FINAL REPORT

Northern Central City Corridor Study

APPRAISAL OF TRANSIT STRATEGY RESULTS

Department of Infrastructure

Melbourne, Australia

August 2002

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Booz | Allen | Hamilton

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Executive Summary

1. Aims and Objectives

This is the transit appraisal review of the strategy modeling results from the Northern Central City Corridor (NCCC) Study. It is presented by Booz Allen Hamilton to Sinclair Knight Merz and the Department of Infrastructure.

This report reviews the outputs from the VLC modelling analysis of a series of strategy options for the NCCC from the perspective of public transport. It covers:

- Identification of strategy inputs
- Identification of key strategy modelling outcomes, with an emphasis on public transport issues
- A review of these outcomes.

2. Transit Strategy Modelling Review Findings

Some 8 strategies were tested of which two; involve public transport services:

- Strategy A: Significant Upgrade of Transit Services
- Strategy F: Doncaster Area Rapid Transit (DART) service Light Rail

All strategies are cumulative in an alphabetical sense (B includes A, C includes B and C etc). In addition an alternative strategy F option was tested (strategy F2) which examines a heavy rail version of DART. Tables 1, 2 and 3 summarises the key findings from the review in relation to Strategy A, F and F2.

3. Overall Strategy Impacts on Transit

Figure 1 illustrates the impacts of strategy option results on transit mode share.

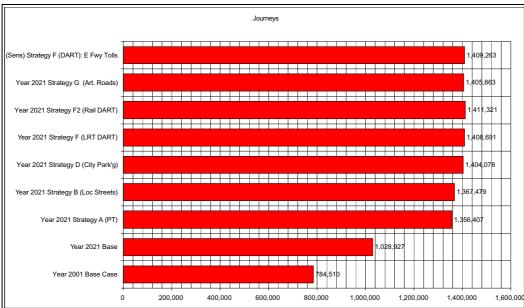


Figure 1: Total Transit Journeys by Strategy

Note: All strategies are cumulative except strategy F2 which includes strategies A, B, and D but not F. Strategies G and E including strategy A to F but not F2. Strategy F2 is a variation of strategy F

Overall Strategy A has the most significant influence on transit usage. Of the two DART options F2, the heavy rail service has the larger effect on transit usage.

Table 1 : Summary of Major Weekday Strategy Elements and Impacts : Strategy A

Strategy Elements

- Substantial increases in public transport service frequencies most study area services including some services operating in the rest of Melbourne
- Improves station access improvements including improvements within Melbourne CBD
- Tram upgrades reliability, stops and through routing of the Elizabeth S tram group to St Kilda
- Improved bus services improved area coverage in Doncaster and Melbourne CBD, reliability improvements better interchanges
- Better study area East-West links Eastern Freeway and Johnston Street bus route groups operate to Melbourne University plus Johnson and Elgin Street Busway

Market	Impact (from 2021 Base)
NCCC Trav	el Impacts
Total Travel	 Transit journeys increase by 105K sourced from car 71%, walk/cycle, 22% Transit journey growth is from Through and External Travel markets (48% each)
Temporal Impacts	 A.M. Peak NCCC transit journey mode share increases from 32% to 41% Most transit journey growth and car travel decline occurs inter peak
Spatial Impacts	 Almost a third of transit journey growth is external travel from the South and almost a third is through travel North to South Theses are also the sources of equivalent car travel reductions
Metropolita	n Wide Travel ¹
Total Travel Temporal	 Transit journeys increase by 327K sourced from car (75%) and walk (25%) Transit journey mode share increases from 7% to 9% Transit journey growth at the expense of car follows through to each time period
Impacts	 60% of transit journey growth occurs in the inter-peak Transit journey mode share increases most in the a.m. peak (to 11%)
Individual S	Service Impacts
Service Boarding	• Transit boardings increase by 827K (+54%) implying much transfer behaviour on new journeys. Tram boardings increase by 105%, Rail 21% and Bus 26%
Impacts	• Strategy A more than doubles tram patronage; high growth in the Eastern Freeway and Johnson Street buses (135%/78%) also occurs, rail notably the Upfield line, also has considerable increased boardings (+63%)
	• Transit boarding growth is highest in the peak (P.M. Peak 60%) . Yarra has 150% more a.m. peak boardings and M>Tram 105%
Maximum Load Demand Impacts	 Strategy A impacts on peak tram maximum loads are very large and will require the development of additional strategy measures to managing overloading an tram congestion if realised in practice. Routes 19, 55, 11, 109 and 86 have forecast average maximum loads per tram in the 200-300 range with others in the high 100-200 range. These maximum loads are not sustainable and would require either larger capacity vehicles (usually articulated tram sets) and/or increased frequency Running trams at higher frequency or larger trams are not considered a reasonable option since trams will 'platoon' and queue slowing the service
	 Other possible options include grade separation of all tram operations or upgrading to a higher capacity transit mode (e.g. heavy rail). Spreading tram routes over more streets may also assist e.g. bifurcating routes on Elizabeth, William and/or Swanston Street Strategy A runs over 60% more peak direction trains than at present. Peak trains go to 51/hr on some groups. Measures to enable train volumes of this size will be required
	• Strategy A does not increase train overloading; rather it increases train frequencies alleviating demand on the overloaded 2021 base network. In this context it can be argued that the Strategy A service frequencies are needed for the 2021 base case

Table 2 : Summary of Major Weekday Strategy Elements and Impacts : Strategy F DART LF	2 Τ
Tuble 2. Summary of major Weekaay Strategy Elements and impasts . Strategy i DART El	

	Strategy Elements
MelbourneHigh frequ	capacity light rail system operating Doncaster Shoppingtown, Eastern Freeway, NCCC, Uni, Swanston Street to St Kilda termed DART (Doncaster Area Rapid Transit) ency, high quality priority and stops (stations) uses cut to operate at 3 Freeway station interchanges
Market	Impact (from 2021 Strategy D Base Case)
Total Metropolitan travel	 Transit journeys increase by 4,613 sourced from car travel No impact on transit journey mode share Transit boardings increase by 3,650 implying DART reduces overall transfers between transit modes
Total NCCC	Transit journeys increase by 1,866 sourced from car
Travel	Transit journey growth is mainly from Through and some External Travel
Temporal Impacts– NCCC	 Transit boarding increases are concentrated in the a.m. peak and inter-peak Interestingly P.M. transit boardings decline. We suggest that a group of commuters travel in by bus and out by rail but for strategy F they use DART in both directions
Spatial Impacts– NCCC	 Through travel between East and South accounts for 71% of NCCC journey growth Car travel decline also follows this pattern
Service	• DART achieves 68,721 boardings per weekday.
Boarding	Most other tram services have boarding declines
Impacts	• Bus have general boarding declines notably the Eastern Freeway group (-50%). Some selected NCCC bus routes have modest boarding growth.
	Rail has a mixed bag of low boarding impacts
DART Loadings	• Most DART usage is between Doncaster and the CBD. This suggests the operation should be cut back to a Doncaster-CBD service
	• Key DART stations are the CBD stops, Doncaster Shoppingtown and the Freeway interchange station. NCCC stops have lower order usage to these stations
Maximum Load	• DART achieves an average maximum load of 240 well within the scope of the high capacity LRT service designed.
Demand Impacts	• Other tram services maintain excessively high maximum loads. Strategy F acts to slightly alleviate the tram maximum issues identified in Strategy A. However these issues are increased in the strategies implemented since strategy A.
	• Bus has a mixed bag of maximum load impacts. The Eastern Freeway Group are all well under-loaded and may warrant reductions in service levels as feeder bus services. Other services have no maximum load issues

