026



VLC Ref #	Project #	Project	Scope	Reference Case Year
053	4160	Craigieburn Rd - Hanson Rd to Dorchester St	Duplication (4 lanes divided)	2026
158	8163	Craigieburn Rd from Mickleham Rd to Aitken Bvd (E14)	Duplication (4 lanes divided)	2026
212	8442	Craigieburn Road East - Hume Freeway to Epping Rd	Duplication (4 lanes divided)	2026
160	9450	Edgars Rd - Cooper St to O'Herns Rd	Widening (6 lanes divided)	2026
162	8168	Epping Rd - Findon Rd to Craigieburn Rd	Duplication (4 lanes divided)	2026
125	2146	Epping Rd - Memorial Av to Findon Rd	Duplication (4 lanes divided)	2026
117	NW077	Childs Road - Beaumont Cr to west of Prince of Wales Ave (existing duplicated section)	Duplication (4 land divided)	2026
676	NW100	Craigieburn Road, Overpass - Craigieburn Road East to Craigieburn Road West	New route (4 lanes)	2026
608	NW101	Donnybrook Rd - OMR to Hume Fwy	Widening (4 lanes)	2026
225	NW079	Findon Road - Williamsons Rd to Plenty Rd	New route (4 lane divided)	2026
101	5006	Dandenong Bypass - South Gippsland Hwy to South Gippsland Fwy	New route (6 lanes divided)	2026
061	3173	Hallam South Rd - Princes Hwy to Pound Rd	Duplication (4 lanes divided) and grade separation	2026
168	4119	Mickleham Road - Somerton Road to Craigieburn Road	Duplication (4 lanes divided)	2026
134	4157	Narre Warren - Cranbourne Rd - Thompsons Rd to South Gippsland Hwy	Duplication (4 lanes divided)	2026
069	3375	O'Shea Rd - Soldiers Rd to Princes Fwy including South-East facing ramps and bridge widening	New route (4 lanes)	2026
076	2135	Somerton Road - Mickleham Rd to Roxburgh Park Dr	Duplication (4 lanes divided)	2026
140	5183	Pound Rd - West to Remington Drive Extension	New route (4 lanes divided) and	2026
108	4156	Berwick-Cranbourne Rd - Pattersons Rd to Narre Warren-Cranbourne Rd	Duplication (4 lanes, not divided)	2026
777	5131	Koo-Wee-Rup Rd - Hall Rd to Ballarto Rd	Duplication (4 lanes divided)	2026
776	5130	Koo-Wee-Rup Rd - Ballarto Rd to Manks Rd	Duplication (4 lanes divided)	2026
246	8152	Pound Rd/Greaves Rd/o'Shea Rd route - Berwick-Cranbourne Rd to Princes Freeway	Duplication (4 lanes divided)	2026
233	5132	Koo-Wee-Rup Rd - Pakenham Bypass to Hall Rd	Duplication (4 lanes divided)	2026
641	NW013	Beattys Road - Melton Hwy to Hopkins Rd extension	New route 2 lanes	2026
676	7996	Craigieburn Rd - Hanson Road to Hume Freeway	Duplication (4 lanes divided)	2026
673	NW010	Taylors Road - Plumpton Rd to Leakes Rd	New route 2 lanes	2026
464	2182	Paynes Road - Western Fwy to Harrison Rd	New route (2 lanes)	2026
658	7995	Derrimut Road - Dohertys Road to Boundary Road	Duplication (4 lanes divided)	2026
451	8188	Glasscocks Road - Western Port Hwy to Evans Rd	Duplication (4 lanes divided)	2026
451	8204	Glasscocks Road - Evans Rd to South Gippsland Hwy	Duplication (4 lanes divided)	2026
838	SE063	McGregors Rd - at Level Crossing	Duplication (4 lanes without grade separation)	2026
840	NW002	Wallan-Whittlesea Rd (Watson St) - Hume Fwy Interchange	Southerly ramps and duplication of overpass	2026



VLC Ref #	Project #	Project	Scope	Reference Case Year
795	NW032	Cameron Street (east of Cloverton Boulevard)	New route (2 lanes)	2026
825	8436	Glasscocks Road - Dandenong Valley Hwy to Western Port Hwy	Duplication (4 lanes divided)	2026
836	NW103	Melton Hwy - The Regency to Leakes Rd	Duplication (4 lanes divided)	2026
669	4180	Thompsons Rd Extension - Soldiers Rd to Officer South Rd	New route (2 lanes)	2026
846	NW070	Kokoura Drive- Donnybrook Road to Gunns Gully Road	New route (2 lanes) (interim)	2026
769	2205	Casey Fields Boulevard - Thompsons Rd to Linsell Av	New route (2 lanes)	2031
120	3122	E14 (Aitken Bvd) - Broadmeadows Rd Deviation to Somerton Rd	New route (4 lanes divided)	2031
414	5187	Cooper St - Hume Hwy to Hume Freeway	Widening (6 lanes divided)	2031
063	3180	Heaths Rd - Shaws Rd to Tarneit Rd	Duplication (4 lanes divided)	2031
064	3181	Heaths Rd/Bolton Rd - Ballan Rd to Shaws Rd	Duplication (4 lanes divided) and bridge widening	2031
314	6116	Mickleham Road - Craigieburn Road to Donnybrook Road	Duplication (4 lanes divided)	2031
114	6128	Westwood Drive - Western Hwy to Rockbank Middle Rd	Widening (4 lanes divided)	2031
598	8335	Princes Fwy - Kororoit Creek Rd to Dohertys Rd	Widening (10 lanes freeway)	2031
307	7169	Childs Road - High St to Edgars Rd	New route (4 lanes divided)	2031
595	5191	E14 (Mandalay Road) - Gunns Gully Rd to Camerons Lane	New route (2 lanes)	2031
666	3190	Gunns Gully Road - Hume Fwy to Scanlon Drive Extension	New route (2 lanes)	2031
680	5196	New east-west arterial north of Camerons Lane - Old Sydney Rd to Stewart St	New route (2 lanes)	2031
677	4170	New east-west arterial south of Camerons Lane (Rankin St?) - Old Sydney Rd to Stewart St	New route (2 lanes)	2031
402	5193	Stewart Street - Beveridge to Northern Highway at Hume Interchange	New route (2 lanes)	2031
156	7171	Childs Road - High St to Dalton Rd	Duplication (4 lanes divided)	2031
173	8124	Somerton Road - Mickleham Rd to Oaklands Rd	Duplication (4 lanes divided)	2031
509	8355	Somerton Rd - Tullamarine Fwy extension to Oaklands Rd	Widening (4 lanes divided)	2031
511	8440	Somerton Road - Wildwood Rd to Tullamarine Fwy extension	Widening (4 lanes divided)	2031
466	3101	Armstrong Road - Ballan Rd to Sayers Rd	New route (2 lanes)	2031
462	4175	Bells Road - Pound Rd to Ballarto Rd	New route (2 lanes)	2031
471	4173	Bells Road/Yallambie Road - Ballarto Rd to Manks Rd	New route (2 lanes)	2031
681	5197	Beveridge-Darraweit Road Extension - Old Sydney Rd to Scanlon Drive Extension	New route (2 lanes)	2031
472	3199	Bodycoats Road - Craigieburn Rd to Summerhill Rd	New route (2 lanes)	2031
112	4134	C21 North South Boulevard - Princes Fwy to Grices Rd	New route (4 lanes divided)	2031
769	2206	Casey Fields Boulevard - Patterson Rd to South Gippsland Hwy	New route (2 lanes)	2031
514	2160	Davis Rd - Dohertys Rd to Hogans Rd	New route (2 lanes)	2031
221	4159	Dorset Rd - Burwood Hwy to Lysterfield Rd	New route (2 lanes)	2031
605	5195	E14 (Mandalay Road) - Camerons Lane to north of boundary	New route (2 lanes)	2031
456	4178	Hardys Road - Pound Rd to Muddy Gates La	New route (2 lanes)	2031



VLC Ref #	Project #	Project	Scope	Reference Case Year
475	6140	Harrison Rd - Downing St to Hopkins Rd	New route (2 lanes)	2031
481	2189	Harrison Rd - Mount Cottrell Rd to Downing St	New route (2 lanes)	2031
463	3202	Hume Drive - Plumpton Road to Gourlay Road	New route (2 lanes)	2031
460	2186	Iramoo Rd - Ferris Rd to Greigs Rd	New route (2 lanes)	2031
470	4174	Moore's Road - South Gippsland Hwy to Bells Rd	New route (2 lanes)	2031
486	4177	Muddy Gates Lane - Ballarto Rd to Hardys Rd	New route (2 lanes)	2031
476	5205	Paynes Road - Melton Hwy to Western Fwy	New route (2 lanes)	2031
454	3203	Saric Road - Melton Highway to Taylors Rd	New route (2 lanes)	2031
593	5194	Scanlon Drive Extension - Beveridge Rd to Wallan	New route (2 lanes)	2031
482	5201	Tarletons Road - Leakes Rd to Plumpton Rd	New route (2 lanes)	2031
479	3195	Tuckers Road - Pound Rd to Ballarto Rd	New route (2 lanes)	2031
485	4176	Tuckers Road/Derricks Rd - Ballarto Rd to Manks Rd	New route (2 lanes)	2031
522	7302	Boundary Rd - Davis Rd to Derrimut Rd	Duplication (4 lanes divided)	2031
507	8338	Boundary Rd - Fitzgerald Rd to Western Ring Rd	Widening (6 lanes divided)	2031
207	7172	Calder Park Dr - Melton Hwy to Taylors Rd	Duplication (4 lanes divided)	2031
512	2190	Davis Rd - Boundary Rd to Dohertys Rd	Sealing (2 lanes)	2031
508	9294	Derrimut Road - Hogans Rd to Sayers Rd	Widening (6 lanes divided)	2031
309	6110	Evans Road - South Gippsland Hwy to Hall Rd	Duplication (4 lanes divided) and	2031
459	8317	Hopkins Rd - Greigs Rd to Plumpton Rd	Widening (4 lanes divided)	2031
504	9453	Melton Hwy - Banchory Av to The Regency	Widening (6 lanes divided)	2031
135	5179	Narre Warren North Rd - Ernst Wanke Rd to Heatherton Rd	Duplication (4 lanes divided)	2031
609	8431	Plumpton Road - Hopkins Road Extension to Calder Freeway	Widening (4 lanes divided)	2031
074	6124	Point Cook Road - Pt Cook Homestead Road to Dunnings Road	Duplication (4 lanes divided)	2031
531	4122	Racecourse Road - Princes Hwy to Princes Fwy	Duplication (4 lanes divided) and	2031
142	7170	Robinsons Rd/Westwood Dve - Deer Park Bypass to Western Hwy	Duplication (4 lanes divided) and	2031
146 , 520	8144	Taylors Rd - Calder Park Dve to Plumpton Rd	Duplication (4 lanes divided)	2031
675	8305	Taylors Road Extension - Melton Hwy to Plumpton Rd	Duplication (4 lanes divided)	2031
149	3157	Templestowe Rd - Bridge St to Thompsons Rd	Duplication (4 lanes divided)	2031
527	6008	Calder Freeway - Vineyard Rd to Melton Hwy	Widening (6 lanes)	2031
636	8315	Epping Rd - Bridge Inn Rd to Craigieburn Rd	Widening (4 lanes divided)	2031
175	9114	Hall Rd - Western Port Hwy to Sladen St	Duplication (4 lanes divided)	2031
241	8193	McGregor Rd - South of Henty St to Pakenham Bypass	Duplication (4 lanes divided)	2031
480	3201	Summerhill Rd/Masons Rd - Scanlon Dr to E6	New route (2 lanes)	2031
PT022	NW071	Gunns Gully Road- Sydney Melb railway overpass to E6	New route (2 lanes) (interim)	2031
589	3196	Pattersons Road - Berwick-Cranbourne Rd to Tuckers Rd	New route (2 lanes)	2031



VLC Ref #	Project #	Project	Scope	Reference Case Year
590	4179	Pattersons Road - Tuckers Rd to Pound Rd	New route (2 lanes)	2031
109	4155	Berwick-Cranbourne Rd - Thompsons Rd to Pattersons Rd	Duplication (4 lanes not divided)	2031
452	SE032	Grices Rd - Soldiers Rd to west of Cardinia Creek	New route (2 lanes)	2031
352	5306	Tullamarine Freeway Extension - Melbourne Airport to Somerton Rd	New route (4 lane freeway)	2031
172	8308	Soldiers Rd - Grices Rd to Pound Rd	Duplication (4 lanes divided)	2031
474	3200	Boundary Road - Scanlon Dr to Epping Rd	New route (2 lanes)	2031
620	8439	Melbourne Airport - New elevated ring road connecting to Tullamarine Fwy	New link (1-way, 1-3 lanes)	2031
594	5192	Patterson Street - Beveridge to north of Beveridge	New route (2 lanes)	2031
110	8143	Broadmeadows Rd - Mickleham Rd to Ripplebrook Dr	Duplication (4 lanes divided)	2031
523	8139	Sunbury Rd - Melbourne-Lancefield Road to Powlett Street	Duplication (4 lanes divided)	2031
147	7167	Taylors Rd - Kings Rd to Kurung Dr	Duplication (4 lanes divided)	2031
596	9010	Mt Cottrell Rd/Western Freeway Interchange	New interchange (half diamond,	2031
774	SE024	Monash Freeway - Warrigal Rd to Springvale Rd (outbound	Widening (5 lanes outbound, no change to inbound)	2031
802	SE027	Brunt Rd - Rix Rd to Princes Hwy	Duplication (4 lanes)	2031
839	NW105	Christies Rd - Western Fwy to Caroline Springs Station	Duplication (4 lanes divided)	2031
794	NW033	Cameron Street (west of Hume Fwy)	New route (2 lanes)	2031
796	NW068	Cameron Street- Sydney Melb railway overpass to Merriang Road	New route (2 lanes) (interim)	2031
804	9289	Christies Rd - Western Highway to Western Freeway	Duplication (4 lanes divided)	2031
805	9216	Mornington-Tyabb Road - Nepean Hwy to Moorooduc Hwy	Duplication (4 lanes divided)	2031
806	9228	Shrives/Centre/Fullard Rds - Pound Rd to Narre Warren-Cranbourne Rd	Widening (4 lanes not divided)	2031
837	NW104	Melton Hwy - Leakes Rd to Federation Dr	Duplication (4 lanes divided)	2031
468	5204	Mt Cottrell Rd - Western Fwy to Melton Hwy	New route (2 lanes)	2031
174	5176	Western Port Hwy - North Rd to Baxter Tooradin Rd	Duplication (4 lanes divided)	2031
799	SE022	Monash Freeway - Cardinia Road to Koo Wee Rup Rd	Widening (6 lanes freeway)	2031
524	9378	Scanlon Drive - O'Herns Rd to Craigieburn Rd	Duplication	2031
242	8135	Melton Hwy - The Regency to Ryans Lane	Widening (6 lanes divided)	2031
670	5198	Thompsons Rd Extension - Officer South Rd to Cardinia Rd	New route (2 lanes)	2031
847	SE036	Rix Rd - Officer South Rd to Brunt Rd	Duplication (4 lanes)	2031
667	3194	Hardys Road - Berwick-Cranbourne Rd to Pound Rd	New route (2 lanes)	2036
650	2171	Craig Road - new connection to South Gippsland Hwy	New route (2 lanes)	2036
505	8180	Boundary Rd- Derrimut Rd to Palmers Rd	Widening (6 lanes divided)	2036
506	8426	Boundary Rd- Palmers Rd to Fitzgerald Rd	Widening (6 lanes divided)	2036
518	8429	Hopkins Rd - Boundary Rd to Greigs Rd	Widening (6 lanes divided)	2036
525	8320	Leakes Rd - Davis Rd to Shanahans Rd	Widening (4 lanes divided)	2036
691	8430	Mt Cottrell Rd - Leakes Rd to Melton Hwy	Widening (4 lanes divided)	2036



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526	5200	Officer South Rd - Pakenham Bypass to Patterson Rd	Sealing (2 lanes)	2036
688	8410	Thompsons Rd - Eastlink to McCormicks Rd	Widening (6 lanes divided)	2036
632	4145	Officer South Rd - Rix Rd to Pakenham Bypass	Interchange (full diamond), duplication	2036
779	2302	Princes Freeway East, Interchange - McGregor Rd	Interchange (easterly oriented ramps)	2036
516	9005	Calder Freeway - M80 Ring Road to Melton Hwy	Widening (8 lanes divided)	2036
487	3185	Canterbury Avenue - Bundanoon Avenue to Albert Road	New route (2 lanes)	2036
621	4167	Merrifield Road - north of Donnybrook Rd to Beveridge	New route (2 lanes)	2036
304	9163	Bridge Inn Rd - Cravens Rd to Plenty Rd	Duplication (4 lanes divided)	2036
303	9161	Bridge Inn Rd - E6 to Cravens Rd	Duplication (4 lanes divided)	2036
302	9162	Bridge Inn Rd - Epping Rd to E6	Duplication (4 lanes divided)	2036
250	8334	Sayers Rd - Derrimut Rd to Palmers Rd	Widening (4 lanes)	2036
617	3314	Princes Fwy / Clyde Road Interchange	Upgrade - improve c	2036
693	9286	Sunbury Rd - OMR to Melbourne-Lancefield Rd	Widening (6 lanes divided)	2036
634	3193	Pound Road - Soldiers Rd Extension to Bells Rd	New route (2 lanes)	2036
489	6143	Riding Boundary Rd - Mt Atkinson Rd to Hopkins Rd	New route (2 lanes)	2036
635	6141	Troups Road South - Greigs Rd to Harrison Rd	New route (2 lanes)	2036
696	7306	Dandenong Bypass - Perry Rd to South Gippsland Hwy	Widening (6 lanes divided)	2036
488	2188	Downing Street - Greigs Rd to Harrison Rd	Sealing (2 lanes)	2036
570	8307	Duncans Rd - Princes Highway to Princes Freeway	Duplication (4 lanes divided)	2036
568	8345	Federation Dr - Centenary Av to Melton Hwy	Widening (4 lanes)	2036
569	8344	Leakes Rd - Iramoo Rd to Taylors Rd	Widening (4 lanes)	2036
247	8153	Pound Rd/Greaves Rd/O'Shea Rd route - Hallam South Rd to Narre Warren-Cranbourne Rd	Duplication (4 lanes divided)	2036
141	4137	Pound Rd/Greaves Rd/O'Shea Rd route - Narre Warren-Cranbourne Rd to Berwick-Cranbourne Rd	Duplication (4 lanes divided)	2036
580	8330	Sneydes Rd - Hoppers La to Boardwalk Bvd	Widening (4 lanes)	2036
251	8378	South Gippsland Hwy - South Gippsland Fwy to Thompsons Rd	Widening (6 lanes divided)	2036
695	7305	Westall Rd - Dingley Arterial to Springvale Rd	Widening (6 lanes divided)	2036
534	3207	Greens Rd - Ison Rd to OMR	Sealing (2 lanes)	2036
832	8179	Leakes Rd - Davis Rd to Derrimut Rd	Duplication (4 lanes)	2036
807	3113	Canterbury Rd - Dorset Rd to Liverpool Rd	Widening (6 lanes divided)	2036
808	9259	Narre Warren-Cranbourne Rd - Centre Rd to Pound Rd	Widening (6 lanes divided)	2036
809	9258	Narre Warren-Cranbourne Rd - Pound Rd to Thompsons Rd	Widening (6 lanes divided)	2036
810	9438	William Thwaites Boulevard - Glasscocks Rd to Thompsons Rd	Duplication (4 lanes divided)	2036
359	7311	Dohertys Rd - Derrimut Rd to Palmers Rd	Widening (4 lanes divided)	2036
791	NW102	Donnybrook Rd - Hume Fwy to E6	Widening (4 lanes)	2036



VLC Ref #	Project #	Project	Scope	Reference Case Year
628	SE023	Monash Freeway - South Gippsland Fwy Interchange	New ramp (south to east) and additional lane on Monash Fwy E bd to Tinks Rd	2036
129	8198	Hall Rd - McCormicks Rd to Western Port Hwy	Duplication (4 lanes divided)	2036
467	3192	Scanlon Drive Extension - Gunns Gully Rd to Beveridge Rd	New route (2 lanes)	2036
687	8420	Barry Road - Malsbury Dr to E14	New route (2 lanes)	2041
455	6142	Mt Atkinson Rd - Boundary Rd to Greigs Rd	New route (2 lanes)	2041
519	9253	Berwick-Cranbourne Rd - Pound Rd to Thompsons Rd	Widening (6 lanes divided)	2041
536	8339	Boundary Rd - WRR to Fairbairn Rd	Widening (6 lanes divided)	2041
588	8419	Brookville Dr - Amaroo Rd to Donnybrook Rd	Widening (4 lanes divided)	2041
116	6137	Canterbury Rd - Liverpool Rd to Mount Dandenong Tourist Rd	Widening (6 lanes divided)	2041
567	9440	Casey Fields Bvd/Craig Road - Ballarto Rd to Browns Rd	Duplication (4 lanes divided)	2041
581	8370	Clyde Road - Grices Rd to Moondarra Dr	Widening (6 lanes divided)	2041
521	6135	Clyde-Five Ways Rd - Pattersons Rd to South Gippsland Hwy	Duplication (4 lanes divided)	2041
557	8380	Dandenong-Frankston Rd - Thompsons Rd to Greens Rd	Widening (6 lanes divided)	2041
163	6138	Ferntree Gully Rd - Scoresby Rd to Burwood Hwy	Widening (6 lanes divided)	2041
619	9110	Glasscocks Road - South Gippsland Hwy to Berwick-Cranbourne Rd	Duplication (4 lanes divided)	2041
578	8343	Greigs Road - Troups Rd Sth to Hopkins Rd	Widening (4 lanes)	2041
230	9111	Grices Rd - Berwick-Cranbourne Rd to Soldiers Rd	Duplication (4 lanes divided)	2041
166	7159	Heatherton Rd - Hallam North Rd to Belgrave-Hallam Rd	Duplication (4 lanes divided)	2041
545	8408	Heatherton Rd - Monash Fwy to Power Rd	Widening (6 lanes divided)	2041
575	8342	Iramoo Rd - Mt Cottrell Rd to Greigs Rd	Widening (4 lanes)	2041
630	6132	Leakes Rd - Palmers Rd to Fitzgerald Rd	Widening (6 lanes divided)	2041
563	8340	Little Boundary Rd - Fairbairn Rd to Princes Hwy	Widening (6 lanes divided)	2041
633	9232	Officer South Rd - Princes Hwy to Rix Rd	Widening (4 lanes divided)	2041
599	8368	Princes Hwy - Old Princes Hwy to Officer South Rd	Widening (6 lanes divided)	2041
249	9522	Robinsons Rd - through Deer Park Bypass interchange	Widening (6 lanes divided)	2041
551	5994	Sayers Road/ Old Geelong Road - Palmers Road to Kororoit Creek Road	Duplication (4 lanes divided)	2041
571	8409	Swansea Rd - York Rd to Mt Dandenong Rd	Widening (6 lanes divided)	2041
387	8311	Thompsons Rd - Berwick-Cranbourne Rd to Officer South Rd	Widening (4 lanes divided)	2041
318	9145	Thompsons Rd - McCormicks Rd to Clyde Rd	Widening (6 lanes divided)	2041
388	8190	Thompsons Rd Extension - Officer South Rd to McGregors Rd	Widening (4 lanes not divided)	2041
626	7175	Wantirna Road - Canterbury Road to Maroondah Hwy	Duplication (4 lanes divided)	2041
528	8993	Wellington Road- Kellets Road to Lysterfield Road	Duplication (4 lanes divided)	2041
554	6125	Westbrook Dr - Ballan Rd to Leakes Rd	Duplication (4 lanes)	2041
591	9018	South Gippsland Freeway - Monash Fwy to South Gippsland Hwy	Widening (6 lanes)	2041



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603	8382	Mornington Peninsula Fwy - Springvale Rd to Eastlink	Widening (8 lane freeway)	2041
154	8136	Calder Freeway, Interchange - Sunshine Ave	Interchange (1/2 diamond, west	2041
611	9007	Western Freeway - Deer Park Bypass	Widening (6 lane freeway)	2041
616	6007	Western Fwy - Hopkins Rd to Leakes Rd	Widening (6 lanes)	2041
683	8014	E6 - Metropolitan Ring Rd to Findon Rd	New route (4 lane freeway)	2041
638	7001	E6 - Findon Rd to Bridge Inn Rd (includes sealing of Craigieburn Rd East from OMR to Epping Rd)	New route (4 lane freeway)	2041
383	8012	E6 - Scanlon Dr to Bridge Inn Rd	New route (4 lane freeway)	2041
684	8309	E6 - Hume Fwy to Scanlon Dr	New route (4 lane freeway)	2041
381	8007	OMR - Princes Fwy to Ballan Rd	New route (4 lane freeway)	2041
532	8318	Ballan Rd - OMR to Bulban Rd	Widening (4 lanes divided)	2041
582	9226	Gorge Rd/ Kurrak Rd - Plenty Rd to Yan Yean Rd	Duplication (4 lanes divided)	2041
625	9254	Berwick-Cranbourne Rd - Thompsons Rd to Pattersons Rd	Widening (6 lanes divided)	2041
209	SE051	Cardinia Road South of western arterial to Thompsons Rd	Duplication (4 lanes)	2041
655	NW111	Ison Road (Westbrook Dr) - Armstrong Rd to Ballan Rd	Duplication (4 lanes divided)	2041
679	5206	Western Port Hwy - South Gippsland Hwy to Cranbourne-Frankston Rd	Widening (6 lanes divided)	2041
499	9280	Somerton Road - Hume Hwy to Roxburgh Park Drive	Widening (6 lanes divided)	2041
082	6134	Burwood Highway - Scoresby Rd to Ferntree Gully Rd	Widening (6 lanes divided)	2041
144	5182	Springvale Rd - Mitcham Rd to Old Warrandyte Rd	Duplication (4 lanes divided)	2041
152	7176	Wellington Rd - Napoleon Rd to Kelletts Rd	Duplication (4 lanes divided)	2041
556	8016	Punt Road - Swan Street to St Kilda junction	Widening (6 lanes)	2041
811	9213	Ballarto Road - South Gippsland Hwy to Casey Fields Bvd	Duplication (4 lanes divided)	2041
813	9265	Cranbourne-Frankston Rd - Western Port Hwy to Hall Rd	Widening (6 lanes divided)	2041
814	8185	Lysterfield Rd -Napoleon Rd to Wellington Rd	Duplication (4 lanes divided)	2041
815	8192	McGregor Rd - Pakenham Bypass to Thompsons Rd Extension	Duplication (4 lanes divided)	2041
817	9137	Remington Dve to Bangholme Rd (via Colemans and Taylors Rds)	New route (4 lanes divided)	2041
818	4129	Springvale Rd - Old Warrandyte Rd to Reynolds Rd	Duplication (4 lanes divided)	2041
541	8424	Surrey Rd - Eastern Fwy to Springfield Rd	Widening (4 lanes divided)	2041
812	9104	Cranbourne Local Bypass/Linsell Blvd/Hardys Road - South Gippsland Hwy to Muddy Gates La	Duplication (4 lanes divided)	2041
816	9130	Mount Dandenong Road - Liverpool Rd to Canterbury Rd	Duplication (4 lanes divided)	2041
262	5174	Western Port Hwy - Baxter Tooradin Rd to Frankston Flinders Rd	Duplication (4 lanes divided)	2041
602	8381	Mornington Peninsula Fwy - Lower Dandenong Rd to Springvale Rd	Widening (6 lane freeway)	2041
822	9516	Dingley Freeway - Perry Rd to South Gippsland Fwy	Conversion to freeway (6 lanes)	2051
566	8372	Ballarto Road - Casey Fields Bvd to Clyde-Five Ways Rd	Widening (4 lanes divided)	2051
461	4169	Scanlon Drive Extension - Summerhill Rd to Gunns Gully Rd	New route (2 lanes)	2051



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107	5180	Bayswater Rd - Canterbury Rd to Mt Dandenong Rd	Widening (4 lanes)	2051
500	7174	Main Rd - Fitzsimons La to Bridge St	Widening (4 lanes not divided)	2051
572	8376	Baxter-Tooradin Rd - Western Port Hwy to South Gippsland Hwy	Widening (4 lanes divided)	2051
623	8187	Belgrave Hallam Road - New Wellington Road connection to Heatherton Rd	Duplication (4 lanes divided)	2051
565	8375	Browns Rd - Western Port Hwy to Craig Rd	Widening (4 lanes divided)	2051
549	8371	Clyde-Five Ways Rd - Ballarto Rd to Berwick-Cranbourne Rd	Widening (6 lanes divided)	2051
574	8412	Craigieburn Rd - Hanson Rd to Hardy Av	Widening (6 lanes divided)	2051
694	7178	Croydon Road/Wonga Road/Warranwood Road/Plymouth Road - Yarra Road to Ringwood-Warrandyte	Duplication (4 lanes divided)	2051
213	8435	Dandenong-Frankston Rd - Greens Rd to Dandenong Bypass	Widening (6 lanes divided)	2051
657	8428	Derrimut Road - Leakes Road to Dohertys Road	Widening (6 lanes divided)	2051
654	9293	Derrimut Road - Sayers Rd to Leakes Rd	Widening (6 lanes divided)	2051
405	8184	Dorset Road - Olive Grove to Rosella Grove	Duplication (4 lanes divided)	2051
562	9503	Fitzgerald Road - Kororoit Creek Rd to Western Fwy ramp	Widening (6 lanes divided)	2051
584	9298	Hobbs Rd/Sewells Rd - Ballan Rd to Sayers Rd	Duplication (4 lanes divided)	2051
558 and 698	9185	Leakes Rd - Mt Cottrell Rd to Palmers Rd	Widening (6 lanes divided)	2051
539	8353	Melbourne-Lancefield Rd - Sunbury Rd to north of Raes Rd	Widening (4 lanes divided)	2051
535	8366	Mt Dandenong Rd - Whitehorse Rd to Dublin Rd	Widening (6 lanes divided)	2051
316	9134	Officer South Rd - Lecky Rd to Thompsons Rd	Widening (4 lanes not divided)	2051
631	8154	Officer South Rd - Pakenham Bypass to Lecky Rd	Widening (4 lanes not divided)	2051
553	8336	Palmers Rd - Leakes Rd to Middle Rd	Widening (6 lanes divided)	2051
601	8407	Peninsula Link (Frankston Bypass) - EastLink to Frankston-Flinders Rd	Widening (6 lane freeway)	2051
651	8433	Princes Fwy West - Heaths Rd	New interchange	2051
618	9009	Western Freeway - Leakes Rd to Coburns Rd	Widening (6 lanes)	2051
610	9011	Western Freeway - Western Highway to Hopkins Rd	Widening (6 lanes)	2051
380	4006	OMR - Ballan Rd to East-West Freeway	New route (4 lane freeway)	2051
379	8008	OMR - East-West Freeway to Calder Fwy	New route (4 lane freeway)	2051
378	7304	OMR - Calder Fwy to Sunbury Rd	New route (4 lane freeway)	2051
382	6009	OMR - Sunbury Rd to Hume Fwy	New route (4 lane freeway)	2051
689	6014	OMR - Easterly oriented ramps at Sunbury Rd	New freeway ramps (1 lane)	2051
396	4007	East-West Freeway - OMR to Deer Park Bypass	New route (4 lane freeway)	2051
682	5300	Tullamarine Freeway Extension - Somerton Rd to OMR	New route (4 lane freeway)	2051
401	6004	Koo Wee Rup Rd, new freeway - Princes Freeway at Pakenham to South Gippsland Highway at Koo Wee R	Conversion to freeway (4 lanes)	2051
219	8147	Dandenong Valley Hwy (Stud Road) - High Street to Burwood Highway	Widening (3 lanes north bound)	2051
217	8146	Dandenong Valley Hwy (Stud Road) - Burwood Hwy to Boronia Rd	Widening (3 lanes north bound)	2051



VLC Ref #	Project #	Project	Scope	Reference Case Year
216	8150	Dandenong Valley Hwy (Stud Road) - Ferntree Gully Road to High St Road	Widening (6 lanes divided)	2051
220	8148	Dandenong Valley Hwy (Stud Road) - Monash Fwy to Heatherton Road	Widening (3 lanes south bound)	2051
218	8149	Dandenong Valley Hwy (Stud Road) - Wellington Road to Kellets Road Rowville	Widening (6 lanes divided)	2051
214	8151	Dandenong Valley Hwy (Stud Road) - Wellington Road to Monash Freeway (Widen 4 to 6 Lanes Divided)	Widening (6 lanes divided)	2051
564	7993	Diamond Creek Road- Aqueduct Road to Ryans Road	Duplication (4 lanes divided)	2051
788	9123	Maroondah Highway - Warburton Highway to Melba Highway	Duplication (4 lanes divided)	2051
237	8155	Maroondah Hwy from Lilydale Deviation to Anderson Rd	New	2051
789	9418	Victoria Road - Maroondah Hwy to Paynes Rd Extension	Duplication (4 lanes divided)	2051
790	8995	Victoria St - Doncaster Road to King St	Widening (4 lanes not divided)	2051
604	6010	Tullamarine Freeway Extension - Melbourne Airport to Somerton Rd	New route (6 lane freeway)	2051
515	8427	Derrimut Road - Dohertys Road to Boundary Road	Widening (6 lanes divided)	2051
111	5181	Burwood Highway - Cathies Lane to Stud Road	Widening (6 lanes divided)	2051
126	5178	Ferntree Gully Rd - Stud Rd to Scoresby Rd	Widening (6 lanes divided)	2051
510	8312	Greenhills Rd - McGregor Rd to Koo Wee Rup Rd	Widening (4 lanes divided)	2051
244	7177	Napoleon Rd - Kelletts Rd to Lysterfield Rd	Duplication (4 lanes divided)	2051
415	9199	Somerton Road - Mickleham Rd to Roxburgh Park Dr	Widening (6 lanes divided)	2051
204	6001	Western Port Hwy - South Gippsland Hwy to Cranbourne-Frankston Rd (excludes Wedge Rd interchange)	Conversion to freeway (4 lanes)	2051
258	8186	Wellington Rd - Lysterfield Rd to Belgrave-Hallam Rd	Duplication (4 lanes divided)	2051
561	8422	Elgar Rd - Eastern Fwy to Woodhouse Gr	Widening (6 lanes divided)	2051
819	9256	Berwick-Cranbourne Rd/Sladen St - Pattersons Rd to South Gippsland Hwy	Widening (6 lanes divided)	2051
820	4131	Boronia Rd - Mountain Hwy to Stud Rd	Widening (6 lanes divided)	2051
821	9439	Casey Fields Boulevard - Thompsons Rd to Ballarto Rd	Duplication (4 lanes divided)	2051
824	8157	Dorset Rd - Hull Rd to Maroondah Highway	Duplication (4 lanes divided)	2051
826	9109	Glasscocks Road - Dandenong Valley Hwy to Evans Rd	Widening (6 lanes divided)	2051
827	9113	Hall Rd - Dandenong-Frankston Rd to Western Port Hwy	Widening (6 lanes divided)	2051
828	9127	Melba Highway - Coldstream to north of Yarra Glen	Duplication and deviation (4 lanes divided)	2051
835	9428	Pattersons Road - Bells Rd to Pound Rd	Duplication (4 lanes divided)	2051
803	9444	Cardinia Road - Henry Rd to Lecky Rd	Widening (6 lanes divided)	2051
823	9107	Dorset Rd - Boronia Rd to Burwood Hwy	Widening (6 lanes divided)	2051
831	9432	Muddy Gates Lane - Ballarto Rd to Hardys Rd	Duplication (4 lanes divided)	2051
775	4190	Golf Links Rd - Peninsula Link to Baxter-Tooradin Rd	Duplication (4 lanes divided)	2051
800	9524	Dingley Freeway - South Road to Cheltenham Rd	Conversion to freeway (6 lanes)	2051



Table D.2 - Road Project Assumptions – Edited Road Projects

VLC Ref #	Project #	Project	Scope	Reference Case Year	NELA Modelled Assumption
092	2198	APAC Drive Extension - Melrose Dr to Tullamarine Fwy	New overpass (2 lane, 1-way)	2015	NELA year: 2013 (from observations)
087	2154	Calder Freeway/Kings Rd Interchange, and Kings Rd duplication Calder Fwy - Melton Hwy	Interchange (full diamond) and duplication (	2015	NELA year: 2012 (from observations)
050	2106	Clyde Road - Kangan Dr to High St (Princes Hwy)	Duplication (4 lanes divided), no grade separ	2015	NELA year: 2014 (from observations)
039	2001	Dingley Arterial East - Springvale Rd to Perry Rd	New route (6 lanes divided)	2015	NELA year: 2013 (from observations)
131	2156	Kororoit Creek Rd - Grieve Pde to Millers Rd (4 lanes divided, includes grade separation)	Duplication (4 lanes divided) and grade separation	2015	NELA year: 2012 (from observations)
067	2173	Linsell Blvd - Narre Warren-Cranbourne Rd to Berwick-Cranbourne Rd	New route (2 lanes)	2015	NELA year: 2013 (from observations)
043	2010	M80 - Edgars Rd to Plenty Rd	Widening (to 6 or 8 lanes)	2015	NELA year: 2014 (from observations)
041	2008	M80 - Calder Fwy to Sydney Rd	Widening (to 6 or 8 lanes)	2015	NELA year: 2013 (from observations)
041	2202	Tullamarine Fwy/M80 interchange - Tullamarine Fwy (S bd) to M80 (SW bd)	New elevated ramp (2 lanes)	2015	NELA year: 2013 (from observations)
041	2203	M80 - Tullamarine Fwy to Pascoe Vale Rd	New exit ramp to Pascoe Vale Rd (2 lanes)	2015	NELA year: 2013 (from observations)
042	2006	M80 - Western Hwy to Sunshine Av	Widening (to 6 or 8 lanes)	2015	NELA year: 2014 (from observations)
010	1104	Marathon Bvd - Aitken Bvd to Windrock Av	New route (2 lanes)	2015	NELA year: 2014 (from observations)
491	2201	Melrose Dr - Centre Rd to APAC Dr	Duplication (4 lanes divided)	2015	NELA year: 2016 (from observations)
647	2153	Mitcham Rd - Whitehorse Rd to Brunswick Rd, and Rooks Rd - Whitehorse Rd to Station St	Rail grade separation	2015	NELA year: 2016 (from observations)
660	2157	Palmers Road - Extension beyond Princes Fwy across the Werribee rail line	New route (2 lanes)	2015	NELA year: 2013 (from observations)
085 , 086	2004	Peninsula Link - Dandenong-Frankston Rd to Morn Pen Fwy	New route (4 lane freeway)	2015	NELA year: 2013 (from observations)
040	2002	Peninsula Link (Frankston Bypass) - EastLink to Dandenong-Frankston Rd	New route (4 lane freeway)	2015	NELA year: 2013 (from observations)
020	2155	Plenty Road - Gordons Rd to Riverdale Bvd	Duplication (4 lanes divided)	2015	NELA year: 2013 (from observations)
443	2166	Brookfield Boulevard - Vantage Boulevard to Aitken Boulevard	New route (2 lanes)	2015	NELA year: 2014 (from observations). Project 443 includes the section from Aitken Boulevard to Waterview Boulevard.
442	2180	Harvest Home Road - Scanlon Dr to Edgars Rd	New route (2 lanes)	2015	NELA year: 2016 (from observations)
PT068	2149	Palmers Rd - Connectors to new Williams Landing railway station New P	T connectors	2015	NELA year: 2013 (from observations)
029	2158	Windrock Av/Main St - Marathon Bvd to Craigieburn Rd	New route (2 lanes)	2015	NELA year: 2014 (from observations)
base	2164	Bridgewater Road - James Mirams Drive to Donald Cameron Drive	Duplication (4 lanes divided)	2015	Exists in 2011, is in NELA base.
base	2199	Mercer Dr - Tullamarine Fwy to Melrose Dr	Widening (2 lanes)	2015	Exists in 2011, is in NELA base.
base	2169	William Thwaites Boulevard - Glasscocks Rd to Thompsons Rd	New route (2 lanes)	2015	Exists in 2011, is in NELA base.
640	2196	Grassland Drive - Hacketts Rd to Point Cook Rd	New route (2 lanes)	2016	NELA year: 2021 (from observations)
627	2105	Cardinia Rd - Princes Hwy to Shearwater Dr	Duplication (4 lanes divided)	2016	NELA year: 2015 (from observations)
446	2159	Henry Rd - McCubbin Av to Cardinia Rd	New route (2 lanes)	2016	NELA year: 2014 (from observations)
313	2312	McGregors Road - Level Crossing to Princes Hwy	Duplication (with exception of level crossing)	2016	NELA year: 2015 (from observations)
469	2170	Casey Fields Boulevard - Linsell Av to Patterson Rd	New route (2 lanes)	2016	NELA year: 2015 (from observations)



VLC Ref #	Project #	Project	Scope	Reference Case Year	NELA Modelled Assumption
092	2198	APAC Drive Extension - Melrose Dr to Tullamarine Fwy	New overpass (2 lane, 1-way)	2015	NELA year: 2013 (from observations)
663	2183	Shogaki Drive - Ferris Rd to Mount Cottrell Rd	New route (2 lanes)	2016	NELA year: 2021 (from observations)
base	2311	McGregors Road - Henry Rd to Henty St	Duplication	2016	Exists in 2011, is in NELA base.
453	2168	Scanlon Drive Extension - Cooper St to Craigieburn Road	New route (2 lanes)	2016	NELA year: 2021 (from observations)
644	3303	Main Rd, St Albans	Grade separation	2021	NELA year: 2016 (from observations)
424	9236	Princes Freeway West, Interchange - Sneydes Road	Interchange (full diamond)	2021	NELA year: 2016 (from observations)
648	3304	Scoresby Rd, Bayswater	Grade separation	2021	NELA year: 2017 (from observations)
648	3371	Mountain Hwy, Bayswater	Grade separation	2021	NELA year: 2017 (from observations)
685	3312	Sladen St - Narre Warren-Cranbourne Rd to South Gippsland Hwy	Duplication (4 lanes, not divided)	2021	NELA year: 2017 (from observations)
057	3179	E14 (Aitken Bvd) - Craigieburn Rd to Central Arterial	New route (2 lanes)	2021	NELA year: 2014 (from observations)
048	3302	Cardinia Rd, Shearwater Dr to Pakenham Bypass	Duplication	2021	NELA year: 2017 (from observations)
772	3373	Maroondah Highway - Ringwood St to Warrandyte Rd	Speed reduction (40 kph)	2021	NELA year: 2016 (from observations)
728	8998	West Gate Distributor Shepherds Bridge and Moreland St Widening	Widening (4 lanes outbound)	2021	NELA year: 2017 (from observations)
062	2117	Hallam South Rd - Ormond Rd to South Gippsland Hwy	Duplication (4 lanes divided)	2021	On advice of NELA this project has been given year 2026 for modelling purposes (OSARs).
138	9233	O'Herns Rd from Edgars Rd to Epping Rd	Duplication (4 lanes divided)	2021	NELA year: 2014 (from observations)
668	3197	Thompsons Rd Extension - Berwick-Cranbourne Rd to Soldiers Rd	New route (2 lanes)	2021	NELA year: 2031
514	NW106	Davis Rd - Hogans Rd to Leakes Rd	Sealing (2 lanes)	2021	NELA year: 2031
base	NW019	Hogans Road - Davis Creek to Davis Road	Sealing (2 lanes)	2021	Exists in 2011, is in NELA base.
base	NW074	Lehmans Road - Bindts Road to North South Connector	New route (2 lanes)	2021	In NELA base
base	3209	Nicholson St - Blyth St to Holmes St	Speed reduction (40 kph)	2021	In NELA base
PT036	NW066	Salt Lake Boulevard- Lehmans Road - Edgars Road	New route (2 lanes)	2021	PT036 covers this in year 2016.
base	NW045	Section Road	New route (2 lanes)	2021	Exists in 2011, is in NELA base.
base	SE011	Thewlis Road extension from Princes Highway to Kenneth Road	Extension	2021	Exists in 2014, is in NELA base.
PT035	NW049	Elizabeth Drive (Racecourse to Jacksons Creek)	New route (2 lanes)	2021	NELA year: 2016
318	SE018	Thompsons Rd, Marriott Boulevard to South Gippsland Hwy	Widening (6 lanes)	2021	NELA year: 2041
PT025	NW024	Ison Road (Westbrook Dr) - Ballan Road to 1km north of Ballan Road	New route (2 lanes)	2021	NELA year: 2046
452	SE013	Western Arterial road (Cardinia Rd to Gum Scrum Creek)	Extension	2021	Alignment may be slightly different and NELA year is 2031.
base	SE012	Cardinia Road South of Princes Freeway to western arterial (Glasscocks Rd extension)	Extension	2021	In NELA base
263	NW030	Cloverton Boulevard (south of Cameron Street)	New route (2 lanes)	2021	Former Amaroo Rd extension used.
base	NW012	Boundary Road - Mt Cottrell Rd to Davis Rd	Sealing 2 lanes	2026	In NELA base
PT052	NW052	Jacksons Hill Link	New route (2 lanes)	2026	NELA year: 2046
444	NW038	Marathon Boulevard (Whites Lane to Craigieburn West PSP connector road)	New route (2 lanes)	2026	NELA year: 2016
PT051	NW053	Polaris Road (Donnybrook Rd to English St)	New route (2 lanes)	2026	NELA year:2046
666	NW084	Gunns Gully Road Southern Half Connection to Hume Freeway	Interchange (1/2 diamond, southerly oriented)	2026	NELA year: 2031 and has Northern ramps as well as Southern.