Table 2 : Summary of Major Weekday Strategy Elements and Impacts : Strategy F2 DARTHeavy Rail

	Strategy Elements
Eastern Fre Clifton Hill High freque express Vio	/ rail system operating to the following stations Doncaster Shoppingtown, Bulleen Road eeway, Chandler Highway Eastern Freeway, Victoria Park Station than all stations on the group into the city loop ency, slightly faster running than the LRT DART including two thirds of trains running ctoria Park to Parliament/Flinders Street uses cut to operate at 3 Freeway station interchanges
Market	Impact (from 2021 Strategy D Base Case)
Total Metropolitan travel Total NCCC Travel	 Transit journeys increase by 7.2k compared to 4.6K with DART as a light ril service Transit boardings increase by 33.5K implying much interchanging in new transit journeys. This contrasts with the DART LRT option which reduces transfer overall Transit journeys increase by 3.7 compared to 1.9K with the DART LRT service Transit journey growth is mainly from Through and External Travel
Spatial Impacts- NCCC	 Transit boarding increases are spread through all time periods DART heavy rail has a wider regional impact on transit journey growth and associated car travel decline than the LRT option. LRT only really impacted on travel between East and South whilst the Heavy rail includes this effect and also impacts other through travel and external travel corridors mostly those associated with the South and North. This impact is probably caused by the easier integration with regional heavy rail services provided by DART heavy rail compared to DART LRT
Service Boarding Impacts	 DART heavy rail achieves 50.6K boardings which is 26% less than those for LRT. However the heavy rail option has almost half the catchment of the LRT, hence the relative boardings performance is no a good indicator of overall success With 50.6K boardings per weekday, the DART heavy rail would e carrying more than any exiting rail line in Melbourne In general bus does better in boarding terms than with DART LRT mainly because the Johnson Street group has higher loadings. In contrast the Eastern Freeway group of bus routes, which are cut to feed DART stations, do better under LRT since it is easier to transfer to LRT than heavy rail
DART Loadings	 DART heavy rail has a maximum inbound daily loading of just under 18,000 passengers. This is more than double the inbound daily load of the LRT. Bulleen Road and Shoppingtown are the major suburban commuter stations with Victoria Park playing an important interchange role for about 20% of all DART travel.
Maximum Load Demand Impacts	 DART heavy rail achieves an average maximum load of 244 well within the scope of a rail service and arguably very low for rail. It is suggestive that 3 car sets could be deployed on the service rather than the standard 6 car sets used elsewhere Other loading estimates provide similar results to thise identified in option F DART light rail

1 INTRODUCTION

1.1 Aims and Objectives

This is the transit appraisal review of the strategy modeling results from the Northern Central City Corridor (NCCC) Study. It is presented by Booz Allen Hamilton to Sinclair Knight Merz and the Department of Infrastructure.

This report reviews the outputs from the VLC modelling analysis of a series of strategy options for the NCCC Area from the perspective of public transport. It covers:

- Identification of strategy inputs
- Identification of key strategy modelling outcomes, with an emphasis on public transport issues
- A review of these outcomes.

1.2 Focus of this Review

The transit strategies investigated using the VLC model involve significant change from current operations and service levels. Their impacts are substantial and complex. A key focus of this review is to explore the results from a range of perspectives to:

- Understand how travel is forecast to change
- Explain the basis and drivers for travel changes as forecast
- Explore how the strategies are performance and where improvements can be made or to identify issues to be addressed in further planning fo these strategies.

Given the expansionist and far reaching nature of the transit strategies tested, the latter point is particularly important in developing strategies further.

1.3 Report Structure

This report is divided into the following sections:

2. Strategy A – Significant Public Transport Improvements

Examines the inputs and modelled outcomes of strategy A for the year 2021

3. Strategy F - Doncaster Area Rapid Transit - Light Rail

Examines the inputs and modelled outcomes of strategy F for the year 2021

4. Strategy F2 – Doncaster Area Rapid Transit – Heavy Rail

Examines the inputs and modelled outcomes of strategy F2 for the year 2021

5. Overview of Other Strategy Impacts on Transit

Considers the transit implications of the other NCCC strategy tests

2 STRATEGY A : SIGNIFICANT PUBLIC TRANSPORT IMPROVEMENT

2.1 Strategy Inputs

The aim of this strategy is to significantly improve public transport services in order to increase public transport usage and to reduce road congestion levels.

Key elements of the strategy are illustrated in Figure 2.1. The main service upgrades include:

2.1.1 Rail

General Frequency Improvements

Upfield Line:

- frequency doubled
- Ringwood, Northern, Epping & Hurstbridge groups:

• frequency increased by 50%

Craigieburn/Roxburgh VLine services:

• have been re-routed using the Upfield line, these services stop at Craigieburn, Gowrie, Coburg, Royal Park and Spencer St.

Station Access Improvements

Generic improvement to bus and tram access to stations to reflect improved bus/train and tram/train station interchange/ service coordination. The following was applied in the model:

- for 'premium' stations (premium station locations are based on Melways descriptions):
 - interchange penalties reduced to 5 minutes
 - maximum walk interchange time of one minute
 - maximum wait time of 5 minutes
- for other stations:
 - rail/rail, rail/bus and rail/tram interchanges, 50% improvement in transfer penalty but with a minimum penalty of 5 minutes)

Park/ride, kiss/ride - 25% reduction in car access terminal penalties - equivalent to about 60 cents in generalised cost

CBD Intermodal Interchange Improvements

Improved rail/tram/bus interchange at Flinders Street station by reducing the transfer penalties between all modes using the interchange by 2 minutes

2.1.2 Tram

General Frequency Improvements

All study area tram services (routes 1, 11, 19, 22, 23, 42, 59, 109, 96) frequency increased by 50%

Tram Reliability Improvements

Route 109 type upgrades for study area tram routes including:

- reduce travel time by 25%,
- reducing the 'variance' (reliability factor) to 1 minute,
- reduce access terminal penalty by 5 minutes (67 cents) to reflect a constant in vehicle perception reduction.

Tram Stop Upgrades

Tram Super Stops (all CBD tram stops and the top 25% most utilised tram stops outside the CBD) including reduce access penalty by 3.5 min (50cents) at tram super stops.

Tram Route Coverage Improvements

Elizabeth Street trams (59, 57, 19) extended to St Kilda following the route of tram 55 to Domain, thence to St Kilda.

2.1.3 Bus

General Frequency Increases

Eastern Freeway, Johnston Street & Northern groups improve frequencies to 10 minutes in the peaks and double present frequencies in the off peak <u>Improve External Bus Catchment Coverage</u>

Improve bus route coverage outside the study area for the Eastern Freeway/Johnston Street route groups including 7 new bus routes:

- 30A Templestowe Village to City via Lower Templestowe (Eastern Fwy),
- 30B Templestowe (Porter Road) to City via Serpells Road (Eastern Fwy),
- 30C The Pines to City via Doncaster East (Eastern Fwy),
- 30D Doncaster Shoppingtown to City via Ayr St and Bulleen (Eastern Fwy),
- 30E Doncaster Shoppingtown to City via Doncaster South (Eastern Fwy).
- 20A Doncaster Shoppingtown to City via Balwyn (Johnston St),
- 20B Doncaster Shoppingtown to City via Balwyn North/Greythorn (Johnston St).

Increase spatial coverage (city end) for Eastern Freeway & Johnston Street groups:

Pattern 1 : Johnston Street CBD Group (200,201,203 and 207) new alignment as follows:

- Lonsdale Street to Spencer Street Station then
- loop Spencer Street, Latrobe Street Extension, Docklands Esplanade, Collins Street Extension
- Spencer Street to Lonsdale Street and so on.

Pattern 2 : Eastern Freeway Group 1: 301-9 and 319;

- extension from Queens/Collins to Spencer Street Station via Collins Street then:
- loop Spencer Street, Latrobe Street Extension, Docklands Esplanade, Collins Street Extension and back

Pattern 3 : Eastern Freeway Group 2: 313, 315, 316;

- extension from Collins Street to Spencer Street Station then
- loop Spencer Street, Latrobe Street Extension, Docklands Esplanade, Collins Street Extension and back

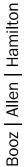
Bus Reliability/Quality Improvements

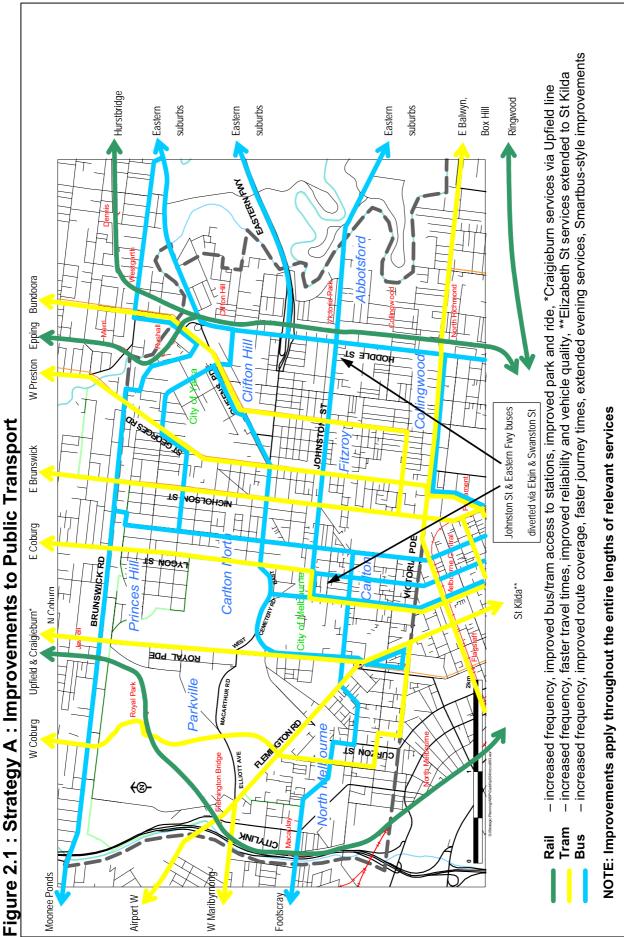
Widespread Smartbus-style improvements:

- To reflect priority measures travel times reduced by 15%
- To reflect changed bus perceptions in vehicle travel time constant reduced access terminal penalty by 2.5 minutes (33 cents)

Better Quality Intermodal Interchanges

Tram/bus and bus/bus interchanging in the study area - reduce interchange penalties by 25%





Ref No: BFinal Transit Appraisal Report V2.3.doc 8/22/2003

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Improved Internal Study Area Linkages

East-west bus service Brunswick Road (504):

- Increase frequency to 10 mins in the peak and 15 mins in the off-peak,
- reduce 504/tram and 504/bus interchange penalties by 25%.

Johnston Street and Eastern Freeway bus groups:

- Buses were diverted to operate to the University via Johnston and Elgin Streets, University and Swanston Street to City to provide improved access into and across the study area
- One of the Doncaster Shoppingtown/Eastern Freeway bus services was retained on the existing Hoddle Street/Victoria Parade route into the City these buses use tram fairways where available.
- Includes bus way in both directions, down the median of Johnston Street and Elgin Street. Traffic impacts include:
 - reduced vehicle capacity of Johnston Street and Elgin Street to 2 lanes
 - right turn bans at Brunswick St, Smith St and Wellington St.
- Includes bus lanes in both directions on Hoddle Street between Johnston Street and Alexandra Parade. Loss of one northbound traffic lane on Hoddle Street.

2.2 Types of Travel Modelling Impacts

The forecast impacts of travel in Melbourne are considerable and complex. To assist understanding these impacts we analyse the forecasts from two main perspectives including:

- 1. **Direct impacts on the Northern Central City Corridor Study Area**. This is divided into three separate component markets:
 - Through Travel (trips passing through the study area)
 - External Travel (trips from and to locations outside the study are that start or finish in the study area)
 - Internal Travel (travel starting and finishing within the study area)

2. Metropolitan Wide impacts.

Travel impacts are also investigated in terms of :

- **journeys**, which are linked trip legs ;and
- **boardings**, which represent a single trip leg where a person boards a public transport vehicle.

2.3 Impacts on NCCC Area Travel

2.3.1 Strategic Travel Behaviour Changes

Table 2.1 presents a summary of the major weekday journey impacts suggested by the modelling on the NCCC Area.