VLC Ref #	Project #	Project	Scope	Reference Case Year	NELA Modelled Assumption
092	2198	APAC Drive Extension - Melrose Dr to Tullamarine Fwy	New overpass (2 lane, 1-way)	2015	NELA year: 2013 (from observations)
PT035	NW041	Marathon Boulevard (Craigieburn West PSP connector road to Micklehwa Rd)	New route (2 lanes)	2026	Covered by PT035 in year 2016.
465	2185	Iramoo Rd - Exford Rd to Ferris Rd	New route (2 lanes)	2031	NELA year: 204618 (from observations)
666	NW085	Gunns Gully Road Northern Half Connection to Hume Freeway	Interchange (1/2 diamond, northerly oriented)	2031	Full diamond is coded as per project 3183 from 1.08a
base	NW073	Harvest Home Road - Epping Road to Bindts Road	New route (2 lanes)	2031	Exists in 2011, is in NELA base.
PT036	NW065	Andrew Road - Craigieburn Road to Summerhill Road	New route (2 lanes)	2031	NELA year: 2016
base	SE028	Cardinia Rd - South of Western Arterial to Thompsons Rd	upgrade to 2 lane	2031	2 lane upgrade is present in 2014
PT034	SE048	New East-West road (north of Princes Freeway) - Timbertop Bvd to Gum Scrub Creek	New route (2 lane bvd)	2031	Partially covered by PT034 in year 2016
673 and 674	NW011	Taylors Road - Leakes Rd to Melton Hwy (Federation Dr)	New route 2 lanes	2031	NELA year: 2026 as comes in with 773.
452	SE031	Western Arterial Rd - Gum Scrub Creek to east of Cardinia Creek	New route (2 lanes)	2031	Alignment may be slightly different
263	NW031	Cloverton Boulevard (north of Cameron Street)	New route (2 lanes)	2031	NELA year: 2021 and Former Amaroo Rd extension used.
PT036	NW064	Edgars Road- Craigieburn Road to Summerhill Road	New route (2 lanes)	2031	Covered by PT036 in year 2016.
PT036	4172	New north-south route in Donnybrook - Gunns Gully Rd to Scanlon Dr Extension	New route (2 lanes)	2031	NELA year for PT036 is 2016
533	9244	Yan Yean Road -Kurrak Road to Bridge Inn Road	Duplication (4 lanes divided)	2036	On advice of NELA this project has been given year 2026 for modelling purposes (OSARs).
PT034	3194	Hardys Road - Berwick-Cranbourne Rd to Pound Rd	New route (2 lanes)	2036	NELA year is 2016, and a slightly different alignment.
117	6123	Childs Rd - Bowman Dr to Proposed E6	Duplication (4 lanes divided)	2041	On advice of NELA this project has been given year 2026 for modelling purposes (OSARs).
803	SE050	Cardinia Road South of Princes Freeway to western arterial	Widening (6 lanes)	2041	NELA year 2051
PT037	NW009	Tarletons Road - Leakes Rd to Mt Cottrell Rd	New route 2 lanes	2041	Small section of this is covered by PT037 in year 2021
585	SE049	Western Arterial road (Cardinia Road to Soldiers Road)	Duplication (4 lanes)	2051	Alignment may be slightly different
204	2140	Thompsons Rd/Western Port Hwy Interchange	Interchange (full diamond) and g	2041	NELA year 2051 with the freeway standard.



Table D.3 - Road Project Assumptions – Additional Road Projects Implemented by NELA

VLC Ref #	Project #	Project	Scope	NELA Year	Comments
038	N/A	Grand Bvd from Mt Ridley Rd to Winrock Ave	Upgrade	2012	Existing – in base year
083	N/A	Sayers Rd from Derrimut Rd to Tarneit Rd=> 4 lane Divided	Upgrade	2012	Existing – in base year
084	N/A	Shearwater Dr from Cardinia Rd to Princes Hwy	New	2012	Existing – in base year
091	N/A	M1 at WGB	Upgrade	2012	Existing – in base year
423	N/A	Bush Bvd from Plenty Rd to McDonalds Rd	New	2012	Existing – in base year
427	N/A	Breakwater Rd from Tucker Rd to Barwon Heads Rd	Upgrade	2012	Existing – in base year
238	N/A	McGrath Rd from Bulban Rd to Black Forest Rd	New	2013	Existing – in base year
419	N/A	Geelong Ring Rd Stages 4A 4B & 4C from to	New	2013	Existing – in base year
429	N/A	Nagambie Bypass from Mitchellstown Rd to Moss Rd	New	2013	Existing – in base year
434	N/A	Bass Hwy from Lang Lang to Anderson	Upgrade	2013	Existing – in base year
435	N/A	Western Hwy from Beaufort to Ballarat	Upgrade	2013	Existing – in base year
436	N/A	Extra Rds for the 2013 PT network	Growth Areas	2013	Existing – in base year
766	N/A	Growth area road improvements	New	2013	Existing – in base year
421	N/A	Princes Fwy East from Melbourne to Sale	Upgrade	2014	Existing – in base year
428	N/A	Midland Hwy from Florence St to Doyles Rd	Upgrade	2014	Existing – in base year
430	N/A	Princes Hwy from Reid Dr (Wurruk) to Reeve St (Sale)	Upgrade	2014	Existing – in base year
433	N/A	Warragul Rail Precinct Upgrade from Howitt St to Normanby Place	New	2014	Existing – in base year
662	N/A	Extra Rds for the 2014 PT network	0	2014	Existing – in base year
768	N/A	Growth area road improvements	New	2014	Existing – in base year
420	N/A	Princes Hwy from Waurin Ponds to Winchelsea	Upgrade	2015	Existing – in base year
702	N/A	Ballarat Western Link Rd from Remembrance Dr to Learmonth Rd	New	2015	Existing – in base year
725	N/A	Inner West Truck Curfews from Moore St to Francis St	Turn bans	2015	Existing – in base year
764	N/A	North-East Truck curfew (Greensborough) from Waterdale Rd to Ryans Rd	Turn bans	2015	Existing – in base year
767	N/A	Growth area road improvements	New	2015	Existing – in base year
699	N/A	Western Hwy from Beaufort to Buangor	Upgrade	2016	Existing – in base year
700	N/A	Western Hwy from Buangor to Ararat	Upgrade	2016	Existing – in base year
703	N/A	Pioneer Rd from Church St to Waurin Ponds Creek	Upgrade	2016	Existing – in base year
704	N/A	Sneydes Rd from Princes Hwy to South Rd	Upgrade	2016	Existing – in base year
721	N/A	Princes Hwy from Denison Rd to Nambrook Rd	Upgrade	2016	Existing – in base year
722	N/A	Princes Hwy from Sale-Heyfield Rd to Reid Dr (Wurruk)	Upgrade	2016	Existing – in base year
724	N/A	Webb Dock Dr from Williamstown Rd to Cook St	New	2016	Existing – in base year
765	N/A	Growth area road improvements	New	2016	Existing – in base year
PT018	N/A	Growth Area Bus Infrastructure- Outer SW (Werribee/Hoppers Crossing)	Growth Areas	2016	Existing – in base year
PT034	N/A	Growth Area Bus Infrastructure- Outer SE (Cranbourne/Pakenham)	Growth Areas	2016	Existing – in base year
PT035	N/A	Growth Area Bus Infrastructure- Outer NW (Craigieburn/Sunbury)	Growth Areas	2016	Existing – in base year
PT036	N/A	Growth Area Bus Infrastructure- Outer North (South Morang/Epping)	Growth Areas	2016	Existing – in base year



VLC Ref #	Project #	Project	Scope	NELA Year	Comments
PT038	N/A	Growth Area Bus Infrastructure- Outer SW (Point Cook)	Growth Areas	2016	Existing – in base year
PT069	N/A	Growth area infrastructure for 2016 bus network	Growth Areas	2016	Existing – in base year
705	N/A	Princes Hwy East/Sand Rd Interchange	New	2017	Rural road not in reference case
706	N/A	Calder Hwy/Ravenswood	New	2017	Rural road not in reference case
701	N/A	Western Hwy from Ararat to Stawell	Upgrade	2019	Rural road not in reference case
785	N/A	Warrandyte Bridge upgrade	Upgrade	2019	Planning underway according to VicRoads Projects website
714	N/A	Princes Hwy from Winchelsea to Colac	Upgrade	2019	Rural road not in reference case
707	N/A	Clayton Rd - Houghton Rd to Carinish Rd	Grade separation	2021	
360	N/A	Elizabeth Dr Extension (Sunbury) from existing urban area. Northwards to line of future ring route (new link)	New	2021	Construction completed late 2017 (satellite imagery)
PT026	N/A	Growth Area Bus Infrastructure- Outer North (Epping/South Morang/Wallan)	Growth Areas	2021	Growth area links to accommodate bus service plans
PT037	N/A	Growth Area Bus Infrastructure- Outer West (Caroline Springs/Melton)	Growth Areas	2021	Growth area links to accommodate bus service plans
PT055	N/A	Growth Area Bus Infrastructure- Outer SE (Pakenham)	Growth Areas	2021	Growth area links to accommodate bus service plans
PT056	N/A	Growth Area Bus Infrastructure- Outer SE (Dandenong/Cranbourne/Warneet)	Growth Areas	2021	Growth area links to accommodate bus service plans
PT058	N/A	Growth Area Bus Infrastructure- Outer SW (Werribee/Hoppers Crossing)	Growth Areas	2021	Growth area links to accommodate bus service plans
PT059	N/A	Growth Area Bus Infrastructure- Outer West (Melton)	Growth Areas	2021	Growth area links to accommodate bus service plans
PT060	N/A	Growth Area Bus Infrastructure- Outer NW (Sunbury)	Growth Areas	2021	Growth area links to accommodate bus service plans
PT061	N/A	Hillview Rd from Mickleham Rd	Growth Areas	2021	Construction commenced 2015 (still ongoing)
308	N/A	Evans Rd from South Gippsland Hwy to Thompsons Rd	Upgrade	2021	
124	N/A	Edgars Rd - Cooper St to O'Herns Rd	New route (2 lanes)	2021	From reference case 1.08a (id=3124). 2 lane inclusion to come before 6 lanes upgrade.
450	N/A	Glasscocks Road - Western Port Hwy to South Gippsland Hwy	New route (2 lanes)	2021	From reference case 1.08a (id=2178)
483	N/A	Grants Road Extension - Hume Fwy to Merriang Rd	New route (2 lanes)	2026	From reference case 1.08a (id=4168)
622	N/A	Beveridge-Darraweit Rd from Romsey Rd to Old Sydney Rd	New	2031	Rural road not in reference case
477	N/A	Federation Dr - Melton Hwy to Beattys Rd	New	2031	From reference case 1.08a (id=5307)
119	N/A	E14 (Aitken Bvd) from MRR to Broadmeadows Rd	New	2031	
229	N/A	Governor Rd from Boundary Rd to Springvale Rd	New	2031	
257	N/A	Wedge Rd from Western Port Hwy to Evans Rd	New	2031	
711	N/A	Beaufort Bypass	New	2031	Rural road not in reference case
712	N/A	Ararat Bypass	New	2031	Rural road not in reference case
713	N/A	Horsham bypass	New	2031	Rural road not in reference case
715	N/A	Drysdale Bypass	New	2031	Rural road not in reference case
PT022	N/A	Growth Area Bus Infrastructure- Outer NW (Craigieburn/Sunbury/Kalkallo)	Growth Areas	2031	Growth area links to accommodate bus service plans
PT039	N/A	Growth Area Bus Infrastructure- Outer SE (Cranbourne/Pakenham/Dandenong)	Growth Areas	2031	Growth area links to accommodate bus service plans
PT040	N/A	Growth Area Bus Infrastructure- Mornington Pen. (Mount Martha)	Growth Areas	2031	Growth area links to accommodate bus service plans
PT041	N/A	Growth Area Bus Infrastructure- Outer SW (Werribee/Hoppers Crossing)	Growth Areas	2031	Growth area links to accommodate bus service plans
PT042	N/A	Growth Area Bus Infrastructure- Outer West (Melton)	Growth Areas	2031	Growth area links to accommodate bus service plans
484	N/A	Troups Road North - Melton Hwy to Taylors Rd	New route (2 lanes)	2031	From reference case 1.08a (id=5202)



VLC Ref #	Project #	Project	Scope	NELA Year	Comments
422	N/A	Westwood Drive - Rockbank Middle Rd to Taylors Rd	New route (4 lanes divided)	2031	From reference case 1.08a (id=6129)
133	N/A	Mornington Peninsula Fwy from Jetty Rd to Melbourne Rd	New	2046	
151	N/A	Wedge Rd from Taylors Rd to Western Port Hwy	New	2046	
211	N/A	Craigieburn Rd from Outer Ring Rd to Mickleham Rd	New	2046	
226	N/A	Findon Rd from Plenty Rd to Gorge Rd	New	2026	On advice of NELA this project has been given year 2026 for modelling purposes (OSARs).
384	N/A	South Gippsland Hwy from Koo Wee Rup Rd to Bass Hwy turnoff	Upgrade	2046	
403	N/A	Barry Rd Extension from E14 to Tullamarine Fwy	New	2046	
PT025	N/A	Growth Area Bus Infrastructure- Outer SW (Werribee/Hoppers Crossing)	Growth Areas	2046	Growth area links to accommodate bus service plans
PT050	N/A	Growth Area Bus Infrastructure- Outer SE (Cranbourne)	Growth Areas	2046	Growth area links to accommodate bus service plans
PT051	N/A	Growth Area Bus Infrastructure- Outer North (Craigieburn/Wallan/Whittlesea)	Growth Areas	2046	Growth area links to accommodate bus service plans
PT052	N/A	Growth Area Bus Infrastructure- Outer NW (Sunbury)	Growth Areas	2046	Growth area links to accommodate bus service plans
PT053	N/A	Growth Area Bus Infrastructure- Outer West (Caroline Springs/Melton)	Growth Areas	2046	Growth area links to accommodate bus service plans
PT054	N/A	Growth Area Bus Infrastructure- Outer SW (Point Cook)	Growth Areas	2046	Growth area links to accommodate bus service plans
224	N/A	Findon Rd from Epping Rd to Glendale Ave	New	2046	On advice of NELA this project has been given year 2026 for modelling purposes (OSARs).
310	N/A	Golf Links Rd/Baxter-Tooradin Rd, Peninsula Link to Western Port Highway connection	New route (4 lanes divided)	2046	Covers section from Frankston-Flinders Rd to Western Port Highway. Informed from reference case 1.08a (id=8201)
537	N/A	Cheddar Rd West - Hickford St to Keon Pde	Widening (4 lanes divided)	2046	From reference case 1.08a (id=8359)



Table D.4 - Road Project Assumptions – Excluded Road Projects

VLC Ref #	Project #	Project	Scope	Reference Case Year	Description
N/A	2152	Springvale Rd - Virgina St to Balmoral Av	Grade separation	2015	Not relevant for strategic modelling
N/A	3301	Burke Rd, Glen Iris	Grade separation	2016	Not relevant for strategic modelling
N/A	3300	Blackburn Rd, Blackburn	Grade separation	2021	Not relevant for strategic modelling
N/A	3340	Centre Rd, Bentleigh	Grade separation	2021	Not relevant for strategic modelling
N/A	3360	Furlong Rd, St Albans	Grade separation	2021	Not relevant for strategic modelling
N/A	3339	McKinnon Rd, McKinnon	Grade separation	2021	Not relevant for strategic modelling
N/A	3306	North Rd	Grade separation	2021	Not relevant for strategic modelling
N/A	3305	Murrumbeena Rd	Grade separation	2021	Not relevant for strategic modelling
N/A	3308	Koornang Rd	Grade separation	2021	Not relevant for strategic modelling
N/A	3333	Chandler Rd, Noble Park	Grade separation	2021	Not relevant for strategic modelling
N/A	3334	Abbotts Rd, Lyndhurst	Grade separation	2021	Not relevant for strategic modelling
N/A	3335	Thompsons Rd, Cranbourne West	Grade separation	2021	Not relevant for strategic modelling
N/A	3336	South Gippsland Hwy, Dandenong South	Grade separation	2021	Not relevant for strategic modelling
N/A	3337	Hallam South Road, Hallam	Grade separation	2021	Not relevant for strategic modelling
N/A	3338	Clyde Rd, Berwick	Grade separation	2021	Not relevant for strategic modelling
N/A	3341	Charman Rd, Cheltenham	Grade separation	2021	Not relevant for strategic modelling
N/A	3342	Balcombe Rd, Mentone	Grade separation	2021	Not relevant for strategic modelling
N/A	3343	Edithvale Rd, Edithvale	Grade separation	2021	Not relevant for strategic modelling
N/A	3344	Station St, Bonbeach	Grade separation	2021	Not relevant for strategic modelling
N/A	3347	Seaford Rd, Seaford	Grade separation	2021	Not relevant for strategic modelling
N/A	3348	Overton Rd (Skye Rd), Seaford	Grade separation	2021	Not relevant for strategic modelling
N/A	3349	Toorak Rd, Kooyong	Grade separation	2021	Not relevant for strategic modelling
N/A	3350	Heatherdale Rd, Ringwood	Grade separation	2021	Not relevant for strategic modelling
N/A	3351	Buckley St, Essendon	Grade separation	2021	Not relevant for strategic modelling
N/A	3352	Glenroy Rd, Glenroy	Grade separation	2021	Not relevant for strategic modelling
N/A	3353	Moreland Rd, Brunswick	Grade separation	2021	Not relevant for strategic modelling
N/A	3354	Bell St, Coburg	Grade separation	2021	Not relevant for strategic modelling
N/A	3356	Grange Rd, Fairfield	Grade separation	2021	Not relevant for strategic modelling
N/A	3357	Lower Plenty Rd, Rosanna	Grade separation	2021	Not relevant for strategic modelling
N/A	3358	Bell St, Preston	Grade separation	2021	Not relevant for strategic modelling
N/A	3359	High St, Reservoir	Grade separation	2021	Not relevant for strategic modelling
N/A	3361	Melton Hwy, Taylors Lakes	Grade separation	2021	Not relevant for strategic modelling
N/A	3362	Aviation Rd, Laverton	Grade separation	2021	Not relevant for strategic modelling
N/A	3363	Cherry St, Werribee	Grade separation	2021	Not relevant for strategic modelling
N/A	3364	Werribee St, Werribee	Grade separation	2021	Not relevant for strategic modelling
N/A	3365	Manchester Rd, Mooroolbark	Grade separation	2021	Not relevant for strategic modelling
N/A	3366	Maroondah Hwy, Lilydale	Grade separation	2021	Not relevant for strategic modelling
N/A	3367	Kororoit Creek Rd, Altona	Grade separation	2021	Not relevant for strategic modelling



VLC Ref #	Project #	Project	Scope	Reference Case Year	Description
N/A	3368	Ferguson St, Williamstown	Grade separation	2021	Not relevant for strategic modelling
N/A	3370	Centre Rd, Clayton	Grade separation	2021	Not relevant for strategic modelling
N/A	SE006	Park Road, Cheltenham	Grade Separation	2021	Not relevant for strategic modelling
N/A	3099	2021 PT access		2021	VITM specific
N/A	NW056	East - West Connector - Edgars Road to Epping Central	New route (2 lanes)	2021	Not enough information to code this up.
N/A	NW044	Blosson Boulevard	New route (2 lanes)	2021	Not enough information to code this up.
N/A	NW025	Bulban Road deviation to intersect with Ison Road (Existing road for 1.7km west from McGrath Road is deviated off the current alignment)	New route (2 lanes)	2021	Not enough information to code this up.
N/A	NW042	Horizon Boulevard	New route (2 lanes)	2021	Not enough information to code this up.
N/A	NW083	Auxiliary lane from Craigieburn Bypass to Edgars Rd	New Link (2 lanes)	2021	Not relevant for strategic modelling
N/A	NW015	Foundation Road - Dohertys Road to Leakes Road	New route (4 lanes)	2021	Excluded
N/A	NW057	North- South Connector - Cooper Street to Deveny Road	New route (2 lanes)	2021	Not enough information to code this up.
N/A	NW061	Riversdale Boulevard - Berry Lane to Bridge Inn Road	New route (2 lanes)	2021	Excluded
N/A	NW075	Vearings Road- Cooper Street to O'Herns	New route (2 lanes)	2021	Excluded
N/A	SE003	Mascot Avenue, Carrum	Closing/truncating road	2021	Not relevant for strategic modelling
N/A	SE004	McLeod Road, Carrum	Extension with Grade Separation	2021	Not relevant for strategic modelling
N/A	SE001	Station Street, Carrum	Closing/truncating road	2021	Not relevant for strategic modelling
N/A	SE002	Eel Race Road, Carrum	Closing/truncating road	2021	Not relevant for strategic modelling
N/A	4010	NEL / Manningham Rd interchange	Full interchange	2026	Project case
N/A	5308	M80 - Plenty Rd to Greensborough Hwy	Widening (8 lane freeway)	2026	Project case
136	4008	North-East Link -connection between Metropolitan Ring Road and Eastern Freeway at Bulleen	New route (6-8 lane freeway)	2026	Project case
N/A	4003	Eastern Freeway - Bulleen Rd to Doncaster Rd	Widening (10 lanes)	2026	Project case
N/A	4004	Eastern Freeway - Doncaster Rd to Springvale Rd	Widening (8 lanes)	2026	Project case
N/A	8385	Eastern Fwy - Chandler Hwy to Bulleen Rd	Widening (10 lane freeway)	2026	Project case
N/A	NW043	Craigieburn West PSP connector road	New route (2 lanes)	2026	Not enough information to code this up.
N/A	4188	Hallam South Rd - At railway crossing	Duplication (4 lanes divided)	2026	Is covered by 3173 (CS061)
N/A	NW040	Elevation Boulevard (Vantage Blv to Mickleham Rd)	New route (2 lanes)	2026	Excluded
N/A	NW059	Grange Drive Extension	New route (2 lanes)	2026	Not enough information to code this up.
502	7173	Fitzsimons La - Main Rd to Porter St	Widening (6 lanes divided)	2031	Excluded
N/A	4171	New east-west route north of OMR - Mandalay Rd to Patterson St	New route (2 lanes)	2031	Not enough information to code this up.
N/A	3098	Road adjustment around Melbourne Metro Stations		2031	Not enough information to code this up.
N/A	SE035	East west road (north of Princes Freeway) - O'Neill Road to Timbertop Blvd	New route (2 lane bvd)	2031	Not enough information to code this up.
N/A	SE037	North South Collector	New route (2 lanes)	2031	Not enough information to code this up.
N/A	SE034	northern east west road (west of Cardinia Road extension)	upgrade to final 2 lane boulevard standard	2031	Not enough information to code this up.



VLC Ref #	Project #	Project	Scope	Reference Case Year	Description
N/A	NW001	Kilmore Wallan Bypass, Northern Hwy at Boundary Road to Hume Fwy at Wandong	New Link	2031	Excluded
N/A	SE030	Southern Collector Rd - Ryan Rd to Princes Hwy	4 lane boulevard	2031	Excluded
517	8432	Hume Freeway - Western Ring Rd to Cooper St	Widening (6 lanes)	2031	Excluded
787	8414	Hume Fwy - Hume Hwy to Craigieburn Rd	Widening (6 lane freeway)	2036	Excluded
N/A	5008	Eastern Freeway - Doncaster Rd to Springvale Rd	Widening (8 lanes; and 10 lanes btn Tram Rd and Blackburn Rd)	2036	Project case
786	8017	Hume Freeway - Cooper St to Craigieburn Rd	Widening (6 lanes)	2036	Excluded
555	8358	Diamond Creek Rd - Greensborough Bypass to Yan Yean Rd	Widening (6 lanes divided)	2041	Project case
612	4005	Eastlink - Maroondah Hwy to Dingley Arterial	Widening (8 lanes)	2041	Excluded
587	8415	Hume Fwy - Gunns Gully Rd to south of Donnybrook Rd	Widening (6 lane freeway)	2041	Excluded
586	9514	Hume Fwy - south of Donnybrook Rd to Hume Hwy	Widening (8 lane freeway)	2041	Excluded
614 , 778	8421	M80 - E6 to Greensborough Hwy	Widening (10 lane freeway)	2041	Project case
N/A	4108	Stud Road Extension (Bayswater Bypass) - Mountain Highway to Dorset Road	New route (4 lanes)	2041	Excluded
671	3198	Thompsons Rd Extension - Cardinia Rd to McGregors Rd	New route (2 lanes)	2041	This project has been superseded due to project 8190 which widens the same section in the same year.
607	NA	Greensborough Bypass - Metropolitan Ring Rd to Diamond Creek Rd	Conversion to freeway (4 lanes)	2046	Project case
544	8364	Williamsons Rd/Fitzsimons La - Foote St to Main Rd	Widening (8 lanes divided)	2051	Excluded
573	8418	Hume Highway - Craigieburn Rd to Hume Freeway	Widening (6 lanes divided)	2051	Excluded
542	8363	Williamsons Rd - Eucalypt Av to Foote St	Widening (6 lanes divided)	2051	Excluded
N/A	9389	New east-west arterial south of Donnybrook Road (includes half interchange with Hume Fwy) - Aitken Bvd	Duplication (4 lanes divided) + 1/	2051	Not enough information to code this up.
N/A	SE064	Healesville Freeway - Stud Rd to Canterbury Rd	New route (4 lane freeway)	2051	Not enough information to code this up.
603	6002	Mornington Peninsula Fwy - Eastlink to Springvale Rd	Widening (6 lanes)	2051	There are 2 entries in reference case v1.09 for this section of road. As 8382 occurs before this and is a higher standard (8 lanes) this entry (id 6002) has been excluded.



Appendix E – Commercial vehicle bans

Table E.1 - Modelled Commercial Vehicle Bans and Curfews (Base Year)

Road	Suburb / Town	Location	Time of Curfew
Henry Street	Boronia		24 hours a day, 7 days a week
Power Road	Boronia	Woodmason Road to William Street	24 hours a day, 7 days a week
Rankin Road	Boronia		24 hours a day, 7 days a week
Clyde-Fiveways Road	Clyde		24 hours a day, 7 days a week
Pascoe Vale Road	Essendon & Strathmore	Dean Street to Western Ring Road	8pm to 6am, Monday to Saturday, 1pm to 6am, Saturday to Monday
Blackwood Park Road	Ferntree Gully		24 hours a day, 7 days a week
Commercial Road	Ferntree Gully		24 hours a day, 7 days a week
Francis Crescent	Ferntree Gully		24 hours a day, 7 days a week
Napoleon Road	Ferntree Gully	Kellets Road to Wellington Road	8am to 9.30am, 2.30pm to 4pm, School days
Underwood Rd	Ferntree Gully		24 hours a day, 7 days a week
Barkly St / Hopkins St	Footscray	Moore St to Geelong Rd	24 hours a day, 7 days a week
Irving St	Footscray	Hopkins St to Nicholson St	24 hours a day, 7 days a week
Nicholson St	Footscray	Barkly St to Ballarat Rd	24 hours a day, 7 days a week
Victoria St	Footscray	Barkly St to Buckley St	24 hours a day, 7 days a week
Church Street	Geelong	Vines Road to the Midland Highway	8:30am to 9:30am & 3:30pm to 5:30pm, School days
Station Street	Geelong	St Georges Road to North Shore Road	9pm to 6am, 7 days a week
Jika & Dora Streets,	Heidelberg	Between Rosanna Road and Banksia Street	8:00pm and 6:00am, 7 days a week
Macaulay Road	Kensington	Epsom Road to Stubbs Street	7am to 7pm, Monday to Friday, 7am to 1pm, Saturday
Allister Avenue	Knoxfield		24 hours a day, 7 days a week
Victoria Road	Lilydale		24 hours a day, 7 days a week
Malvern Road	Malvern	Burke Road to Waverley Road	8pm to 6am, Monday to Saturday, 1pm to 6am, Saturday to Monday
Wattletree Road	Malvern	Dandenong Road to Burke Road	8pm to 6am, Monday to Saturday, 1pm to 6am, Saturday to Monday
Waverley Road	Malvern	Dandenong Road to Warrigal Road	8pm to 6am, Monday to Saturday, 1pm to 6am, Saturday to Monday
Gatehouse Street	North Melbourne	Flemington Road to Royal Parade	24 hours a day, 7 days a week
Haughton Road	Oakleigh	Oakleigh to Huntingdale stations	24 hours a day, 7 days a week
Bergins Road	Rowville		24 hours a day, 7 days a week
Kellets Road	Rowville	Stud Road to Wellington Road	8am to 9.30am, 2.30pm to 4pm, School days
Taylors Lane	Rowville		24 hours a day, 7 days a week
George Street	Scoresby		24 hours a day, 7 days a week
Hyde Street/Douglas Parade	Spotswood	South of Francis St, from Francis St through to Hobsons St	8pm to 6am, Monday to Saturday, 1pm Saturday to 6am Monday
Lewis Road	Studfield	Boronia Road to Wadhurst Drive	24 hours a day, 7 days a week
Fairbairn Road	Sunshine		24 hours a day, 7 days a week
Cathies Lane	Wantirna South	Burwood Highway to High Street Road	24 hours a day, 7 days a week



Road	Suburb / Town	Location	Time of Curfew
Francis Street	Yarraville		8pm to 6am, Monday to Saturday, 1pm Saturday to 6am Monday
Hyde Street	Yarraville	North of Francis St	24 hours a day, 7 days a week
Somerville Road	Yarraville	Geelong Road to Hyde Street	8pm to 6am, Monday to Saturday, 1pm Saturday to 6am Monday
Ascot Vale Road		Epsom Road to Western Ring Road	8pm to 6am, Monday to Saturday, 1pm to 6am, Saturday to Monday
Beaconsfield Pde, Jacka Blvd, Marine Pde, Ormond Esplanade, St Kilda Espl and Beach Road		Bay Street to Nepean Highway	8pm to 6am, Monday to Saturday, 1pm to 6am, Saturday to Monday

Table E.2 - Modelled Commercial Vehicle Bans and Curfews (assumed from 2015 onwards)

Road	Suburb / Town	Location	Time of Curfew
Moore Street	Footscray	Hopkins St to Princes Hwy	8pm and 6am weeknights and from 1pm Saturday to 6am Monday
Somerville Road	Yarraville	Geelong Road to Whitehall Street	8pm and 6am weeknights and from 1pm Saturday to 6am Monday. 8am and 9.30am weekdays and 2.30pm and 4pm Monday to Friday. (Applied in modelled AM Peak and Evening Off Peak periods).
North East Truck Curfews (2016 onwards)	Rosanna, Eltham, Montmorency, Viewbank	Various	Daily, 10pm – 6am

Sources:

- VicRoads List of Truck Curfews (<https://www.vicroads.vic.gov.au/business-and-industry/heavy-vehicle-industry/heavy-vehicle-road-safety/truck-curfews>)
- VicRoads Additional Truck Curfews in the Inner West effective January 2015 (<https://www.vicroads.vic.gov.au/business-and-industry/heavy-vehicle-industry/heavy-vehicle-road-safety/truck-curfews/truck-curfews-in-the-inner-west>)
- VicRoads North East Truck Curfew Trial (<https://www.vicroads.vic.gov.au/planning-and-projects/melbourne-road-projects/north-east-truck-curfew-trial>)



Appendix F – Public transport service plans

RAIL

Table F.1 - 2026 Train Service Plan - Melbourne Metro service plan: STAGEB_MM-1C_2031

Table F.2 - 2036 Train Service Plan - Melbourne Metro service plan: STAGEB_MM-2B_2031

Table F.3 - 2051 Train Service Plan - Melbourne Metro service plan: STAGEB_MM-2B_2031 with additional services

TRAM

Table F.4- Tram Service Plan 2026, 2036 and 2051, adopted for 2026, 2036 and 2051

BUS

Table F.5 - Bus Service Levels & Categories - 2026 Base Case

Table F.6 - Bus Service Levels & Categories - 2036 Base Case

Table F.7 - Bus Service Levels & Categories - 2051 Base Case

Please note that these service plans have been created for transport modelling and planning purposes, and do not necessarily represent future commitments regarding capital spending or infrastructure works.