		Base Ca	ese 2021		Strategy I	A: Significe	est Public	Transport	0	Herence (Numberij			Difference	a (5) a	
	Car	Public	Walk	Total	Car	Public	Walk	Total	Car	Public	Walk	Total	Car	Public	Walk	Total
		Transport				Transport				Transport				Transport		
NCCC Corridor																
Through	333,926	153,015	8,561	495,502	292,777	202,838	5,766	501,381	-41,149		-2,795		-12%	33%		
Talkon	372,440	121,800	139,891	634,131	341,181	171,724	121,213	634,118	-31,259	49,924			-8%	41%	-13%	0%
Ultrin .	49,122	7,734	50,020	106,876	45,452	12,894	47.541	106.997	-2.670	5,160	-2,479	11	-5%	67%	-5%	0%
TOTAL	755,400	202,649	190,472	1,236,509	680,410	307,496	174,520	1,242,396	-75,078	104,907	-23,952	5,877	-10%	37%	-12%	0%
Mode Share by H	arket															
NCCC Corridor	27547	2444	744		7.0 m	100	- 14						244	1744	- 15	-
Through	67%		2%		58%	40%	1%		_				-5%	10%		
Tahon	59%	19%	22%		54%	27%	19%						-5%	- 6%		
uten	46%	7%	47%		43%	12%	44%						-3%		-25	
TOTAL	61%	23%	16%		55%	31%	14%						-6%	8%	-2%	

Impacts on total weekday travel

This indicates that:

- Total NCCC travel increases by 5.9K. This is entirely sourced from through travel.
- NCCC public transport use increases by 105K. This indicates diversion from other modes to public transport. Public transport journey growth is sourced (approximately) from :

 Car travelers 	71%
– Walk/cycle	22%
 Trip generation 	6 %

- Most public transport travel growth is from through and external travel markets (in roughly similar quantities).
- NCCC car travel reduces by 10%
- The biggest reductions in car travel are in through travel markets (-12%)
- Reductions in NCCC car journeys total 75K
- NCCC walk/cycle travel declines by about 24K trips/day or 12%. The bulk of reduced walk travel is external trips (19K).

2.3.2 Temporal Distribution of Impacts

Table 2.2 shows the impact on journeys by time period <u>for NCCC area related</u> <u>travel</u>. This indicates that:

- The general picture of increased transit journeys at the expense of car and walk travel follows through in all time periods
- Most transit journey growth occurs in off peak times (61K). Of reduced car travel 42K or 56% is sourced from off peak times.

- Total NCCC travel currently has a high transit share of travel (23%), this increases to 31%. Transit shares in the a.m. peak grow to 41% and remain the higher share of travel by time period.
- By time period the majority of transit growth occurs in the off peak. However the a.m. peak retains the highest market share (41% for NCCC)

		Base Ca	ase 2021		Strategy	A: Significa	ant Public 1	ransport		Difference (Number)			Difference	(%)	
	Car	Public	Walk	Total	Car	Public	Walk	Total	Car	Public	Walk	Total	Car	Public	Nalk	Tota
		Transport				Transport				Transport				Transport		
Total NCCC Journe	eys per Wee	ekday							-							
A.M. Peak	131,025	75,337	25,948	232,310	115,212	96,519	21,977	233,708	-15,812	21,182	-3,971	1,399	-12%	28%	-15%	19
P.M. Peak	141,153	67,468	32,536	241,157	124,286	90,336	28,024	242,646	-16,867	22,868	-4,512	1,489	-12%	34%	-14%	19
Sub-Total Peak	272,178	142,805	58,484	473,467	239,498	186,855	50,001	476,354	-32,680	44,050	-8,483	2,887	-12%	31%	-15%	19
Off Peak	483,310	139,744	139,988	763,042	440,912	200,601	124,519	766,032	-42,398	60,857	-15,469	2,990	-9%	44%	-11%	0%
Total NCCC	755,488	282,549	198,472	1,236,509	680,410	387,456	174,520	1,242,386	-75,078	104,907	-23,952	5,877	-10%	37%	-12%	0%
Mode Share																
A.M. Peak	56%	32%	11%		49%	41%	9%						-7%	9%	-2%	i
P.M. Peak	59%	28%	13%		51%	37%	12%						-7%	9%	-2%	
Sub-Total Peak	57%	30%	12%		50%	39%	10%						-7%	9%	-2%	
Off Peak	63%	18%	18%		58%	26%	16%						-6%	8%	-2%	
Total NCCC	61%	23%	16%		55%	31%	14%						-6%	8%	-2%	i

Table 2.2 : Journey Impacts by Time Period – <u>NCCC Related Trips</u>

2.3.3 Spatial Distribution of Impacts

Table 2.3 shows an analysis of changes in modal trip patterns by sector of Melbourne between the 2021 base case and the 2021 Strategy A case. This indicates that:

NCCC Public Transport Travel

- As noted the 105K per day (or 37%) increase in NCCC PT travel is mainly sourced from external and through travel. By individual spatial area this indicates that:
 - External travel growth has the highest proportional growth from the South (49%)
 - Through travel growth has the highest proportional growth between the East and North (48-9%) and from West-East (45-6%)
- In volume terms the additional 105K NCCC transit trips are sourced mostly from:
 - Between the North and the South (29K or 28% of transit growth)
 - Between the South and NCCC (28K or 27% of transit growth)
 - Between the North and NCCC (9K or 9%)
 - Between the South and West (8K or 7%)
 - Between the South and East (6K or 6%)

NCCC Car Travel

- As noted the 75K per day (or 10%) decrease in NCCC car travel is mainly sourced from through travel followed by external travel. By individual spatial area this indicates that:
 - External travel decline has the highest proportional growth from the South (9%)

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- Through travel growth has the highest proportional decline between the East and South (18-19%) and from West-South(16-17%)
- In volume terms the reduction of 75K NCCC car trips are sourced mostly from:
 - Between the North and the South (26K or 33% of car decline)
 - Between the South and NCCC (12K or 15% of car decline)
 - Between the North and NCCC (8K or 11%)
 - Between the South and East (6K or 8%)
 - NCCC travel to and from the South accounts for 64% of all decline in car travel.

2.4 Impacts on Metropolitan Wide Travel

Because NCCC lies next to the CBD, the changes to public transport services included in Strategy A include changes to services operating throughout Metropolitan Melbourne. As a result, NCCC travel impacts are only a sub-set of significant changes in travel throughout Metropolitan Melbourne. This section presents a summary of forecast modelled impacts on a Metropolitan Wide basis.

2.4.1 Strategic Travel Behaviour Changes

Table 2.4 presents a summary of the major weekday journey impacts suggested by the modelling.

Table 2.4 : Strategy A: Total Journey Impacts by Mode – Metropolitan Melbourne

		Base Case 2821				Strategy & Significant Public Transport Improvement				Difference (Number)				Difference (%)			
	Саг	Public Transport	Walk	Total	Car	Public Transport	Walk	Total	Сн	Public Transport	Walk	Total	Car	Public Transport	Walk	Total	
Tetal Jescorys p Tetal Nelbourne			2,332,541	15,106,601	11,429,979	1,358,407	2,250,218	15,106,804	-248,154	327,480	-82,323	3	-2%	32%	-4%	D%	
Mede Share Tetal Melbourne	78%	7%	15%		76%	9%	15%						-2%	25	-1%		

This indicates that:

- Total travel does not change. This is to be expected, the forecast has been undertaken with a fixed travel matrix to explore shifts in total travel between modes.
- Total public transport travel increases by 327K journeys. This appears to be principally sourced from:
 - Car travelers 75%
 - Walk/Bike 25%
- Transit mode share increases from 7% to 9%. Car declines by 2% to 76%

2.4.2 Temporal Distribution of Impacts

Table 2.5 shows the impacts on journeys by mode <u>throughout Melbourne</u> for different times of the day.

		Base Ca	ase 2021		Strategy	A: Signific	ant Public	Transport	D	ifference (N	lumber)			Differenc	e (%)	
	Car	Public	Walk	Total	Car	Public	Walk	Total	Car	Public	Walk	Total	Car	Public	Walk	Total
		Transport				Transport				Transport				Transport		
Total Journeys pe	r Weekday															
A.M. Peak	1,833,188	262,762	259,613	2,355,563	1,784,053	324,026	247,484	2,355,563	-49,135	61,264	-12,129	0	-3%	23%	-5%	0%
P.M. Peak	2,077,395	212,840	362,510	2,652,745	2,023,636	281,488	347,621	2,652,745	-53,759	68,648	-14,889	0	-3%	32%	-4%	0%
Sub-Total Peak	3,910,583	475,602	622,123	5,008,308	3,807,689	605,514	595,105	5,008,308	-102,894	129,912	-27,018	0	-3%	27%	-4%	0%
Off Peak	7,834,550	553,325	1,710,418	10098293	7,692,290	750,893	1,655,113	10098296	-142,260	197,568	-55,305	3	-2%	36%	-3%	0%
Total Melbourne	11,745,133	1,028,927	2,332,541	15,106,601	11,499,979	1,356,407	2,250,218	15,106,604	-245,154	327,480	-82,323	3	-2%	32%	-4%	0%
Mode Share																_
A.M. Peak	78%	11%	11%		76%	14%	11%						-2%	3%	-1%	
P.M. Peak	78%	8%	14%		76%	11%	13%						-2%	3%	-1%	
Sub-Total Peak	78%	9%	12%		76%	12%	12%						-2%	3%	-1%	l
Off Peak	78%	5%	17%		76%	7%	16%	l					-1%	2%	-1%	1
Total Melbourne	78%	7%	15%		76%	9%	15%	l					-2%	2%	-1%	I

Table 2.5 : Journey Impacts by Time Period – Total Metropolitan Area

This indicates that:

- The general picture of increased transit journeys at the expense of car and walk travel follows through in all time periods
- Most transit journey growth occurs in off peak times (60%). Of reduced car travel 58% is sourced from off peak times and 67% of walking
- The a.m. peak retains the highest share of the transit journey travel (14%)

2.5 Impacts on Transit Boardings

2.5.1 Strategic Metropolitan Wide Impacts

Metropolitan wide transit boarding impacts are illustrated in Table 2.6.

	Base Ca	se 2021	Strateg Significan Transport I	t Public	Chan	ge
Total PT Journeys	1,028,927		1,356,407		327,480	32%
Total PT Boardings		%Total		%Total		
M> Tram	318,351	21%	648,551	27%	330,200	104%
Yarra Tram	265,983	17%	546,622	23%	280,639	106%
Sub-Total Tram	584,334	38%	1,195,173	51%	610,839	105%
M> Train	333,499	22%	419,815	18%	86,316	26%
Connex	236,680	15%	270,095	11%	33,415	14%
Sub-Total Rail	570,179	37%	689,910	29%	119,731	21%
Metro Bus	371,536	24%	466.821	20%	95,285	26%

Table 2.6 : Modelled Impacts on Transit Boardings – Strategy A
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M> Train	333,499	22%	419,815	18%	86,316	26%
Connex	236,680	15%	270,095	11%	33,415	14%
Sub-Total Rail	570,179	37%	689,910	29%	119,731	21%
Metro Bus	371,536	24%	466,821	20%	95,285	26%
Other	13,123	1%	14,162	1%	1,039	8%
Total	1,539,172		2,366,066		826,894	54%
Boardings per Journey	1.50		1.74		2.53	

This indicates that for <u>Metropolitan wide travel</u>:

- Whilst total transit journeys increase by 31%, boardings increase by 54%. This is suggestive of considerable increases in transferring behaviour
- Average boardings per transfer increase from 1.50 (base case, which is high) to 1.74 with new transit journeys have an average transfer of 2.53 per journey (an exceptionally high number)
- There are over 826K additional transit boardings per weekday.
- 611K or 74% of this growth occurs on trams which effectively double metropolitan wide usage as part of this option
- Rail boardings increase by 119K or a more modest 21% although interestingly boardings on M>Train increase by more than twice those on Connex trains
- Bus usage increases by 95K (or 26%) a similar volume to that of rail.

2.5.2 Boarding Forecasts by Time Period

Table 2.7 illustrates the change in transit boardings by time period associated with Strategy A modelling. This indicates that for <u>total Metropolitan Travel</u>:

- Whilst total boardings increase by 54%, P.M. Peak boardings increases are a higher (60%)
- By transit mode, tram has by far the highest boardings growth, although interestingly the proportional increase in boardings is higher in the peak than interpeak for both tram companies but particularly so for Yarra whos a.m. peak market increases by 150%. It will be important area to examine maximum loading points for overloading on services.

			Base C	ose 2021		Skiategy /		ant Public rade	Transport			Сьа	ngo Fran	n Base Case			
	foardie ge	A.M. Peak			Total	A.M. Pask		P.M. Pask		A.M. Peak		P.M. Peak		A.M. Peak		P.N. Pus	
M> Touts			179,091	69,309	318,361	143,528			641,551	73,177	183,480		230,200	105%	102%		104%
Yers Tren		46,663		48,705	266,983	116,458			646,822	69,803	141,586		280,639	150%	83%		106%
5	hib-Total Tran	116,604	348,716	110,014	554,334	259,554	673,782	261 (607	1,195,173	142,980	325,086	142,793	61D,629	123%	53%	1215	105%
M= Train			148,683		333,499	121,551	196,298	101,368	419,815	16,903	47,205	20,208		18%	32%	25% 15%	28%
Сована			100,909	60,495	236,680	70,999			270,095	3,684	20,697	0,024	33,415	5%	21%	15%	14%
	Bub-Total Rul.	177,963	250,602	141,634	570,179	200,550	318,704	170,656	689,910	22,587	68,102	29,032	119,731	13%	27%	20%	21%
Meter Fas		96,199	215,535	69742	371,536	121,001	262,847	62,790	466,821	24,982	0,20	23,061	95,285	26%	22%	39%	28%
Other		6,066	3,636	3,421	13,123	7,214		3,531	14,162	1,148	-219	110	1,039	19%	-8%	3%	- 8%
	Total	396,822	918,549	329,801	1,539,172	688.529	1,298,790	619,797	2,366,066	191,707	440,201	194,996	826,994	43%	54%	60%	54%
Time Peri	od Share	A.M. Peak	Of Peak	P.M. Paak	Total	A.M. Pask	Of Peak	P.M. Paul	Total	A.M. Peak	Of Peak	P.M. Peak	Tatal				
MP Tram		22%	- 58%	22%	100%	22%	56%	22%	100%	22%		22%	100%				
Yara Tran		10%	84%	12%	100%	21%	57%	22%	100%	25%	50%	25%	100%				
2	No.Total Tran	20%	62%	21%	100%	22%	96%	22%	100%	23%	67%	27%	100%				
M> Train		31%	45%		100%	29%	47%	24%	100%	22%	55%	23%	100%				
Compete		32%	43%	3%	100%	29%	45%	36%	100%	11%	63%	36%	100%				
	Sub-Total Rail	31%	44%	25%	100%	29%	46%	25%	100%	19%	57%	24%	100%				
Mates Bas		25%	58%	19%	100%	29%	56%	19%	100%	28%	50%	24%	100%				
Other		48%	28%		100%	51%	24%	25%	100%	110%	-21%	11%	100%				
	Total	28%	53%	21%	100%	25%	53%	22%	100%	23%	53%	24%	100%				