Transport Modelling for North East Link
Base Case Model Development – Business Case



Table F.1 - 2026 Train Service Plan - Melbourne Metro service plan: STAGEB_MM-1C_2031

	Origin/Destination	Loop Direction	Stopping Pattern	AM PEAK												INTER PEAK												PM PEAK												EVENING OFF PEAK											
				1 HOUR				2 HOUR				1 HOUR				2 HOUR				1 HOUR				2 HOUR				1 HOUR				2 HOUR																			
				SERVICES	HEADWAY	SERVICES	HEADWAY	SERVICES	HEADWAY	SERVICES	HEADWAY	SERVICES	HEADWAY	SERVICES	HEADWAY	SERVICES	HEADWAY	SERVICES	HEADWAY	SERVICES	HEADWAY	SERVICES	HEADWAY	SERVICES	HEADWAY	SERVICES	HEADWAY	SERVICES	HEADWAY	SERVICES	HEADWAY																				
				(TPH)	(MINS)	(TPH)	(MINS)	(TPH)	(MINS)	(TPH)	(MINS)	(TPH)	(MINS)	(TPH)	(MINS)	(TPH)	(MINS)	(TPH)	(MINS)	(TPH)	(MINS)	(TPH)	(MINS)	(TPH)	(MINS)	(TPH)	(MINS)	(TPH)	(MINS)																						
SUNSHINE - DANDENONG	SIDENHAM - PKEENHAM	DIRECT - VIA MELBOURNE METAL STATIONS TO DOMAN EXPRESS TO CAULFIELD THEN ALL STATIONS		4	15	8	15	0	0	4	15	8	15	0	0	4	15	8	15	0	0	4	15	8	15	0	0	4	15	8	15	0	0																		
	PKEENHAM - SIDENHAM	DIRECT - VIA MELBOURNE METAL STATIONS TO CAULFIELD EXPRESS TO DOMAN THEN ALL STATIONS		4	15	8	15	0	0	4	15	8	15	0	0	4	15	8	15	0	0	4	15	8	15	0	0	4	15	8	15	0	0																		
	SUNBURY - PKEENHAM	DIRECT - VIA MELBOURNE METAL STATIONS TO DOMAN EXPRESS TO CAULFIELD THEN ALL STATIONS		6	10	9	13.3333	3	20	6	10	9	13.3333	3	20	6	10	9	13.3333	3	20	6	10	9	13.3333	3	20	6	10	9	13.3333	3	20																		
	PKEENHAM - SUNBURY	DIRECT - VIA MELBOURNE METAL STATIONS TO CAULFIELD EXPRESS TO DOMAN THEN ALL STATIONS		6	10	9	13.3333	3	20	6	10	9	13.3333	3	20	6	10	9	13.3333	3	20	6	10	9	13.3333	3	20	6	10	9	13.3333	3	20																		
	SIDENHAM - CRANBOURNE	DIRECT - VIA MELBOURNE METAL STATIONS TO CAULFIELD EXPRESS TO DOMAN THEN ALL STATIONS		2	30	4	30	0	0	2	30	4	30	0	0	2	30	4	30	0	0	2	30	4	30	0	0	2	30	4	30	0	0																		
	CRANBOURNE - SIDENHAM	DIRECT - VIA MELBOURNE METAL STATIONS TO CAULFIELD EXPRESS TO DOMAN THEN ALL STATIONS		3	20	6	20	0	0	3	20	6	20	0	0	3	20	6	20	0	0	3	20	6	20	0	0	3	20	6	20	0	0																		
	ALBION - CRANBOURNE	DIRECT - VIA MELBOURNE METAL STATIONS TO DOMAN EXPRESS TO CAULFIELD THEN ALL STATIONS		3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20																		
	CRANBOURNE - ALBION	DIRECT - VIA MELBOURNE METAL STATIONS TO CAULFIELD EXPRESS TO DOMAN THEN ALL STATIONS		3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20																		
	SIDENHAM - DANDENONG	DIRECT - VIA MELBOURNE METAL STATIONS TO DOMAN EXPRESS TO CAULFIELD THEN ALL STATIONS		3	20	3	40	0	0	3	20	3	40	0	0	5	12	5	24	0	0	5	12	5	24	0	0	5	12	5	24	0	0																		
	DANDENONG - SIDENHAM	DIRECT - VIA MELBOURNE METAL STATIONS TO CAULFIELD EXPRESS TO DOMAN THEN ALL STATIONS		5	12	5	24	0	0	3	20	3	40	0	0	3	20	3	40	0	0	5	12	5	24	0	0	3	20	3	40	0	0																		
	SIDENHAM - WEST ALL	DIRECT - VIA MELBOURNE METAL STATIONS TO DOMAN EXPRESS TO CAULFIELD THEN ALL STATIONS		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
	WEST ALL - SIDENHAM	DIRECT - VIA MELBOURNE METAL STATIONS TO CAULFIELD EXPRESS TO DOMAN THEN ALL STATIONS		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
ALBION - WEST ALL	DIRECT - VIA MELBOURNE METAL STATIONS TO DOMAN EXPRESS TO CAULFIELD THEN ALL STATIONS		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
NORTHERN AS PER MM-1A (2021)	CRANBOURNE - CITY LOOP	ANTI-CLOCKWISE	ALL STATIONS	4	15	11	10.90909	6	10	4	15	11	10.90909	6	10	4	15	11	10.90909	6	10	4	15	11	10.90909	6	10	4	15	11	10.90909	6	10																		
	CITY LOOP - CRANBOURNE	ANTI-CLOCKWISE	ALL STATIONS	10	6	19	6.315789	6	10	4	15	11	10.90909	6	10	4	15	11	10.90909	6	10	4	15	11	10.90909	6	10	4	15	11	10.90909	6	10																		
	CRANBOURNE - CITY LOOP	ANTI-CLOCKWISE	ALL STATIONS	6	10	8	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
	CITY LOOP - CRANBOURNE	ANTI-CLOCKWISE	ALL STATIONS TO ESSENDON THEN EXPRESS TO NORTHERN MELBOURNE THEN EXPRESS TO ESSENDON THEN ALL STATIONS (TRAVEL TIME SAVING)	0	0	0	0	0	0	0	0	0	0	0	0	0	6	10	8	15	0	0	0	0	0	0	0	0	0	0	0	0	0																		
	BROADMEADOWS - CITY LOOP	ANTI-CLOCKWISE	ALL STATIONS	2	30	3	40	0	0	2	30	3	40	0	0	2	30	3	40	0	0	2	30	3	40	0	0	2	30	3	40	0	0																		
	CITY LOOP - BROADMEADOWS	ANTI-CLOCKWISE	ALL STATIONS	2	30	3	40	0	0	2	30	3	40	0	0	2	30	3	40	0	0	2	30	3	40	0	0	2	30	3	40	0	0																		
	ESSENDON - CITY LOOP	ANTI-CLOCKWISE	ALL STATIONS	4	15	5	24	0	0	4	15	5	24	0	0	4	15	5	24	0	0	4	15	5	24	0	0	4	15	5	24	0	0																		
	CITY LOOP - ESSENDON	ANTI-CLOCKWISE	ALL STATIONS	4	15	5	24	0	0	4	15	5	24	0	0	4	15	5	24	0	0	4	15	5	24	0	0	4	15	5	24	0	0																		
	LOWRIE - CITY LOOP	ANTI-CLOCKWISE	ALL STATIONS	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20																		
	CITY LOOP - LOWRIE	ANTI-CLOCKWISE	ALL STATIONS	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20																		
	UPFIELD - CITY LOOP	ANTI-CLOCKWISE	ALL STATIONS	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20																		
	CITY LOOP - UPFIELD	ANTI-CLOCKWISE	ALL STATIONS	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20	3	20	6	20	3	20																		
FRANKSTON (CAULFIELD LOOP)	MORDIALLOC - CITY LOOP	ANTI-CLOCKWISE	ALL STATIONS	3	20	9	13.3333	0	0	3	20	9	13.3333	0	0	3	20	9	13.3333	0	0	3	20	9	13.3333	0	0	3	20	9	13.3333	0	0																		
	CITY LOOP - MORDIALLOC	ANTI-CLOCKWISE	ALL STATIONS	3	20	9	13.3333	0	0	3	20	9	13.3333	0	0	3	20	9	13.3333	0	0	3	20	9	13.3333	0	0	3	20	9	13.3333	0	0																		
	CARRUM - CITY LOOP	ANTI-CLOCKWISE	ALL STATIONS	4	15	5	24	0	0	4	15	5	24	0	0	4	15	5	24	0	0	4	15	5	24	0	0	4	15	5	24	0	0																		
	CITY LOOP - CARRUM	ANTI-CLOCKWISE	ALL STATIONS	4	15	5	24	0	0	4	15	5	24	0	0	4	15	5	24	0	0	4	15	5	24	0	0	4	15	5	24	0	0																		
	BAXTER - CITY LOOP	ANTI-CLOCKWISE	ALL STATIONS	1	60	1	120	6	10	1	60	1	120	6	10	1	60	1	120	6	10	1	60	1	120	6	10	1	60	1	120	6	10																		
	CITY LOOP - BAXTER	ANTI-CLOCKWISE	ALL STATIONS	1	60	1	120	6	10	1	60	1	120	6	10	1	60	1	120	6	10	1	60	1	120	6	10	1	60	1	120	6	10																		
	BAXTER - CITY LOOP	ANTI-CLOCKWISE	All Stations to Cheltenham then Express to Caulfield then All stations	9	6.66667	15	8	0	0	9	6.6667	15	8	0	0	9	6.6667	15	8	0	0	9	6.6667	15	8	0	0	9	6.6667	15	8	0	0																		
	CITY LOOP - BAXTER	ANTI-CLOCKWISE	All Stations to Cheltenham then Express to Caulfield then All stations	9	6.66667	15	8	0	0	9	6.6667	15	8	0	0	9	6.6667	15	8	0	0	9	6.6667	15	8	0	0	9	6.6667	15	8	0	0																		
	CROSS CITY	NEERIM - SANDRINGHAM	DIRECT - MAIN LINE	ALL STATIONS EXCEPT NEERIM - LAVERTON via MAINLINE	10	6	16	7.5	3	20	9	6.6667	15	8	0	0	9	6.6667	15	8	0	0	9	6.6667	15	8	0	0	9	6.6667	15	8	0	0																	
		SANDRINGHAM - NEERIM	DIRECT - MAIN LINE	ALL STATIONS EXCEPT NEERIM - LAVERTON via MAINLINE	9	6.66667	15	8	3	20	9	6.6667	15	8	3	20	9	6.6667	15	8	3	20	9	6.6667	15	8	3	20	9	6.6667	15	8	3	20																	
		WILLIAMTOWN - SANDRINGHAM	DIRECT - MAIN LINE	ALL STATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
		SANDRINGHAM - WILLIAMTOWN	DIRECT - MAIN LINE	ALL STATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
NEERIM - SANDRINGHAM		DIRECT - VIA ALTONA	ALL STATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
SANDRINGHAM - NEERIM		DIRECT - VIA ALTONA	ALL STATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
LAVERTON - SOUTH YARRA		DIRECT - VIA ALTONA	ALL STATIONS	4	15	7	17.4286	3	20	4	15	7	17.4286	3	20	4	15	7	17.4286	3	20	4	15	7	17.4286	3	20	4	15	7	17.4286	3	20																		
SOUTH YARRA - LAVERTON		DIRECT - VIA ALTONA	ALL STATIONS	4	15	7	17.4286	3	20	4	15	7	17.4286	3	20	4	15	7	17.4286	3	20	4	15	7	17.4286	3	20	4	15	7	17.4286	3	20																		
WILLIAMSTOWN - SOUTH YARRA		DIRECT - VIA ALTONA	ALL STATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
SOUTH YARRA - WILLIAMSTOWN		DIRECT - VIA ALTONA	ALL STATIONS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
WILLIAMSTOWN - FLINDERS STREET		DIRECT	ALL STATIONS	3	20	7	17.4286	0	0	3	20	7	17.4286	0	0	3	20	7	17.4286	0	0	3	20	7	17.4286	0	0	3	20	7	17.4286	0	0																		
FLINDERS STREET - WILLIAMSTOWN		DIRECT	ALL STATIONS	3																																															



Table F.2 - 2036 Train Service Plan - Melbourne Metro service plan: STAGEB_MM-2B_2031

Group	Origin-Destination	Loop Direction	Stopping Pattern	AM PEAK		INTER PEAK		PM PEAK		WEEKDAY OFF PEAK	
				1 HOUR	2 HOUR	1 HOUR	2 HOUR	1 HOUR	2 HOUR	1 HOUR	2 HOUR
				SERVICES HEADWAY (T/PH) (MINS)	SERVICES HEADWAY (T/PH) (MINS)	SERVICES HEADWAY (T/PH) (MINS)	SERVICES HEADWAY (T/PH) (MINS)	SERVICES HEADWAY (T/PH) (MINS)	SERVICES HEADWAY (T/PH) (MINS)	SERVICES HEADWAY (T/PH) (MINS)	SERVICES HEADWAY (T/PH) (MINS)
SUNSHINE - DANDENONG	SYDENHAM - PAKENHAM	DIRECT WAMELBOURNE METRO	ALL STATIONS TO DOMAN, EXPRESS TO CAULFIELD THEN ALL STATIONS	1 60	5 24	0 0	0 0	1 60	5 24	0 0	0 0
	PAKENHAM - SYDENHAM	DIRECT WAMELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMAN, THEN ALL STATIONS	1 60	5 24	0 0	0 0	1 60	5 24	0 0	0 0
	SUNBURY - PAKENHAM	DIRECT WAMELBOURNE METRO	ALL STATIONS TO DOMAN, EXPRESS TO CAULFIELD THEN ALL STATIONS	6 10	9 13.3333	3 20	6 10	9 13.3333	3 20	6 10	9 13.3333
	PAKENHAM - SUNBURY	DIRECT WAMELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMAN, THEN ALL STATIONS	6 10	9 13.3333	3 20	6 10	9 13.3333	3 20	6 10	9 13.3333
	SYDENHAM - CRANBOURNE	DIRECT WAMELBOURNE METRO	ALL STATIONS TO DOMAN, EXPRESS TO CAULFIELD THEN ALL STATIONS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
	CRANBOURNE - SYDENHAM	DIRECT WAMELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMAN, THEN ALL STATIONS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
	MELTON - CRANBOURNE	DIRECT WAMELBOURNE METRO	ALL STATIONS TO DOMAN, EXPRESS TO CAULFIELD THEN ALL STATIONS	6 10	12 16	3 20	6 10	12 16	3 20	6 10	12 16
	CRANBOURNE - MELTON	DIRECT WAMELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMAN, THEN ALL STATIONS	6 10	12 16	3 20	6 10	12 16	3 20	6 10	12 16
	SYDENHAM - DANDENONG	DIRECT WAMELBOURNE METRO	ALL STATIONS TO DOMAN, EXPRESS TO CAULFIELD THEN ALL STATIONS	3 20	3 40	0 0	3 20	3 40	0 0	3 20	3 40
	DANDENONG - SYDENHAM	DIRECT WAMELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMAN, THEN ALL STATIONS	3 20	3 40	0 0	3 20	3 40	0 0	3 20	3 40
	SYDENHAM - WESTALL	DIRECT WAMELBOURNE METRO	ALL STATIONS TO DOMAN, EXPRESS TO CAULFIELD THEN ALL STATIONS	4 15	6 20	0 0	0 0	4 15	6 20	0 0	0 0
	WESTALL - SYDENHAM	DIRECT WAMELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMAN, THEN ALL STATIONS	0 0	3 40	0 0	0 0	4 15	6 20	0 0	0 0
	MELTON - PAKENHAM	DIRECT WAMELBOURNE METRO	ALL STATIONS TO DOMAN, EXPRESS TO CAULFIELD THEN ALL STATIONS	3 20	3 40	0 0	3 20	3 40	0 0	3 20	3 40
	PAKENHAM - MELTON	DIRECT WAMELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMAN, THEN ALL STATIONS	3 20	3 40	0 0	3 20	3 40	0 0	3 20	3 40
NORTHERN PLUS WALLAN	WALLAN - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS VIA UPFIELD LINK	6 10	10 12	3 20	6 10	10 12	3 20	6 10	10 12
	CITY LOOP - WALLAN	ANTI-CLOCK WISE	ALL STATIONS VIA UPFIELD LINK	6 10	10 12	3 20	6 10	10 12	3 20	6 10	10 12
	CRAIGBURN - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS VIA UPFIELD LINK	3 20	6 20	3 20	3 20	6 20	3 20	3 20	6 20
	CITY LOOP - CRAIGBURN	ANTI-CLOCK WISE	ALL STATIONS VIA UPFIELD LINK	3 20	6 20	3 20	3 20	6 20	3 20	3 20	6 20
	ROXBURGH PARK - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS TO ESSENDON, THEN EXPRESS TO NORTH MELBOURNE, THEN ALL STATIONS	3 20	5 24	0 0	0 0	0 0	0 0	0 0	0 0
	CITY LOOP - ROXBURGH PARK	ANTI-CLOCK WISE	ALL STATIONS TO NORTH MELBOURNE, EXPRESS TO ESSENDON, THEN ALL STATIONS	0 0	0 0	0 0	3 20	5 24	0 0	3 20	5 24
	ROXBURGH PARK - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS	9 6.666667	17 7.058824	6 10	10 12	20 5.454545	3 20	6 10	17 7.058824
	CITY LOOP - ROXBURGH PARK	ANTI-CLOCK WISE	ALL STATIONS	9 6.666667	17 7.058824	6 10	10 12	20 5.454545	3 20	6 10	17 7.058824
	ESSENDON - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS	3 20	5 24	0 0	3 20	5 24	0 0	3 20	5 24
	CITY LOOP - ESSENDON	ANTI-CLOCK WISE	ALL STATIONS	3 20	5 24	0 0	3 20	5 24	0 0	3 20	5 24
FRANKSTON (CAULFIELD LOOP)	MORDALLO - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS	3 20	9 13.3333	0 0	3 20	9 13.3333	0 0	3 20	9 13.3333
	CITY LOOP - MORDALLO	ANTI-CLOCK WISE	ALL STATIONS	3 20	9 13.3333	0 0	3 20	9 13.3333	0 0	3 20	9 13.3333
	CARRUM - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS	4 15	5 24	0 0	4 15	5 24	0 0	4 15	5 24
	CITY LOOP - CARRUM	ANTI-CLOCK WISE	ALL STATIONS	4 15	5 24	0 0	4 15	5 24	0 0	4 15	5 24
	BAXTER - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS	1 60	1 120	6 10	1 60	1 120	6 10	1 60	1 120
	CITY LOOP - BAXTER	ANTI-CLOCK WISE	ALL STATIONS	1 60	1 120	6 10	1 60	1 120	6 10	1 60	1 120
	BAXTER - CITY LOOP	ANTI-CLOCK WISE	All Stations to Cheltenham then Express to Caulfield then All stations	9 6.666667	15 8	0 0	9 6.6667	15 8	0 0	9 6.6667	15 8
CITY LOOP - BAXTER	ANTI-CLOCK WISE	All Stations to Caulfield then Express to Cheltenham then All stations	9 6.666667	15 8	0 0	9 6.6667	15 8	0 0	9 6.6667	15 8	
CROSS CITY	WERRIBEE - SANDRINGHAM	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON via MAINLINE)	10 6	16 7.5	3 20	9 6.6667	15 8	0 0	0 0	0 0
	SANDRINGHAM - WERRIBEE	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON via MAINLINE)	9 6.666667	15 8	3 20	10 6	16 7.5	0 0	0 0	0 0
	WILLIAMSTOWN - SANDRINGHAM	DIRECT - MAIN LINE	ALL STATIONS	0 0	0 0	3 20	0 0	0 0	0 0	0 0	0 0
	SANDRINGHAM - WILLIAMSTOWN	DIRECT - MAIN LINE	ALL STATIONS	0 0	0 0	3 20	0 0	0 0	0 0	0 0	0 0
	WERRIBEE - SANDRINGHAM	DIRECT - VIA ALTONA	ALL STATIONS	0 0	0 0	0 0	0 0	0 0	0 0	3 20	0 0
	SANDRINGHAM - WERRIBEE	DIRECT - VIA ALTONA	ALL STATIONS	0 0	0 0	0 0	0 0	0 0	0 0	3 20	0 0
	LAVERTON - SOUTH YARRA	DIRECT - VIA ALTONA	ALL STATIONS	4 15	7 17.14286	3 20	4 15	8 15	0 0	0 0	0 0
	SOUTH YARRA - LAVERTON	DIRECT - VIA ALTONA	ALL STATIONS	4 15	8 15	3 20	4 15	7 17.143	0 0	0 0	0 0
	WILLIAMSTOWN - SOUTH YARRA	DIRECT	ALL STATIONS	0 0	0 0	0 0	0 0	0 0	0 0	3 20	0 0
	SOUTH YARRA - WILLIAMSTOWN	DIRECT	ALL STATIONS	0 0	0 0	0 0	0 0	0 0	0 0	3 20	0 0
	WILLIAMSTOWN - FLINDERS STREET	DIRECT	ALL STATIONS	3 20	7 17.14286	0 0	3 20	6 20	0 0	0 0	0 0
	FLINDERS STREET - WILLIAMSTOWN	DIRECT	ALL STATIONS	3 20	6 20	0 0	3 20	7 17.143	0 0	0 0	0 0
	WERRIBEE - SOUTH YARRA	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON via MAINLINE)	1 60	1 120	0 0	1 60	1 120	0 0	0 0	0 0
	SOUTH YARRA - WERRIBEE	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON via MAINLINE)	1 60	1 120	0 0	1 60	1 120	0 0	0 0	0 0
	WERRIBEE - FLINDERS STREET	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON via MAINLINE)	1 60	1 120	0 0	1 60	1 120	0 0	0 0	0 0
	FLINDERS STREET - WERRIBEE	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON via MAINLINE)	1 60	1 120	0 0	1 60	1 120	0 0	0 0	0 0
	BRIGHTON BEACH - WERRIBEE	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON via MAINLINE)	3 20	6 20	0 0	3 20	6 20	0 0	0 0	0 0
	WERRIBEE - BRIGHTON BEACH	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON via MAINLINE)	3 20	6 20	0 0	3 20	6 20	0 0	0 0	0 0
STONY POINT	STONY POINT - BAXTER	DIRECT	ALL STATIONS	15 40	3 40	1 60	1 60	2 60	1 60	1 60	1 60
	BAXTER - STONY POINT	DIRECT	ALL STATIONS	1 60	2 60	1 60	1 60	15 40	3 40	1 60	1 60
VLIN	BACCHUS MARSH - SOUTHERN CROSS	DIRECT - VIA RRL	ALL STATIONS TO DEER PARK Then Sunshine (Set down only) EXPRESS TO ALL STATIONS AFTER DEER PARK (Footscray - Sunshine - pick up only)	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
	SOUTHERN CROSS - BACCHUS MARSH	DIRECT - VIA RRL	ALL STATIONS AFTER DEER PARK Then Sunshine (Set down only) EXPRESS TO ALL STATIONS AFTER DEER PARK (Footscray - Sunshine - pick up only)	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
	MELTON - SOUTHERN CROSS	DIRECT - VIA RRL	ALL STATIONS AFTER DEER PARK Then Sunshine (Set down only) EXPRESS TO ALL STATIONS AFTER DEER PARK (Footscray - Sunshine - pick up only)	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
	SOUTHERN CROSS - MELTON	DIRECT - VIA RRL	ALL STATIONS AFTER DEER PARK (Footscray - Sunshine - pick up only)	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
	WENDOUREE - SOUTHERN CROSS	DIRECT - VIA RRL	ALL STATIONS - Express Melton - Footscray (Set down only)	0.666667	22.5 4.33333	27.69231	1 60	1 60	22.5 4.33333	27.69231	1 60
	SOUTHERN CROSS - WENDOUREE	DIRECT - VIA RRL	Express Footscray (pick up only) - Melton - All Stations	1 60	2 60	1 60	0.6667	22.5 4.33333	27.69231	1 60	0.6667
	ARARAT - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations to Melton - Sunshine (Set Down Only) - Footscray (Set Down Only)	0.333333	180 0.666667	180 0.333333	180 0.333333	180 0.6667	180 0.333333	180 0.6667	180 0.333333
	SOUTHERN CROSS - ARARAT	DIRECT - VIA RRL	Express Footscray (Pick Up Only) - Sunshine (Pick Up Only) - Melton - All Stations	0.333333	180 0.666667	180 0.333333	180 0.333333	180 0.6667	180 0.333333	180 0.6667	180 0.333333
	MARYBOROUGH - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations - Bacchus Marsh - Sunshine (Set Down Only) - Footscray (Set Down Only)	0.041667	1440 0.083333	1440 0.041667	1440 0.041667	1440 0.0833	1440 0.041667	1440 0.0833	1440 0.041667
	SOUTHERN CROSS - MARYBOROUGH	DIRECT - VIA RRL	Express Footscray (Pick Up Only) - Sunshine (Pick Up Only) - Bacchus Marsh - All Stations - Sunbury (Set Down Only) - Sunshine (Set Down Only) - Footscray (Set Down Only)	0.041667	1440 0.083333	1440 0.041667	1440 0.041667	1440 0.0833	1440 0.041667	1440 0.0833	1440 0.041667
	KYNETON - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations - Sunbury (Set Down Only) - Sunshine (Set Down Only) - Footscray (Set Down Only)	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
	SOUTHERN CROSS - KYNETON	DIRECT - VIA RRL	Express Footscray (Pick Up Only) - Sunshine (Pick Up Only) - Sunbury (Set Down Only)	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
	BENDIGO - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations - Sunbury (Set Down Only) - Sunshine (Set Down Only) - Footscray (Set Down Only)	0 30	2 60	1 60	1 60	2 60	1 60	2 60	1 60
	SOUTHERN CROSS - BENDIGO	DIRECT - VIA RRL	Express Footscray (Pick Up Only) - Sunshine (Pick Up Only) - Sunbury (Pick Up Only)	1 60	2 60	1 60	0 30	2 60	1 60	1 60	0 30
	EPSOM - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations - Sunbury (Set Down Only) - Sunshine (Set Down Only) - Footscray (Set Down Only)	1 60	1 120	0 0	0 0	0 0	0 0	0 0	0 0
	SOUTHERN CROSS - EPSOM	DIRECT - VIA RRL	Express Footscray (Pick Up Only) - Sunshine (Pick Up Only) - Sunbury (Pick Up Only)	0 0	0 0	0 0	1 60	1 120	0 0	0 0	0 0
	EAGLEHAWK - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations - Sunbury (Set Down Only) - Sunshine (Set Down Only) - Footscray (Set Down Only)	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
	SOUTHERN CROSS - EAGLEHAWK	DIRECT - VIA RRL	Express Footscray (Pick Up Only) - Sunshine (Pick Up Only) - Sunbury (Pick Up Only)	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
	ECHUCA - SOUTHERN CROSS	DIRECT - VIA RRL	Epston - All Stations - Sunbury (Set Down Only) - Sunshine (Set Down Only) - Footscray (Set Down Only)	0.142857	420 0.285714	420 0.142857	420 0.1429	420 0.2857	420 0.1429	420 0.2857	420 0.1429
	SOUTHERN CROSS - ECHUCA	DIRECT - VIA RRL	Express Footscray (Pick Up Only) - Sunshine (Pick Up Only) - Sunbury (Set Down Only)	0.142857	420 0.285714	420 0.142857	420 0.1429	420 0.2857	420 0.1429	420 0.2857	420 0.1429
	SWAN HILL - SOUTHERN CROSS	DIRECT - VIA RRL	Eaglehawk - Bendigo - Castlemaine - Kyneton - Woodend - Gisborne - Sunbury (Set Down Only)	0.142857	420 0.285714	420 0.142857	420 0.1429	420 0.2857	420 0.1429	420 0.2857	420 0.1429
SOUTHERN CROSS - SWAN HILL	DIRECT - VIA RRL	Express Footscray (Pick Up Only) - Sunshine (Pick Up Only) - Sunbury (Set Down Only)	0.142857	420 0.285714	420 0.142857	420 0.1429	420 0.2857	420 0.1429	420 0.2857	420 0.1429	
SOUTH GEELONG - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations to North Geelong - Express - Lara - Express - Sunshine (pick up only)	2 30	6 20	0 0	0 0	0 0	0 0	0 0	0 0	
SOUTHERN CROSS - SOUTH GEELONG	DIRECT - VIA RRL	Express Footscray (pick up only) Sunshine (pick up only) - Express - Lara - Express - Sunshine (pick up only)	0 0	0 0	0 0	0 0	2 30	6 20	0 0	0 0	
SOUTH GEELONG - SOUTHERN CROSS	DIRECT - VIA RRL	ALL STATIONS to Truganina - Express - Sunshine (set down only) - Footscray (set down only)	0 0	0 0	0 0	1.5 40	0 0	0 0	0 0	1.5 40	
SOUTHERN CROSS - SOUTH GEELONG	DIRECT - VIA RRL	Southern Cross - Footscray (pick up only) - Sunshine (pick up only) - Express to Truganina via Wyndham Vale - Tarnet - Sunshine (Set down only) - Footscray (set down only)	0 0	0 0	0 0	1.5 40	0 0	0 0	0 0	1.5 40	
SOUTHERN CROSS - WAIRN PONDS	DIRECT - VIA RRL	All Stations to Wyndham Vale - Tarnet - Sunshine (Set down only) - Footscray (set down only)	4 15	4 26	0 0	0 0	4 15	6 20	0 0	0 0	
SOUTHERN CROSS - WAIRN PONDS	DIRECT - VIA RRL	Express Footscray (pick up only) - Sunshine (pick up only) - Tarnet - Wyndham Vale	0 0	0 0	0 0	4 15	6 20	0 0	0 0	0 0	
BLACK FOREST - SOUTHERN CROSS	DIRECT - VIA RRL	ALL STATIONS to Truganina - Express - Sunshine - Footscray - Southern Cross	6 10	10 12	3 20	3 20	6 20	0 0	0 0	0 0	
SOUTHERN CROSS - BLACK FOREST	DIRECT - VIA RRL	Southern Cross - Footscray - Sunshine - Truganina - All Stations	3 20	6 20	3 20	6 10	10 12	0 0	0 0	0 0	
WAIRN PONDS - SOUTHERN CROSS	DIRECT - VIA RRL	ALL STATIONS to Truganina - Express - Sunshine (set down only) - Footscray (set down only)	0 0	0 0	0 0	1.5 40	3 20	6 20	1.5 40	0 0	
SOUTHERN CROSS - WAIRN PONDS	DIRECT - VIA RRL	Southern Cross - Footscray (pick up only) - Sunshine (pick up only) - Express to Truganina	3 20	6 20	1.5 40	0 0	0 0	0 0	0 0	1.5 40	
WARRNAMBOOL - SOUTHERN CROSS	DIRECT - VIA RRL	EXPRESS WAIRN PONDS - GEELONG - FOOTSCRAY (set down only) - SOUTHERN CROSS	0.333333	180 0.666667	180 0.333333	180 0.333333	180 0.6667	180 0.333333	180 0.6667	180 0.333333	
SOUTHERN CROSS - WARRNAMBOOL	DIRECT - VIA RRL	EXP									

Table F.3 - 2051 Train Service Plan - Melbourne Metro service plan: STAGEB_MM-2B_2031 with additional services

Group	Origin-Destination	Loop Direction	Stopping Pattern	AM PEAK		INTER PEAK		PM PEAK		WEEKEND/OFF PEAK						
				1 HOUR	2 HOUR	1 HOUR	2 HOUR	1 HOUR	2 HOUR	1 HOUR	2 HOUR					
				SERVICES (TPH)	HEADWAY (MINS)	SERVICES (TPH)	HEADWAY (MINS)	SERVICES (TPH)	HEADWAY (MINS)	SERVICES (TPH)	HEADWAY (MINS)	SERVICES (TPH)	HEADWAY (MINS)			
SUNSHINE - DANDENONG	SYDENHAM - PAKENHAM	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO DOMINAM, EXPRESS TO CAULFIELD THEN ALL STATIONS	1	60	5	20	0	0	1	60	5	20	0	0	
	PAKENHAM - SYDENHAM	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMINAM, THEN ALL STATIONS	1	60	5	20	0	0	1	60	5	20	0	0	
	SUNBURY - PAKENHAM	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO DOMINAM, EXPRESS TO CAULFIELD THEN ALL STATIONS	6	10	9	13:33:33	3	20	6	10	9	13:33:33	3	20	
	PAKENHAM - SUNBURY	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMINAM, THEN ALL STATIONS	6	10	9	13:33:33	3	20	6	10	9	13:33:33	3	20	
	PAKENHAM - MELBOURNE AIRPORT	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMINAM, THEN ALL STATIONS	0	0	0	0	3	20	0	0	0	0	3	20	
	MELBOURNE AIRPORT - PAKENHAM	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO DOMINAM, EXPRESS TO CAULFIELD THEN ALL STATIONS	0	0	0	0	3	20	0	0	0	0	3	20	
	SYDENHAM - CLYDE	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO DOMINAM, EXPRESS TO CAULFIELD THEN ALL STATIONS	3	20	6	20	0	0	3	20	6	20	0	0	
	CLYDE - SYDENHAM	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMINAM, THEN ALL STATIONS	3	20	6	20	0	0	3	20	6	20	0	0	
	MELBOURNE AIRPORT - CLYDE	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO DOMINAM, EXPRESS TO CAULFIELD THEN ALL STATIONS	3	20	6	20	3	20	3	20	6	20	3	20	
	CLYDE - MELBOURNE AIRPORT	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMINAM, THEN ALL STATIONS	3	20	6	20	3	20	3	20	6	20	3	20	
	PAKENHAM - MELBOURNE AIRPORT	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMINAM, THEN ALL STATIONS	0	0	0	0	3	20	0	0	0	0	3	20	
	DANDENONG - SYDENHAM	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMINAM, THEN ALL STATIONS	3	20	3	40	0	0	3	20	3	40	0	0	
	SYDENHAM - WESTALL	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO DOMINAM, EXPRESS TO CAULFIELD THEN ALL STATIONS	0	0	0	0	4	15	0	0	0	0	4	15	
	WESTALL - SYDENHAM	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMINAM, THEN ALL STATIONS	0	0	0	0	4	15	0	0	0	0	4	15	
	MELTON - ROWVILLE	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO DOMINAM, EXPRESS TO CAULFIELD THEN ALL STATIONS	6	10	12	10	3	20	6	10	12	10	3	20	
	ROWVILLE - MELTON	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMINAM, THEN ALL STATIONS	6	10	12	10	3	20	6	10	12	10	3	20	
MELTON - PAKENHAM	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO DOMINAM, EXPRESS TO CAULFIELD THEN ALL STATIONS	3	20	3	40	0	0	3	20	3	40	0	0		
PAKENHAM - MELTON	DIRECT VIA MELBOURNE METRO	ALL STATIONS TO CAULFIELD, EXPRESS TO DOMINAM, THEN ALL STATIONS	3	20	3	40	0	0	3	20	3	40	0	0		
NORTHERN PLUS WALLAN	WALLAN - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS VIA UPFIELD LINK	6	10	10	12	3	20	6	10	10	12	3	20	
	CITY LOOP - WALLAN M	ANTI-CLOCK WISE	ALL STATIONS VIA UPFIELD LINK	6	10	10	12	3	20	6	10	10	12	3	20	
	CRAIQUEBURN - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS VIA UPFIELD LINK	3	20	6	20	3	20	3	20	6	20	3	20	
	CITY LOOP - CRAIQUEBURN	ANTI-CLOCK WISE	ALL STATIONS VIA UPFIELD LINK	3	20	6	20	3	20	3	20	6	20	3	20	
	ROXBURGH PARK - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS TO ESSENDON, THEN EXPRESS TO NORTH MELBOURNE, THEN ALL STATIONS	3	20	5	24	0	0	0	0	0	0	1	0	
	CITY LOOP - ROXBURGH PARK	ANTI-CLOCK WISE	ALL STATIONS TO NORTH MELBOURNE, EXPRESS TO ESSENDON, THEN ALL STATIONS	0	0	0	0	3	20	5	24	0	0	1	0	
	ROXBURGH PARK - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS	9	6:06:06	17	7:05:00:04	6	12	5	22	5:45:45	3	20		
	CITY LOOP - ROXBURGH PARK	ANTI-CLOCK WISE	ALL STATIONS	12	5	22	5:45:45:04	6	10	9	6:06:07	17	7:05:00:04	3	20	
	ESSENDON - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS	3	20	5	24	0	0	3	20	5	24	0	0	
	CITY LOOP - ESSENDON	ANTI-CLOCK WISE	ALL STATIONS	3	20	5	24	0	0	3	20	5	24	0	0	
	MORIDALOC - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS	3	20	9	13:33:33	0	0	3	20	9	13:33:33	0	0	
	CITY LOOP - MORIDALOC	ANTI-CLOCK WISE	ALL STATIONS	3	20	9	13:33:33	0	0	3	20	9	13:33:33	0	0	
	CARLUM - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS	4	15	5	24	0	0	4	15	5	24	0	0	
	CITY LOOP - CARLUM	ANTI-CLOCK WISE	ALL STATIONS	4	15	5	24	0	0	4	15	5	24	0	0	
	BAXTER - CITY LOOP	ANTI-CLOCK WISE	ALL STATIONS	1	60	1	120	6	10	1	60	1	120	3	20	
	CITY LOOP - BAXTER	ANTI-CLOCK WISE	ALL STATIONS	1	60	1	120	6	10	1	60	1	120	3	20	
BAXTER - CITY LOOP	ANTI-CLOCK WISE	All Stations to Cheltenham then Express to Caulfield then All Stations	9	6:06:07	15	8	0	0	9	6:06:07	15	8	0	0		
CITY LOOP - BAXTER	ANTI-CLOCK WISE	All Stations to Cheltenham then Express to Caulfield then All Stations	9	6:06:07	15	8	0	0	9	6:06:07	15	8	0	0		
CROSS CITY	WERRIEBE - SANDRINGHAM	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON VIA MAINLINE)	19	6	16	7.5	3	20	9	6:06:07	15	8	0	0	
	SANDRINGHAM - WERRIEBE	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON VIA MAINLINE)	9	6:06:07	15	8	3	20	9	6:06:07	16	7.5	0	0	
	WILLIAMTOWN - SANDRINGHAM	DIRECT - MAIN LINE	ALL STATIONS	0	0	0	0	3	20	0	0	0	0	0	0	
	SANDRINGHAM - WILLIAMTOWN	DIRECT - MAIN LINE	ALL STATIONS	0	0	0	0	3	20	0	0	0	0	0	0	
	WERRIEBE - SANDRINGHAM	DIRECT - VIA AATONA	ALL STATIONS	0	0	0	0	0	0	0	0	0	0	3	20	
	SANDRINGHAM - WERRIEBE	DIRECT - VIA AATONA	ALL STATIONS	0	0	0	0	0	0	0	0	0	0	3	20	
	LAVERTON - SOUTH YARRA	DIRECT - VIA AATONA	ALL STATIONS	4	15	7	17:42:06	3	20	4	15	8	15	0	0	
	SOUTH YARRA - LAVERTON	DIRECT - VIA AATONA	ALL STATIONS	4	15	8	15	3	20	4	15	7	17:42:09	0	0	
	WILLIAMTOWN - SOUTH YARRA	DIRECT	ALL STATIONS	0	0	0	0	0	0	0	0	0	0	3	20	
	SOUTH YARRA - WILLIAMTOWN	DIRECT	ALL STATIONS	0	0	0	0	0	0	0	0	0	0	3	20	
	WILLIAMTOWN - FLINDERS STREET	DIRECT	ALL STATIONS	3	20	7	17:42:06	0	0	3	20	6	20	0	0	
	FLINDERS STREET - WILLIAMTOWN	DIRECT	ALL STATIONS	3	20	6	20	0	0	3	20	7	17:42:09	0	0	
	WERRIEBE - SOUTH YARRA	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON VIA MAINLINE)	1	60	1	120	0	0	1	60	1	120	0	0	
	SOUTH YARRA - WERRIEBE	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON VIA MAINLINE)	1	60	1	120	0	0	1	60	1	120	0	0	
	WERRIEBE - FLINDERS STREET	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON VIA MAINLINE)	1	60	1	120	0	0	1	60	1	120	0	0	
	FLINDERS STREET - WERRIEBE	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON VIA MAINLINE)	1	60	1	120	0	0	1	60	1	120	0	0	
BRIGHTON BEACH - WERRIEBE	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON VIA MAINLINE)	3	20	6	20	0	0	3	20	6	20	0	0		
WERRIEBE - BRIGHTON BEACH	DIRECT - MAIN LINE	ALL STATIONS (EXCEPT NEWPORT - LAVERTON VIA MAINLINE)	3	20	6	20	0	0	3	20	6	20	0	0		
STONY POINT	WERRIEBE - STONY POINT	DIRECT	ALL STATIONS	1.5	40	3	6	0	0	1	60	1	60	0	0	
	BAXTER - STONY POINT	DIRECT	ALL STATIONS	1	60	2	60	1	60	1.5	40	3	60	1	60	
V/LINE	BACCHUS MARSH - SOUTHERN CROSS	DIRECT - VIA RRL	ALL STATIONS TO DEER PARK THEN Sunshine (Set down only) EXPRESS TO ALL STATIONS AFTER DEER PARK (Footcary - pick up only) - Footcary	0	0	0	0	0	0	0	0	0	0	0	0	
	SOUTHERN CROSS - BACCHUS MARSH	DIRECT - VIA RRL	ALL STATIONS AFTER DEER PARK (Footcary - pick up only) - Footcary	0	0	0	0	0	0	0	0	0	0	0	0	
	MELTON - SOUTHERN CROSS	DIRECT - VIA RRL	ALL STATIONS AFTER DEER PARK (Footcary - pick up only) EXPRESS TO ALL STATIONS AFTER DEER PARK (Footcary - pick up only) - Footcary	0	0	0	0	0	0	0	0	0	0	0	0	
	SOUTHERN CROSS - MELTON	DIRECT - VIA RRL	ALL STATIONS AFTER DEER PARK (Footcary - pick up only) - Footcary	0	0	0	0	0	0	0	0	0	0	0	0	
	WENDOUREE - SOUTHERN CROSS	DIRECT - VIA RRL	ALL STATIONS - Express Melton - Footcary (Set down only) - Footcary	2	6:06:07	22.5	4:33:33	27.69:23	1	60	2	6:07	27.69:23	1	60	
	SOUTHERN CROSS - WENDOUREE	DIRECT - VIA RRL	Express Footcary (pick up only) - Melton - All Stations	1	60	2	60	1	60	1.60:06	22.5	4:33:33	27.69:23	1	60	
	ARARAT - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations to Melton - Sunshine (Set Down Only) - Footcary (Set Down Only)	0	0	0	0	0	0	0	0	0	0	0	0	
	SOUTHERN CROSS - ARARAT	DIRECT - VIA RRL	Express Footcary (Pick Up Only) - Sunshine (Pick Up Only) - Melton - All Stations	0	0	0	0	0	0	0	0	0	0	0	0	
	MARYBOROUGH - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations - Bacchus Marsh - Sunshine (Set Down Only) - Footcary (Set Down Only)	0	0	0	0	0	0	0	0	0	0	0	0	
	SOUTHERN CROSS - MARYBOROUGH	DIRECT - VIA RRL	Express Footcary (Pick Up Only) - Sunshine (Pick Up Only) - Bacchus Marsh	0	0	0	0	0	0	0	0	0	0	0	0	
	KYNETON - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations - Sunbury (Set Down Only) - Sunshine (Set Down Only) - Footcary	0	0	0	1	120	0	0	0	0	0	0	0	
	SOUTHERN CROSS - KYNETON	DIRECT - VIA RRL	Express Footcary (Pick Up Only) - Sunshine (Pick Up Only) - Sunbury (Set Down Only)	0	0	0	0	0	0	0	0	0	1	120	0	
	BENDIGO - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations - Sunbury (Set Down Only) - Sunshine (Set Down Only) - Footcary	0	0	0	1	60	0	0	0	0	0	1	60	
	SOUTHERN CROSS - BENDIGO	DIRECT - VIA RRL	Express Footcary (Pick Up Only) - Sunshine (Pick Up Only) - Sunbury (Pick Up Only)	1	60	2	60	1	60	1	60	30	2	60	1	60
	EPSOM - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations - Sunbury (Set Down Only) - Sunshine (Set Down Only) - Footcary	1	60	1	120	0	0	0	0	0	0	0	0	0
	SOUTHERN CROSS - EPSOM	DIRECT - VIA RRL	Express Footcary (Pick Up Only) - Sunshine (Pick Up Only) - Sunbury (Pick Up Only)	0	0	0	0	0	0	0	0	1	60	1	120	0
EAGLEHAWK - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations - Sunbury (Set Down Only) - Sunshine (Set Down Only) - Footcary	0	0	0	7:14:28	168	0	0	0	0	0	0	0	0	
SOUTHERN CROSS - EAGLEHAWK	DIRECT - VIA RRL	Express Footcary (Pick Up Only) - Sunshine (Pick Up Only) - Footcary	0	0	0	0	0	0	0	0	7:14:29	168	0	0		
ETCHUCA - SOUTHERN CROSS	DIRECT - VIA RRL	Express Footcary (Pick Up Only) - Sunshine (Pick Up Only) - Footcary	0	0	0	0	0	0	0	0	0	0	0	0	0	
SOUTHERN CROSS - ETCHUCA	DIRECT - VIA RRL	Express Footcary (Pick Up Only) - Sunshine (Pick Up Only) - Sunbury (Set Down Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	
BIWAN HILL - SOUTHERN CROSS	DIRECT - VIA RRL	Express Footcary (Pick Up Only) - Sunshine (Pick Up Only) - Sunbury (Set Down Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	
SOUTHERN CROSS - BIWAN HILL	DIRECT - VIA RRL	Express Footcary (Pick Up Only) - Sunshine (Pick Up Only) - Sunbury (Set Down Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	
SOUTH GEELONG - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations to North Geelong - Express - Lara - Sunshine (pick up only) - Sunshine	0	0	0	0	0	0	0	0	0	0	0	0	0	
SOUTHERN CROSS - SOUTH GEELONG	DIRECT - VIA RRL	Express Footcary (pick up only) Sunshine (pick up only) - Express - Lara - Sunshine (pick up only) - Sunshine	0	0	0	0	0	0	0	2	30	6	20	0	0	
SOUTH GEELONG - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations to Truganina - Express - Sunshine (pick down only) - Footcary	0	0	0	0	0	1.5	40	0	0	0	0	1.5	40	
SOUTHERN CROSS - SOUTH GEELONG	DIRECT - VIA RRL	Southern Cross - Footcary (pick up only) - Sunshine (pick up only) - Express	0	0	0	0	0	1.5	40	0	0	0	0	1.5	40	
WALRIN PONDS - SOUTHERN CROSS	DIRECT - VIA RRL	All Stations to Wyndham - Express - Sunshine (Set down only) - Footcary	0	0	0	0	0	0	0	0	0	0	0	0	0	
SOUTHERN CROSS - WALRIN PONDS	DIRECT - VIA RRL	Express Footcary (pick up only) - Sunshine (pick up only) - Tamlet - Wyndham	0	0	0	0	0	0	0	4	15	6	20	0	0	
SOUTHERN CROSS - WALRIN PONDS	DIRECT - VIA RRL	ALL STATIONS TO Truganina - Express - Sunshine - Footcary - Southern Cross	6	10	10	12	3	20	3	20	6	20	0	0	0	
WALRIN PONDS - SOUTHERN CROSS	DIRECT - VIA RRL	Southern Cross - Footcary - Sunshine - Truganina - All Stations	3	20	6	20	3	20	6	10	10	12	0	0	0	
SOUTHERN CROSS - WALRIN PONDS	DIRECT - VIA RRL	ALL STATIONS TO Truganina - Express - Sunshine (Set down only) - Footcary	0	0	0	0	0	3	20	4	20	6	20	1.5	40	
WARRNAMBOOL - SOUTHERN CROSS	DIRECT - VIA RRL	Southern Cross - Footcary (pick up only) - Sunshine (pick up only) - Express	0	0	0	0	0	20	1.5	0	0	0	0	1.5	40	
SOUTHERN CROSS - WARRNAMBOOL	DIRECT - VIA RRL	EXPRESS WALRIN PONDS - GEELONG - FOOTCARY (set down only) - SOUTH	0	0	0	0	0	0	0	0	0	0	0	0	0	
SOUTHERN CROSS - WARRNAMBOOL	DIRECT - VIA RRL	EXPRESS SOUTHERN CROSS - FOOTCARY (pick up only) - GEELONG - WALRIN	0	0	0	0	0	0	0	0	0	0	0	0	0	
SEYMOUR - SOUTHERN CROSS	DIRECT - VIA UPFIELD	All Stations to Roxburgh Park (Roxburgh Park Set Down Only) - Coburg (Express Coburg) (pick up only) - Roxburgh Park (pick up only) - All Stations	1	60	2	60	1	60	1	60	2	60	1	60	2	60
SOUTHERN CROSS - SEYMOUR	DIRECT - VIA UPFIELD	All Stations to Roxburgh Park (Roxburgh Park Set Down Only) - Coburg (Express Coburg) (pick up only) - Roxburgh Park (pick up only) - All Stations	1	60	2	60	1	60	1	60	2	60	1	60	2	60
WALLAN - SOUTHERN CROSS	DIRECT - VIA UPFIELD	All Stations to Wallan - Roxburgh Park (Set Down Only) - Coburg (Express Coburg) (pick up only) - Roxburgh Park (pick up only) - Wallan then All Stations	0	0	0	0	0	0	0	0	0	0	0	0	0	
SHEPPARTON - SOUTHERN CROSS	DIRECT - VIA UPFIELD	All Stations	0	0	0	0	0	0	0	0	0	0	0	0	0	
SOUTHERN CROSS - SHEPPARTON	DIRECT - VIA UPFIELD	All Stations - Seymour - Broadford - Kilmore East - Wodang - Wallan - Coburg - Express - Coburg (Pick Up Only) - Craig														



Table F.4- Tram Service Plan 2026, 2036 and 2051

Parent Route	Route Id	Direction	Line From	Line To	Via	AM Peak (1 hour)					Interpeak (1 hour)					PM Peak (1 hour)					Off Peak (1 hour)				
						Frequency	Headway	SEATED	LOAD STANDARD	CRUSH LOAD	Frequency	Headway	SEATED	LOAD STANDARD	CRUSH LOAD	Frequency	Headway	SEATED	LOAD STANDARD	CRUSH LOAD	Frequency	Headway	SEATED	LOAD STANDARD	CRUSH LOAD
						(tph)	(mins)	(pax)	(pax)	(pax)	(tph)	(mins)	(pax)	(pax)	(pax)	(tph)	(mins)	(pax)	(pax)	(pax)	(tph)	(mins)	(pax)	(pax)	(pax)
1	1	D	South Melbourne	East Coburg	Swanston	10	6	64	180	290	6	10	64	180	290	10	6	64	180	290	6	10	64	180	290
		U	East Coburg	South Melbourne	Swanston	10	6	64	180	290	6	10	64	180	290	10	6	64	180	290	6	10	64	180	290
2	2	D	Melbourne University	Caulfield	Swanston	8	8	64	180	290	6	10	64	180	290	8	8	64	180	290	6	10	64	180	290
		U	Caulfield	Melbourne University	Swanston	8	8	64	180	290	6	10	64	180	290	8	8	64	180	290	6	10	64	180	290
3	3	D	East Malvern Station	Melbourne University	Swanston	8	8	64	180	290	6	10	64	180	290	8	8	64	180	290	6	10	64	180	290
		U	Melbourne University	East Malvern Station	Swanston	8	8	64	180	290	6	10	64	180	290	8	8	64	180	290	6	10	64	180	290
5	5	D	Malvern	Parkville	William/La Trobe/Spencer	6	10	60	180	290	6	10	60	180	290	6	10	60	180	290	6	10	60	180	290
		U	Parkville	Malvern	William/La Trobe/Spencer	6	10	60	180	290	6	10	60	180	290	6	10	60	180	290	6	10	60	180	290
6	6	D	Glen Iris	Moreland	Swanston	10	6	64	180	290	6	10	64	180	290	10	6	64	180	290	6	10	64	180	290
		U	Moreland	Glen Iris	Swanston	10	6	64	180	290	6	10	64	180	290	10	6	64	180	290	6	10	64	180	290
11	11	D	Fishermans Bend	Reservoir	Collins	10	6	64	180	290	6	10	64	180	290	10	6	64	180	290	6	10	64	180	290
		U	Reservoir	Fishermans Bend	Collins	10	6	64	180	290	6	10	64	180	290	10	6	64	180	290	6	10	64	180	290
12	12	D	St Kilda/Fitzroy Street	Victoria Gardens	La Trobe/Spencer	10	6	60	120	230	6	10	60	120	230	10	6	60	120	230	6	10	60	120	230
		U	Victoria Gardens	St Kilda/Fitzroy Street	La Trobe/Spencer	10	6	60	120	230	6	10	60	120	230	10	6	60	120	230	6	10	60	120	230
19	19	D	Jolimont	North Coburg	Elizabeth	12	5	64	180	290	6	10	64	180	290	12	5	64	180	290	6	10	64	180	290
		U	North Coburg	Jolimont	Elizabeth	12	5	64	180	290	6	10	64	180	290	12	5	64	180	290	6	10	64	180	290
35	35	CCW	Anticlockwise	Anticlockwise	-	-	-	40	-	130	6	10	40	-	130	-	-	40	-	130	6	10	40	-	130
		CW	Clockwise	Clockwise	-	-	-	40	-	130	6	10	40	-	130	-	-	40	-	130	6	10	40	-	130
48	48	D	Victoria Harbour Docklands	Doncaster Park and Ride	Collins	10	6	64	180	290	6	10	64	180	290	10	6	64	180	290	6	10	64	180	290
		U	Doncaster Park and Ride	Victoria Harbour Docklands	Collins	10	6	64	180	290	6	10	64	180	290	10	6	64	180	290	6	10	64	180	290
55	55	D	Toorak	West Coburg	William	12	5	62	180	290	6	10	62	180	290	12	5	62	180	290	6	10	62	180	290
		U	West Coburg	Toorak	William	12	5	62	180	290	6	10	62	180	290	12	5	62	180	290	6	10	62	180	290
57	57	D	Gardiner	Highpoint	Elizabeth	12	5	60	180	290	6	10	60	180	290	12	5	60	180	290	6	10	60	180	290
		U	Highpoint	Gardiner	Elizabeth	12	5	60	180	290	6	10	60	180	290	12	5	60	180	290	6	10	60	180	290
59	59	D	City	Airport West	Elizabeth	12	5	64	180	290	6	10	64	180	290	12	5	64	180	290	6	10	64	180	290
		U	Airport West	City	Elizabeth	12	5	64	180	290	6	10	64	180	290	12	5	64	180	290	6	10	64	180	290
63	63	D	Malvern Station	Waterfront City Docklands	Spencer	12	5	62	180	290	6	10	62	180	290	12	5	62	180	290	6	10	62	180	290
		U	Waterfront City Docklands	Malvern Station	Spencer	12	5	62	180	290	6	10	62	180	290	12	5	62	180	290	6	10	62	180	290
67	67	D	Carnegie	Melbourne University	Swanston	10	6	64	180	290	6	10	64	180	290	10	6	64	180	290	6	10	64	180	290
		U	Melbourne University	Carnegie	Swanston	10	6	64	180	290	6	10	64	180	290	10	6	64	180	290	6	10	64	180	290
70	70	D	E-Gate	Wattle Park	Flinders	10	6	60	120	230	6	10	60	120	230	10	6	60	120	230	6	10	60	120	230
		U	Wattle Park	E-Gate	Flinders	10	6	60	120	230	6	10	60	120	230	10	6	60	120	230	6	10	60	120	230
75	75	D	Waterfront City Docklands	Vermont South	Flinders	10	6	60	120	230	6	10	60	120	230	10	6	60	120	230	6	10	60	120	230
		U	Vermont South	Waterfront City Docklands	Flinders	10	6	60	120	230	6	10	60	120	230	10	6	60	120	230	6	10	60	120	230
78	78	D	Prahran	North Richmond	-	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230
		U	North Richmond	Prahran	-	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230
80	80	D	Kew	East Brighton	-	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230
		U	East Brighton	Kew	-	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230
81	81	D	Camdenwell	Gardiner	-	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230
		U	Gardiner	Camdenwell	-	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230
82	82	D	Maribyrnong Defence Site	Footscray	-	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230
		U	Footscray	Maribyrnong Defence Site	-	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230	6	10	60	120	230
86	86	D	Port Melbourne	Bundoora RMIT	Bourke/Spencer	12	5	64	180	290	6	10	64	180	290	12	5	64	180	290	6	10	64	180	290
		U	Bundoora RMIT	Port Melbourne	Bourke/Spencer	12	5	64	180	290	6	10	64	180	290	12	5	64	180	290	6	10	64	180	290
96	96	D	St Kilda Beach	East Brunswick	Bourke/Spencer	12	5	64	180	290	6	10	64	180	290	12	5	64	180	290	6	10	64	180	290
		U	East Brunswick	St Kilda Beach	Bourke/Spencer	12	5	64	180	290	6	10	64	180	290	12	5	64	180	290	6	10	64	180	290
109	109	D	Fishermans Bend	Box Hill	Collins	10	6	60	120	230	6	10	60	120	230	10	6	60	120	230	6	10	60	120	230
		U	Box Hill	Fishermans Bend	Collins	10	6	60	120	230	6	10	60	120	230	10	6	60	120	230	6	10	60	120	230

With the following updates as per v1.09 TfV Reference Case (see Appendix A – TfV transport modelling reference case assumptions v1.09):



Table 2: Summary of Tram Investment Sequence

Year	Project
2021	- Route 58 (Toorak-West Coburg introduced in 2017 to replace route 55 and Route 8). Route 6 extended to Moreland (top end of Route 8) and Route 55 extended to Toorak (bottom end of Route 8) - Glenferrie Rd Shuttle (68 Malvern to Caulfield), taken from Routes 16 & 64 - Route 12 via La Trobe St - E Class Tranche 2-3 (80-110) and Route 3 extension beyond Melbourne University to Brunswick Road - Route 2 discontinued
2026	- Route 86 runs to Port Melbourne - Route 109 runs to Victoria Harbour - Route 5 runs north to the Remand Centre on Spencer St via Park St link and south to Darling Station - Route 64 runs to Waterfront City via Park St Link to Malvern Station - Elizabeth St curves mean Route 19 runs to Jolimont, Route 57 to Melbourne Park, Route 59 to Jolimont - Route 12 via La Trobe St - Route 11 extension to Fishermans Bend - E-Gate extensions – Route 70, 75 - Route 30 discontinued - Next Generation Tram upgrades
2031	- Route 82 extension to Maribyrnong Defence Site - Route 48 extension to Doncaster - Route 3 extension to Malvern East Station - Route 5 extended to Footscray via Dynon Rd
2036+	No further changes



Table F.5 - Bus Service Levels & Categories - 2026 Base Case

Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
c001_in	Southland to Northland	P2B	3	3	3	3
c001_out	Northland to Southland	P2B	3	3	3	3
c234_in	Garden City to City	P1B	6	6	6	6
c234_out	City to Garden City	P1B	6	6	6	6
c235_in	Fishermans Bend to City	P2B	3	3	3	3
c235_out	City to Fishermans Bend	P2B	3	3	3	3
c237_in	Fishermans Bend to City	Ind6	4	2	4	0
c237_out	City to Fishermans Bend	Ind6	4	2	4	0
c246_in	Elsternwick to Clifton Hill	P1B	6	6	6	6
c246_out	Clifton Hill to Elsternwick	P1B	6	6	6	6
c606_in	Elsternwick to Fishermans Bend	C3	3	3	3	1.5
c606_out	Fishermans Bend to Elsternwick	C3	3	3	3	1.5
c903_in	Mentone to La Trobe Uni	P1B	6	6	6	6
c903_out	La Trobe Uni to Mentone	P1B	6	6	6	6
e01_in	Cranbourne to Springvale	P2B	3	3	3	3
e01_out	Springvale to Cranbourne	P2B	3	3	3	3
e011_in	Cardinia Road to Officer Sth	NL3	1.5	1.5	1.5	1
e011_out	Officer Sth to Cardinia Road	NL3	1.5	1.5	1.5	1
e013_in	Lilydale to Mooroolbark	C4	3	1.5	3	1.5
e013_out	Mooroolbark to Lilydale	C4	3	1.5	3	1.5
e014_in	Cranbourne East to Narre Warren	NL2	2	2	2	1
e014_out	Narre Warren to Cranbourne East	NL2	2	2	2	1
e015_in	Cranbourne East to Merinda Park	NL3	1.5	1.5	1.5	1
e015_out	Merinda Park to Cranbourne East	NL3	1.5	1.5	1.5	1
e016_in	Clyde to Merinda Park	NL3	1.5	1.5	1.5	1
e016_out	Merinda Park to Clyde	NL3	1.5	1.5	1.5	1
e017_in	Highett to Carnegie	C3	3	3	3	1.5
e017_out	Carnegie to Highett	C3	3	3	3	1.5
e019_in	Berwick to Narre Warren North	N3	1.5	1	1.5	0
e019_out	Narre Warren North to Berwick	N3	1.5	1	1.5	0
e02_in	Carrum to Berwick	P2B	3	3	3	3
e02_out	Berwick to Carrum	P2B	3	3	3	3
e020_in	Cheltenham to Chadstone SC	C3	3	3	3	1.5
e020_out	Chadstone SC to Cheltenham	C3	3	3	3	1.5
e023_in	Westall to Clayton	N3	1.5	1	1.5	0
e023_out	Clayton to Westall	N3	1.5	1	1.5	0
e024_in	Officer to Beaconsfield	N3	1.5	1	1.5	0
e024_out	Beaconsfield to Officer	N3	1.5	1	1.5	0
e025_in	Ringwood to Box Hill	C3	3	3	3	1.5
e025_out	Box Hill to Ringwood	C3	3	3	3	1.5
e04_in	Frankston to Narre Warren	C3	3	3	3	1.5
e04_out	Narre Warren to Frankston	C3	3	3	3	1.5
e05_in	Pakenham to Berwick	P2B	3	3	3	3
e05_out	Berwick to Pakenham	P2B	3	3	3	3
e06_in	Westall to Southland	C3	3	3	3	1.5
e06_out	Southland to Westall	C3	3	3	3	1.5
e07_in	Lynbrook to Noble Park via South Dandenong industrial	C3	3	3	3	1.5
e07_out	Noble Park to Lynbrook via South Dandenong industrial	C3	3	3	3	1.5
e08_in	Benton Grange to Mornington Town	NL3	1.5	1.5	1.5	1
e08_out	Mornington Town to Benton Grange	NL3	1.5	1.5	1.5	1
e09_in	Beaconsfield to Narre Warren	C3	3	3	3	1.5
e09_out	Narre Warren to Beaconsfield	C3	3	3	3	1.5
e10_in	Mornington Town to Tanti Park	NL3	1.5	1.5	1.5	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e10_out	Tanti Park to Mornington Town	NL3	1.5	1.5	1.5	1
e105_in	Mordialloc to Dandenong	C3	3	3	3	1.5
e105_out	Dandenong to Mordialloc	C3	3	3	3	1.5
e107_in	Brighton to Huntingdale	P2B	3	3	3	3
e107_out	Huntingdale to Brighton	P2B	3	3	3	3
e109_in	Glen Waverley to Oakleigh	P2B	3	3	3	3
e109_out	Oakleigh to Glen Waverley	P2B	3	3	3	3
e111_in	Heathmont to Camberwell	P2B	3	3	3	3
e111_out	Camberwell to Heathmont	P2B	3	3	3	3
e118_in	Beaconsfield to Lynbrook	C3	3	3	3	1.5
e118_out	Lynbrook to Beaconsfield	C3	3	3	3	1.5
e119_in	Pakenham to Officer	C3	3	3	3	1.5
e119_out	Officer to Pakenham	C3	3	3	3	1.5
e200_b_in	Doncaster SC to Southern Cross	P2A	6	3	6	3
e200_b_out	Southern Cross to Doncaster SC	P2A	6	3	6	3
e200_in	Auburn Station to Southern Cross	P2B	3	3	3	3
e200_out	Southern Cross to Auburn Station	P2B	3	3	3	3
e203_in	Holmesglen to Darling Road	N1	3	1.5	3	0
e203_out	Darling Road to Holmesglen	N1	3	1.5	3	0
e216_in	Middle Brighton to Caulfield to	N4	1	1	1	0
e216_out	Caulfield to Middle Brighton	N4	1	1	1	0
e219_in	Elsternwick to City via Williams Road	P2B	3	3	3	3
e219_out	City to Elsternwick via Williams Road	P2B	3	3	3	3
e245_in	Sandringham to St Kilda	N1	3	1.5	3	0
e245_out	St Kilda to Sandringham	N1	3	1.5	3	0
e270_in	Mitcham to Box Hill	C3	3	3	3	1.5
e270_out	Box Hill to Mitcham	C3	3	3	3	1.5
e271_in	Park Orchards to Blackburn	N4	1	1	1	0
e271_out	Blackburn to Park Orchards	N4	1	1	1	0
e275_in	Blackburn to Box Hill via Blackburn North	N3	1.5	1	1.5	0
e275_out	Box Hill to Blackburn via Blackburn North	N3	1.5	1	1.5	0
e279_in	The Pines to Box Hill	P2B	3	3	3	3
e279_out	Box Hill to The Pines	P2B	3	3	3	3
e280_in	The Pines to Doncaster SC via Tunstall Square	N4	1	1	1	0
e280_out	Doncaster SC to The Pines via Tunstall Square	N4	1	1	1	0
e282_in	The Pines SC to Doncaster PR	C4	3	1.5	3	1.5
e282_out	Doncaster PR to The Pines SC	C4	3	1.5	3	1.5
e284_in	Box Hill to La Trobe Uni	C3	3	3	3	1.5
e284_out	La Trobe Uni to Box Hill	C3	3	3	3	1.5
e285_in	Doncaster Park and Ride to Camberwell	C3	3	3	3	1.5
e285_out	Camberwell to Doncaster Park and Ride	C3	3	3	3	1.5
e286_in	Templestowe Village to Jackson Court	N4	1	1	1	0
e286_out	Jackson Court to Templestowe Village	N4	1	1	1	0
e287_in	Mont Albert to Camberwell	N4	1	1	1	0
e287_out	Camberwell to Mont Albert	N4	1	1	1	0
e293_in	Eltham to Deakin Uni	C3	3	3	3	1.5
e293_out	Deakin Uni to Eltham	C3	3	3	3	1.5
e302_in	Box Hill to Southern Cross	C3	3	3	3	1.5
e302_out	Southern Cross to Box Hill	C3	3	3	3	1.5
e305_in	The Pines to Doncaster SC via Doncaster East SC	C3	3	3	3	1.5
e305_out	Doncaster SC to The Pines via Doncaster East SC	C3	3	3	3	1.5
e309_in	The Pines SC to Nunawading	C4	3	1.5	3	1.5
e309_out	Nunawading to The Pines SC	C4	3	1.5	3	1.5
e364_in	Warrandyte Bridge to Ringwood	C4	3	1.5	3	1.5
e364_out	Ringwood to Warrandyte Bridge	C4	3	1.5	3	1.5
e367_in	Ringwood East to Heathmont	C4	3	1.5	3	1.5
e367_out	Heathmont to Ringwood East	C4	3	1.5	3	1.5
e370_in	Ringwood to Mitcham	NL2	2	2	2	1
e370_out	Mitcham to Ringwood	NL2	2	2	2	1
e371_in	Ringwood to Park Orchards	C3	3	3	3	1.5



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e371_out	Park Orchards to Ringwood	C3	3	3	3	1.5
e380_in	Lilydale to Ringwood	P2B	3	3	3	3
e380_out	Ringwood to Lilydale	P2B	3	3	3	3
e381_in	Croydon to Ringwood East	C4	3	1.5	3	1.5
e381_out	Ringwood East to Croydon	C4	3	1.5	3	1.5
e548_in	Southland to La Trobe Uni	P2A	6	3	6	3
e548_out	La Trobe Uni to Southland	P2A	6	3	6	3
e600_in	Cheltnham to Sandringham	N1	3	1.5	3	0
e600_out	Sandringham to Cheltnham	N1	3	1.5	3	0
e605_in	Gardenvale to City	N1	3	1.5	3	0
e605_out	City to Gardenvale	N1	3	1.5	3	0
e612_in	Box Hill to Chadstone SC	N4	1	1	1	0
e612_out	Chadstone SC to Box Hill	N4	1	1	1	0
e613_in	Burwood to Canterbury	C4	3	1.5	3	1.5
e613_out	Canterbury to Burwood	C4	3	1.5	3	1.5
e622_in	Holmesglen to Oakleigh	N4	1	1	1	0
e622_out	Oakleigh to Holmesglen	N4	1	1	1	0
e623_in	Gardenvale to Caulfield	N1	3	1.5	3	0
e623_out	Caulfield to Gardenvale	N1	3	1.5	3	0
e625_in	Carnegie to Burke Road/Tram 5	N3	1.5	1	1.5	0
e625_out	Burke Road/Tram 5 to Carnegie	N3	1.5	1	1.5	0
e640_in	Glen Waverley to Glen Iris	P2B	3	3	3	3
e640_out	Glen Iris to Glen Waverley	P2B	3	3	3	3
e664_in	Croydon to Knox SC	P2B	3	3	3	3
e664_out	Knox SC to Croydon	P2B	3	3	3	3
e670_in	Lilydale to Ringwood	P2B	3	3	3	3
e670_out	Ringwood to Lilydale	P2B	3	3	3	3
e671_in	Chirnside Park SC to Croydon	NL3	1.5	1.5	1.5	1
e671_out	Croydon to Chirnside Park SC	NL3	1.5	1.5	1.5	1
e672_in	Chirnside Park SC to Croydon	N4	1	1	1	0
e672_out	Croydon to Chirnside Park SC	N4	1	1	1	0
e677_in	Lilydale to Chirnside Park SC	NL3	1.5	1.5	1.5	1
e677_out	Chirnside Park SC to Lilydale	NL3	1.5	1.5	1.5	1
e679_in	Lilydale to Ringwood	C3	3	3	3	1.5
e679_out	Ringwood to Lilydale	C3	3	3	3	1.5
e680_in	Lilydale to Mooroolbark	NL3	1.5	1.5	1.5	1
e680_out	Mooroolbark to Lilydale	NL3	1.5	1.5	1.5	1
e681_in	Rowville Medical/Kellets Rd to Stud Park SC	N4	1	1	1	0
e681_out	Stud Park SC to Rowville Medical/Kellets Rd	N4	1	1	1	0
e682_in	Stud Park SC to Ferntree Gully Station	N1	3	1.5	3	0
e682_out	Ferntree Gully Station to Stud Park SC	N1	3	1.5	3	0
e683_in	Warburton to Lilydale	C4	3	1.5	3	1.5
e683_out	Lilydale to Warburton	C4	3	1.5	3	1.5
e683_short_in	Wandon to Lilydale	N4	1	1	1	0
e683_short_out	Lilydale to Wandon	N4	1	1	1	0
e684_in	Stud Park SC to Knox SC	N4	1	1	1	0
e684_out	Knox SC to Stud Park SC	N4	1	1	1	0
e685_in	Healesville to Lilydale	N4	1	1	1	0
e685_out	Lilydale to Healesville	N4	1	1	1	0
e687_in	Kilsyth to Croydon via Mooroolbark	N1	3	1.5	3	0
e687_out	Croydon to Kilsyth via Mooroolbark	N1	3	1.5	3	0
e688_in	Mooroolbark to Upper Ferntree Gully	N4	1	1	1	0
e688_out	Upper Ferntree Gully to Mooroolbark	N4	1	1	1	0
e689_in	Lilydale to Mooroolbark via Montrose	NL3	1.5	1.5	1.5	1
e689_out	Mooroolbark to Lilydale via Montrose	NL3	1.5	1.5	1.5	1
e690_in	Boronia to Croydon	N1	3	1.5	3	0
e690_out	Croydon to Boronia	N1	3	1.5	3	0
e691_in	Ferntree Gully to Boronia	N1	3	1.5	3	0



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e691_out	Boronia to Ferntree Gully	N1	3	1.5	3	0
e692_in	Chirnside SC to Croydon via Mooroolbark	N3	1.5	1	1.5	0
e692_out	Croydon to Chirnside SC via Mooroolbark	N3	1.5	1	1.5	0
e693_in	Ferntree Gully to Caulfield	P2B	3	3	3	3
e693_out	Caulfield to Ferntree Gully	P2B	3	3	3	3
e694_in	Chirnside SC to Croydon	N3	1.5	1	1.5	0
e694_out	Croydon to Chirnside SC	N3	1.5	1	1.5	0
e695_in	Gembrook to Belgrave	Peri	0.75	0.75	0.75	0.75
e695_out	Belgrave to Gembrook	Peri	0.75	0.75	0.75	0.75
e697_in	Belgrave to Narre Warren Station	N4	1	1	1	0
e697_out	Narre Warren Station to Belgrave	N4	1	1	1	0
e698_ccw	Upwey Loop	C4	3	1.5	3	1.5
e699_in	Belgrave to Upwey	C4	3	1.5	3	1.5
e699_out	Upwey to Belgrave	C4	3	1.5	3	1.5
e700_in	Monash Uni to Glen Waverley via Mt Waverley	N4	1	1	1	0
e700_out	Glen Waverley to Monash Uni via Mt Waverley	N4	1	1	1	0
e701_in	Middle Brighton to Oakleigh	C3	3	3	3	1.5
e701_out	Oakleigh to Middle Brighton	C3	3	3	3	1.5
e702_in	Hampton to Westall	C3	3	3	3	1.5
e702_out	Westall to Hampton	C3	3	3	3	1.5
e703_b_in	Brighton to Clayton	P2B	3	3	3	3
e703_b_out	Clayton to Brighton	P2B	3	3	3	3
e703_c_in	Doncaster E to Blackburn	P2B	3	3	3	3
e703_c_out	Blackburn to Doncaster E	P2B	3	3	3	3
e703_in	Clayton to Blackburn	P1A	12	6	12	6
e703_out	Blackburn to Clayton	P1A	12	6	12	6
e704_in	Ormond to Oakleigh	N1	3	1.5	3	0
e704_out	Oakleigh to Ormond	N1	3	1.5	3	0
e706_in	Aspendale to Mentone	C4	3	1.5	3	1.5
e706_out	Mentone to Aspendale	C4	3	1.5	3	1.5
e707_in	Mordialloc to Mentone	NL3	1.5	1.5	1.5	1
e707_out	Mentone to Mordialloc	NL3	1.5	1.5	1.5	1
e709_in	Brighton Beach to Clayton	C3	3	3	3	1.5
e709_out	Clayton to Brighton Beach	C3	3	3	3	1.5
e728_in	Glen Waverley to Box Hill	NL5	1	1	1	1
e728_out	Box Hill to Glen Waverley	NL5	1	1	1	1
e729_in	Huntingdale to Mt Waverley	N3	1.5	1	1.5	0
e729_out	Mt Waverley to Huntingdale	N3	1.5	1	1.5	0
e730_in	Nunawading to Ashburton via Deakin Uni	N1	3	1.5	3	0
e730_out	Ashburton to Nunawading via Deakin Uni	N1	3	1.5	3	0
e731_in	Forest Hill SC to Deakin Uni	N3	1.5	1	1.5	0
e731_out	Deakin Uni to Forest Hill SC	N3	1.5	1	1.5	0
e732_in	Ferntree Gully to Vermont SC	P2A	6	3	6	3
e732_out	Vermont SC to Ferntree Gully	P2A	6	3	6	3
e733_in	Mordialloc to Box Hill	P2B	3	3	3	3
e733_out	Box Hill to Mordialloc	P2B	3	3	3	3
e734_in	Boronia to Caulfield	P2B	3	3	3	3
e734_out	Caulfield to Boronia	P2B	3	3	3	3
e735_in	Vermont South SC to Blackburn	N4	1	1	1	0
e735_out	Blackburn to Vermont South SC	N4	1	1	1	0
e736_in	Vermont SC to Mitcham	N3	1.5	1	1.5	0
e736_out	Mitcham to Vermont SC	N3	1.5	1	1.5	0
e739_in	Holmesglen to Mt Waverley	N1	3	1.5	3	0
e739_out	Mt Waverley to Holmesglen	N1	3	1.5	3	0
e740_in	Heatherdale to Vermont SC	N3	1.5	1	1.5	0
e740_out	Vermont SC to Heatherdale	N3	1.5	1	1.5	0
e741_in	Glen Waverley to Syndal	N1	3	1.5	3	0
e741_out	Syndal to Glen Waverley	N1	3	1.5	3	0
e742_in	Boronia to Bayswater	N1	3	1.5	3	0
e742_out	Bayswater to Boronia	N1	3	1.5	3	0



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e745_in	Knox SC to Bayswater	N1	3	1.5	3	0
e745_out	Bayswater to Knox SC	N1	3	1.5	3	0
e746_in	Boronia to Knox SC	N4	1	1	1	0
e746_out	Knox SC to Boronia	N4	1	1	1	0
e747_in	Ferntree Gully to Knox SC	N3	1.5	1	1.5	0
e747_out	Knox SC to Ferntree Gully	N3	1.5	1	1.5	0
e754_in	Monash Uni to Glen Waverley via Mt Waverley	N4	1	1	1	0
e754_out	Glen Waverley to Monash Uni via Mt Waverley	N4	1	1	1	0
e755_in	Boronia to Bayswater	N1	3	1.5	3	0
e755_out	Bayswater to Boronia	N1	3	1.5	3	0
e757_in	Stud Park SC to Knox SC	N4	1	1	1	0
e757_out	Knox SC to Stud Park SC	N4	1	1	1	0
e758_in	Ferntree Gully to Knox SC via Knoxfield	N4	1	1	1	0
e758_out	Knox SC to Ferntree Gully via Knoxfield	N4	1	1	1	0
e765_in	Nunawading to Box Hill	N1	3	1.5	3	0
e765_out	Box Hill to Nunawading	N1	3	1.5	3	0
e767_in	Southland to Box Hill	P2A	6	3	6	3
e767_out	Box Hill to Southland	P2A	6	3	6	3
e769_in	Clyde North to Cranbourne via Linsell Boulevard	C3	3	3	3	1.5
e769_out	Cranbourne to Clyde North via Linsell Boulevard	C3	3	3	3	1.5
e770_in	Karingal SC to Frankston	P2B	3	3	3	3
e770_out	Frankston to Karingal SC	P2B	3	3	3	3
e772_in	Frankston South to Frankston via Rosedale Grove	NL3	1.5	1.5	1.5	1
e772_out	Frankston to Frankston South via Rosedale Grove	NL3	1.5	1.5	1.5	1
e773_in	Frankston South to Frankston via Humphries Road	NL3	1.5	1.5	1.5	1
e773_out	Frankston to Frankston South via Humphries Road	NL3	1.5	1.5	1.5	1
e774_in	Mt Eliza to Frankston	NL3	1.5	1.5	1.5	1
e774_out	Frankston to Mt Eliza	NL3	1.5	1.5	1.5	1
e775_in	Frankston South to Frankston	C3	3	3	3	1.5
e775_out	Frankston to Frankston South	C3	3	3	3	1.5
e776_in	Pearcedale to Frankston	NL3	1.5	1.5	1.5	1
e776_out	Frankston to Pearcedale	NL3	1.5	1.5	1.5	1
e778_in	Seaford to Carrum Downs via Hall Rd	C3	3	3	3	1.5
e778_out	Carrum Downs to Seaford via Hall Rd	C3	3	3	3	1.5
e779_in	Carrum to Mordialloc	C4	3	1.5	3	1.5
e779_out	Mordialloc to Carrum	C4	3	1.5	3	1.5
e780_in	Frankston to Carrum via Seaford	P2B	3	3	3	3
e780_out	Carrum to Frankston via Seaford	P2B	3	3	3	3
e781_in	Mt Martha to Frankston	C4	3	1.5	3	1.5
e781_out	Frankston to Mt Martha	C4	3	1.5	3	1.5
e782_in	Flinders to Frankston via Balnarring	Peri	0.75	0.75	0.75	0.75
e782_out	Frankston to Flinders via Balnarring	Peri	0.75	0.75	0.75	0.75
e783_in	Balnarring to Frankston	NL3	1.5	1.5	1.5	1
e783_out	Frankston to Balnarring	NL3	1.5	1.5	1.5	1
e784_in	Osbourne to Mornington Town via Dunns Road	NL3	1.5	1.5	1.5	1
e784_out	Mornington Town to Osbourne via Dunns Road	NL3	1.5	1.5	1.5	1
e785_in	Osbourne to Mornington Town via Racecourse Road	NL3	1.5	1.5	1.5	1
e785_out	Mornington Town to Osbourne via Racecourse Road	NL3	1.5	1.5	1.5	1
e786_in	St Andrews to Rye	NL3	1.5	1.5	1.5	1
e786_out	Rye to St Andrews	NL3	1.5	1.5	1.5	1
e788_in	Portsea to Frankston via Nepean Highway	NL3	1.5	1.5	1.5	1
e788_out	Frankston to Portsea via Nepean Highway	NL3	1.5	1.5	1.5	1
e788a_in	Portsea to Frankston via Melbourne Rd	NL3	1.5	1.5	1.5	1
e788a_out	Frankston to Portsea via Melbourne Rd	NL3	1.5	1.5	1.5	1
e789_in	Langwarrin North to Frankston	NL3	1.5	1.5	1.5	1
e789_out	Frankston to Langwarrin North	NL3	1.5	1.5	1.5	1
e790_in	Langwarrin South to Frankston	NL3	1.5	1.5	1.5	1
e790_out	Frankston to Langwarrin South	NL3	1.5	1.5	1.5	1
e791_in	Frankston to Cranbourne	P2B	3	3	3	3
e791_out	Cranbourne to Frankston	P2B	3	3	3	3