 Table 2.7 : Change in Transit Boardings by Time Period – Metropolitan Melbourne

2.5.3 Individual Service and Route Boarding Impacts

Total Daily Boardings Impacts

Table 2.8 shows the changes in transit boardings by individual route or line. NCCC related services are highlighted in this discussion. Changes are shown for two sets of forecasts:

- for travel between 2000 and 2021 base case's
- for travel between the 2021 base case and Strategy A in 2021.

The two sets of forecasts enable a better understanding of the magnitude of changes in boardings relative to current levels of service usage.

Table 2.8 indicates that by transit mode:

Rail

- Considerable growth is expected on all services by the 2021 base case. Of particular note are boardings increases on the NCCC line services; the Epping line, which increases by 70% and the Upfield Line which has boarding increases of 65%
- Strategy A results in more modest growth overall compared to the above (21%) with Bayside services realising the higher growth impacts (26%) over Hillside (14%)
- Particular services where growth is higher than average are:
 - Upfield Line (specifically upgraded as part of Strategy A)
 - Werribee and St Albans Lines

Tram

- Metro wide baordings growth of 34% is expected by 2021 for Trams with Yarra services experiencing higher growth (43%).
- Strategy A results in significantly higher boardings ; more than double for both Yarra and Swanston tram groups
- Services where the growth impacts of Strategy A are particularly significant are generally NCCC related including (in order of growth):
 - Routes 23/42/109 Mont Albert (+353% on year 2000 loads)
 - Route 11 West Preston (+260% on year 2000 loads)
 - Route 19 North Coburg (+248% on year 2000 loads)
 - Route 59 Airport West (+226% on year 2000 loads)
 - Route 86 Bundoora (+180% on year 2000 loads)

TRAIN				Hed	elled Baan	dings		
Line		Stations	2000	2021		2821 A - P	Timps	
				Ne	% 2001	No	% 2001	% 2021
Bayside	Broadmeadows	Broadmoadews to Flinders St.	30,278	47,292	66%	54,743	81%	161
	Frankston	Montialloc to Franksten	44,053	57,992	32%	62,184	41%	71
	Pakenhare	Flinders St to Pakesham	50,327	76,100	61%	02,477	64%	01
	Sandringham	Flinders St to Sandtingham	26,567	35,306	33%	39,678	49%	125
	St Abans	St Albans to Finders Street	25,858	45,255	87%	74 006	100%	535
	Stany Paint	Franksten to Story Point	1,111	1,973	78%	2,204	96%	125
	Upfield	Upfield to Flagstaff	10,839	17,884	65%	29,221	170%	635
	Wentee	Flinders St to Wenibee	19,569	39,085	100%	61 (672	216%	581
	Williamstown	Williamstown to Flinders St.	6,442	9,523	43%	13,430	108%	411
	Sub-total		215,042	333,499	99%	419,815	95%	26/
Hilside	Hillside							
	Aloneais	Carribervell to Alamoin	6,296	8,862	41%	11,540	83%	301
	Belgrave	Flinders St to Blackbern	32,161	41,702	30%	39,737	24%	-51
	Epping	Epping - Padiament	29,805	49,002	70%	60,672	78%	- 31
	Glan Warerley	Flinders St - Glen Waverley	26,660	41,464	55%	61,790	94%	265
	Hurstbridge	Greensborough - Plinders St	28,154	40,371	43%	61 JJ37	81%	287
	Litydale	Parkament to Litydale	43,730	55,279	20%	85,349	42%	105
	Sub-total		165,813	236,680	43%	270,895	63%	14
	All Bail		380,855	570,179	50%	689,510	815	215
TRAM					Nodelled	Beardings		
Route No		Suburbs	2000	2021			A - PT im	
NOTE NO		Steams	2000					n
Supportan	4	Oth Malhought Banch in East Co.	10.704	Na 22.005	% 2001	No 65.697	% 2001	4.722
Swanston	10	Sth Melbourne Beach to East Co	16,254	23,896		65,597	242%	1305
	16	Melb University to St. Kilda Beach	0,600	11,321	32%	17 /120	107%	675
	19	City to North Coburg	32,515	30,466	21%	112,997	245%	1067
	22	Arts Centre to Moreland	7,853	10,527	34%	26,420	238%	1515
	3	Melb University to East Malvern	12,039	15,150	26%	28,535	137%	BB/9
	P.	Melbourne University to Malvern	8,924	11,549	29%	18,227	104%	587
	50	North Melbourne to City	1,595	2,186	37%	3 (683	131%	669
	66 67	West Ceburg to Domain Rd	19,634	26,262	34%	37,509	91%	439
	57	City to West Manbymong	14,097	16,397	16%	25,815	83%	57%
	59	City to Airport Wiest	26,480	33,112	25%	86,365	226%	1619
	6	University to Glex Iris	13,710	17,413	27%	29,965	118%	729
	64	University to East Brighton	11,845	15,117	28%	22,964	99%	519
	67	University to Carnegie	14,141	18,990	34%	33,796	139%	789
	6.9	St Kilda Beach ta Kew	14,417	18,710	30%	44,046	206%	1365
	72	Melbourse University to Camber	19,591	24,581	25%	42,335	110%	729
	78 & 79	North Richmond to Prahtan	6,885	6,230	20%	13,130	91%	80.9
	в	Melbourse University to Taorak	18,292	21,151	30%	42 (617	162%	1019
	82	Moonee Ponds to Footscray	3,764	4,303	14%	6,230	84%	619
	Sub-total		248,621	318,351	28%	648,551	161%	1049
Yerro	11	City to West Preston	20,602	26,843	30%	74,141	260%	1769
	12	St Kilde to City	10,049	14,425	44%	27,839	177%	999
	23/42/109	City to Mont Albert	26,385	44,706	69%	119,628	363%	168%
	24 8.49	City to Narth Balwys	18,433	23,923	30%	32,190	74%	349
	30 & 34	City to East Melbourse	2,769	4,297	99%	8,298	201%	939
	70	City to Wattle Park	10,764	24,457	30%	30,922	107%	58%
	75	City to East Burwood	15,400	30,200	84%	64,957	231%	80%
	06	City to Bundoora	32,664	44,550	37%	90,859	100%	1045
	96	St Kilds to Eard Brunswick	23,771	31,262	32%	73 (509	211%	1367
	City Circle	Within CBD	13,339	17,457	31%	13,491	1%	-239
	Sub-total		183,034	262,200	43%	533,754	192%	1045
	All Tram		431,655	560,551	34%	1,182,305	1745	1045
BUS					Nedelled	Baardinas		
Route Name		Subuth	2000	2021			A - PT im	
NOTE HERE		Sanda	2000	Nii	% 2001	No	% 2001	m
Citton Hill to Brannalck D4	504	Moonee Posts to Cittory Mill						1736
Citten Hill to Brunswick Rd	5DI Sub total	Moonee Ponds ta Cliffon Hill	449	454	1%	1,239	176/%	1735
- Northern Bus Lines	Sub total		445	454	1%	1,239	176% 176%	1735
- Northern Bus Lines East Melb to Footscray	Sub total 402	Moonee Ponds to Cliffon Hill Footocray to East Melbourne	445	454 454 3,545	1% 4% -12%	1,239 1,239 8,230	176% 176% 67%	1735
- Northern Bus Lines East Melb to Footscray - SITA	Sub total AD2 Sub-total	Fontocray to East Melbourne	449 4,017 4,017	454 454 3,545 3,545	1% 4% -12% -62%	1,239 1,239 8,890 6,890	176% 176% 67% 67%	1735 80% 85%
- Northern Bus Lines East Molb to Footscray - SITA Eastern Freeway Group	Sub total AD2 Sub-total 301	Footocrag to East Melbourne The Pines to City	445 4,017 4,017 1,858	454 454 3,545 3,545 2,033	1% 4% -12% -52% -23%	1,239 1,239 6,890 6,890 3,835	176% 176% 67% 67% 132%	1734 85% 85%
- Northern Dus Lines East Melb to Footscray - SITA	Sub-total 402 Sub-total 301 302	Footocray to East Melbourne The Pines to City Box Hill to City	445 4,017 4,017 1,858 930	454 454 3,545 2,033 847	1% 4% -12% -42% 23% -9%	1,239 1,239 6,690 6,690 3,835 2,248	178% 176% 67% 67% 130% 141%	1731 805 851 855 1655
- Northern Bus Lines East Molb to Footscray - SITA Eastern Freeway Group	Sub.total 402 Sub-total 301 302 303	Footocray to East Melbourne The Pines to City Box Hill to City Michani Sta to City	445 4,017 4,017 1,658 932 32	454 454 3,545 2,033 847 30	1% 4% -12% -52% -52% -5% -6%	1,239 6, 239 6, 690 3,835 2,248 884	176% 176% 67% 67% 130% 141% 2663%	1734 895 895 895 1655 28475
- Northern Bus Lines East Molb to Footscray - SITA Eastern Freeway Group	Sub total 402 Sub total 301 302 303 304	Footocray to East Melbourne The Pines to City Box Hill to City Michaen Sin to City Respected Sin to City	445 4,017 1,656 932 32 1,832	454 454 3,545 2,033 847 30 1,670	1% 1% -12% -32% -23% -3% -6% -3%	1,239 8,239 8,690 3,835 2,248 884 3,961	178% 176% 67% 67% 130% 141% 2663% 100%	1735 895 895 1657 28475 1195
- Northern Bus Lines East Molb to Footscray - SITA Eastern Freeway Group	Sub total 402 Sub total 301 302 303 304 306	Footocray to East Melbourne The Pines to City Box Hill to City Michael Sta to City Responde Sta to City City to Warrandyte Bridge	445 4,017 1,656 932 32 1,832 1,650	454 3,545 2,033 847 30 1,670 1,765	1% 4% -12% 23% 3% 8% 8% 8% 7%	1,239 1,239 8,890 3,835 2,248 884 3,961 1,996	176% 176% 67% 67% 132% 141% 266% 100% 20%	1734 859 859 1659 2847% 1199 139
- Northern Bus Lines East Molb to Footscray - SITA Eastern Freeway Group	Sub total 402 Sub total 301 302 303 304 305 306	Footocray to East Melbourne The Pines to City Box Hill to City Michael Shi to City Ringwood Shi to City City to Wesnedyte Bridge North Ringwood to City	445 4,017 1,656 930 30 1,832 1,650 378	454 854 3,545 2,033 847 30 1,670 1,765 329	1% 1% -12% -32% -3% -3% -3% -13%	1,239 1,239 6,430 3,835 2,249 884 3,961 1,396 884	176% 176% 67% 67% 132% 141% 2663% 100% 20% 134%	1734 894 895 1659 2847% 1199 139 1699