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e792_in	Botanic Ridge to Cranbourne	NL3	1.5	1.5	1.5	1
e792_out	Cranbourne to Botanic Ridge	NL3	1.5	1.5	1.5	1
e793_in	Tooradin to Cranbourne	Peri	0.75	0.75	0.75	0.75
e793_out	Cranbourne to Tooradin	Peri	0.75	0.75	0.75	0.75
e794_in	Warneet to Cranbourne	Peri	0.75	0.75	0.75	0.75
e794_out	Cranbourne to Warneet	Peri	0.75	0.75	0.75	0.75
e795_in	Cannons Creek to Cranbourne	Peri	0.75	0.75	0.75	0.75
e795_out	Cranbourne to Cannons Creek	Peri	0.75	0.75	0.75	0.75
e796_in	Cranbourne West to Cranbourne	NL3	1.5	1.5	1.5	1
e796_out	Cranbourne to Cranbourne West	NL3	1.5	1.5	1.5	1
e797_in	Cranbourne West Loop	NL2	2	2	2	1
e797_out	Cranbourne West Loop	NL2	2	2	2	1
e798_in	Selandra Rise to Cranbourne via Linsell Boulevard	C3	3	3	3	1.5
e798_out	Cranbourne to Selandra Rise via Linsell Boulevard	C3	3	3	3	1.5
e799_in	Merinda Park to Casey Central SC	NL3	1.5	1.5	1.5	1
e799_out	Casey Central SC to Merinda Park	NL3	1.5	1.5	1.5	1
e800_in	Dandenong to Chadstone SC	P2B	3	3	3	3
e800_out	Chadstone SC to Dandenong	P2B	3	3	3	3
e801_in	Cranbourne East to Lynbrook	NL3	1.5	1.5	1.5	1
e801_out	Lynbrook to Cranbourne East	NL3	1.5	1.5	1.5	1
e803_in	Cranbourne East to Merinda Park	NL3	1.5	1.5	1.5	1
e803_out	Merinda Park to Cranbourne East	NL3	1.5	1.5	1.5	1
e813_in	Sandown to Waverley Gardens	N3	1.5	1	1.5	0
e813_out	Waverley Gardens to Sandown	N3	1.5	1	1.5	0
e814_in	Waverley Gardens SC to Westall	N3	1.5	1	1.5	0
e814_out	Westall to Waverley Gardens SC	N3	1.5	1	1.5	0
e815_in	Parkmore SC to Yarraman	N3	1.5	1	1.5	0
e815_out	Yarraman to Parkmore SC	N3	1.5	1	1.5	0
e816_in	Parkmore SC to Noble Park	NL3	1.5	1.5	1.5	1
e816_out	Noble Park to Parkmore SC	NL3	1.5	1.5	1.5	1
e817_in	Parkmore SC to Sandown	N3	1.5	1	1.5	0
e817_out	Sandown to Parkmore SC	N3	1.5	1	1.5	0
e825_in	Mentone to Sandringham	C3	3	3	3	1.5
e825_out	Sandringham to Mentone	C3	3	3	3	1.5
e826_in	Sandringham to Caulfield	NL3	1.5	1.5	1.5	1
e826_out	Caulfield to Sandringham	NL3	1.5	1.5	1.5	1
e827_in	Hallam to Dandenong	C4	3	1.5	3	1.5
e827_out	Dandenong to Hallam	C4	3	1.5	3	1.5
e828_in	Dandenong to Sandringham	P2B	3	3	3	3
e828_out	Sandringham to Dandenong	P2B	3	3	3	3
e829_in	Berwick to Dandenong	C3	3	3	3	1.5
e829_out	Dandenong to Berwick	C3	3	3	3	1.5
e832_in	Frankston to Carrum via Carrum Downs	P2B	3	3	3	3
e832_out	Carrum to Frankston via Carrum Downs	P2B	3	3	3	3
e833_in	Seaford to Carrum Downs	C3	3	3	3	1.5
e833_out	Carrum Downs to Seaford	C3	3	3	3	1.5
e834_in	Berwick RS to Jackson Reserve	C4	3	1.5	3	1.5
e834_out	Jackson Reserve to Berwick RS	C4	3	1.5	3	1.5
e835_in	Berwick North to Narren Warren	N3	1.5	1	1.5	0
e835_out	Narren Warren to Berwick North	N3	1.5	1	1.5	0
e836_in	Officer to Beaconsfield via Clyde North	NL3	1.5	1.5	1.5	1
e836_out	Beaconsfield to Officer via Clyde North	NL3	1.5	1.5	1.5	1
e837_in	Princes Hwy Activity Centre (Officer) to Berwick via Beaconsfield	N3	1.5	1	1.5	0
e837_out	Berwick to Princes Hwy Activity Centre (Officer) via Beaconsfield	N3	1.5	1	1.5	0
e839_in	Berwick East to Parkhill Plaza	N3	1.5	1	1.5	0
e839_out	Parkhill Plaza to Berwick East	N3	1.5	1	1.5	0
e841_in	Narre Warren to Endeavour Hills	N4	1	1	1	0
e841_out	Endeavour Hills to Narre Warren	N4	1	1	1	0



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e844_in	Endeavour Hills SC to Dandenong	N1	3	1.5	3	0
e844_out	Dandenong to Endeavour Hills SC	N1	3	1.5	3	0
e845_ccw	Endeavour Hills SC Loop	N3	1.5	1	1.5	0
e845_cw	Endeavour Hills SC Loop	N3	1.5	1	1.5	0
e846_cw	Berwick town Loop	N4	1	1	1	0
e848_in	Wheelers Hill SC to Brandon Park SC	N4	1	1	1	0
e848_out	Brandon Park SC to Wheelers Hill SC	N4	1	1	1	0
e850_in	Brandon Park SC to Glen Waverley	N3	1.5	1	1.5	0
e850_out	Glen Waverley to Brandon Park SC	N3	1.5	1	1.5	0
e851_in	Noble Park to Mitcham	P2B	3	3	3	3
e851_out	Mitcham to Noble Park	P2B	3	3	3	3
e852_in	Dandenong to Clayton	C3	3	3	3	1.5
e852_out	Clayton to Dandenong	C3	3	3	3	1.5
e857_in	Bonbeach to Chelsea	C4	3	1.5	3	1.5
e857_out	Chelsea to Bonbeach	C4	3	1.5	3	1.5
e858_in	Parkmore SC to Dandenong	NL3	1.5	1.5	1.5	1
e858_out	Dandenong to Parkmore SC	NL3	1.5	1.5	1.5	1
e866_in	Chisholm TAFE to Rosebud	N4	1	1	1	0
e866_out	Rosebud to Chisholm TAFE	N4	1	1	1	0
e891_in	Lynbrook to Narre Warren	NL3	1.5	1.5	1.5	1
e891_out	Narre Warren to Lynbrook	NL3	1.5	1.5	1.5	1
e892_in	Casey Central to Dandenong	C3	3	3	3	1.5
e892_out	Dandenong to Casey Central	C3	3	3	3	1.5
e893_in	Cranbourne to Dandenong	NL3	1.5	1.5	1.5	1
e893_out	Dandenong to Cranbourne	NL3	1.5	1.5	1.5	1
e895_in	Fountain Gate SC to Casey Central SC	NL3	1.5	1.5	1.5	1
e895_out	Casey Central SC to Fountain Gate SC	NL3	1.5	1.5	1.5	1
e900_in	Croydon to Elsternwick	P1A	12	6	12	6
e900_out	Elsternwick to Croydon	P1A	12	6	12	6
e901_in	Frankston to Ringwood	P1B	6	6	6	6
e901_out	Ringwood to Frankston	P1B	6	6	6	6
e902_in	Chelsea to Greensborough	P1B	6	6	6	6
e902_out	Greensborough to Chelsea	P1B	6	6	6	6
e905_in	The Pines SC to City via Templestowe	P2A	6	3	6	3
e905_out	City to The Pines SC via Templestowe	P2A	6	3	6	3
e906_in	The Pines SC to Docklands via Doncaster	P1A	12	6	12	6
e906_out	City to Warrandyte	P1A	12	6	12	6
e907_in	The Pines SC to Docklands via Doncaster	P1A	12	6	12	6
e907_out	Docklands to Mitcham	P1A	12	6	12	6
e908_in	The Pines SC to Docklands via Doncaster	P2A	6	3	6	3
e908_out	Docklands to The Pines SC via Doncaster	P2A	6	3	6	3
e920_in	Officer to Lynbrook	P2B	3	3	3	3
e920_out	Lynbrook to Officer	P2B	3	3	3	3
e921_in	Cardinia Road to Officer	NL3	1.5	1.5	1.5	1
e921_out	Officer to Cardinia Road	NL3	1.5	1.5	1.5	1
e922_in	Princess Hwy Activity Centre (Officer) to Officer Town Centre	N3	1.5	1	1.5	0
e922_out	Officer Town Centre to Princess Hwy Activity Centre (Officer)	N3	1.5	1	1.5	0
e923_in	Casey Central to Beaconsfield via Clyde North	NL3	1.5	1.5	1.5	1
e923_out	Beaconsfield to Casey Central via Clyde North	NL3	1.5	1.5	1.5	1
e924_cw	Pakenham Business Park Loop	NL3	1.5	1.5	1.5	1
e925_in	Cardinia Road to Officer Nth	NL3	1.5	1.5	1.5	1
e925_out	Officer Nth to Cardinia Road	NL3	1.5	1.5	1.5	1
e926_in	Pakenham to Cardinia Road via Pakenham North West	NL3	1.5	1.5	1.5	1
e926_out	Cardinia Road to Pakenham via Pakenham North West	NL3	1.5	1.5	1.5	1
e927_ccw	Pakenham Station/Pakenham North Loop	NL3	1.5	1.5	1.5	1
e928_in	Pakenham to Cardinia Road via Pakenham Sth	C4	3	1.5	3	1.5
e928_out	Cardinia Road to Pakenham via Pakenham Sth	C4	3	1.5	3	1.5
e929_cw	Pakenham Station/Pakenham North East Loop	NL3	1.5	1.5	1.5	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e931_in	Officer to Beaconsfield	NL3	1.5	1.5	1.5	1
e931_out	Beaconsfield to Officer	NL3	1.5	1.5	1.5	1
n001_tb_in	Merrifield Express Beveridge - Upfield	C3	3	3	3	1.5
n001_tb_out	Merrifield Express Upfield - Beveridge	C3	3	3	3	1.5
n002_tb_in	Beveridge - Epping	C4	3	1.5	3	1.5
n002_tb_out	Epping - Beveridge	C4	3	1.5	3	1.5
n003_tb_in	Donnybrook - Upfield	C4	3	1.5	3	1.5
n003_tb_out	Upfield - Donnybrook	C4	3	1.5	3	1.5
n004_tb_in	Beveridge - Epping	C4	3	1.5	3	1.5
n004_tb_out	Epping - Beveridge	C4	3	1.5	3	1.5
n250_in	La Trobe University to City	P1A	12	6	12	6
n250_out	City to La Trobe University	P1A	12	6	12	6
n251_in	La Trobe Uni to Moonee Ponds via Clifton Hill & Northland	C4	3	1.5	3	1.5
n251_out	Moonee Ponds to La Trobe Uni via Clifton Hill & Northland	C4	3	1.5	3	1.5
n301_in	La Trobe University to Reservoir	Shuttle3	6	6	6	0
n301_out	Reservoir to La Trobe University	Shuttle3	6	6	6	0
n303_in	Greensborough to Pascoe Vale	P2A	6	3	6	3
n303_out	Pascoe Vale to Greensborough	P2A	6	3	6	3
n311_in	Doreen West to South Morang	C4	3	1.5	3	1.5
n311_out	South Morang to Doreen West	C4	3	1.5	3	1.5
n312_in	Doreen East to South Morang	C4	3	1.5	3	1.5
n312_out	South Morang to Doreen East	C4	3	1.5	3	1.5
n313_in	Doreen South to South Morang	C4	3	1.5	3	1.5
n313_out	South Morang to Doreen South	C4	3	1.5	3	1.5
n315_in	South Morang to Greensborough	NL5	1	1	1	1
n315_out	Greensborough to South Morang	NL5	1	1	1	1
n317_in	Whittlesea to Mernda	NL5	1	1	1	1
n317_out	Mernda to Whittlesea	NL5	1	1	1	1
n322_in	Mernda to South Morang via Lakes Bvd	C3	3	3	3	1.5
n322_out	South Morang to Mernda via Lakes Bvd	C3	3	3	3	1.5
n323_in	Mernda to South Morang via Everywhere	NL2	2	2	2	1
n323_out	South Morang to Mernda via Everywhere	NL2	2	2	2	1
n331_in	South Morang to Bundoora RMIT	C4	3	1.5	3	1.5
n331_out	Bundoora RMIT to South Morang	C4	3	1.5	3	1.5
n332_in	South Morang to Thomastown	C4	3	1.5	3	1.5
n332_out	Thomastown to South Morang	C4	3	1.5	3	1.5
n333_in	South Morang to Greensborough	C4	3	1.5	3	1.5
n333_out	Greensborough to South Morang	C4	3	1.5	3	1.5
n334_in	East South Morang to Bundoora RMIT	C3	3	3	3	1.5
n334_out	Bundoora RMIT to East South Morang	C3	3	3	3	1.5
n341_in	Eltham North to Greensborough	C3	3	3	3	1.5
n341_out	Greensborough to Eltham North	C3	3	3	3	1.5
n342_in	Eltham North to Greensborough	C4	3	1.5	3	1.5
n342_out	Greensborough to Eltham North	C4	3	1.5	3	1.5
n343_in	Diamond Creek to Greensborough	C4	3	1.5	3	1.5
n343_out	Greensborough to Diamond Creek	C4	3	1.5	3	1.5
n344_in	Campbellfield to West Preston	C3	3	3	3	1.5
n344_out	West Preston to Campbellfield	C3	3	3	3	1.5
n345_in	South Morang to Northland	C4	3	1.5	3	1.5
n345_out	Northland to South Morang	C4	3	1.5	3	1.5
n346_in	South Morang to Thomastown	NL5	1	1	1	1
n346_out	Thomastown to South Morang	NL5	1	1	1	1
n347_in	Greensborough to Rosanna	C4	3	1.5	3	1.5
n347_out	Rosanna to Greensborough	C4	3	1.5	3	1.5
n351_in	Beveridge - Epping	C3	3	3	3	1.5
n351_out	Epping - Beveridge	C3	3	3	3	1.5
n352_in	Northland to Keon Park	NL2	2	2	2	1
n352_out	Keon Park to Northland	NL2	2	2	2	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
n353_in	Eltham to Rosanna	NL3	1.5	1.5	1.5	1
n353_out	Rosanna to Eltham	NL3	1.5	1.5	1.5	1
n354_in	Thomastown West Loop SB	C4	3	1.5	3	1.5
n354_out	Thomastown West Loop NB	C4	3	1.5	3	1.5
n355_in	Epping Plaza to Northland Shopping Centre	C4	3	1.5	3	1.5
n355_out	Northland Shopping Centre to Epping Plaza	C4	3	1.5	3	1.5
n356_in	Aurora to Epping	C4	3	1.5	3	1.5
n356_out	Epping to Aurora	C4	3	1.5	3	1.5
n357_in	West Aurora to Epping Station	NL2	2	2	2	1
n357_out	Epping Station to West Aurora	NL2	2	2	2	1
n358_in	Epping North to Epping	C4	3	1.5	3	1.5
n358_out	Epping to Epping North	C4	3	1.5	3	1.5
n361_in	Epping North to Thomastown	C4	3	1.5	3	1.5
n361_out	Thomastown to Epping North	C4	3	1.5	3	1.5
n365_in	Kinglake to Whittlesea	#N/A	0	0.285 714	0	0
n365_out	Whittlesea to Kinglake	#N/A	0	0.285 714	0	0
n368_in	Greensborough to Macleod	NL2	2	2	2	1
n368_out	Macleod to Greensborough	NL2	2	2	2	1
n378x_in	Warrandyte to Eltham	N4	1	1	1	0
n378x_out	Eltham to Warrandyte	N4	1	1	1	0
n379_in	Warrandyte to Eltham	NL3	1.5	1.5	1.5	1
n379_out	Eltham to Warrandyte	NL3	1.5	1.5	1.5	1
n382_ccw	Eltham Town Service Loop	NL2	2	2	2	1
n398_in	Wattle Glen to Diamond Creek	N4	1	1	1	0
n398_out	Diamond Creek to Wattle Glen	N4	1	1	1	0
n401_in	North Melbourne to Parkville	Shuttle1	20	10	20	6
n401_out	Parkville to North Melbourne	Shuttle1	20	10	20	6
n407_ccw	Moonee Valley Mover Loop	N4	1	1	1	0
n407_cw	Moonee Valley Mover Loop	N4	1	1	1	0
n464_in	Airport West to Essendon	C4	3	1.5	3	1.5
n464_out	Essendon to Airport West	C4	3	1.5	3	1.5
n465_in	Keilor Park to Essendon	C3	3	3	3	1.5
n465_out	Essendon to Keilor Park	C3	3	3	3	1.5
n466_in	Niddrie to Essendon	C4	3	1.5	3	1.5
n466_out	Essendon to Niddrie	C4	3	1.5	3	1.5
n467_in	Aberfeldie to Moonee Ponds	C4	3	1.5	3	1.5
n467_out	Moonee Ponds to Aberfeldie	C4	3	1.5	3	1.5
n480_in	Roxburgh Park to Essendon	C4	3	1.5	3	1.5
n480_out	Essendon to Roxburgh Park	C4	3	1.5	3	1.5
n482_in	Melbourne Airport to Airport West via Industrial Route	N4	1	1	1	0
n482_out	Airport West to Melbourne Airport via Industrial Route	N4	1	1	1	0
n484_in	Roxburgh Park to Broadmeadows	NL3	1.5	1.5	1.5	1
n484_out	Broadmeadows to Roxburgh Park	NL3	1.5	1.5	1.5	1
n490x_in	Airport West to Gowanbrea	N4	1	1	1	0
n490x_out	Gowanbrea to Airport West	N4	1	1	1	0
n500_in	Melbourne Airport to Airport West	P1B	6	6	6	6
n500_out	Airport West to Melbourne Airport	P1B	6	6	6	6
n503_in	Essendon to East Brunswick	N1	3	1.5	3	0
n503_out	East Brunswick to Essendon	N1	3	1.5	3	0
n505x_in	Moonee Ponds to Melbourne University	NL2	2	2	2	1
n505x_out	Melbourne University to Moonee Ponds	NL2	2	2	2	1
n506_in	Moonee Ponds to Clifton Hil	P2A	6	3	6	3
n506_out	Clifton Hil to Moonee Ponds	P2A	6	3	6	3
n507_in	Airport West to Moonee Ponds	NL3	1.5	1.5	1.5	1
n507_out	Moonee Ponds to Airport West	NL3	1.5	1.5	1.5	1
n508_in	Heidelberg to Moonee Ponds	P2B	3	3	3	3
n508_out	Moonee Ponds to Heidelberg	P2B	3	3	3	3
n509_in	La Trobe Uni to Airport West	P2A	6	3	6	3



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
n509_out	Airport West to La Trobe Uni	P2A	6	3	6	3
n510_in	Ivanhoe to Essendon	C4	3	1.5	3	1.5
n510_out	Essendon to Ivanhoe	C4	3	1.5	3	1.5
n511_in	North Lockerbie to Craigieburn	NL3	1.5	1.5	1.5	1
n511_out	Craigieburn to North Lockerbie	NL3	1.5	1.5	1.5	1
n512_in	East Coburg to Essendon DFO	N1	3	1.5	3	0
n512_out	Essendon DFO to East Coburg	N1	3	1.5	3	0
n513_in	Eltham to Glenroy	P2A	6	3	6	3
n513_out	Glenroy to Eltham	P2A	6	3	6	3
n525_in	Mt Ridley to Craigieburn Central	NL3	1.5	1.5	1.5	1
n525_out	Craigieburn Central to Mt Ridley	NL3	1.5	1.5	1.5	1
n526_in	Mt Ridley Road to Craigieburn	C4	3	1.5	3	1.5
n526_out	Craigieburn to Mt Ridley Road	C4	3	1.5	3	1.5
n527_in	Glenroy to Northland	C4	3	1.5	3	1.5
n527_out	Northland to Glenroy	C4	3	1.5	3	1.5
n528_in	Craigieburn South to Craigieburn Station	C4	3	1.5	3	1.5
n528_out	Craigieburn Station to Craigieburn South	C4	3	1.5	3	1.5
n529_in	Epping - Lockerbie	C4	3	1.5	3	1.5
n529_out	Lockerbie - Epping	C4	3	1.5	3	1.5
n530_in	Cambellfield to Coburg	NL3	1.5	1.5	1.5	1
n530_out	Coburg to Cambellfield	NL3	1.5	1.5	1.5	1
n531_in	Upfield to North Coburg	NL4	1.5	1	1.5	1
n531_out	North Coburg to Upfield	NL4	1.5	1	1.5	1
n532_in	Broadmeadows to Coburg	NL4	1.5	1	1.5	1
n532_out	Coburg to Broadmeadows	NL4	1.5	1	1.5	1
n533_in	Craigieburn North to Craigieburn	C3	3	3	3	1.5
n533_out	Craigieburn to Craigieburn North	C3	3	3	3	1.5
n536_in	Gowrie to Pascoe Vale	C4	3	1.5	3	1.5
n536_out	Pascoe Vale to Gowrie	C4	3	1.5	3	1.5
n537_in	Craigieburn to Roxburgh Park	C4	3	1.5	3	1.5
n537_out	Roxburgh Park to Craigieburn	C4	3	1.5	3	1.5
n538_in	Greenvale North to Roxburgh Park	C4	3	1.5	3	1.5
n538_out	Roxburgh Park to Greenvale North	C4	3	1.5	3	1.5
n540_in	Upfield to Broadmeadows	NL3	1.5	1.5	1.5	1
n540_out	Broadmeadows to Upfield	NL3	1.5	1.5	1.5	1
n541_in	Roxburgh Park to Broadmeadows	C4	3	1.5	3	1.5
n541_out	Broadmeadows to Roxburgh Park	C4	3	1.5	3	1.5
n542_in	Broadmeadows to Coburg	C4	3	1.5	3	1.5
n542_out	Coburg to Broadmeadows	C4	3	1.5	3	1.5
n544_in	Craigieburn to Roxburgh Park	C3	3	3	3	1.5
n544_out	Roxburgh Park to Craigieburn	C3	3	3	3	1.5
n902_in	Melbourne Airport to Greensborough	P1B	6	6	6	6
n902_out	Greensborough to Melbourne Airport	P1B	6	6	6	6
n911_in	Craigieburn Town Centre to Roxburgh Park	P2B	3	3	3	3
n911_out	Roxburgh Park to Craigieburn Town Centre	P2B	3	3	3	3
n913_in	Heidelberg to Essendon	P2A	6	3	6	3
n913_out	Essendon to Heidelberg	P2A	6	3	6	3
w101_in	Caroline Springs to Watergardens	C4	3	1.5	3	1.5
w101_out	Watergardens to Caroline Springs	C4	3	1.5	3	1.5
w102_in	Laverton to Deer Park	N3	1.5	1	1.5	0
w102_out	Deer Park to Laverton	N3	1.5	1	1.5	0
w105_in	Tarneit to Williams Landing	N1	3	1.5	3	0
w105_out	Williams Landing to Tarneit	N1	3	1.5	3	0
w106_in	Werribee to Tarneit	P2A	6	3	6	3
w106_out	Tarneit to Werribee	P2A	6	3	6	3
w107_in	Hoppers Crossing to Tarneit	NL3	1.5	1.5	1.5	1
w107_out	Tarneit to Hoppers Crossing	NL3	1.5	1.5	1.5	1
w108_in	Manor Lakes to Werribee	P2A	6	3	6	3
w108_out	Werribee to Manor Lakes	P2A	6	3	6	3
w110_in	Werribee to Tarneit	P2B	3	3	3	3



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
w110_out	Tarneit to Werribee	P2B	3	3	3	3
w113_in	Exford Rd to Melton	NL3	1.5	1.5	1.5	1
w113_out	Melton to Exford Rd	NL3	1.5	1.5	1.5	1
w116_in	Melton to Rockbank	NL4	1.5	1	1.5	1
w116_out	Rockbank to Melton	NL4	1.5	1	1.5	1
w117_in	Melton to Melton South	C4	3	1.5	3	1.5
w117_out	Melton South to Melton	C4	3	1.5	3	1.5
w119_in	Woodgrove SC to Melton	NL3	1.5	1.5	1.5	1
w119_out	Melton to Woodgrove SC	NL3	1.5	1.5	1.5	1
w121_in	Caroline Springs to Ravenhall	NL4	1.5	1	1.5	1
w121_out	Ravenhall to Caroline Springs	NL4	1.5	1	1.5	1
w131_in	Laverton to Sunshine	N3	1.5	1	1.5	0
w131_out	Sunshine to Laverton	N3	1.5	1	1.5	0
w216_in	Caroline Springs to Sunshine	P2B	3	3	3	3
w216_out	Sunshine to Caroline Springs	P2B	3	3	3	3
w219_in	Sunshine to Footscray	P1B	6	6	6	6
w219_out	Footscray to Sunshine	P1B	6	6	6	6
w220_in	Sunshine to City	P1A	12	6	12	6
w220_out	City to Sunshine	P1A	12	6	12	6
w232_in	Altona Gate to City	P2B	3	3	3	3
w232_out	City to Altona Gate	P2B	3	3	3	3
w236_in	Garden City to City via Pickles	C4	3	1.5	3	1.5
w236_out	City to Garden City via Pickles	C4	3	1.5	3	1.5
w400_in	Williams Landing to Deer Park	N3	1.5	1	1.5	0
w400_out	Deer Park to Williams Landing	N3	1.5	1	1.5	0
w400a_in	Derrimut West to Deer Park	NL4	1.5	1	1.5	1
w400a_out	Deer Park to Derrimut West	NL4	1.5	1	1.5	1
w402_in	Footscray to East Melbourne	P1B	6	6	6	6
w402_out	East Melbourne to Footscray	P1B	6	6	6	6
w404n_in	Footscray to Moonee Ponds	P1B	6	6	6	6
w404n_out	Moonee Ponds to Footscray	P1B	6	6	6	6
w404s_in	Williamstown to Footscray	P1B	6	6	6	6
w404s_out	Footscray to Williamstown	P1B	6	6	6	6
w406_in	St Albans to Footscray via Highpoint SC	P2B	3	3	3	3
w406_out	Footscray to St Albans via Highpoint SC	P2B	3	3	3	3
w406a_in	Highpoint SC to Footscray	P2A	6	3	6	3
w406a_out	Footscray to Highpoint SC	P2A	6	3	6	3
w408_in	St Albans to Sunshine	P2B	3	3	3	3
w408_out	Sunshine to St Albans	P2B	3	3	3	3
w409_in	Highpoint SC to Footscray	N1	3	1.5	3	0
w409_out	Footscray to Highpoint SC	N1	3	1.5	3	0
w410_in	Sunshine to City via Footscray	P2A	6	3	6	3
w410_out	City to Sunshine via Footscray	P2A	6	3	6	3
w411_in	Laverton to Footscray	P2A	6	3	6	3
w411_out	Footscray to Laverton	P2A	6	3	6	3
w414_in	Laverton to Footscray	C3	3	3	3	1.5
w414_out	Footscray to Laverton	C3	3	3	3	1.5
w415_in	Laverton to Williamstown	NL4	1.5	1	1.5	1
w415_out	Williamstown to Laverton	NL4	1.5	1	1.5	1
w418_in	Caroline Springs to St Albans	C3	3	3	3	1.5
w418_out	St Albans to Caroline Springs	C3	3	3	3	1.5
w419_in	Watergardens to Sunshine	C3	3	3	3	1.5
w419_out	Sunshine to Watergardens	C3	3	3	3	1.5
w420_in	Watergardens to Sunshine	P2A	6	3	6	3
w420_out	Sunshine to Watergardens	P2A	6	3	6	3
w421_in	Watergardens to St Albans	C4	3	1.5	3	1.5
w421_out	St Albans to Watergardens	C4	3	1.5	3	1.5
w423_in	Brimbank Plaza to St Albans	C4	3	1.5	3	1.5
w423_out	St Albans to Brimbank Plaza	C4	3	1.5	3	1.5
w424_in	Brimbank Plaza to St Albans	C4	3	1.5	3	1.5



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
w424_out	St Albans to Brimbank Plaza	C4	3	1.5	3	1.5
w425_in	Watergardens to St Albans	C3	3	3	3	1.5
w425_out	St Albans to Watergardens	C3	3	3	3	1.5
w427_in	Sunshine West to Sunshine	P2B	3	3	3	3
w427_out	Sunshine to Sunshine West	P2B	3	3	3	3
w428_in	Sunshine West to Sunshine	P2B	3	3	3	3
w428_out	Sunshine to Sunshine West	P2B	3	3	3	3
w431_in	Highpoint SC to Yarraville	P2B	3	3	3	3
w431_out	Yarraville to Highpoint SC	P2B	3	3	3	3
w432_in	Altona Gate to Yarraville	N3	1.5	1	1.5	0
w432_out	Yarraville to Altona Gate	N3	1.5	1	1.5	0
w437_in	Werribee to Hoppers Crossing	N1	3	1.5	3	0
w437_out	Hoppers Crossing to Werribee	N1	3	1.5	3	0
w439_in	Werribee South to Werribee	N4	1	1	1	0
w439_out	Werribee to Werribee South	N4	1	1	1	0
w440_in	Wyndham Vale to Hoppers Crossing	C3	3	3	3	1.5
w440_out	Hoppers Crossing to Wyndham Vale	C3	3	3	3	1.5
w441_cw	West Werribee One Way Loop	N4	1	1	1	0
w442_in	Werribee to Hoppers Crossing	N1	3	1.5	3	0
w442_out	Hoppers Crossing to Werribee	N1	3	1.5	3	0
w443_ccw	Werribee/Werribee Sth Loop	NL3	1.5	1.5	1.5	1
w443_cw	Werribee/Werribee Sth Loop	NL3	1.5	1.5	1.5	1
w444_in	Hoppers Crossing to Tarneit	P2B	3	3	3	3
w444_out	Tarneit to Hoppers Crossing	P2B	3	3	3	3
w445_in	Wyndam Vale to Werribee via Westleigh Dr	NL3	1.5	1.5	1.5	1
w445_out	Werribee to Wyndam Vale via Westleigh Dr	NL3	1.5	1.5	1.5	1
w446_in	Wyndham Vale to Williams Landing	C3	3	3	3	1.5
w446_out	Williams Landing to Wyndham Vale	C3	3	3	3	1.5
w447_in	Wyndham Vale to Werribee	NL3	1.5	1.5	1.5	1
w447_out	Werribee to Wyndham Vale	NL3	1.5	1.5	1.5	1
w448_in	Wyndam Vale to Werribee	NL3	1.5	1.5	1.5	1
w448_out	Werribee to Wyndam Vale	NL3	1.5	1.5	1.5	1
w449_in	Manor Lakes to Werribee	C3	3	3	3	1.5
w449_out	Werribee to Manor Lakes	C3	3	3	3	1.5
w453_in	West Melton to Melton	NL3	1.5	1.5	1.5	1
w453_out	Melton to West Melton	NL3	1.5	1.5	1.5	1
w455_in	Melton North to Melton	C3	3	3	3	1.5
w455_out	Melton to Melton North	C3	3	3	3	1.5
w456_in	Melton Station to Caroline Springs	NL5	1	1	1	1
w456_out	Caroline Springs to Melton Station	NL5	1	1	1	1
w457_in	Westlakes Dr to Melton	N3	1.5	1	1.5	0
w457_out	Melton to Westlakes Dr	N3	1.5	1	1.5	0
w458_in	Centenary Dr to Melton	NL3	1.5	1.5	1.5	1
w458_out	Melton to Centenary Dr	NL3	1.5	1.5	1.5	1
w459_in	Kurunjang to Melton	C3	3	3	3	1.5
w459_out	Melton to Kurunjang	C3	3	3	3	1.5
w460_in	Ravenhall to Watergardens	P2A	6	3	6	3
w460_out	Watergardens to Ravenhall	P2A	6	3	6	3
w461_in	Watergardens to Caroline Springs	C3	3	3	3	1.5
w461_out	Caroline Springs to Watergardens	C3	3	3	3	1.5
w462_in	Watergardens to Deer Park via Caroline Springs	P2B	3	3	3	3
w462_out	Deer Park to Watergardens via Caroline Springs	P2B	3	3	3	3
w471_in	Williamstown to Sunshine	P2A	6	3	6	3
w471_out	Sunshine to Williamstown	P2A	6	3	6	3
w472_in	Moonee Ponds to Footscray	C3	3	3	3	1.5
w472_out	Footscray to Moonee Ponds	C3	3	3	3	1.5
w476_in	Watergardens to Moonee Pds	C3	3	3	3	1.5
w476_out	Moonee Pds to Watergardens	C3	3	3	3	1.5
w479_in	Sunbury to Melbourne Airport	C3	3	3	3	1.5
w479_out	Melbourne Airport to Sunbury	C3	3	3	3	1.5



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
w479a_in	Sunbury west to Sunbury	C3	3	3	3	1.5
w479a_out	Sunbury to Sunbury west	C3	3	3	3	1.5
w481_in	Mt Lion to Sunbury	C4	3	1.5	3	1.5
w481_out	Sunbury to Mt Lion	C4	3	1.5	3	1.5
w483_in	Diggers Rest to Sunbury	NL4	1.5	1	1.5	1
w483_out	Sunbury to Diggers Rest	NL4	1.5	1	1.5	1
w485_in	Sunbury west to Sunbury	NL4	1.5	1	1.5	1
w485_out	Sunbury to Sunbury west	NL4	1.5	1	1.5	1
w486_in	Rolling Meadows to Sunbury	NL4	1.5	1	1.5	1
w486_out	Sunbury to Rolling Meadows	NL4	1.5	1	1.5	1
w487_in	Cantebury Hills to Sunbury	C3	3	3	3	1.5
w487_out	Sunbury to Cantebury Hills	C3	3	3	3	1.5
w488_in	Jacksons Hill to Sunbury	NL4	1.5	1	1.5	1
w488_out	Sunbury to Jacksons Hill	NL4	1.5	1	1.5	1
w489_in	Elizabeth Dr to Sunbury	NL4	1.5	1	1.5	1
w489_out	Sunbury to Elizabeth Dr	NL4	1.5	1	1.5	1
w493_in	Werribee to Williams Landing	C4	3	1.5	3	1.5
w493_out	Williams Landing to Werribee	C4	3	1.5	3	1.5
w494_in	Point Cook South to Williams Landing	C3	3	3	3	1.5
w494_out	Williams Landing to Point Cook South	C3	3	3	3	1.5
w495_in	Point Cook South to Williams Landing	C3	3	3	3	1.5
w495_out	Williams Landing to Point Cook South	C3	3	3	3	1.5
w496_in	Sanctuary Lakes to Laverton	NL3	1.5	1.5	1.5	1
w496_out	Laverton to Sanctuary Lakes	NL3	1.5	1.5	1.5	1
w497_in	Saltwater Coast to Williams Landing	C3	3	3	3	1.5
w497_out	Williams Landing to Saltwater Coast	C3	3	3	3	1.5
w498_in	Hoppers Crossing to Aircraft via East Werribee	C3	3	3	3	1.5
w498_out	Aircraft to Hoppers Crossing via East Werribee	C3	3	3	3	1.5
w903_in	Sunshine to Essendon via Highpoint	P1B	6	6	6	6
w903_out	Essendon to Sunshine via Highpoint	P1B	6	6	6	6
wairport_in	Melb Airport to Keilor Plains	C3	3	3	3	1.5
wairport_out	Keilor Plains to Melb Airport	C3	3	3	3	1.5
waltona_in	Altona to Sunshine	N3	1.5	1	1.5	0
waltona_out	Sunshine to Altona	N3	1.5	1	1.5	0
wdohertys_in	Tarneit to Sunshine	Ind4	1.5	0	1.5	0
wdohertys_out	Sunshine to Tarneit	Ind4	1.5	0	1.5	0
wforythrd_in	Tarneit to Williams Landing	C4	3	1.5	3	1.5
wforythrd_out	Williams Landing to Tarneit	C4	3	1.5	3	1.5
wmeltax1_in	Melton South West to Melton	N4	1	1	1	0
wmeltax1_out	Melton to Melton South West	N4	1	1	1	0
wmeltax2_in	Brookfield to Melton	N4	1	1	1	0
wmeltax2_out	Melton to Brookfield	N4	1	1	1	0



Table F.6 - Bus Service Levels & Categories - 2036 Base Case

Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
c001_in	Southland to Northland	P2B	3	3	3	3
c001_out	Northland to Southland	P2B	3	3	3	3
c246_in	Elsternwick to Clifton Hill	P1A	12	6	12	6
c246_out	Clifton Hill to Elsternwick	P1A	12	6	12	6
c606_in	Elsternwick to Fishermans Bend	C3	3	3	3	1.5
c606_out	Fishermans Bend to Elsternwick	C3	3	3	3	1.5
e000_in	Waverley Gardens to Dandenong	NL3	1.5	1.5	1.5	1
e000_out	Dandenong to Waverley Gardens	NL3	1.5	1.5	1.5	1
e01_in	Cranbourne to Springvale	P2B	3	3	3	3
e01_out	Springvale to Cranbourne	P2B	3	3	3	3
e011_in	Cardinia Road to Officer Sth	NL3	1.5	1.5	1.5	1
e011_out	Officer Sth to Cardinia Road	NL3	1.5	1.5	1.5	1
e012_in	Clyde to Beaconsfield Station	C3	3	3	3	1.5
e012_out	Beaconsfield Station to Clyde	C3	3	3	3	1.5
e013_in	Lilydale to Mooroolbark	C4	3	1.5	3	1.5
e013_out	Mooroolbark to Lilydale	C4	3	1.5	3	1.5
e015_in	Cranbourne East to Merinda Park	P2B	3	3	3	3
e015_out	Merinda Park to Cranbourne East	P2B	3	3	3	3
e016_in	Clyde to Cranbourne	NL3	1.5	1.5	1.5	1
e016_out	Cranbourne to Clyde	NL3	1.5	1.5	1.5	1
e017_in	Highett to Carnegie	C3	3	3	3	1.5
e017_out	Carnegie to Highett	C3	3	3	3	1.5
e018_in	Clyde to Officer	C4	3	1.5	3	1.5
e018_out	Officer to Clyde	C4	3	1.5	3	1.5
e019_in	Berwick to Narre Warren North	N3	1.5	1	1.5	0
e019_out	Narre Warren North to Berwick	N3	1.5	1	1.5	0
e02_in	Beaconsfield to Carrum	P2A	6	3	6	3
e02_out	Carrum to Beaconsfield	P2A	6	3	6	3
e020_in	Cheltenham to Chadstone SC	C3	3	3	3	1.5
e020_out	Chadstone SC to Cheltenham	C3	3	3	3	1.5
e022_in	Clyde to Berwick	P2B	3	3	3	3
e022_out	Berwick to Clyde	P2B	3	3	3	3
e023_in	Westall to Clayton	N3	1.5	1	1.5	0
e023_out	Clayton to Westall	N3	1.5	1	1.5	0
e024_in	Officer to Beaconsfield	NL3	1.5	1.5	1.5	1
e024_out	Beaconsfield to Officer	NL3	1.5	1.5	1.5	1
e025_in	Ringwood to Box Hill	C3	3	3	3	1.5
e025_out	Box Hill to Ringwood	C3	3	3	3	1.5
e026_in	Clyde to Berwick	NL3	1.5	1.5	1.5	1
e026_out	Berwick to Clyde	NL3	1.5	1.5	1.5	1
e03_in	Officer to Cranbourne	P2B	3	3	3	3
e03_out	Cranbourne to Officer	P2B	3	3	3	3
e04_b_in	Frankston to Cranbourne via Botanic Ridge	P2B	3	3	3	3
e04_b_out	Cranbourne to Frankston via Botanic Ridge	P2B	3	3	3	3
e04_in	Cranbourne to Narre Warren	P2B	3	3	3	3
e04_out	Narre Warren to Cranbourne	P2B	3	3	3	3
e05_in	Pakenham to Berwick	P2B	3	3	3	3
e05_out	Berwick to Pakenham	P2B	3	3	3	3
e06_in	Westall to Southland	C3	3	3	3	1.5
e06_out	Southland to Westall	C3	3	3	3	1.5
e07_in	Lynbrook to Noble Park via South Dandenong industrial	C3	3	3	3	1.5
e07_out	Noble Park to Lynbrook via South Dandenong industrial	C3	3	3	3	1.5
e08_in	Benton Grange to Mornington Town	NL3	1.5	1.5	1.5	1
e08_out	Mornington Town to Benton Grange	NL3	1.5	1.5	1.5	1
e09_in	Beaconsfield to Narre Warren	NL3	1.5	1.5	1.5	1
e09_out	Narre Warren to Beaconsfield	NL3	1.5	1.5	1.5	1
e10_in	Mornington Town to Tanti Park	NL3	1.5	1.5	1.5	1
e10_out	Tanti Park to Mornington Town	NL3	1.5	1.5	1.5	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e105_in	Mordialloc to Dandenong	C3	3	3	3	1.5
e105_out	Dandenong to Mordialloc	C3	3	3	3	1.5
e107_in	Brighton to Huntingdale	P2C	12	3	12	3
e107_out	Huntingdale to Brighton	P2C	12	3	12	3
e109_in	Glen Waverley to Oakleigh	P2B	3	3	3	3
e109_out	Oakleigh to Glen Waverley	P2B	3	3	3	3
e111_in	Heathmont to Camberwell	P2B	3	3	3	3
e111_out	Camberwell to Heathmont	P2B	3	3	3	3
e118_in	Beaconsfield to Lynbrook	P2B	3	3	3	3
e118_out	Lynbrook to Beaconsfield	P2B	3	3	3	3
e119_in	Pakenham to Officer	C3	3	3	3	1.5
e119_out	Officer to Pakenham	C3	3	3	3	1.5
e121_in	Officer to Cranbourne	P2A	6	3	6	3
e121_out	Cranbourne to Officer	P2A	6	3	6	3
e200_b_in	Doncaster SC to Southern Cross	P2A	6	3	6	3
e200_b_out	Southern Cross to Doncaster SC	P2A	6	3	6	3
e200_in	Auburn Station to Southern Cross	P2C	12	3	12	3
e200_out	Southern Cross to Auburn Station	P2C	12	3	12	3
e203_in	Holmesglen to Darling Road	N1	3	1.5	3	0
e203_out	Darling Road to Holmesglen	N1	3	1.5	3	0
e216_in	Middle Brighton to Caulfield to	N4	1	1	1	0
e216_out	Caulfield to Middle Brighton	N4	1	1	1	0
e219_in	Elsternwick to City via Williams Road	P2B	3	3	3	3
e219_out	City to Elsternwick via Williams Road	P2B	3	3	3	3
e270_in	Mitcham to Box Hill	C3	3	3	3	1.5
e270_out	Box Hill to Mitcham	C3	3	3	3	1.5
e271_in	Park Orchards to Blackburn	N4	1	1	1	0
e271_out	Blackburn to Park Orchards	N4	1	1	1	0
e275_in	Blackburn to Box Hill via Blackburn North	N3	1.5	1	1.5	0
e275_out	Box Hill to Blackburn via Blackburn North	N3	1.5	1	1.5	0
e279_in	The Pines to Box Hill	P2B	3	3	3	3
e279_out	Box Hill to The Pines	P2B	3	3	3	3
e280_in	The Pines to Doncaster SC via Tunstall Square	N4	1	1	1	0
e280_out	Doncaster SC to The Pines via Tunstall Square	N4	1	1	1	0
e282_in	The Pines SC to Doncaster PR	C4	3	1.5	3	1.5
e282_out	Doncaster PR to The Pines SC	C4	3	1.5	3	1.5
e284_in	Box Hill to La Trobe Uni	C3	3	3	3	1.5
e284_out	La Trobe Uni to Box Hill	C3	3	3	3	1.5
e285_in	Doncaster Park and Ride to Camberwell	C3	3	3	3	1.5
e285_out	Camberwell to Doncaster Park and Ride	C3	3	3	3	1.5
e286_in	Templestowe Village to Jackson Court	N4	1	1	1	0
e286_out	Jackson Court to Templestowe Village	N4	1	1	1	0
e287_in	Mont Albert to Camberwell	N4	1	1	1	0
e287_out	Camberwell to Mont Albert	N4	1	1	1	0
e293_in	Eltham to Deakin Uni	C3	3	3	3	1.5
e293_out	Deakin Uni to Eltham	C3	3	3	3	1.5
e302_in	Box Hill to Southern Cross	C3	3	3	3	1.5
e302_out	Southern Cross to Box Hill	C3	3	3	3	1.5
e304_in	Doncaster SC to City via Kew	C3	3	3	3	1.5
e304_out	City to Doncaster SC via Kew	C3	3	3	3	1.5
e305_in	The Pines to Doncaster SC via Doncaster East SC	C3	3	3	3	1.5
e305_out	Doncaster SC to The Pines via Doncaster East SC	C3	3	3	3	1.5
e309_in	The Pines SC to Nunawading	C4	3	1.5	3	1.5
e309_out	Nunawading to The Pines SC	C4	3	1.5	3	1.5
e364_in	Warrandyte Bridge to Ringwood	C4	3	1.5	3	1.5
e364_out	Ringwood to Warrandyte Bridge	C4	3	1.5	3	1.5
e367_in	Ringwood East to Heathmont	C4	3	1.5	3	1.5
e367_out	Heathmont to Ringwood East	C4	3	1.5	3	1.5
e370_in	Ringwood to Mitcham	NL2	2	2	2	1
e370_out	Mitcham to Ringwood	NL2	2	2	2	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e371_in	Ringwood to Park Orchards	C3	3	3	3	1.5
e371_out	Park Orchards to Ringwood	C3	3	3	3	1.5
e380_in	Lilydale to Ringwood	P2B	3	3	3	3
e380_out	Ringwood to Lilydale	P2B	3	3	3	3
e381_in	Croydon to Ringwood East	C4	3	1.5	3	1.5
e381_out	Ringwood East to Croydon	C4	3	1.5	3	1.5
e548_in	Southland to La Trobe Uni	P2A	6	3	6	3
e548_out	La Trobe Uni to Southland	P2A	6	3	6	3
e600_in	Cheltnham to Sandringham	N1	3	1.5	3	0
e600_out	Sandringham to Cheltnham	N1	3	1.5	3	0
e605_in	Gardenvale to City	C4	3	1.5	3	1.5
e605_out	City to Gardenvale	C4	3	1.5	3	1.5
e612_in	Box Hill to Chadstone SC	NL3	1.5	1.5	1.5	1
e612_out	Chadstone SC to Box Hill	NL3	1.5	1.5	1.5	1
e613_in	Burwood to Canterbury	C4	3	1.5	3	1.5
e613_out	Canterbury to Burwood	C4	3	1.5	3	1.5
e622_in	Holmesglen to Oakleigh	N4	1	1	1	0
e622_out	Oakleigh to Holmesglen	N4	1	1	1	0
e623_in	Gardenvale to Caulfield	N1	3	1.5	3	0
e623_out	Caulfield to Gardenvale	N1	3	1.5	3	0
e625_in	Carnegie to Burke Road/Tram 5	N3	1.5	1	1.5	0
e625_out	Burke Road/Tram 5 to Carnegie	N3	1.5	1	1.5	0
e640_in	Glen Waverley to Glen Iris	P2B	3	3	3	3
e640_out	Glen Iris to Glen Waverley	P2B	3	3	3	3
e664_in	Croydon to Knox SC	P2B	3	3	3	3
e664_out	Knox SC to Croydon	P2B	3	3	3	3
e670_in	Lilydale to Ringwood	P2B	3	3	3	3
e670_out	Ringwood to Lilydale	P2B	3	3	3	3
e671_in	Chirnside Park SC to Croydon	NL3	1.5	1.5	1.5	1
e671_out	Croydon to Chirnside Park SC	NL3	1.5	1.5	1.5	1
e672_in	Chirnside Park SC to Croydon	N4	1	1	1	0
e672_out	Croydon to Chirnside Park SC	N4	1	1	1	0
e677_in	Lilydale to Chirnside Park SC	NL3	1.5	1.5	1.5	1
e677_out	Chirnside Park SC to Lilydale	NL3	1.5	1.5	1.5	1
e679_in	Lilydale to Ringwood	C3	3	3	3	1.5
e679_out	Ringwood to Lilydale	C3	3	3	3	1.5
e680_in	Lilydale to Mooroolbark	NL3	1.5	1.5	1.5	1
e680_out	Mooroolbark to Lilydale	NL3	1.5	1.5	1.5	1
e681_in	Rowville Medical/Kellets Rd to Stud Park SC	NL3	1.5	1.5	1.5	1
e681_out	Stud Park SC to Rowville Medical/Kellets Rd	NL3	1.5	1.5	1.5	1
e682_in	Stud Park SC to Ferntree Gully Station	C4	3	1.5	3	1.5
e682_out	Ferntree Gully Station to Stud Park SC	C4	3	1.5	3	1.5
e683_in	Warburton to Lilydale	C4	3	1.5	3	1.5
e683_out	Lilydale to Warburton	C4	3	1.5	3	1.5
e683_short_in	Wandon to Lilydale	N4	1	1	1	0
e683_short_out	Lilydale to Wandon	N4	1	1	1	0
e684_in	Stud Park SC to Knox SC	NL3	1.5	1.5	1.5	1
e684_out	Knox SC to Stud Park SC	NL3	1.5	1.5	1.5	1
e685_in	Healesville to Lilydale	N4	1	1	1	0
e685_out	Lilydale to Healesville	N4	1	1	1	0
e687_in	Kilsyth to Croydon via Mooroolbark	N1	3	1.5	3	0
e687_out	Croydon to Kilsyth via Mooroolbark	N1	3	1.5	3	0
e688_in	Mooroolbark to Upper Ferntree Gully	N4	1	1	1	0
e688_out	Upper Ferntree Gully to Mooroolbark	N4	1	1	1	0
e689_in	Lilydale to Mooroolbark via Montrose	NL3	1.5	1.5	1.5	1
e689_out	Mooroolbark to Lilydale via Montrose	NL3	1.5	1.5	1.5	1
e690_in	Boronia to Croydon	C4	3	1.5	3	1.5
e690_out	Croydon to Boronia	C4	3	1.5	3	1.5
e691_in	Ferntree Gully to Boronia	C4	3	1.5	3	1.5



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e691_out	Boronia to Ferntree Gully	C4	3	1.5	3	1.5
e692_in	Chirnside SC to Croydon via Mooroolbark	NL3	1.5	1.5	1.5	1
e692_out	Croydon to Chirnside SC via Mooroolbark	NL3	1.5	1.5	1.5	1
e693_in	Ferntree Gully to Caulfield	P2B	3	3	3	3
e693_out	Caulfield to Ferntree Gully	P2B	3	3	3	3
e694_in	Chirnside SC to Croydon	N3	1.5	1	1.5	0
e694_out	Croydon to Chirnside SC	N3	1.5	1	1.5	0
e695_in	Gembrook to Belgrave	Peri	0.75	0.75	0.75	0.75
e695_out	Belgrave to Gembrook	Peri	0.75	0.75	0.75	0.75
e697_in	Belgrave to Narre Warren Station	N4	1	1	1	0
e697_out	Narre Warren Station to Belgrave	N4	1	1	1	0
e698_ccw	Upwey Loop	C4	3	1.5	3	1.5
e699_in	Belgrave to Upwey	C4	3	1.5	3	1.5
e699_out	Upwey to Belgrave	C4	3	1.5	3	1.5
e700_in	Monash Uni to Glen Waverley via Mt Waverley	NL3	1.5	1.5	1.5	1
e700_out	Glen Waverley to Monash Uni via Mt Waverley	NL3	1.5	1.5	1.5	1
e701_in	Middle Brighton to Oakleigh	C3	3	3	3	1.5
e701_out	Oakleigh to Middle Brighton	C3	3	3	3	1.5
e702_in	Hampton to Westall	C3	3	3	3	1.5
e702_out	Westall to Hampton	C3	3	3	3	1.5
e703_b_in	Brighton to Clayton	P2B	3	3	3	3
e703_b_out	Clayton to Brighton	P2B	3	3	3	3
e703_c_in	Doncaster E to Blackburn	C4	3	1.5	3	1.5
e703_c_out	Blackburn to Doncaster E	C4	3	1.5	3	1.5
e703_in	Clayton to Blackburn	P1A	12	6	12	6
e703_out	Blackburn to Clayton	P1A	12	6	12	6
e704_in	Ormond to Oakleigh	N1	3	1.5	3	0
e704_out	Oakleigh to Ormond	N1	3	1.5	3	0
e706_in	Aspendale to Mentone	C4	3	1.5	3	1.5
e706_out	Mentone to Aspendale	C4	3	1.5	3	1.5
e707_in	Mordialloc to Mentone	NL3	1.5	1.5	1.5	1
e707_out	Mentone to Mordialloc	NL3	1.5	1.5	1.5	1
e709_in	Brighton Beach to Clayton	C4	3	1.5	3	1.5
e709_out	Clayton to Brighton Beach	C4	3	1.5	3	1.5
e728_in	Glen Waverley to Box Hill	NL5	1	1	1	1
e728_out	Box Hill to Glen Waverley	NL5	1	1	1	1
e729_in	Huntingdale to Mt Waverley	N3	1.5	1	1.5	0
e729_out	Mt Waverley to Huntingdale	N3	1.5	1	1.5	0
e730_in	Nunawading to Ashburton via Deakin Uni	C4	3	1.5	3	1.5
e730_out	Ashburton to Nunawading via Deakin Uni	C4	3	1.5	3	1.5
e731_in	Forest Hill SC to Deakin Uni	N3	1.5	1	1.5	0
e731_out	Deakin Uni to Forest Hill SC	N3	1.5	1	1.5	0
e732_in	Ferntree Gully to Vermont SC	P2A	6	3	6	3
e732_out	Vermont SC to Ferntree Gully	P2A	6	3	6	3
e733_in	Mordialloc to Box Hill	P2A	6	3	6	3
e733_out	Box Hill to Mordialloc	P2A	6	3	6	3
e734_in	Boronia to Caulfield	P2B	3	3	3	3
e734_out	Caulfield to Boronia	P2B	3	3	3	3
e735_in	Vermont South SC to Blackburn	N4	1	1	1	0
e735_out	Blackburn to Vermont South SC	N4	1	1	1	0
e736_in	Vermont SC to Mitcham	N3	1.5	1	1.5	0
e736_out	Mitcham to Vermont SC	N3	1.5	1	1.5	0
e739_in	Holmesglen to Mt Waverley	C4	3	1.5	3	1.5
e739_out	Mt Waverley to Holmesglen	C4	3	1.5	3	1.5
e740_in	Heatherdale to Vermont SC	N3	1.5	1	1.5	0
e740_out	Vermont SC to Heatherdale	N3	1.5	1	1.5	0
e741_in	Glen Waverley to Syndal	N1	3	1.5	3	0
e741_out	Syndal to Glen Waverley	N1	3	1.5	3	0
e742_in	Boronia to Bayswater	N1	3	1.5	3	0
e742_out	Bayswater to Boronia	N1	3	1.5	3	0



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e745_in	Knox SC to Bayswater	C4	3	1.5	3	1.5
e745_out	Bayswater to Knox SC	C4	3	1.5	3	1.5
e746_in	Boronia to Knox SC	NL3	1.5	1.5	1.5	1
e746_out	Knox SC to Boronia	NL3	1.5	1.5	1.5	1
e747_in	Ferntree Gully to Knox SC	N3	1.5	1	1.5	0
e747_out	Knox SC to Ferntree Gully	N3	1.5	1	1.5	0
e754_in	Monash Uni to Glen Waverley via Mt Waverley	C4	3	1.5	3	1.5
e754_out	Glen Waverley to Monash Uni via Mt Waverley	C4	3	1.5	3	1.5
e755_in	Boronia to Bayswater	C4	3	1.5	3	1.5
e755_out	Bayswater to Boronia	C4	3	1.5	3	1.5
e757_in	Stud Park SC to Knox SC	N4	1	1	1	0
e757_out	Knox SC to Stud Park SC	N4	1	1	1	0
e758_in	Ferntree Gully to Knox SC via Knoxfield	N4	1	1	1	0
e758_out	Knox SC to Ferntree Gully via Knoxfield	N4	1	1	1	0
e765_in	Nunawading to Box Hill	N1	3	1.5	3	0
e765_out	Box Hill to Nunawading	N1	3	1.5	3	0
e767_in	Southland to Box Hill	P2A	6	3	6	3
e767_out	Box Hill to Southland	P2A	6	3	6	3
e770_in	Karingal SC to Frankston	P2B	3	3	3	3
e770_out	Frankston to Karingal SC	P2B	3	3	3	3
e772_in	Frankston South to Frankston via Rosedale Grove	NL3	1.5	1.5	1.5	1
e772_out	Frankston to Frankston South via Rosedale Grove	NL3	1.5	1.5	1.5	1
e773_in	Frankston South to Frankston via Humphries Road	NL3	1.5	1.5	1.5	1
e773_out	Frankston to Frankston South via Humphries Road	NL3	1.5	1.5	1.5	1
e774_in	Mt Eliza to Frankston	NL3	1.5	1.5	1.5	1
e774_out	Frankston to Mt Eliza	NL3	1.5	1.5	1.5	1
e775_in	Frankston South to Frankston	C3	3	3	3	1.5
e775_out	Frankston to Frankston South	C3	3	3	3	1.5
e776_in	Pearcedale to Frankston	NL3	1.5	1.5	1.5	1
e776_out	Frankston to Pearcedale	NL3	1.5	1.5	1.5	1
e778_in	Seaford to Carrum Downs via Hall Rd	C3	3	3	3	1.5
e778_out	Carrum Downs to Seaford via Hall Rd	C3	3	3	3	1.5
e779_in	Carrum to Mordialloc	C4	3	1.5	3	1.5
e779_out	Mordialloc to Carrum	C4	3	1.5	3	1.5
e780_in	Frankston to Carrum via Seaford	P2B	3	3	3	3
e780_out	Carrum to Frankston via Seaford	P2B	3	3	3	3
e781_in	Rye to Frankston via Mt Martha	C4	3	1.5	3	1.5
e781_out	Frankston to Rye via Mt Martha	C4	3	1.5	3	1.5
e782_in	Flinders to Frankston via Balnarring	Peri	0.75	0.75	0.75	0.75
e782_out	Frankston to Flinders via Balnarring	Peri	0.75	0.75	0.75	0.75
e783_in	Balnarring to Frankston	NL3	1.5	1.5	1.5	1
e783_out	Frankston to Balnarring	NL3	1.5	1.5	1.5	1
e784_in	Osbourne to Mornington Town via Dunns Road	NL3	1.5	1.5	1.5	1
e784_out	Mornington Town to Osbourne via Dunns Road	NL3	1.5	1.5	1.5	1
e785_in	Osbourne to Mornington Town via Racecourse Road	NL3	1.5	1.5	1.5	1
e785_out	Mornington Town to Osbourne via Racecourse Road	NL3	1.5	1.5	1.5	1
e786_in	St Andrews to Rye	NL3	1.5	1.5	1.5	1
e786_out	Rye to St Andrews	NL3	1.5	1.5	1.5	1
e788_in	Portsea to Frankston via Nepean Highway	P2B	3	3	3	3
e788_out	Frankston to Portsea via Nepean Highway	P2B	3	3	3	3
e788a_in	Portsea to Frankston via Melbourne Rd	P2B	3	3	3	3
e788a_out	Frankston to Portsea via Melbourne Rd	P2B	3	3	3	3
e789_in	Langwarrin North to Frankston	NL3	1.5	1.5	1.5	1
e789_out	Frankston to Langwarrin North	NL3	1.5	1.5	1.5	1
e790_in	Langwarrin South to Frankston	NL3	1.5	1.5	1.5	1
e790_out	Frankston to Langwarrin South	NL3	1.5	1.5	1.5	1
e791_in	Frankston to Cranbourne	P2B	3	3	3	3
e791_out	Cranbourne to Frankston	P2B	3	3	3	3
e792_in	Botanic Ridge to Cranbourne	P2A	6	3	6	3
e792_out	Cranbourne to Botanic Ridge	P2A	6	3	6	3



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e793_in	Tooradin to Cranbourne	Peri	0.75	0.75	0.75	0.75
e793_out	Cranbourne to Tooradin	Peri	0.75	0.75	0.75	0.75
e794_in	Warneet to Cranbourne	Peri	0.75	0.75	0.75	0.75
e794_out	Cranbourne to Warneet	Peri	0.75	0.75	0.75	0.75
e795_in	Cannons Creek to Cranbourne	Peri	0.75	0.75	0.75	0.75
e795_out	Cranbourne to Cannons Creek	Peri	0.75	0.75	0.75	0.75
e797_in	Cranbourne West to Cranbourne	C4	3	1.5	3	1.5
e797_out	Cranbourne to Cranbourne West	C4	3	1.5	3	1.5
e798_in	Clyde North to Cranbourne via Heather Ave	P2B	3	3	3	3
e798_out	Cranbourne to Clyde North via Heather Ave	P2B	3	3	3	3
e799_in	Merinda Park to Casey Central SC	NL3	1.5	1.5	1.5	1
e799_out	Casey Central SC to Merinda Park	NL3	1.5	1.5	1.5	1
e800_in	Dandenong to Chadstone SC	P2B	3	3	3	3
e800_out	Chadstone SC to Dandenong	P2B	3	3	3	3
e801_in	Cranbourne East to Lynbrook	C4	3	1.5	3	1.5
e801_out	Lynbrook to Cranbourne East	C4	3	1.5	3	1.5
e813_in	Sandown to Waverley Gardens	N3	1.5	1	1.5	0
e813_out	Waverley Gardens to Sandown	N3	1.5	1	1.5	0
e814_in	Waverley Gardens SC to Westall	N3	1.5	1	1.5	0
e814_out	Westall to Waverley Gardens SC	N3	1.5	1	1.5	0
e815_in	Parkmore SC to Yarraman	N3	1.5	1	1.5	0
e815_out	Yarraman to Parkmore SC	N3	1.5	1	1.5	0
e816_in	Parkmore SC to Noble Park	NL3	1.5	1.5	1.5	1
e816_out	Noble Park to Parkmore SC	NL3	1.5	1.5	1.5	1
e817_in	Parkmore SC to Sandown	NL3	1.5	1.5	1.5	1
e817_out	Sandown to Parkmore SC	NL3	1.5	1.5	1.5	1
e825_in	Mentone to Sandringham	C3	3	3	3	1.5
e825_out	Sandringham to Mentone	C3	3	3	3	1.5
e826_in	Sandringham to Caulfield	NL3	1.5	1.5	1.5	1
e826_out	Caulfield to Sandringham	NL3	1.5	1.5	1.5	1
e827_in	Hallam to Dandenong	P2A	6	3	6	3
e827_out	Dandenong to Hallam	P2A	6	3	6	3
e828_in	Dandenong to Sandringham	P2B	3	3	3	3
e828_out	Sandringham to Dandenong	P2B	3	3	3	3
e829_in	Berwick to Dandenong	C3	3	3	3	1.5
e829_out	Dandenong to Berwick	C3	3	3	3	1.5
e83_in	Noble Park to Glen Waverley	P2B	3	3	3	3
e83_out	Glen Waverley to Noble Park	P2B	3	3	3	3
e832_in	Frankston to Carrum via Carrum Downs	P2B	3	3	3	3
e832_out	Carrum to Frankston via Carrum Downs	P2B	3	3	3	3
e833_in	Seaford to Carrum Downs	C3	3	3	3	1.5
e833_out	Carrum Downs to Seaford	C3	3	3	3	1.5
e834_in	Berwick RS to Jackson Reserve	C4	3	1.5	3	1.5
e834_out	Jackson Reserve to Berwick RS	C4	3	1.5	3	1.5
e835_in	Cranbourne East to Narre Warren	N3	1.5	1	1.5	0
e835_out	Narre Warren to Cranbourne East	N3	1.5	1	1.5	0
e837_in	Princes Hwy Activity Centre (Officer) to Berwick via Beaconsfield	N3	1.5	1	1.5	0
e837_out	Berwick to Princes Hwy Activity Centre (Officer) via Beaconsfield	N3	1.5	1	1.5	0
e839_in	Berwick East to Parkhill Plaza	C4	3	1.5	3	1.5
e839_out	Parkhill Plaza to Berwick East	C4	3	1.5	3	1.5
e841_in	Narre Warren to Endeavour Hills	NL3	1.5	1.5	1.5	1
e841_out	Endeavour Hills to Narre Warren	NL3	1.5	1.5	1.5	1
e844_in	Endeavour Hills SC to Dandenong	P2A	6	3	6	3
e844_out	Dandenong to Endeavour Hills SC	P2A	6	3	6	3
e845_ccw	Endeavour Hills SC Loop	NL3	1.5	1.5	1.5	1
e845_cw	Endeavour Hills SC Loop	NL3	1.5	1.5	1.5	1
e846_cw	Berwick town Loop	N4	1	1	1	0
e848_in	Wheelers Hill SC to Brandon Park SC	N4	1	1	1	0



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e848_out	Brandon Park SC to Wheelers Hill SC	N4	1	1	1	0
e850_in	Brandon Park SC to Glen Waverley	N3	1.5	1	1.5	0
e850_out	Glen Waverley to Brandon Park SC	N3	1.5	1	1.5	0
e851_in	Glen Waverley to Mitcham	P2B	3	3	3	3
e851_out	Mitcham to Glen Waverley	P2B	3	3	3	3
e852_in	Dandenong to Clayton	P2C	12	3	12	3
e852_out	Clayton to Dandenong	P2C	12	3	12	3
e857_in	Bonbeach to Chelsea	C4	3	1.5	3	1.5
e857_out	Chelsea to Bonbeach	C4	3	1.5	3	1.5
e858_in	Parkmore SC to Dandenong	NL3	1.5	1.5	1.5	1
e858_out	Dandenong to Parkmore SC	NL3	1.5	1.5	1.5	1
e866_in	Chisholm TAFE to Rosebud	N4	1	1	1	0
e866_out	Rosebud to Chisholm TAFE	N4	1	1	1	0
e891_in	Lynbrook to Narre Warren	NL3	1.5	1.5	1.5	1
e891_out	Narre Warren to Lynbrook	NL3	1.5	1.5	1.5	1
e892_in	Narre Warren South to Dandenong	NL3	1.5	1.5	1.5	1
e892_out	Dandenong to Narre Warren South	NL3	1.5	1.5	1.5	1
e893_in	Cranbourne to Dandenong	NL3	1.5	1.5	1.5	1
e893_out	Dandenong to Cranbourne	NL3	1.5	1.5	1.5	1
e895_in	Narre Warren to Jackson Reserve via Lynbrook	NL3	1.5	1.5	1.5	1
e895_out	Jackson Reserve to Narre Warren via Lynbrook	NL3	1.5	1.5	1.5	1
e900_in	Croydon to Elsternwick	P1A	12	6	12	6
e900_out	Elsternwick to Croydon	P1A	12	6	12	6
e901_in	Frankston to Ringwood	P1B	6	6	6	6
e901_out	Ringwood to Frankston	P1B	6	6	6	6
e902_in	Chelsea to Greensborough	P1B	6	6	6	6
e902_out	Greensborough to Chelsea	P1B	6	6	6	6
e903_in	Mentone to La Trobe Uni	P0A	12	12	12	12
e903_out	La Trobe Uni to Mentone	P0A	12	12	12	12
e905_in	The Pines SC to City via Templestowe	P2A	6	3	6	3
e905_out	City to The Pines SC via Templestowe	P2A	6	3	6	3
e906_in	Warrandyte to City	P1A	12	6	12	6
e906_out	City to Warrandyte	P1A	12	6	12	6
e907_in	Mitcham to Docklands	P1A	12	6	12	6
e907_out	Docklands to Mitcham	P1A	12	6	12	6
e908_in	The Pines SC to Docklands via Doncaster	P2A	6	3	6	3
e908_out	Docklands to The Pines SC via Doncaster	P2A	6	3	6	3
e920_in	Officer to Lynbrook	P2B	3	3	3	3
e920_out	Lynbrook to Officer	P2B	3	3	3	3
e921_in	Cardinia Road to Officer	C4	3	1.5	3	1.5
e921_out	Officer to Cardinia Road	C4	3	1.5	3	1.5
e922_in	Princess Hwy Activity Centre (Officer) to Officer Town Centre	N3	1.5	1	1.5	0
e922_out	Officer Town Centre to Princess Hwy Activity Centre (Officer)	N3	1.5	1	1.5	0
e923_in	Officer to Casey Central	C3	3	3	3	1.5
e923_out	Casey Central to Officer	C3	3	3	3	1.5
e924_cw	Pakenham Business Park Loop	NL3	1.5	1.5	1.5	1
e925	Cardinia Road to Officer Nth	NL3	1.5	1.5	1.5	1
e925_in	Officer Nth to Cardinia Road	NL3	1.5	1.5	1.5	1
e926_in	Pakenham to Cardinia Road via Pakenham North West	C4	3	1.5	3	1.5
e926_out	Cardinia Road to Pakenham via Pakenham North West	C4	3	1.5	3	1.5
e927_ccw	Pakenham Station via Pakenham North	NL3	1.5	1.5	1.5	1
e928_in	Pakenham to Cardinia Road via Pakenham Sth	C4	3	1.5	3	1.5
e928_out	Cardinia Road to Pakenham via Pakenham Sth	C4	3	1.5	3	1.5
e929_cw	Pakenham Station via Pakenham North East	C4	3	1.5	3	1.5
e930_in	Pakenham Station to Pakenham East	NL3	1.5	1.5	1.5	1
e930_out	Pakenham East to Pakenham Station	NL3	1.5	1.5	1.5	1
e931_in	Officer to Beaconsfield	NL3	1.5	1.5	1.5	1
e931_out	Beaconsfield to Officer	NL3	1.5	1.5	1.5	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
n001_tb_in	Merrifield Express (Beveridge-Upfield)	P2B	3	3	3	3
n001_tb_out	Merrifield Express (Upfield-Beveridge)	P2B	3	3	3	3
n002_tb_in	Craigieburn - Merrifield	C4	3	1.5	3	1.5
n002_tb_out	Merrifield - Craigieburn	C4	3	1.5	3	1.5
n003_tb_in	Donnybrook - Upfield	C3	3	3	3	1.5
n003_tb_out	Upfield - Donnybrook	C3	3	3	3	1.5
n004_tb_in	Epping - Beveridge	C3	3	3	3	1.5
n004_tb_out	Beveridge - Epping	C3	3	3	3	1.5
n011_in	Donnybrook to Craigieburn	NL4	1.5	1	1.5	1
n011_out	Craigieburn to Donnybrook	NL4	1.5	1	1.5	1
n250_in	La Trobe University to City	P1A	12	6	12	6
n250_out	City to La Trobe University	P1A	12	6	12	6
n251_in	La Trobe Uni to Moonee Ponds via Clifton Hill & Northland	C4	3	1.5	3	1.5
n251_out	Moonee Ponds to La Trobe Uni via Clifton Hill & Northland	C4	3	1.5	3	1.5
n303_in	Greensborough to Coburg	P2A	6	3	6	3
n303_out	Coburg to Greensborough	P2A	6	3	6	3
n311_in	Doreen West to South Morang	C4	3	1.5	3	1.5
n311_out	South Morang to Doreen West	C4	3	1.5	3	1.5
n312_in	Doreen East to South Morang	C4	3	1.5	3	1.5
n312_out	South Morang to Doreen East	C4	3	1.5	3	1.5
n313_in	Doreen South to South Morang	C4	3	1.5	3	1.5
n313_out	South Morang to Doreen South	C4	3	1.5	3	1.5
n315_in	South Morang to Greensborough	NL5	1	1	1	1
n315_out	Greensborough to South Morang	NL5	1	1	1	1
n317_in	Whittlesea to Mernda	NL5	1	1	1	1
n317_out	Mernda to Whittlesea	NL5	1	1	1	1
n322_in	Mernda to South Morang via Lakes Bvd	C3	3	3	3	1.5
n322_out	South Morang to Mernda via Lakes Bvd	C3	3	3	3	1.5
n323_in	Doreen to Bundoora	NL2	2	2	2	1
n323_out	Bundoora to Doreen	NL2	2	2	2	1
n326_in	South Morang to La Trobe University	P2B	3	3	3	3
n326_out	La Trobe University to South Morang	P2B	3	3	3	3
n342_in	St Helena to Eltham	C4	3	1.5	3	1.5
n342_out	Eltham to St Helena	C4	3	1.5	3	1.5
n343_in	Diamond Creek to Greensborough	C4	3	1.5	3	1.5
n343_out	Greensborough to Diamond Creek	C4	3	1.5	3	1.5
n344_in	Campbellfield to West Preston	C4	3	1.5	3	1.5
n344_out	West Preston to Campbellfield	C4	3	1.5	3	1.5
n345_in	South Morang to Northland	C4	3	1.5	3	1.5
n345_out	Northland to South Morang	C4	3	1.5	3	1.5
n346_in	North South Morang to Thomastown	NL5	1	1	1	1
n346_out	Thomastown to North South Morang	NL5	1	1	1	1
n347_in	St Helena to Heidelberg	C4	3	1.5	3	1.5
n347_out	Heidelberg to St Helena	C4	3	1.5	3	1.5
n351_in	Beveridge - Epping	P2C	12	3	12	3
n351_out	Epping - Beveridge	P2C	12	3	12	3
n352_in	Northland to Keon Park	NL2	2	2	2	1
n352_out	Keon Park to Northland	NL2	2	2	2	1
n353_in	Eltham to Heidelberg via Rosanna	NL3	1.5	1.5	1.5	1
n353_out	Heidelberg to Eltham via Rosanna	NL3	1.5	1.5	1.5	1
n354_in	Lalor to Thomastown	C4	3	1.5	3	1.5
n354_out	Thomastown to Lalor	C4	3	1.5	3	1.5
n355_in	Epping Plaza to Thornbury	NL5	1	1	1	1
n355_out	Thornbury to Epping Plaza	NL5	1	1	1	1
n356_in	Wollert to Epping	C4	3	1.5	3	1.5
n356_out	Epping to Wollert	C4	3	1.5	3	1.5
n357_in	Wollert to Bundoora	NL2	2	2	2	1
n357_out	Bundoora to Wollert	NL2	2	2	2	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
n358_in	Wollert to Epping	C4	3	1.5	3	1.5
n358_out	Epping to Wollert	C4	3	1.5	3	1.5
n361_in	Wollert to Thomastown via Harvest Home Rd	C3	3	3	3	1.5
n361_out	Thomastown to Wollert via Harvest Home Rd	C3	3	3	3	1.5
n368_in	Greensborough to Macleod	NL2	2	2	2	1
n368_out	Macleod to Greensborough	NL2	2	2	2	1
n378x_in	Research East to Research via Warrandyte	N4	1	1	1	0
n378x_out	Research to Research East via Warrandyte	N4	1	1	1	0
n379_in	Research to Eltham	NL3	1.5	1.5	1.5	1
n379_out	Eltham to Research	NL3	1.5	1.5	1.5	1
n382_ccw	Eltham Town Service Loop	NL2	2	2	2	1
n401_in	North Melbourne to Parkville	401_SPECIAL (2031)	30	15	30	6
n401_out	Parkville to North Melbourne	401_SPECIAL (2031)	30	15	30	6
n464_in	Airport West to Essendon	C4	3	1.5	3	1.5
n464_out	Essendon to Airport West	C4	3	1.5	3	1.5
n465_in	Keilor Park to Essendon	P2A	6	3	6	3
n465_out	Essendon to Keilor Park	P2A	6	3	6	3
n467_in	Aberfeldie to Moonee Ponds	C4	3	1.5	3	1.5
n467_out	Moonee Ponds to Aberfeldie	C4	3	1.5	3	1.5
n479_in	Sunbury to Melbourne Airport	NL5	1	1	1	1
n479_out	Melbourne Airport to Sunbury	NL5	1	1	1	1
n480_in	Roxburgh Park to Essendon	C4	3	1.5	3	1.5
n480_out	Essendon to Roxburgh Park	C4	3	1.5	3	1.5
n482_in	Melbourne Airport to Airport West via Industrial Route	N3	1.5	1	1.5	0
n482_out	Airport West to Melbourne Airport via Industrial Route	N3	1.5	1	1.5	0
n484_in	Roxburgh Park to Broadmeadows	NL3	1.5	1.5	1.5	1
n484_out	Broadmeadows to Roxburgh Park	NL3	1.5	1.5	1.5	1
n490x_in	Gowanbrae to Airport West	N4	1	1	1	0
n490x_out	Airport West to Gowanbrae	N4	1	1	1	0
n500_in	Melbourne Airport to Airport West	C4	3	1.5	3	1.5
n500_out	Airport West to Melbourne Airport	C4	3	1.5	3	1.5
n503_in	Essendon to East Brunswick	NL2	2	2	2	1
n503_out	East Brunswick to Essendon	NL2	2	2	2	1
n505_in	Moonee Ponds to Melbourne University	C4	3	1.5	3	1.5
n505_out	Melbourne University to Moonee Ponds	C4	3	1.5	3	1.5
n506_in	Moonee Ponds to Clifton Hil	P2A	6	3	6	3
n506_out	Clifton Hil to Moonee Ponds	P2A	6	3	6	3
n507_in	Airport West to Moonee Ponds	NL3	1.5	1.5	1.5	1
n507_out	Moonee Ponds to Airport West	NL3	1.5	1.5	1.5	1
n508_in	Heidelberg to Moonee Ponds	P2A	6	3	6	3
n508_out	Moonee Ponds to Heidelberg	P2A	6	3	6	3
n509_in	La Trobe Uni to Airport West	P2A	6	3	6	3
n509_out	Airport West to La Trobe Uni	P2A	6	3	6	3
n510_in	Ivanhoe to Essendon	C4	3	1.5	3	1.5
n510_out	Essendon to Ivanhoe	C4	3	1.5	3	1.5
n512_in	East Coburg to Essendon DFO	C4	3	1.5	3	1.5
n512_out	Essendon DFO to East Coburg	C4	3	1.5	3	1.5
n513_in	Eltham to Glenroy	P1A	12	6	12	6
n513_out	Glenroy to Eltham	P1A	12	6	12	6
n525_in	West Craigieburn to North Craigieburn	NL5	1	1	1	1
n525_out	North Craigieburn to West Craigieburn	NL5	1	1	1	1
n526_in	West Craigieburn to Craigieburn	C4	3	1.5	3	1.5
n526_out	Craigieburn to West Craigieburn	C4	3	1.5	3	1.5
n527_in	Glenroy to Heidelberg	C4	3	1.5	3	1.5
n527_out	Heidelberg to Glenroy	C4	3	1.5	3	1.5
n529_in	Lockerbie - Epping	C3	3	3	3	1.5
n529_out	Epping - Lockerbie	C3	3	3	3	1.5
n530_in	Cambellfield to Coburg	NL3	1.5	1.5	1.5	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
n530_out	Coburg to Cambellfield	NL3	1.5	1.5	1.5	1
n531_in	Upfield to North Coburg	N4	1	1	1	0
n531_out	North Coburg to Upfield	N4	1	1	1	0
n532_in	Craigieburn to Broadmeadows	NL4	1.5	1	1.5	1
n532_out	Broadmeadows to Craigieburn	NL4	1.5	1	1.5	1
n533_in	Donnybrook to Craigieburn North	C3	3	3	3	1.5
n533_out	Craigieburn North to Donnybrook	C3	3	3	3	1.5
n536_in	Gowrie to Pascoe Vale	C3	3	3	3	1.5
n536_out	Pascoe Vale to Gowrie	C3	3	3	3	1.5
n537_in	Roxburgh Park to Craigieburn	C4	3	1.5	3	1.5
n537_out	Craigieburn to Roxburgh Park	C4	3	1.5	3	1.5
n538_in	Craigieburn Station to Roxburgh Park	C3	3	3	3	1.5
n538_out	Roxburgh Park to Craigieburn Station	C3	3	3	3	1.5
n540_in	Campbellfield to Glenroy via Upfield	C4	3	1.5	3	1.5
n540_out	Glenroy to Campbellfield via Upfield	C4	3	1.5	3	1.5
n541_in	Roxburgh Park to Broadmeadows	C4	3	1.5	3	1.5
n541_out	Broadmeadows to Roxburgh Park	C4	3	1.5	3	1.5
n542_in	Broadmeadows to Coburg	C4	3	1.5	3	1.5
n542_out	Coburg to Broadmeadows	C4	3	1.5	3	1.5
n544_in	Roxburgh Park to Craigieburn	C3	3	3	3	1.5
n544_out	Craigieburn to Roxburgh Park	C3	3	3	3	1.5
n565x_in	Humevale to Whittlesea	Peri2	0	0.2857 14	0	0
n565x_out	Whittlesea to Humevale	Peri2	0	0.2857 14	0	0
n566_in	La Trobe Uni to Airport West	C4	3	1.5	3	1.5
n566_out	Airport West to La Trobe Uni	C4	3	1.5	3	1.5
n583_in	Lockerbie to Epping	C4	3	1.5	3	1.5
n583_out	Epping to Lockerbie	C4	3	1.5	3	1.5
n584_in	Mernda to Craigieburn	P2B	3	3	3	3
n584_out	Craigieburn to Mernda	P2B	3	3	3	3
n585_in	Donnybrook to Craigieburn South	Ind4	1.5	0	1.5	0
n585_out	Craigieburn South to Donnybrook	Ind4	1.5	0	1.5	0
n589_ccw	Lockerbie Eastern Loop	C3	3	3	3	1.5
n589_cw	Lockerbie Eastern Loop	C3	3	3	3	1.5
n590_in	Beveridge to Mandalay	NL5	1	1	1	1
n590_out	Mandalay to Beveridge	NL5	1	1	1	1
n591_in	Merrifields to Craigieburn Central	NL5	1	1	1	1
n591_out	Craigieburn Central to Merrifields	NL5	1	1	1	1
n902_in	Melbourne Airport to Greensborough	P1A	12	6	12	6
n902_out	Greensborough to Melbourne Airport	P1A	12	6	12	6
n911_in	Craigieburn to Broadmeadows	C4	3	1.5	3	1.5
n911_out	Broadmeadows to Craigieburn	C4	3	1.5	3	1.5
n913_in	Heidelberg to Essendon	P2A	6	3	6	3
n913_out	Essendon to Heidelberg	P2A	6	3	6	3
w101_in	Caroline Springs to Watergardens	C4	3	1.5	3	1.5
w101_out	Watergardens to Caroline Springs	C4	3	1.5	3	1.5
w102_in	Laverton to Deer Park	N3	1.5	1	1.5	0
w102_out	Deer Park to Laverton	N3	1.5	1	1.5	0
w105_in	Tarneit to Williams Landing	N1	3	1.5	3	0
w105_out	Williams Landing to Tarneit	N1	3	1.5	3	0
w106_in	Werribee to Tarneit	P2C	12	3	12	3
w106_out	Tarneit to Werribee	P2C	12	3	12	3
w107_in	Hoppers Crossing to Tarneit	P2C	12	3	12	3
w107_out	Tarneit to Hoppers Crossing	P2C	12	3	12	3
w110_in	Werribee to Tarneit	P2C	12	3	12	3
w110_out	Tarneit to Werribee	P2C	12	3	12	3
w113_in	Exford Rd to Melton	C4	3	1.5	3	1.5
w113_out	Melton to Exford Rd	C4	3	1.5	3	1.5
w115_ccw	Rockbank/Rockbank north Loop	NL3	1.5	1.5	1.5	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
w115_cw	Rockbank/Rockbank north Loop	NL3	1.5	1.5	1.5	1
w116_in	Melton to Rockbank	NL3	1.5	1.5	1.5	1
w116_out	Rockbank to Melton	NL3	1.5	1.5	1.5	1
w117_in	Melton to Toolern	P2A	6	3	6	3
w117_out	Toolern to Melton	P2A	6	3	6	3
w118_in	Melton to Toolern	C4	3	1.5	3	1.5
w118_out	Toolern to Melton	C4	3	1.5	3	1.5
w119_in	Woodgrove SC to Melton	NL3	1.5	1.5	1.5	1
w119_out	Melton to Woodgrove SC	NL3	1.5	1.5	1.5	1
w121_in	Plumpton South to Caroline Springs	NL4	1.5	1	1.5	1
w121_out	Caroline Springs to Plumpton South	NL4	1.5	1	1.5	1
w125a_in	Tarneit to Tarneit East	C4	3	1.5	3	1.5
w125a_out	Tarneit East to Tarneit	C4	3	1.5	3	1.5
w135_in	Tarneit to Laverton	Ind4	1.5	0	1.5	0
w135_out	Laverton to Tarneit	Ind4	1.5	0	1.5	0
w144_in	Hoppers Crossing to Williams Landing	C3	3	3	3	1.5
w144_out	Williams Landing to Hoppers Crossing	C3	3	3	3	1.5
w179_in	Tarneit to Hoppers Crossing	P2B	3	3	3	3
w179_out	Hoppers Crossing to Tarneit	P2B	3	3	3	3
w183_in	Wyndham Vale to Werribee	C4	3	1.5	3	1.5
w183_out	Werribee to Wyndham Vale	C4	3	1.5	3	1.5
w185_in	Wyndham Vale to Tarneit	NL3	1.5	1.5	1.5	1
w185_out	Tarneit to Wyndham Vale	NL3	1.5	1.5	1.5	1
w216_in	Caroline Springs to Sunshine	P2B	3	3	3	3
w216_out	Sunshine to Caroline Springs	P2B	3	3	3	3
w219_in	Sunshine to Footscray	P1B	6	6	6	6
w219_out	Footscray to Sunshine	P1B	6	6	6	6
w220_in	Sunshine to City	P0A	12	12	12	12
w220_out	City to Sunshine	P0A	12	12	12	12
w232_in	Altona Gate to City	P2A	6	3	6	3
w232_out	City to Altona Gate	P2A	6	3	6	3
w234_in	Garden City to City	P1A	12	6	12	6
w234_out	City to Garden City	P1A	12	6	12	6
w235_in	Fishermans Bend to City	P2B	3	3	3	3
w235_out	City to Fishermans Bend	P2B	3	3	3	3
w236_in	Garden City to City via Pickles	C4	3	1.5	3	1.5
w236_out	City to Garden City via Pickles	C4	3	1.5	3	1.5
w237_in	Fishermans Bend to City	P2C	12	3	12	3
w237_out	City to Fishermans Bend	P2C	12	3	12	3
w400_in	Williams Landing to Deer Park	N3	1.5	1	1.5	0
w400_out	Deer Park to Williams Landing	N3	1.5	1	1.5	0
w400a_in	Derrimut West to Deer Park	NL4	1.5	1	1.5	1
w400a_out	Deer Park to Derrimut West	NL4	1.5	1	1.5	1
w402_in	Footscray to East Melbourne	P1B	6	6	6	6
w402_out	East Melbourne to Footscray	P1B	6	6	6	6
w404_in	Williamstown to Moonee Ponds	P1A	12	6	12	6
w404_out	Moonee Ponds to Williamstown	P1A	12	6	12	6
w406_in	St Albans to Footscray via Highpoint SC	P2A	6	3	6	3
w406_out	Footscray to St Albans via Highpoint SC	P2A	6	3	6	3
w406a_in	Highpoint SC to Footscray	P2B	3	3	3	3
w406a_out	Footscray to Highpoint SC	P2B	3	3	3	3
w408_in	St Albans to Sunshine	P2B	3	3	3	3
w408_out	Sunshine to St Albans	P2B	3	3	3	3
w409_in	Highpoint SC to Footscray	N1	3	1.5	3	0
w409_out	Footscray to Highpoint SC	N1	3	1.5	3	0
w410_in	Sunshine to City	P2A	6	3	6	3
w410_out	City to Sunshine	P2A	6	3	6	3
w411_in	Laverton to Footscray	P1A	12	6	12	6
w411_out	Footscray to Laverton	P1A	12	6	12	6
w414_in	Williams Landing to Footscray	P2B	3	3	3	3