- Northern Bus Lines East Molb to Footscray - SITA Eastern Freeway Group	Sub total 402 Sub total 301 303 304 306 306 307	Footscrag to East Melbourne The Pines to City Box Hill to City Michael Sta to City Regrecod Sta to City City to Wansindyte Bridge North Ringwood to City Michael to City	445 4,017 1,656 930 30 1,630 1,650 378 2,637	454 454 3,545 2,033 847 30 1,670 1,765 329 2,638	1% 1% -12% -32% -3% -3% -3% -7% -13% -0%	1,239 1,239 8,030 8,639 3,835 2,149 884 3,961 1,395 884 1,395 884 6,230	176% 176% 67% 67% 132% 141% 2663% 100% 20% 134% 137%	1734 855 855 1655 28475 1195 1195 1395 1365
- Northern Bus Lines East Molb to Footscray - SITA Eastern Freeway Group	Sub notal 402 Sub notal 301 302 303 304 305 306 307 307	Footscray to East Melbourne The Pines to City Box Hill to City Michan Ste to City Regiono Sta to City City to Warrandyte Bildgo North Fringwood to City Michain to City Deep Creek to City	445 4,017 1,658 930 30 1,650 378 2,657 631	454 3,545 2,033 847 30 1,670 1,670 1,765 329 2,638 612	1% 4% -12% 23% 3% 8% 8% 7% -13% 0% -3%	1,239 6,430 3,835 2,249 3,961 1,396 984 4,3961 1,396 984 6,200 0,114	176% 176% 67% 130% 141% 2663% 100% 20% 134% 134% 137% 29%	1734 895 895 1659 2847% 1199 139 1699 1365 335
- Northern Bus Lines East Molb to Footscray - SITA Eastern Freeway Group	Sub total 402 Sub total 301 303 304 305 305 305 305 306 305 300 309	Footocray to East Melbourne The Pines to City Box Hill to City Michaim Sta to City Regressed Sta to City City to Warsindyte Bridge North Ringwood to City Mitchain to City Deep Creek to City Davide to City	445 4,017 1,656 930 30 1,830 1,650 3,78 2,637 631 838	454 3,545 2,033 847 30 1,670 1,670 1,670 2,638 612 058	1% 4% -12% 23% 8% 8% 8% 7% -13% -13% -13% -3% -3% -3% -3%	1,239 6,430 3,835 2,248 3,961 1,395 984 6,230 0,114 1,229	176% 176% 67% 67% 130% 141% 2663% 20% 134% 137% 29% 134% 137%	1734 894 894 1659 1659 139 139 1699 1369 1369 1369 1369 1369
- Northern Bus Lines East Molb to Footscray - SITA Eastern Freeway Group	Sub notal 402 Sub notal 301 302 303 304 305 307 309 307 309 307 309 307 309 313	Footocray to East Melbourne The Pines to City Box Hill to City Michael Sta to City Regrecod Sta to City North Ringwood Sta to City Michael to City Deep Creek to City Donole to City Donole to City City 15 Templectowe	445 4,017 1,656 932 1,832 1,832 1,650 3,76 5,627 6,511 8,30 5,52 5,527	454 3,545 3,545 2,033 847 30 1,670 1,765 329 2,638 612 050 71	1% 4% 42% 23% 8% 8% 8% 7% 43% 0% 3% 2% 22%	1,239 6,239 6,239 3,835 2,248 3,861 1,365 984 6,230 0,14 1,379 732 732	176% 126% 67% 67% 132% 141% 2963% 100% 20% 134% 134% 134% 137% 29% 130% 126%	1734 899 899 1669 2847% 1199 139 1699 1369 1369 1369 1369 1369
- Northern Bus Lines East Molb to Footscray - SITA Eastern Freeway Group	Sub notal 402 Sub notal 301 302 303 304 305 306 307 308 309 315	Footscray to East Melbourne The Pines to City Box Hill to City Michain Ste to City Regional Ste to City City to Warrandyte Bridge North Fringwood to City Michain to City Deep Creek to City Dorole to City Dorole to City City to Templestowe City to Templestowe City to Hill	445 4,017 1,858 932 30 1,832 1,650 378 2,627 631 838 539 539 539 539 530	454 3,546 2,033 847 30 1,670 1,765 329 2,638 612 050 71 20	1% 4% 42% 23% 3% 6% 3% 7% 13% 0% 3% 2% 2% 0%	1,239 6,239 6,239 3,835 2,248 884 3,961 1,396 6,230 0,14 1,239 7,32 4,77	175% 57% 57% 132% 141% 2863% 100% 20% 134% 137% 29% 136% 128% 228%	1734 809 889 1669 2847% 1199 139 1699 1369 1699 1305 1265 10159 22859
- Northern Bus Lines East Molb to Footscray - SITA Eastern Freeway Group	Sub notal 402 Sub total 301 302 303 304 305 306 306 307 308 309 309 309 310 315 316	Footocray to East Melbourne The Pines to City Box Hill to City Michael Sta to City Michael Sta to City City to Wanandyte Bridge North Ringwood to City Michael to City Deep Creek to City Darvale to City City to Templectowe City to	449 4,017 1,858 932 32 1,832 1,650 378 2,857 631 838 2,857 631 838 2,857 831 838 2,857 831 838 2,857 831 838 838 838 838 838 838 838 838 838	454 3,546 3,546 2,033 847 30 1,670 1,765 329 2,638 612 050 711 20 20 20 123	1% 1% 42% 42% 3% 5% 5% 5% 1% 0% 0% 0% 0% 0% 1% 2% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 6,239 6,239 3,834 3,861 1,396 884 6,230 0,014 1,329 732 477 634	170% 176% 67% 67% 132% 141% 2563% 100% 20% 130% 132% 132% 132% 132% 132% 132% 132% 132% 132% 132% 141% 141% 142% 14	1734 809 889 1669 199 139 139 1699 1309 1309 1205 10155 22065 3009
- Northern Bus Lines East Molb to Footscray - SITA Eastern Freeway Group	Sub notal 402 Sub sotal 301 302 303 304 305 306 307 309 307 309 307 309 313 315 318 319	Footocray to East Melbourne The Pines to City Box Hill to City Michael Sta to City Regrecod Sta to City City to Warsindyte Brégo North Ringwood to City Michael to City Deep Creek to City Davrole to City Davrole to City City to Templectowe City to East Hill Templectowe to City The Pines to City	445 4,017 1,858 9330 1,832 1,850 3787 631 038 2,877 631 038 2,87 107 038 2,87 107 038 2,87 107 038 2,87 107 038 2,87 107 038 2,87 107 107 107 107 107 107 107 107 107 10	454 3546 2,033 847 30 1,570 1,765 329 2,650 612 050 71 20 319 319	1% 1% -12% -23% -23% -23% -23% -2% -2% -2% -2% -2% -2% -2% -2	1,239 6, 239 8, 230 3,835 2,248 8,84 3,961 1,996 8,84 6,230 0,014 1,379 7,82 4,77 6,54 9,97	178% 87% 87% 132% 141% 266% 100% 100% 126% 127% 22% 130% 128% 128% 128% 128% 128% 128%	1734 889 889 1669 139 139 139 139 1369 1369 1369 13
- Northern Das Lines East Molb to Footocray - SITA Eastern Freeway Group	Sub notal 402 Sub notal 301 302 303 304 305 306 307 308 309 313 315 316 318 319 360	Footocray to East Melbourne The Pines to City Box Hill to City Michael Sta to City Michael Sta to City City to Wanandyte Bridge North Ringwood to City Michael to City Deep Creek to City Darvale to City City to Templectowe City to	445 4,017 1,058 930 1,650 378 2,67 631 038 2,67 631 038 2,67 631 038 2,67 631 039 2,67 1,07 107 107 107 1,055	454 3545 2,033 847 30 1,670 1,765 329 2,638 612 050 71 20 71 20 123 319 1,426	1% 1% 1% 2% 3% 3% 3% 3% 3% 3% 3% 3% 3% 3%	1,239 6,230 6,230 3,835 2,248 8,844 3,961 1,396 8,844 6,230 0,044 1,229 7,922 4,77 6,14 9,97 4,511	176% 67% 67% 132% 141% 2863% 100% 20% 137% 286% 137% 286% 137% 286% 474% 2285% 474% 2285%	1734 889 889 1669 1669 139 1699 139 1699 1399 1259 10157 22857 3099 22869 22899 22099
- Northern Bus Lizes Taet Mells to Footscray - SITA Eastern Freeway Group - National	Sub rotal 402 Sub rotal 301 302 303 304 306 307 308 307 308 307 308 309 313 315 318 319 360 Sub rotal	Footocrag to East Melbourne The Pines to City Box Hill to City Michael Sta to City City to Wanandyte Bridge North Ringwood to City Mitchael to City Desp Creek to City Danxole to City Dity to Templestowe City to Templestowe City to Box Hill Templestowe to City The Pines to City City to Latrobe