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
w414_out	Footscray to Williams Landing	P2B	3	3	3	3
w415_in	Laverton to Williamstown	NL4	1.5	1	1.5	1
w415_out	Williamstown to Laverton	NL4	1.5	1	1.5	1
w418_in	Caroline Springs to St Albans	P2C	12	3	12	3
w418_out	St Albans to Caroline Springs	P2C	12	3	12	3
w419_in	Watergardens to Sunshine	P2B	3	3	3	3
w419_out	Sunshine to Watergardens	P2B	3	3	3	3
w420_in	Watergardens to Sunshine	P2A	6	3	6	3
w420_out	Sunshine to Watergardens	P2A	6	3	6	3
w421_in	Watergardens to St Albans	C4	3	1.5	3	1.5
w421_out	St Albans to Watergardens	C4	3	1.5	3	1.5
w422_in	St Albans to Deer Park	C4	3	1.5	3	1.5
w422_out	Deer Park to St Albans	C4	3	1.5	3	1.5
w423_in	Brimbank Plaza to St Albans	C4	3	1.5	3	1.5
w423_out	St Albans to Brimbank Plaza	C4	3	1.5	3	1.5
w424_in	Brimbank Plaza to St Albans	C4	3	1.5	3	1.5
w424_out	St Albans to Brimbank Plaza	C4	3	1.5	3	1.5
w425_in	Watergardens to St Albans	P2B	3	3	3	3
w425_out	St Albans to Watergardens	P2B	3	3	3	3
w427_in	Sunshine West to Sunshine	NL2	2	2	2	1
w427_out	Sunshine to Sunshine West	NL2	2	2	2	1
w428_in	Sunshine West to Sunshine	NL2	2	2	2	1
w428_out	Sunshine to Sunshine West	NL2	2	2	2	1
w431_in	Highpoint SC to Yarraville	P2B	3	3	3	3
w431_out	Yarraville to Highpoint SC	P2B	3	3	3	3
w432_in	Altona Gate SC to Yarraville	N4	1	1	1	0
w432_out	Yarraville to Altona Gate SC	N4	1	1	1	0
w437_in	Werribee to Hoppers Crossing	NL3	1.5	1.5	1.5	1
w437_out	Hoppers Crossing to Werribee	NL3	1.5	1.5	1.5	1
w439_in	Werribee South to Werribee	N4	1	1	1	0
w439_out	Werribee to Werribee South	N4	1	1	1	0
w440_in	Wyndham Vale to Hoppers Crossing	P2C	12	3	12	3
w440_out	Hoppers Crossing to Wyndham Vale	P2C	12	3	12	3
w441_cw	Werribee/Riverwalk Loop	N1	3	1.5	3	0
w442_in	Tarneit to Hoppers Crossing	NL3	1.5	1.5	1.5	1
w442_out	Hoppers Crossing to Tarneit	NL3	1.5	1.5	1.5	1
w443_ccw	Werribee/South Ring Rd Loop	N1	3	1.5	3	0
w443_cw	Werribee/South Ring Rd Loop	N1	3	1.5	3	0
w444_in	Wyndham Vale to Tarneit via Werribee	P2C	12	3	12	3
w444_out	Tarneit to Wyndham Vale via Werribee	P2C	12	3	12	3
w445_in	Wyndham Vale to Williams Landing	P2A	6	3	6	3
w445_out	Williams Landing to Wyndham Vale	P2A	6	3	6	3
w446_in	Wyndham Vale to Williams Landing	P2A	6	3	6	3
w446_out	Williams Landing to Wyndham Vale	P2A	6	3	6	3
w447_in	Wyndham Vale to Werribee	P2A	6	3	6	3
w447_out	Werribee to Wyndham Vale	P2A	6	3	6	3
w448_in	Wyndham Vale to Werribee	P2C	12	3	12	3
w448_out	Werribee to Wyndham Vale	P2C	12	3	12	3
w449_in	Wyndham Vale to Werribee	P2C	12	3	12	3
w449_out	Werribee to Wyndham Vale	P2C	12	3	12	3
w453_in	West Melton to Melton	NL3	1.5	1.5	1.5	1
w453_out	Melton to West Melton	NL3	1.5	1.5	1.5	1
w455_in	Melton North to Melton	C3	3	3	3	1.5
w455_out	Melton to Melton North	C3	3	3	3	1.5
w456_in	Melton to Caroline Springs	P2A	6	3	6	3
w456_out	Caroline Springs to Melton	P2A	6	3	6	3
w457_in	Westlakes Dr to Melton	C4	3	1.5	3	1.5
w457_out	Melton to Westlakes Dr	C4	3	1.5	3	1.5
w458_in	Centenary Dr to Melton	C4	3	1.5	3	1.5
w458_out	Melton to Centenary Dr	C4	3	1.5	3	1.5



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
w459_in	Kurunjang to Melton	C3	3	3	3	1.5
w459_out	Melton to Kurunjang	C3	3	3	3	1.5
w460_in	Watergardens to Ravenhall	P2C	12	3	12	3
w460_out	Ravenhall to Watergardens	P2C	12	3	12	3
w461_in	Caroline Springs to Watergardens	C3	3	3	3	1.5
w461_out	Watergardens to Caroline Springs	C3	3	3	3	1.5
w462_in	Ravenhall to Watergardens	P2B	3	3	3	3
w462_out	Watergardens to Ravenhall	P2B	3	3	3	3
w466_in	Rockbank to Watergardens	N4	1	1	1	0
w466_out	Watergardens to Rockbank	N4	1	1	1	0
w471_in	Sunshine to Williamstown	P2A	6	3	6	3
w471_out	Williamstown to Sunshine	P2A	6	3	6	3
w472_in	Moonee Ponds to Footscray	P2A	6	3	6	3
w472_out	Footscray to Moonee Ponds	P2A	6	3	6	3
w476_in	Watergardens to Moonee Pds	C4	3	1.5	3	1.5
w476_out	Moonee Pds to Watergardens	C4	3	1.5	3	1.5
w479_in	Sunbury to Melbourne Airport	C4	3	1.5	3	1.5
w479_out	Melbourne Airport to Sunbury	C4	3	1.5	3	1.5
w479a_in	Sunbury west to Sunbury	C3	3	3	3	1.5
w479a_out	Sunbury to Sunbury west	C3	3	3	3	1.5
w480_in	Sunbury to Diggers Rest	NL3	1.5	1.5	1.5	1
w480_out	Diggers Rest to Sunbury	NL3	1.5	1.5	1.5	1
w481_in	Mt Lion to Sunbury	C4	3	1.5	3	1.5
w481_out	Sunbury to Mt Lion	C4	3	1.5	3	1.5
w482_in	Sunbury to Sunbury East	NL4	1.5	1	1.5	1
w482_out	Sunbury East to Sunbury	NL4	1.5	1	1.5	1
w483_in	Diggers Rest to Sunbury	NL3	1.5	1.5	1.5	1
w483_out	Sunbury to Diggers Rest	NL3	1.5	1.5	1.5	1
w485_in	Wilsons Rd to Sunbury	NL4	1.5	1	1.5	1
w485_out	Sunbury to Wilsons Rd	NL4	1.5	1	1.5	1
w486_in	Rolling Meadows to Sunbury	NL4	1.5	1	1.5	1
w486_out	Sunbury to Rolling Meadows	NL4	1.5	1	1.5	1
w487_in	Canterbury Hills to Sunbury	C3	3	3	3	1.5
w487_out	Sunbury to Canterbury Hills	C3	3	3	3	1.5
w488_in	Jacksons Hill to Sunbury	NL4	1.5	1	1.5	1
w488_out	Sunbury to Jacksons Hill	NL4	1.5	1	1.5	1
w489_in	Elizabeth Dr to Sunbury	NL4	1.5	1	1.5	1
w489_out	Sunbury to Elizabeth Dr	NL4	1.5	1	1.5	1
w494_in	Point Cook South to Willilams Landing	C3	3	3	3	1.5
w494_out	Willilams Landing to Point Cook South	C3	3	3	3	1.5
w495_in	Point Cook Sth to Williams Landing	C3	3	3	3	1.5
w495_out	Williams Landing to Point Cook Sth	C3	3	3	3	1.5
w496_in	Hoppers Crossing to Laverton	NL3	1.5	1.5	1.5	1
w496_out	Laverton to Hoppers Crossing	NL3	1.5	1.5	1.5	1
w497_in	Saltwater Coast to Williams Landing	C3	3	3	3	1.5
w497_out	Williams Landing to Saltwater Coast	C3	3	3	3	1.5
w498_in	Hoppers Crossing to Laverton	C4	3	1.5	3	1.5
w498_out	Laverton to Hoppers Crossing	C4	3	1.5	3	1.5
w903_in	Sunshine to Essendon via Highpoint	P1B	6	6	6	6
w903_out	Essendon to Sunshine via Highpoint	P1B	6	6	6	6
wairport_in	Melb Airport to Keilor Plains	C3	3	3	3	1.5
wairport_out	Keilor Plains to Melb Airport	C3	3	3	3	1.5
waltona_in	Altona to Sunshine	N3	1.5	1	1.5	0
waltona_out	Sunshine to Altona	N3	1.5	1	1.5	0
wdohertys_in	Tarneit to Altona Gate	N3	1.5	1	1.5	0
wdohertys_out	Altona Gate to Tarneit	N3	1.5	1	1.5	0
wforsyth_in	Tarneit to Williams Landing	P2C	12	3	12	3



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
wforythrd_out	Williams Landing to Tarneit	P2C	12	3	12	3
whighst_in	Woodgrove SC to Toolern	C4	3	1.5	3	1.5
whighst_out	Toolern to Woodgrove SC	C4	3	1.5	3	1.5
wmelttax1_in	Melton South West to Melton	N4	1	1	1	0
wmelttax1_out	Melton to Melton South West	N4	1	1	1	0
wmelttax2_in	Brookfield to Melton	N4	1	1	1	0
wmelttax2_out	Melton to Brookfield	N4	1	1	1	0



Table F.7 - Bus Service Levels & Categories - 2051 Base Case

Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
c001_in	Southland to Northland	P1B	6	6	6	6
c001_out	Northland to Southland	P1B	6	6	6	6
c246_in	Elsternwick to Clifton Hill	P0A	12	12	12	12
c246_out	Clifton Hill to Elsternwick	P0A	12	12	12	12
c606_in	Elsternwick to Fishermans Bend	P2C	12	3	12	3
c606_out	Fishermans Bend to Elsternwick	P2C	12	3	12	3
c903_in	Mentone to La Trobe	P0A	12	12	12	12
c903_out	La Trobe to Mentone	P0A	12	12	12	12
e000_in	Dandenong to Waverley Gardens	C4	3	1.5	3	1.5
e000_out	Waverley Gardens to Dandenong	C4	3	1.5	3	1.5
e01_in	Cranbourne to Springvale	P0A	12	12	12	12
e01_out	Springvale to Cranbourne	P0A	12	12	12	12
e011_in	Cardinia Road to Officer Sth	NL3	1.5	1.5	1.5	1
e011_out	Officer Sth to Cardinia Road	NL3	1.5	1.5	1.5	1
e012_in	Clyde to Beaconsfield Station	C3	3	3	3	1.5
e012_out	Beaconsfield Station to Clyde	C3	3	3	3	1.5
e013_in	Lilydale to Mooroolbark	C4	3	1.5	3	1.5
e013_out	Mooroolbark to Lilydale	C4	3	1.5	3	1.5
e015_in	Cranbourne East to Merinda Park	P2B	3	3	3	3
e015_out	Merinda Park to Cranbourne East	P2B	3	3	3	3
e017_in	Highett to Carnegie	P2A	6	3	6	3
e017_out	Carnegie to Highett	P2A	6	3	6	3
e018_in	Clyde to Officer	C4	3	1.5	3	1.5
e018_out	Officer to Clyde	C4	3	1.5	3	1.5
e019_in	Berwick to Narre Warren North	N3	1.5	1	1.5	0
e019_out	Narre Warren North to Berwick	N3	1.5	1	1.5	0
e02_in	Beaconsfield to Carrum	P1B	6	6	6	6
e02_out	Carrum to Beaconsfield	P1B	6	6	6	6
e020_in	Cheltenham to Chadstone SC	P2A	6	3	6	3
e020_out	Chadstone SC to Cheltenham	P2A	6	3	6	3
e022_in	Clyde to Berwick	P2A	6	3	6	3
e022_out	Berwick to Clyde	P2A	6	3	6	3
e023_in	Westall to Clayton	N3	1.5	1	1.5	0
e023_out	Clayton to Westall	N3	1.5	1	1.5	0
e024_in	Officer to Beaconsfield	C3	3	3	3	1.5
e024_out	Beaconsfield to Officer	C3	3	3	3	1.5
e025_in	Ringwood to Box Hill	C3	3	3	3	1.5
e025_out	Box Hill to Ringwood	C3	3	3	3	1.5
e026_in	Clyde to Berwick	C3	3	3	3	1.5
e026_out	Berwick to Clyde	C3	3	3	3	1.5
e03_in	Cranbourne to Officer	P2A	6	3	6	3
e03_out	Officer to Cranbourne	P2A	6	3	6	3
e04_b_in	Frankston to Cranbourne via Botanic Ridge	P2B	3	3	3	3
e04_b_out	Cranbourne to Frankston via Botanic Ridge	P2B	3	3	3	3
e04_in	Cranbourne to Narre Warren	P2B	3	3	3	3
e04_out	Narre Warren to Cranbourne	P2B	3	3	3	3
e05_in	Pakenham to Berwick	P2B	3	3	3	3
e05_out	Berwick to Pakenham	P2B	3	3	3	3
e06_in	Westall to Southland	P2A	6	3	6	3
e06_out	Southland to Westall	P2A	6	3	6	3
e07_in	Lynbrook to Noble Park via South Dandenong industrial	C3	3	3	3	1.5
e07_out	Noble Park to Lynbrook via South Dandenong industrial	C3	3	3	3	1.5
e08_in	Benton Grange to Mornington Town	NL3	1.5	1.5	1.5	1
e08_out	Mornington Town to Benton Grange	NL3	1.5	1.5	1.5	1
e09_in	Beaconsfield to Narre Warren	NL3	1.5	1.5	1.5	1
e09_out	Narre Warren to Beaconsfield	NL3	1.5	1.5	1.5	1
e10_in	Mornington Town to Tanti Park	NL3	1.5	1.5	1.5	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e10_out	Tanti Park to Mornington Town	NL3	1.5	1.5	1.5	1
e105_in	Mordialloc to Dandenong	C3	3	3	3	1.5
e105_out	Dandenong to Mordialloc	C3	3	3	3	1.5
e107_in	Brighton to Huntingdale	P2C	12	3	12	3
e107_out	Huntingdale to Brighton	P2C	12	3	12	3
e109_in	Glen Waverley to Oakleigh	P2B	3	3	3	3
e109_out	Oakleigh to Glen Waverley	P2B	3	3	3	3
e111_in	Heathmont to Camberwell	P2B	3	3	3	3
e111_out	Camberwell to Heathmont	P2B	3	3	3	3
e118_in	Beaconsfield to Lynbrook	P2B	3	3	3	3
e118_out	Lynbrook to Beaconsfield	P2B	3	3	3	3
e119_in	Pakenham to Officer	C3	3	3	3	1.5
e119_out	Officer to Pakenham	C3	3	3	3	1.5
e121_in	Cranbourne to Officer	P2A	6	3	6	3
e121_out	Officer to Cranbourne	P2A	6	3	6	3
e200_b_in	Doncaster SC to Southern Cross	P0A	12	12	12	12
e200_b_out	Southern Cross to Doncaster SC	P0A	12	12	12	12
e200_in	Auburn Station to Southern Cross	P2C	12	3	12	3
e200_out	Southern Cross to Auburn Station	P2C	12	3	12	3
e203_in	Holmesglen to Darling Road	N1	3	1.5	3	0
e203_out	Darling Road to Holmesglen	N1	3	1.5	3	0
e216_in	Middle Brighton to Caulfield to	N4	1	1	1	0
e216_out	Caulfield to Middle Brighton	N4	1	1	1	0
e219_in	Elsternwick to City via Williams Road	P0A	12	12	12	12
e219_out	City to Elsternwick via Williams Road	P0A	12	12	12	12
e245_in	Sandringham to St Kilda	N1	3	1.5	3	0
e245_out	St Kilda to Sandringham	N1	3	1.5	3	0
e270_in	Mitcham to Box Hill	C3	3	3	3	1.5
e270_out	Box Hill to Mitcham	C3	3	3	3	1.5
e271_in	Park Orchards to Blackburn	N4	1	1	1	0
e271_out	Blackburn to Park Orchards	N4	1	1	1	0
e275_in	Blackburn to Box Hill via Blackburn North	N3	1.5	1	1.5	0
e275_out	Box Hill to Blackburn via Blackburn North	N3	1.5	1	1.5	0
e279_in	The Pines to Box Hill	P2B	3	3	3	3
e279_out	Box Hill to The Pines	P2B	3	3	3	3
e280_in	The Pines to Doncaster SC via Tunstall Square	N4	1	1	1	0
e280_out	Doncaster SC to The Pines via Tunstall Square	N4	1	1	1	0
e282_in	The Pines SC to Doncaster PR	C4	3	1.5	3	1.5
e282_out	Doncaster PR to The Pines SC	C4	3	1.5	3	1.5
e284_in	Box Hill to La Trobe Uni	C3	3	3	3	1.5
e284_out	La Trobe Uni to Box Hill	C3	3	3	3	1.5
e285_in	Doncaster Park and Ride to Camberwell	C3	3	3	3	1.5
e285_out	Camberwell to Doncaster Park and Ride	C3	3	3	3	1.5
e286_in	Templestowe Village to Jackson Court	N4	1	1	1	0
e286_out	Jackson Court to Templestowe Village	N4	1	1	1	0
e287_in	Mont Albert to Camberwell	N4	1	1	1	0
e287_out	Camberwell to Mont Albert	N4	1	1	1	0
e293_in	Eltham to Deakin Uni	P0A	12	12	12	12
e293_out	Deakin Uni to Eltham	P0A	12	12	12	12
e302_in	Warrandyte to City	C3	3	3	3	1.5
e302_out	Southern Cross to Box Hill	C3	3	3	3	1.5
e304_in	Doncaster SC to Kew	C3	3	3	3	1.5
e304_out	Kew to Doncaster SC	C3	3	3	3	1.5
e305_in	The Pines to Doncaster SC via Doncaster East SC	C3	3	3	3	1.5
e305_out	Doncaster SC to The Pines via Doncaster East SC	C3	3	3	3	1.5
e309_in	The Pines SC to Nunawading	C4	3	1.5	3	1.5
e309_out	Nunawading to The Pines SC	C4	3	1.5	3	1.5
e364_in	Warrandyte Bridge to Ringwood	C4	3	1.5	3	1.5
e364_out	Ringwood to Warrandyte Bridge	C4	3	1.5	3	1.5



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e367_in	Ringwood East to Heathmont	C4	3	1.5	3	1.5
e367_out	Heathmont to Ringwood East	C4	3	1.5	3	1.5
e370_in	Ringwood to Mitcham	NL2	2	2	2	1
e370_out	Mitcham to Ringwood	NL2	2	2	2	1
e371_in	Ringwood to Park Orchards	C3	3	3	3	1.5
e371_out	Park Orchards to Ringwood	C3	3	3	3	1.5
e380_in	Lilydale to Ringwood	P2B	3	3	3	3
e380_out	Ringwood to Lilydale	P2B	3	3	3	3
e381_in	Croydon to Ringwood East	C4	3	1.5	3	1.5
e381_out	Ringwood East to Croydon	C4	3	1.5	3	1.5
e548_in	Southland to La Trobe Uni	P0A	12	12	12	12
e548_out	La Trobe Uni to Southland	P0A	12	12	12	12
e600_in	Cheltnham to Sandringham	N1	3	1.5	3	0
e600_out	Sandringham to Cheltnham	N1	3	1.5	3	0
e605_in	Gardenvale to City	P2A	6	3	6	3
e605_out	City to Gardenvale	P2A	6	3	6	3
e612_in	Box Hill to Chadstone SC	NL3	1.5	1.5	1.5	1
e612_out	Chadstone SC to Box Hill	NL3	1.5	1.5	1.5	1
e613_in	Burwood to Canterbury	C4	3	1.5	3	1.5
e613_out	Canterbury to Burwood	C4	3	1.5	3	1.5
e622_in	Holmesglen to Oakleigh	N4	1	1	1	0
e622_out	Oakleigh to Holmesglen	N4	1	1	1	0
e623_in	Gardenvale to Caulfield	N1	3	1.5	3	0
e623_out	Caulfield to Gardenvale	N1	3	1.5	3	0
e625_in	Carnegie to Burke Road/Tram 5	N3	1.5	1	1.5	0
e625_out	Burke Road/Tram 5 to Carnegie	N3	1.5	1	1.5	0
e640_in	Glen Waverley to Glen Iris	P2B	3	3	3	3
e640_out	Glen Iris to Glen Waverley	P2B	3	3	3	3
e664_in	Croydon to Knox SC	P2A	6	3	6	3
e664_out	Knox SC to Croydon	P2A	6	3	6	3
e670_in	Lilydale to Ringwood	P2B	3	3	3	3
e670_out	Ringwood to Lilydale	P2B	3	3	3	3
e671_in	Chirnside Park SC to Croydon	NL3	1.5	1.5	1.5	1
e671_out	Croydon to Chirnside Park SC	NL3	1.5	1.5	1.5	1
e672_out	Croydon to Chirnside Park SC	N4	1	1	1	0
e672_out	Croydon to Chirnside Park SC	N4	1	1	1	0
e677_in	Lilydale to Chirnside Park SC	NL3	1.5	1.5	1.5	1
e677_out	Chirnside Park SC to Lilydale	NL3	1.5	1.5	1.5	1
e679_in	Lilydale to Ringwood	C3	3	3	3	1.5
e679_out	Ringwood to Lilydale	C3	3	3	3	1.5
e680_in	Lilydale to Mooroolbark	C4	3	1.5	3	1.5
e680_out	Mooroolbark to Lilydale	C4	3	1.5	3	1.5
e681_in	Rowville Medical/Kellets Rd to Stud Park SC	NL3	1.5	1.5	1.5	1
e681_out	Stud Park SC to Rowville Medical/Kellets Rd	NL3	1.5	1.5	1.5	1
e682_in	Stud Park SC to Ferntree Gully Station	C4	3	1.5	3	1.5
e682_out	Ferntree Gully Station to Stud Park SC	C4	3	1.5	3	1.5
e683_in	Warburton to Lilydale	C4	3	1.5	3	1.5
e683_out	Lilydale to Warburton	C4	3	1.5	3	1.5
e683_short_in	Wandon to Lilydale	N4	1	1	1	0
e683_short_out	Lilydale to Wandon	N4	1	1	1	0
e684_in	Stud Park SC to Knox SC	NL3	1.5	1.5	1.5	1
e684_out	Knox SC to Stud Park SC	NL3	1.5	1.5	1.5	1
e685_in	Healesville to Lilydale	N4	1	1	1	0
e685_out	Lilydale to Healesville	N4	1	1	1	0
e687_in	Kilsyth to Croydon via Mooroolbark	N1	3	1.5	3	0
e687_out	Croydon to Kilsyth via Mooroolbark	N1	3	1.5	3	0
e688_in	Mooroolbark to Upper Ferntree Gully	N4	1	1	1	0



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e688_out	Upper Ferntree Gully to Mooroolbark	N4	1	1	1	0
e689_in	Lilydale to Mooroolbark via Montrose	NL3	1.5	1.5	1.5	1
e689_out	Mooroolbark to Lilydale via Montrose	NL3	1.5	1.5	1.5	1
e690_in	Boronia to Croydon	C4	3	1.5	3	1.5
e690_out	Croydon to Boronia	C4	3	1.5	3	1.5
e691_in	Ferntree Gully to Boronia	C4	3	1.5	3	1.5
e691_out	Boronia to Ferntree Gully	C4	3	1.5	3	1.5
e692_in	Chirnside SC to Croydon via Mooroolbark	NL3	1.5	1.5	1.5	1
e692_out	Croydon to Chirnside SC via Mooroolbark	NL3	1.5	1.5	1.5	1
e693_in	Ferntree Gully to Caulfield	P1A	12	6	12	6
e693_out	Caulfield to Ferntree Gully	P1A	12	6	12	6
e694_in	Chirnside SC to Croydon	N3	1.5	1	1.5	0
e694_out	Croydon to Chirnside SC	N3	1.5	1	1.5	0
e695_in	Gembrook to Belgrave	#N/A	0	0	0	0
e695_out	Belgrave to Gembrook	#N/A	0	0	0	0
e697_in	Belgrave to Narre Warren Station	N4	1	1	1	0
e697_out	Narre Warren Station to Belgrave	N4	1	1	1	0
e698_ccw	Upwey Loop	C4	3	1.5	3	1.5
e699_in	Belgrave to Upwey	C4	3	1.5	3	1.5
e699_out	Upwey to Belgrave	C4	3	1.5	3	1.5
e700_in	Monash Uni to Glen Waverley via Mt Waverley	NL3	1.5	1.5	1.5	1
e700_out	Glen Waverley to Monash Uni via Mt Waverley	NL3	1.5	1.5	1.5	1
e701_in	Middle Brighton to Oakleigh	C3	3	3	3	1.5
e701_out	Oakleigh to Middle Brighton	C3	3	3	3	1.5
e702_in	Hampton to Westall	C3	3	3	3	1.5
e702_out	Westall to Hampton	C3	3	3	3	1.5
e703_b_in	Brighton to Clayton	P2A	6	3	6	3
e703_b_out	Clayton to Brighton	P2A	6	3	6	3
e704_in	Ormond to Oakleigh	N1	3	1.5	3	0
e704_out	Oakleigh to Ormond	N1	3	1.5	3	0
e706_in	Aspendale to Mentone	C4	3	1.5	3	1.5
e706_out	Mentone to Aspendale	C4	3	1.5	3	1.5
e707_in	Mordialloc to Mentone	NL3	1.5	1.5	1.5	1
e707_out	Mentone to Mordialloc	NL3	1.5	1.5	1.5	1
e709_in	Brighton Beach to Clayton	C4	3	1.5	3	1.5
e709_out	Clayton to Brighton Beach	C4	3	1.5	3	1.5
e728_in	Glen Waverley to Box Hill	NL5	1	1	1	1
e728_out	Box Hill to Glen Waverley	NL5	1	1	1	1
e729_in	Huntingdale to Mt Waverley	N3	1.5	1	1.5	0
e729_out	Mt Waverley to Huntingdale	N3	1.5	1	1.5	0
e730_in	Nunawading to Ashburton via Deakin Uni	C4	3	1.5	3	1.5
e730_out	Ashburton to Nunawading via Deakin Uni	C4	3	1.5	3	1.5
e731_in	Forest Hill SC to Deakin Uni	N3	1.5	1	1.5	0
e731_out	Deakin Uni to Forest Hill SC	N3	1.5	1	1.5	0
e732_in	Ferntree Gully to Vermont SC	P2A	6	3	6	3
e732_out	Vermont SC to Ferntree Gully	P2A	6	3	6	3
e733_in	Mordialloc to Box Hill	P2A	6	3	6	3
e733_out	Box Hill to Mordialloc	P2A	6	3	6	3
e734_in	Boronia to Caulfield	P1A	12	6	12	6
e734_out	Caulfield to Boronia	P1A	12	6	12	6
e735_in	Vermont South SC to Blackburn	N4	1	1	1	0
e735_out	Blackburn to Vermont South SC	N4	1	1	1	0
e736_in	Vermont SC to Mitcham	N3	1.5	1	1.5	0
e736_out	Mitcham to Vermont SC	N3	1.5	1	1.5	0
e739_in	Holmesglen to Mt Waverley	C4	3	1.5	3	1.5
e739_out	Mt Waverley to Holmesglen	C4	3	1.5	3	1.5
e740_in	Heatherdale to Vermont SC	N3	1.5	1	1.5	0
e740_out	Vermont SC to Heatherdale	N3	1.5	1	1.5	0
e741_in	Glen Waverley to Syndal	N1	3	1.5	3	0



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e741_out	Syndal to Glen Waverley	N1	3	1.5	3	0
e742_in	Boronia to Bayswater	N1	3	1.5	3	0
e742_out	Bayswater to Boronia	N1	3	1.5	3	0
e745_in	Knox SC to Bayswater	C4	3	1.5	3	1.5
e745_out	Bayswater to Knox SC	C4	3	1.5	3	1.5
e746_in	Boronia to Knox SC	NL3	1.5	1.5	1.5	1
e746_out	Knox SC to Boronia	NL3	1.5	1.5	1.5	1
e747_in	Ferntree Gully to Knox SC	N3	1.5	1	1.5	0
e747_out	Knox SC to Ferntree Gully	N3	1.5	1	1.5	0
e754_in	Monash Uni to Glen Waverley via Mt Waverley	C4	3	1.5	3	1.5
e754_out	Glen Waverley to Monash Uni via Mt Waverley	C4	3	1.5	3	1.5
e755_in	Boronia to Bayswater	C4	3	1.5	3	1.5
e755_out	Bayswater to Boronia	C4	3	1.5	3	1.5
e757_in	Stud Park SC to Knox SC	N4	1	1	1	0
e757_out	Knox SC to Stud Park SC	N4	1	1	1	0
e758_in	Ferntree Gully to Knox SC via Knoxfield	N4	1	1	1	0
e758_out	Knox SC to Ferntree Gully via Knoxfield	N4	1	1	1	0
e765_in	Nunawading to Box Hill	N1	3	1.5	3	0
e765_out	Box Hill to Nunawading	N1	3	1.5	3	0
e767_in	Southland to Box Hill	P2A	6	3	6	3
e767_out	Box Hill to Southland	P2A	6	3	6	3
e770_in	Karingal SC to Frankston	P2B	3	3	3	3
e770_out	Frankston to Karingal SC	P2B	3	3	3	3
e772_in	Frankston South to Frankston via Rosedale Grove	NL3	1.5	1.5	1.5	1
e772_out	Frankston to Frankston South via Rosedale Grove	NL3	1.5	1.5	1.5	1
e773_in	Frankston South to Frankston via Humphries Road	NL3	1.5	1.5	1.5	1
e773_out	Frankston to Frankston South via Humphries Road	NL3	1.5	1.5	1.5	1
e774_in	Mt Eliza to Frankston	NL3	1.5	1.5	1.5	1
e774_out	Frankston to Mt Eliza	NL3	1.5	1.5	1.5	1
e775_in	Frankston South to Frankston	C3	3	3	3	1.5
e775_out	Frankston to Frankston South	C3	3	3	3	1.5
e776_in	Pearcedale to Frankston	NL3	1.5	1.5	1.5	1
e776_out	Frankston to Pearcedale	NL3	1.5	1.5	1.5	1
e778_in	Seaford to Carrum Downs via Hall Rd	C3	3	3	3	1.5
e778_out	Carrum Downs to Seaford via Hall Rd	C3	3	3	3	1.5
e779_in	Carrum to Mordialloc	P2B	3	3	3	3
e779_out	Mordialloc to Carrum	P2B	3	3	3	3
e780_in	Frankston to Carrum via Seaford	P2B	3	3	3	3
e780_out	Carrum to Frankston via Seaford	P2B	3	3	3	3
e781_in	Rye to Frankston via Mt Martha	NL3	1.5	1.5	1.5	1
e781_out	Frankston to Rye via Mt Martha	NL3	1.5	1.5	1.5	1
e782_in	Flinders to Bittern via Balnarring	Peri1	0.75	0.75	0.75	0.75
e782_out	Bittern to Flinders via Balnarring	Peri1	0.75	0.75	0.75	0.75
e783/782_in	Belnarring to Bittern	Peri1	0.75	0.75	0.75	0.75
e783/782_o ut	Frankston to Bittern	NL3	1.5	1.5	1.5	1
e783_in	Bittern to Frankston	NL3	1.5	1.5	1.5	1
e783_out	Bittern to Belnarring	Peri1	0.75	0.75	0.75	0.75
e784_in	Osbourne to Mornington Town via Dunns Road	NL3	1.5	1.5	1.5	1
e784_out	Mornington Town to Osbourne via Dunns Road	NL3	1.5	1.5	1.5	1
e785_in	Osbourne to Mornington Town via Racecourse Road	NL3	1.5	1.5	1.5	1
e785_out	Mornington Town to Osbourne via Racecourse Road	NL3	1.5	1.5	1.5	1
e786_in	St Andrews to Rye	NL3	1.5	1.5	1.5	1
e786_out	Rye to St Andrews	NL3	1.5	1.5	1.5	1
e788_in	Rye to Frankston	P2B	3	3	3	3
e788_out	Frankston to Rye	P2B	3	3	3	3
e788a_in	Portsea to Rye via Melbourne Road	NL3	1.5	1.5	1.5	1
e788a_out	Rye to Portsea via Melbourne Road	NL3	1.5	1.5	1.5	1
e788b_in	Portsea to Rye via Point Nepean Hwy	NL3	1.5	1.5	1.5	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e788b_out	Rye to Portsea via Point Nepean Hwy	NL3	1.5	1.5	1.5	1
e789_in	Langwarrin North to Frankston	C4	3	1.5	3	1.5
e789_out	Frankston to Langwarrin North	C4	3	1.5	3	1.5
e790_in	Langwarrin South to Frankston	C4	3	1.5	3	1.5
e790_out	Frankston to Langwarrin South	C4	3	1.5	3	1.5
e791_in	Frankston to Cranbourne	P1A	12	6	12	6
e791_out	Cranbourne to Frankston	P1A	12	6	12	6
e792_in	Clyde to Cranbourne via Botanic Ridge	C4	3	1.5	3	1.5
e792_out	Cranbourne to Clyde via Botanic Ridge	C4	3	1.5	3	1.5
e793_in	Tooradin to Cranbourne	Peri1	0.75	0.75	0.75	0.75
e793_out	Cranbourne to Tooradin	Peri1	0.75	0.75	0.75	0.75
e794_in	Warneet to Cranbourne	Peri1	0.75	0.75	0.75	0.75
e794_out	Cranbourne to Warneet	Peri1	0.75	0.75	0.75	0.75
e795_in	Cannons Creek to Cranbourne	Peri1	0.75	0.75	0.75	0.75
e795_out	Cranbourne to Cannons Creek	Peri1	0.75	0.75	0.75	0.75
e797_in	Cranbourne West to Cranbourne	C4	3	1.5	3	1.5
e797_out	Cranbourne to Cranbourne West	C4	3	1.5	3	1.5
e798_in	Clyde North to Cranbourne via Heather Ave	P2B	3	3	3	3
e798_out	Cranbourne to Clyde North via Heather Ave	P2B	3	3	3	3
e799_in	Merinda Park to Casey Central SC	NL3	1.5	1.5	1.5	1
e799_out	Casey Central SC to Merinda Park	NL3	1.5	1.5	1.5	1
e800_in	Dandenong to Chadstone SC	P2A	6	3	6	3
e800_out	Chadstone SC to Dandenong	P2A	6	3	6	3
e801_in	Cranbourne East to Lynbrook	P2A	6	3	6	3
e801_out	Lynbrook to Cranbourne East	P2A	6	3	6	3
e813_in	Sandown to Waverley Gardens	N3	1.5	1	1.5	0
e813_out	Waverley Gardens to Sandown	N3	1.5	1	1.5	0
e814_in	Waverley Gardens SC to Westall	N3	1.5	1	1.5	0
e814_out	Westall to Waverley Gardens SC	N3	1.5	1	1.5	0
e815_in	Parkmore SC to Yarraman	N3	1.5	1	1.5	0
e815_out	Yarraman to Parkmore SC	N3	1.5	1	1.5	0
e816_in	Parkmore SC to Noble Park	NL3	1.5	1.5	1.5	1
e816_out	Noble Park to Parkmore SC	NL3	1.5	1.5	1.5	1
e817_in	Parkmore SC to Sandown	NL3	1.5	1.5	1.5	1
e817_out	Sandown to Parkmore SC	NL3	1.5	1.5	1.5	1
e825_in	Mentone to Sandringham	C3	3	3	3	1.5
e825_out	Sandringham to Mentone	C3	3	3	3	1.5
e826_in	Sandringham to Caulfield	NL3	1.5	1.5	1.5	1
e826_out	Caulfield to Sandringham	NL3	1.5	1.5	1.5	1
e827_in	Hallam to Dandenong	P2A	6	3	6	3
e827_out	Dandenong to Hallam	P2A	6	3	6	3
e828_in	Dandenong to Sandringham	P0A	12	12	12	12
e828_out	Sandringham to Dandenong	P0A	12	12	12	12
e829_in	Berwick to Dandenong	C3	3	3	3	1.5
e829_out	Dandenong to Berwick	C3	3	3	3	1.5
e83_in	Noble Park to Glen Waverley	P2A	6	3	6	3
e83_out	Glen Waverley to Noble Park	P2A	6	3	6	3
e832_in	Frankston to Carrum via Carrum Downs	P2B	3	3	3	3
e832_out	Carrum to Frankston via Carrum Downs	P2B	3	3	3	3
e833_in	Seaford to Carrum Downs	C3	3	3	3	1.5
e833_out	Carrum Downs to Seaford	C3	3	3	3	1.5
e834_in	Berwick RS to Jackson Reserve	C3	3	3	3	1.5
e834_out	Jackson Reserve to Berwick RS	C3	3	3	3	1.5
e835_in	Cranbourne East to Narre Warren	C3	3	3	3	1.5
e835_out	Narre Warren to Cranbourne East	C3	3	3	3	1.5
e837_in	Princes Hwy Activity Centre (Officer) to Berwick via Beaconsfield	N3	1.5	1	1.5	0
e837_out	Berwick to Princes Hwy Activity Centre (Officer) via Beaconsfield	N3	1.5	1	1.5	0



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e839_in	Berwick East to Parkhill Plaza	NL3	1.5	1.5	1.5	1
e839_out	Parkhill Plaza to Berwick East	NL3	1.5	1.5	1.5	1
e841_in	Narre Warren to Endeavour Hills	NL3	1.5	1.5	1.5	1
e841_out	Endeavour Hills to Narre Warren	NL3	1.5	1.5	1.5	1
e844_in	Endeavour Hills SC to Dandenong	P2A	6	3	6	3
e844_out	Dandenong to Endeavour Hills SC	P2A	6	3	6	3
e845_cw	Endeavour Hills SC Loop	NL3	1.5	1.5	1.5	1
e845_cw	Endeavour Hills SC Loop	NL3	1.5	1.5	1.5	1
e846_cw	Berwick town Loop	N4	1	1	1	0
e848_in	Wheelers Hill SC to Brandon Park SC	N4	1	1	1	0
e848_out	Brandon Park SC to Wheelers Hill SC	N4	1	1	1	0
e850_in	Brandon Park SC to Glen Waverley	N3	1.5	1	1.5	0
e850_out	Glen Waverley to Brandon Park SC	N3	1.5	1	1.5	0
e851_in	Glen Waverley to Mitcham	P2B	3	3	3	3
e851_out	Mitcham to Glen Waverley	P2B	3	3	3	3
e852_in	Dandenong to Clayton	P2C	12	3	12	3
e852_out	Clayton to Dandenong	P2C	12	3	12	3
e857_in	Bonbeach to Chelsea	C4	3	1.5	3	1.5
e857_out	Chelsea to Bonbeach	C4	3	1.5	3	1.5
e858_in	Parkmore SC to Dandenong	NL3	1.5	1.5	1.5	1
e858_out	Dandenong to Parkmore SC	NL3	1.5	1.5	1.5	1
e866_in	Chisholm TAFE to Rosebud	N4	1	1	1	0
e866_out	Rosebud to Chisholm TAFE	N4	1	1	1	0
e891_in	Lynbrook to Narre Warren	C4	3	1.5	3	1.5
e891_out	Narre Warren to Lynbrook	C4	3	1.5	3	1.5
e892_in	Narre Warren South to Dandenong	C4	3	1.5	3	1.5
e892_out	Dandenong to Narre Warren South	C4	3	1.5	3	1.5
e893_in	Cranbourne to Dandenong	C3	3	3	3	1.5
e893_out	Dandenong to Cranbourne	C3	3	3	3	1.5
e895_in	Fountain Gate SC to Casey Central SC	C4	3	1.5	3	1.5
e895_out	Casey Central SC to Fountain Gate SC	C4	3	1.5	3	1.5
e900_in	Croydon to Elsternwick	P1A	12	6	12	6
e900_out	Elsternwick to Croydon	P1A	12	6	12	6
e901_in	Frankston to Ringwood	P0A	12	12	12	12
e901_out	Ringwood to Frankston	P0A	12	12	12	12
e902_in	Chelsea to Greensborough	P0A	12	12	12	12
e902_out	Greensborough to Chelsea	P0A	12	12	12	12
e904_in	The Pines SC to Clayton	P0A	12	12	12	12
e904_out	Clayton to The Pines SC	P0A	12	12	12	12
e905_in	Warrandyte to City	P2A	6	3	6	3
e905_out	City to The Pines SC via Templestowe	P2A	6	3	6	3
e906_in	Warrandyte to City	P1A	12	6	12	6
e906_out	City to Warrandyte	P1A	12	6	12	6
e907_in	Warrandyte to City	P1A	12	6	12	6
e907_out	Docklands to Mitcham	P1A	12	6	12	6
e908_in	Warrandyte to City	P2A	6	3	6	3
e908_out	Docklands to The Pines SC via Doncaster	P2A	6	3	6	3
e920_in	Officer to Lynbrook	P1B	6	6	6	6
e920_out	Lynbrook to Officer	P1B	6	6	6	6
e921_in	Cardinia Road to Officer	C4	3	1.5	3	1.5
e921_out	Officer to Cardinia Road	C4	3	1.5	3	1.5
e922_in	Princess Hwy Activity Centre (Officer) to Officer Town Centre	NL3	1.5	1.5	1.5	1
e922_out	Officer Town Centre to Princess Hwy Activity Centre (Officer)	NL3	1.5	1.5	1.5	1
e923_in	Officer to Casey Central	C3	3	3	3	1.5
e923_out	Casey Central to Officer	C3	3	3	3	1.5
e924_cw	Pakenham Business Park Loop	NL3	1.5	1.5	1.5	1
e925_cw	Cardinia Road to Officer Nth	NL3	1.5	1.5	1.5	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
e925_in	Officer Nth to Cardinia Road	NL3	1.5	1.5	1.5	1
e926_in	Pakenham to Cardinia Road via Pakenham North West	C4	3	1.5	3	1.5
e926_out	Cardinia Road to Pakenham via Pakenham North West	C4	3	1.5	3	1.5
e927_ccw	Pakenham Station/Pakenham North Loop	NL3	1.5	1.5	1.5	1
e928_in	Pakenham to Cardinia Road via Pakenham Sth	C4	3	1.5	3	1.5
e928_out	Cardinia Road to Pakenham via Pakenham Sth	C4	3	1.5	3	1.5
e929_cw	Pakenham Station/Pakenham North East Loop	C4	3	1.5	3	1.5
e930_in	Pakenham East to Pakenham Station	NL3	1.5	1.5	1.5	1
e930_out	Pakenham Station to Pakenham East	NL3	1.5	1.5	1.5	1
e931_in	Officer to Beaconsfield	NL3	1.5	1.5	1.5	1
e931_out	Beaconsfield to Officer	NL3	1.5	1.5	1.5	1
e941_in	Clyde South to Clyde	NL3	1.5	1.5	1.5	1
e941_out	Clyde to Clyde South	NL3	1.5	1.5	1.5	1
e942_in	Pearcedale to Cranbourne	Peri1	0.75	0.75	0.75	0.75
e942_out	Cranbourne to Pearcedale	Peri1	0.75	0.75	0.75	0.75
n001_tb_in	Merrifield Express Upfield - Beveridge	P2B	3	3	3	3
n001_tb_out	Merrifield Express Beveridge - Upfield	P2B	3	3	3	3
n002_tb_in	Merrifield - Craigieburn	C4	3	1.5	3	1.5
n002_tb_out	Craigieburn - Merrifield	C4	3	1.5	3	1.5
n003_tb_in	Donnybrook - Upfield	C3	3	3	3	1.5
n003_tb_out	Upfield - Donnybrook	C3	3	3	3	1.5
n004_tb_in	Beveridge - Epping	C3	3	3	3	1.5
n004_tb_out	Epping - Beveridge	C3	3	3	3	1.5
n011_in	Wallan to Melbourne Airport	P2B	3	3	3	3
n011_out	Melbourne Airport to Wallan	P2B	3	3	3	3
n250_in	La Trobe University to City	P1A	12	6	12	6
n250_out	City to La Trobe University	P1A	12	6	12	6
n251_in	La Trobe Uni to Moonee Ponds via Clifton Hill & Northland	C4	3	1.5	3	1.5
n251_out	Moonee Ponds to La Trobe Uni via Clifton Hill & Northland	C4	3	1.5	3	1.5
n303_in	Greensborough to Coburg	P2A	6	3	6	3
n303_out	Coburg to Greensborough	P2A	6	3	6	3
n311_in	Doreen West to South Morang	C4	3	1.5	3	1.5
n311_out	South Morang to Doreen West	C4	3	1.5	3	1.5
n313_cw	Doreen South/Mernda North Loop	NL2	2	2	2	1
n315_in	South Morang to Greensborough	NL5	1	1	1	1
n315_out	Greensborough to South Morang	NL5	1	1	1	1
n317_in	Whittlesea to Mernda	NL5	1	1	1	1
n317_out	Mernda to Whittlesea	NL5	1	1	1	1
n322_in	Doreen North to South Morang via Lakes Bvd	C4	3	1.5	3	1.5
n322_out	South Morang to Doreen North via Lakes Bvd	C4	3	1.5	3	1.5
n323_in	Mernda North to South Morang	NL2	2	2	2	1
n323_out	South Morang to Mernda North	NL2	2	2	2	1
n342_in	Eltham North to Greensborough	C4	3	1.5	3	1.5
n342_out	Greensborough to Eltham North	C4	3	1.5	3	1.5
n343_in	Diamond Creek to Greensborough	C4	3	1.5	3	1.5
n343_out	Greensborough to Diamond Creek	C4	3	1.5	3	1.5
n344_in	Campbellfield to West Preston	C3	3	3	3	1.5
n344_out	West Preston to Campbellfield	C3	3	3	3	1.5
n345_in	South Morang to Northland	C4	3	1.5	3	1.5
n345_out	Northland to South Morang	C4	3	1.5	3	1.5
n346_in	North South Morang to Thomastown	NL5	1	1	1	1
n346_out	Thomastown to North South Morang	NL5	1	1	1	1
n347_in	Greensborough to Heidelberg	C4	3	1.5	3	1.5
n347_out	Heidelberg to Greensborough	C4	3	1.5	3	1.5
n351_in	Beveridge - Epping	P2C	12	3	12	3
n351_out	Epping - Beveridge	P2C	12	3	12	3
n352_in	Northland to Keon Park	NL2	2	2	2	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
n352_out	Keon Park to Northland	NL2	2	2	2	1
n353_in	Eltham to Heidelberg via Rosanna Stn	NL3	1.5	1.5	1.5	1
n353_out	Heidelberg to Eltham via Rosanna Stn	NL3	1.5	1.5	1.5	1
n354_in	Thomastown West Loop SB	C4	3	1.5	3	1.5
n354_out	Thomastown West Loop NB	C4	3	1.5	3	1.5
n355_in	Epping Plaza to Northland Shopping Centre	C4	3	1.5	3	1.5
n355_out	Northland Shopping Centre to Epping Plaza	C4	3	1.5	3	1.5
n356_in	Wollert to Epping	C4	3	1.5	3	1.5
n356_out	Epping to Wollert	C4	3	1.5	3	1.5
n357_in	Wollert to Epping	NL2	2	2	2	1
n357_out	Epping to Wollert	NL2	2	2	2	1
n358_in	Wollert to Epping	C4	3	1.5	3	1.5
n358_out	Epping to Wollert	C4	3	1.5	3	1.5
n361_in	Wollert to Thomastown via Harvest Home Rd	C3	3	3	3	1.5
n361_out	Thomastown to Wollert via Harvest Home Rd	C3	3	3	3	1.5
n362_in	Wollert to South Morang via Quarry Hills	C4	3	1.5	3	1.5
n362_out	South Morang to Wollert via Quarry Hills	C4	3	1.5	3	1.5
n368_in	Greensborough to Macleod	NL2	2	2	2	1
n368_out	Macleod to Greensborough	NL2	2	2	2	1
n379_in	Research to Eltham	NL3	1.5	1.5	1.5	1
n379_out	Eltham to Research	NL3	1.5	1.5	1.5	1
n382_ccw	Eltham Town Service Loop	NL2	2	2	2	1
n401_in	North Melbourne to Parkville	401_SPECIAL (2046)	40	15	40	6
n401_out	Parkville to North Melbourne	401_SPECIAL (2046)	40	15	40	6
n407_in	Nth Moonee Valley to Sth Moonee Valley	N4	1	1	1	0
n407_out	Sth Moonee Valley to Nth Moonee Valley	N4	1	1	1	0
n464_in	Airport West to Essendon	C4	3	1.5	3	1.5
n464_out	Essendon to Airport West	C4	3	1.5	3	1.5
n465_in	Keilor Park to Essendon	P2A	6	3	6	3
n465_out	Essendon to Keilor Park	P2A	6	3	6	3
n467_in	Aberfeldie to Moonee Ponds	C4	3	1.5	3	1.5
n467_out	Moonee Ponds to Aberfeldie	C4	3	1.5	3	1.5
n480_in	Roxburgh Park to Essendon	C4	3	1.5	3	1.5
n480_out	Essendon to Roxburgh Park	C4	3	1.5	3	1.5
n482_in	Melbourne Airport to Airport West via Industrial Route	N4	1	1	1	0
n482_out	Airport West to Melbourne Airport via Industrial Route	N4	1	1	1	0
n484_in	Roxburgh Park to Broadmeadows	NL3	1.5	1.5	1.5	1
n484_out	Broadmeadows to Roxburgh Park	NL3	1.5	1.5	1.5	1
n490x_in	Gowanbrae to Airport West	N4	1	1	1	0
n490x_out	Airport West to Gowanbrae	N4	1	1	1	0
n500_in	Melbourne Airport to Airport West	P2B	3	3	3	3
n500_out	Airport West to Melbourne Airport	P2B	3	3	3	3
n503_in	Essendon to East Brunswick	NL2	2	2	2	1
n503_out	East Brunswick to Essendon	NL2	2	2	2	1
n505x_in	Moonee Ponds to Melbourne University	N4	1	1	1	0
n505x_out	Melbourne University to Moonee Ponds	N4	1	1	1	0
n506_in	Moonee Ponds to Clifton Hil	P2B	3	3	3	3
n506_out	Clifton Hil to Moonee Ponds	P2B	3	3	3	3
n507_in	Airport West to Moonee Ponds	C4	3	1.5	3	1.5
n507_out	Moonee Ponds to Airport West	C4	3	1.5	3	1.5
n508_in	Heidelberg to Moonee Ponds	P2B	3	3	3	3
n508_out	Moonee Ponds to Heidelberg	P2B	3	3	3	3
n509_in	South Morang to Airport West	P2A	6	3	6	3
n509_out	Airport West to South Morang	P2A	6	3	6	3
n510_in	Ivanhoe to Essendon	P2A	6	3	6	3
n510_out	Essendon to Ivanhoe	P2A	6	3	6	3
n512_in	East Coburg to Essendon DFO	C4	3	1.5	3	1.5



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
n512_out	Essendon DFO to East Coburg	C4	3	1.5	3	1.5
n513_in	Eltham to Glenroy	P1A	12	6	12	6
n513_out	Glenroy to Eltham	P1A	12	6	12	6
n525_in	Lockerbie to Craigieburn Central	C4	3	1.5	3	1.5
n525_out	Craigieburn Central to Lockerbie	C4	3	1.5	3	1.5
n526_in	Mt Ridley Road to Craigieburn	C4	3	1.5	3	1.5
n526_out	Craigieburn to Mt Ridley Road	C4	3	1.5	3	1.5
n527_in	Glenroy to Northland	C4	3	1.5	3	1.5
n527_out	Northland to Glenroy	C4	3	1.5	3	1.5
n529_in	Lockerbie - Epping	C3	3	3	3	1.5
n529_out	Epping - Lockerbie	C3	3	3	3	1.5
n530_in	Cambellfield to Coburg	NL3	1.5	1.5	1.5	1
n530_out	Coburg to Cambellfield	NL3	1.5	1.5	1.5	1
n531_in	Upfield to North Coburg	C4	3	1.5	3	1.5
n531_out	North Coburg to Upfield	C4	3	1.5	3	1.5
n532_in	Craigieburn to Broadmeadows	NL4	1.5	1	1.5	1
n532_out	Broadmeadows to Craigieburn	NL4	1.5	1	1.5	1
n533_in	Craigieburn North to Craigieburn	C3	3	3	3	1.5
n533_out	Craigieburn to Craigieburn North	C3	3	3	3	1.5
n536_in	Gowrie to Pascoe Vale	P2A	6	3	6	3
n536_out	Pascoe Vale to Gowrie	P2A	6	3	6	3
n537_in	Craigieburn to Roxburgh Park	C4	3	1.5	3	1.5
n537_out	Roxburgh Park to Craigieburn	C4	3	1.5	3	1.5
n538_in	Craigieburn Station to Roxburgh Park	C3	3	3	3	1.5
n538_out	Roxburgh Park to Craigieburn Station	C3	3	3	3	1.5
n540_in	Campbellfield to Glenroy via Upfield	C4	3	1.5	3	1.5
n540_out	Glenroy to Campbellfield via Upfield	C4	3	1.5	3	1.5
n541_in	Roxburgh Park to Broadmeadows	C4	3	1.5	3	1.5
n541_out	Broadmeadows to Roxburgh Park	C4	3	1.5	3	1.5
n542_in	Broadmeadows to Coburg	P2A	6	3	6	3
n542_out	Coburg to Broadmeadows	P2A	6	3	6	3
n544_in	Craigieburn to Roxburgh Park	C3	3	3	3	1.5
n544_out	Roxburgh Park to Craigieburn	C3	3	3	3	1.5
n566_in	Epping to Greensborough	C4	3	1.5	3	1.5
n566_out	Greensborough to Epping	C4	3	1.5	3	1.5
n583_in	Lockerbie to Epping	C4	3	1.5	3	1.5
n583_out	Epping to Lockerbie	C4	3	1.5	3	1.5
n584_in	Mernda to Craigieburn	P2B	3	3	3	3
n584_out	Craigieburn to Mernda	P2B	3	3	3	3
n585_in	Donnybrook to Craigieburn South	C4	3	1.5	3	1.5
n585_out	Craigieburn South to Donnybrook	C4	3	1.5	3	1.5
n586_cw	Beveridge/Mandalay Loop	C4	3	1.5	3	1.5
n589_ccw	Lockerbie Loop	C3	3	3	3	1.5
n589_cw	Lockerbie Loop	C3	3	3	3	1.5
n591_in	Beveridge to Lockerbie	C4	3	1.5	3	1.5
n591_out	Lockerbie to Beveridge	C4	3	1.5	3	1.5
n902_in	Melbourne Airport to Eltham	P1A	12	6	12	6
n902_out	Eltham to Melbourne Airport	P1A	12	6	12	6
n911_in	Craigieburn to Broadmeadows	C4	3	1.5	3	1.5
n911_out	Broadmeadows to Craigieburn	C4	3	1.5	3	1.5
n913_in	Heidelberg to Essendon	P2A	6	3	6	3
n913_out	Essendon to Heidelberg	P2A	6	3	6	3
w101_in	Caroline Springs to Watergardens	C4	3	1.5	3	1.5
w101_out	Watergardens to Caroline Springs	C4	3	1.5	3	1.5
w102_in	Laverton to Deer Park	N3	1.5	1	1.5	0
w102_out	Deer Park to Laverton	N3	1.5	1	1.5	0
w105_in	Tarneit to Williams Landing	N1	3	1.5	3	0
w105_out	Williams Landing to Tarneit	N1	3	1.5	3	0
w106_in	Werribee to Tarneit	P2C	12	3	12	3



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
w106_out	Tarneit to Werribee	P2C	12	3	12	3
w107_in	Sayers Rd to Hoppers Crossing	P2C	12	3	12	3
w107_out	Hoppers Crossing to Sayers Rd	P2C	12	3	12	3
w110_in	Werribee to Tarneit	P2C	12	3	12	3
w110_out	Tarneit to Werribee	P2C	12	3	12	3
w113_in	Eynesbury to Melton North	C4	3	1.5	3	1.5
w113_out	Melton North to Eynesbury	C4	3	1.5	3	1.5
w114_in	Rockbank to Caroline Springs	NL3	1.5	1.5	1.5	1
w114_out	Caroline Springs to Rockbank	NL3	1.5	1.5	1.5	1
w115_in	Watergardens to Ravenhall	NL3	1.5	1.5	1.5	1
w115_out	Ravenhall to Watergardens	NL3	1.5	1.5	1.5	1
w116_in	Melton to Rockbank	NL3	1.5	1.5	1.5	1
w116_out	Rockbank to Melton	NL3	1.5	1.5	1.5	1
w117_in	Melton to Toolern	P2A	6	3	6	3
w117_out	Toolern to Melton	P2A	6	3	6	3
w118_in	Melton to Toolern	NL3	1.5	1.5	1.5	1
w118_out	Toolern to Melton	NL3	1.5	1.5	1.5	1
w119_in	Rockbank to Caroline Springs	N3	1.5	1	1.5	0
w119_out	Caroline Springs to Rockbank	N3	1.5	1	1.5	0
w120_in	Woodgrove SC to Melton Station	C4	3	1.5	3	1.5
w120_out	Melton Station to Woodgrove SC	C4	3	1.5	3	1.5
w121_in	Watergardens to Ravenhall	N3	1.5	1	1.5	0
w121_out	Ravenhall to Watergardens	N3	1.5	1	1.5	0
w122_in	Melton to Rockbank	P2C	12	3	12	3
w122_out	Rockbank to Melton	P2C	12	3	12	3
w123_in	Toolern North to Rockbank	NL3	1.5	1.5	1.5	1
w123_out	Rockbank to Toolern North	NL3	1.5	1.5	1.5	1
w124_in	Toolern to Tarneit	P2A	6	3	6	3
w124_out	Tarneit to Toolern	P2A	6	3	6	3
w125_in	Toolern to Tarneit	C4	3	1.5	3	1.5
w125_out	Tarneit to Toolern	C4	3	1.5	3	1.5
w125a_in	Tarneit to Truganina	C4	3	1.5	3	1.5
w125a_out	Truganina to Tarneit	C4	3	1.5	3	1.5
w128_in	Toolern to Rockbank	C4	3	1.5	3	1.5
w128_out	Rockbank to Toolern	C4	3	1.5	3	1.5
w131_in	Laverton to Sunshine	N3	1.5	1	1.5	0
w131_out	Sunshine to Laverton	N3	1.5	1	1.5	0
w135_in	Tarneit to Laverton	C4	3	1.5	3	1.5
w135_out	Laverton to Tarneit	C4	3	1.5	3	1.5
w144_in	Hoppers Crossing to Williams Landing	P2A	6	3	6	3
w144_out	Williams Landing to Hoppers Crossing	P2A	6	3	6	3
w178_in	Truganina to Williams Landing	N4	1	1	1	0
w178_out	Williams Landing to Truganina	N4	1	1	1	0
w179_in	Davis Rd to Hoppers Crossing	P2C	12	3	12	3
w179_out	Hoppers Crossing to Davis Rd	P2C	12	3	12	3
w183_in	Wyndham Vale to Werribee	C4	3	1.5	3	1.5
w183_out	Werribee to Wyndham Vale	C4	3	1.5	3	1.5
w184_ccw	Manor Lakes/Sayers Rd Loop	NL3	1.5	1.5	1.5	1
w184_cw	Manor Lakes/Sayers Rd Loop	NL3	1.5	1.5	1.5	1
w185_in	Sayers Rd to Truganina	NL3	1.5	1.5	1.5	1
w185_out	Truganina to Sayers Rd	NL3	1.5	1.5	1.5	1
w186_in	Wyndham Vale to Truganina	C3	3	3	3	1.5
w186_out	Truganina to Wyndham Vale	C3	3	3	3	1.5
w187_in	Davis Rd to Truganina	C4	3	1.5	3	1.5
w187_out	Truganina to Davis Rd	C4	3	1.5	3	1.5
w216_in	Caroline Springs to Sunshine	P2B	3	3	3	3
w216_out	Sunshine to Caroline Springs	P2B	3	3	3	3
w219_in	Sunshine to Footscray	P1A	12	6	12	6
w219_out	Footscray to Sunshine	P1A	12	6	12	6



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
w220_in	Sunshine to City	P0A	12	12	12	12
w220_out	City to Sunshine	P0A	12	12	12	12
w232_in	Altona Gate to City	P2A	6	3	6	3
w232_out	City to Altona Gate	P2A	6	3	6	3
w234_in	Garden City to City	P1A	12	6	12	6
w234_out	City to Garden City	P1A	12	6	12	6
w235_in	Fishermans Bend to City	P2C	12	3	12	3
w235_out	City to Fishermans Bend	P2C	12	3	12	3
w236_in	Garden City to City via Pickles	C4	3	1.5	3	1.5
w236_out	City to Garden City via Pickles	C4	3	1.5	3	1.5
w237_in	Fishermans Bend to City	P2C	12	3	12	3
w237_out	City to Fishermans Bend	P2C	12	3	12	3
w400_in	Williams Landing to Deer Park	N3	1.5	1	1.5	0
w400_out	Deer Park to Williams Landing	N3	1.5	1	1.5	0
w400a_in	Ravenhall to Deer Park	NL3	1.5	1.5	1.5	1
w400a_out	Deer Park to Ravenhall	NL3	1.5	1.5	1.5	1
w402_in	Footscray to East Melbourne	P1B	6	6	6	6
w402_out	East Melbourne to Footscray	P1B	6	6	6	6
w404_in	Williamstown to Moonee Ponds	P1A	12	6	12	6
w404_out	Moonee Ponds to Williamstown	P1A	12	6	12	6
w406_in	Caroline Springs to Footscray via Highpoint SC	P2A	6	3	6	3
w406_out	Footscray to Caroline Springs via Highpoint SC	P2A	6	3	6	3
w406a_in	Highpoint SC to Footscray	P2B	3	3	3	3
w406a_out	Footscray to Highpoint SC	P2B	3	3	3	3
w409_in	Highpoint SC to Footscray	N1	3	1.5	3	0
w409_out	Footscray to Highpoint SC	N1	3	1.5	3	0
w410_in	Sunshine to City	P2C	12	3	12	3
w410_out	City to Sunshine	P2C	12	3	12	3
w411_in	Laverton to Footscray	P1A	12	6	12	6
w411_out	Footscray to Laverton	P1A	12	6	12	6
w414_in	Williams Landing to Footscray	P2C	12	3	12	3
w414_out	Footscray to Williams Landing	P2C	12	3	12	3
w415_in	Laverton to Williamstown	C4	3	1.5	3	1.5
w415_out	Williamstown to Laverton	C4	3	1.5	3	1.5
w418_in	Woodgrove SC to St Albans	P2C	12	3	12	3
w418_out	St Albans to Woodgrove SC	P2C	12	3	12	3
w419_in	Watergardens to Sunshine	P2A	6	3	6	3
w419_out	Sunshine to Watergardens	P2A	6	3	6	3
w420_in	0 to Sunshine - Watergardens	P2A	6	3	6	3
w420_out	Sunshine - Watergardens to 0	P2A	6	3	6	3
w421_in	Watergardens to St Albans	C4	3	1.5	3	1.5
w421_out	St Albans to Watergardens	C4	3	1.5	3	1.5
w422_in	St Albans to Deer Park	C4	3	1.5	3	1.5
w422_out	Deer Park to St Albans	C4	3	1.5	3	1.5
w423_in	Brimbank SC to Sunshine	C3	3	3	3	1.5
w423_out	Sunshine to Brimbank SC	C3	3	3	3	1.5
w424_in	Brimbank Plaza to St Albans	C4	3	1.5	3	1.5
w424_out	St Albans to Brimbank Plaza	C4	3	1.5	3	1.5
w425_in	Watergardens to St Albans	P2B	3	3	3	3
w425_out	St Albans to Watergardens	P2B	3	3	3	3
w427_in	Sunshine West to Sunshine	NL2	2	2	2	1
w427_out	Sunshine to Sunshine West	NL2	2	2	2	1
w428_in	Sunshine to Sunshine West	NL2	2	2	2	1
w428_out	Sunshine to Sunshine West	NL2	2	2	2	1
w431_in	Highpoint SC to Yarraville	P2C	12	3	12	3
w431_out	Yarraville to Highpoint SC	P2C	12	3	12	3
w432_in	Altona Gate SC to Yarraville	C4	3	1.5	3	1.5
w432_out	Yarraville to Altona Gate SC	C4	3	1.5	3	1.5
w437_in	Werribee to Hoppers Crossing	C4	3	1.5	3	1.5



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
w437_out	Hoppers Crossing to Werribee	C4	3	1.5	3	1.5
w439_in	Werribee South to Werribee	N4	1	1	1	0
w439_out	Werribee to Werribee South	N4	1	1	1	0
w440_in	Wyndham Vale to Hoppers Crossing	P2C	12	3	12	3
w440_out	Hoppers Crossing to Wyndham Vale	P2C	12	3	12	3
w441_cw	Werribee/Riverwalk Loop	N1	3	1.5	3	0
w442_in	Sayers Rd to Hoppers Crossing	NL3	1.5	1.5	1.5	1
w442_out	Hoppers Crossing to Sayers Rd	NL3	1.5	1.5	1.5	1
w443_ccw	Werribee South Ring Rd Loop	N1	3	1.5	3	0
w443_cw	Werribee South Ring Rd Loop	N1	3	1.5	3	0
w444_in	Wyndham Vale to Tarneit via Werribee	P2C	12	3	12	3
w444_out	Tarneit to Wyndham Vale via Werribee	P2C	12	3	12	3
w445_in	Wyndham Vale to Werribee	P2A	6	3	6	3
w445_out	Werribee to Wyndham Vale	P2A	6	3	6	3
w446_in	Sayers Rd to Williams Landing	P2C	12	3	12	3
w446_out	Williams Landing to Sayers Rd	P2C	12	3	12	3
w447_in	Wyndham Vale North to Werribee	P2A	6	3	6	3
w447_out	Werribee to Wyndham Vale North	P2A	6	3	6	3
w448_in	Wyndham Vale to Werribee	P2C	12	3	12	3
w448_out	Werribee to Wyndham Vale	P2C	12	3	12	3
w449_in	Wyndham Vale to Werribee	P2C	12	3	12	3
w449_out	Werribee to Wyndham Vale	P2C	12	3	12	3
w453_ccw	Melton/West Melton Loop	NL3	1.5	1.5	1.5	1
w453_cw	Melton/West Melton Loop	NL3	1.5	1.5	1.5	1
w455_in	Melton North to Melton	C3	3	3	3	1.5
w455_out	Melton to Melton North	C3	3	3	3	1.5
w456_in	Rockbank to Tarneit	P2A	6	3	6	3
w456_out	Tarneit to Rockbank	P2A	6	3	6	3
w456a_in	Toolern to Rockbank	P2A	6	3	6	3
w456a_out	Rockbank to Toolern	P2A	6	3	6	3
w457_in	Westlakes Dr to Melton	N3	1.5	1	1.5	0
w457_out	Melton to Westlakes Dr	N3	1.5	1	1.5	0
w458_in	Centenery Dr to Melton	C4	3	1.5	3	1.5
w458_out	Melton to Centenery Dr	C4	3	1.5	3	1.5
w459_in	Kurunjang to Melton	C3	3	3	3	1.5
w459_out	Melton to Kurunjang	C3	3	3	3	1.5
w460_in	Watergardens to Ravenhall	P2C	12	3	12	3
w460_out	Ravenhall to Watergardens	P2C	12	3	12	3
w461_in	Rockbank to Watergardens	C3	3	3	3	1.5
w461_out	Watergardens to Rockbank	C3	3	3	3	1.5
w462_in	Watergardens to Caroline Springs	P2B	3	3	3	3
w462_out	Caroline Springs to Watergardens	P2B	3	3	3	3
w466_in	Watergardens to Ravenhall	P2B	3	3	3	3
w466_out	Ravenhall to Watergardens	P2B	3	3	3	3
w471_in	Williamstown to Sunshine	P2C	12	3	12	3
w471_out	Sunshine to Williamstown	P2C	12	3	12	3
w472_in	Moonee Ponds to Footscray	P2A	6	3	6	3
w472_out	Footscray to Moonee Ponds	P2A	6	3	6	3
w476_in	Watergardens to Moonee Pds	C4	3	1.5	3	1.5
w476_out	Moonee Pds to Watergardens	C4	3	1.5	3	1.5
w479_in	Sunbury to Melbourne Airport	C4	3	1.5	3	1.5
w479_out	Melbourne Airport to Sunbury	C4	3	1.5	3	1.5
w479a_in	Sunbury west to Sunbury	P2A	6	3	6	3
w479a_out	Sunbury to Sunbury west	P2A	6	3	6	3
w480_in	Diggers Rest to Sunbury	P2A	6	3	6	3
w480_out	Sunbury to Diggers Rest	P2A	6	3	6	3
w481_in	Mt Lion to Sunbury	C4	3	1.5	3	1.5
w481_out	Sunbury to Mt Lion	C4	3	1.5	3	1.5
w483_in	Diggers Rest to Sunbury	NL3	1.5	1.5	1.5	1



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
w483_out	Sunbury to Diggers Rest	NL3	1.5	1.5	1.5	1
w485_in	Wilsons Rd to Sunbury	C4	3	1.5	3	1.5
w485_out	Sunbury to Wilsons Rd	C4	3	1.5	3	1.5
w486_in	Rolling Meadows to Sunbury	NL4	1.5	1	1.5	1
w486_out	Sunbury to Rolling Meadows	NL4	1.5	1	1.5	1
w487_in	Canterbury Hills to Sunbury	C3	3	3	3	1.5
w487_out	Sunbury to Canterbury Hills	C3	3	3	3	1.5
w488_in	Jacksons Hill to Sunbury	NL4	1.5	1	1.5	1
w488_out	Sunbury to Jacksons Hill	NL4	1.5	1	1.5	1
w489_in	Elizabeth Dr to Sunbury	C4	3	1.5	3	1.5
w489_out	Sunbury to Elizabeth Dr	C4	3	1.5	3	1.5
w492_in	Derrimut Rd to Williams Landing	C3	3	3	3	1.5
w492_out	Williams Landing to Derrimut Rd	C3	3	3	3	1.5
w494_in	Point Cook South to Willilams Landing	P2A	6	3	6	3
w494_out	Willilams Landing to Point Cook South	P2A	6	3	6	3
w495_in	Point Cook Sth to Williams Landing	P2A	6	3	6	3
w495_out	Williams Landing to Point Cook Sth	P2A	6	3	6	3
w496_in	Hoppers Crossing to Laverton	NL3	1.5	1.5	1.5	1
w496_out	Laverton to Hoppers Crossing	NL3	1.5	1.5	1.5	1
w497_in	Saltwater Coast to Williams Landing	P2A	6	3	6	3
w497_out	Williams Landing to Saltwater Coast	P2A	6	3	6	3
w498_in	Werribee to Laverton	P2A	6	3	6	3
w498_out	Laverton to Werribee	P2A	6	3	6	3
w499_in	Hoppers Crossing to Williams Landing	C4	3	1.5	3	1.5
w499_out	Williams Landing to Hoppers Crossing	C4	3	1.5	3	1.5
w903_in	Sunshine to Essendon via Highpoint	P1B	6	6	6	6
w903_out	Essendon to Sunshine via Highpoint	P1B	6	6	6	6
wairport_in	Melb Airport to Keilor Plains	P2A	6	3	6	3
wairport_out	Keilor Plains to Melb Airport	P2A	6	3	6	3
waltonaind_in	Altona to Sunshine	N3	1.5	1	1.5	0
waltonaind_out	Sunshine to Altona	N3	1.5	1	1.5	0
wdohertys_in	Davis Rd to Altona Gate	C4	3	1.5	3	1.5
wdohertys_out	Altona Gate to Davis Rd	C4	3	1.5	3	1.5
wforsythrd_in	Truganina to Williams Landing	P2C	12	3	12	3
wforsythrd_out	Williams Landing to Truganina	P2C	12	3	12	3
wmelttax1_in	Melton South West to Melton	N4	1	1	1	0
wmelttax1_out	Melton to Melton South West	N4	1	1	1	0
wmelttax2_in	Brookfield to Melton	N4	1	1	1	0
wmelttax2_out	Melton to Brookfield	N4	1	1	1	0
wrockbankn_in	Rockbank North to Rockbank	C4	3	1.5	3	1.5
wrockbankn_out	Rockbank to Rockbank North	C4	3	1.5	3	1.5
wrockbanks_ccw	Rockbank south loop	NL3	1.5	1.5	1.5	1
wrockbanks_cw	Rockbank south loop	NL3	1.5	1.5	1.5	1
wsunb1_in	Sunbury South to Sunbury via Sunbury SE	C4	3	1.5	3	1.5
wsunb1_out	Sunbury to Sunbury South via Sunbury SE	C4	3	1.5	3	1.5



Route ID	Route Name	PTV Service Level	Frequency			
			AM	IP	PM	OP
wsunb2_in	Sunbury East to Sunbury via Sunbury SE	C4	3	1.5	3	1.5
wsunb2_out	Sunbury to Sunbury East via Sunbury SE	C4	3	1.5	3	1.5
wsunb5_in	Sunbury North to Sunbury via Redstone Hill	P2C	12	3	12	3
wsunb5_out	Sunbury to Sunbury North via Redstone Hill	P2C	12	3	12	3
wsunb6_in	Sunbury North to Sunbury East via Redstone Hill North	C4	3	1.5	3	1.5
wsunb6_out	Sunbury East to Sunbury North via Redstone Hill North	C4	3	1.5	3	1.5
wsunshinee_in	St Albans to Sunshine via Albion	C3	3	3	3	1.5
wsunshinee_out	Sunshine to St Albans via Albion	C3	3	3	3	1.5
wtrugsouth_in	Tarneit to Truganina	NR1	0	0	0	0
wtrugsouth_out	Truganina to Tarneit	NR1	0	0	0	0



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Attachment D – Travel time plots for selected origins

Modelled Travel time from Doncaster 2016 Base Case – Car AM Peak

Modelled Travel time from Doncaster 2036 Base Case – Car AM Peak

Modelled Travel time from Greensborough 2016 Base Case – Car AM Peak

Modelled Travel time from Greensborough 2036 Base Case – Car AM Peak

Modelled Travel time from Heidelberg 2016 Base Case – Car AM Peak

Modelled Travel time from Heidelberg 2036 Base Case – Car AM Peak

Modelled Travel time from LaTrobe University 2016 Base Case – Car AM Peak

Modelled Travel time from LaTrobe University 2036 Base Case – Car AM Peak

Modelled Travel time from Mill Park 2016 Base Case – Car AM Peak

Modelled Travel time from Mill Park 2036 Base Case – Car AM Peak

Modelled Travel time from Doncaster 2036 Base Case – Car AM Peak

Modelled Travel time from Doncaster 2036 Project Case – Car AM Peak

Modelled Travel time from Greensborough 2036 Base Case – Car AM Peak

Modelled Travel time from Greensborough 2036 Project Case – Car AM Peak

Modelled Travel time from Heidelberg 2036 Base Case – Car AM Peak

Modelled Travel time from Heidelberg 2036 Project Case – Car AM Peak

Modelled Travel time from LaTrobe University 2036 Base Case – Car AM Peak

Modelled Travel time from LaTrobe University 2036 Project Case – Car AM Peak

Modelled Travel time from Mill Park 2036 Base Case – Car AM Peak

Modelled Travel time from Mill Park 2036 Project Case – Car AM Peak

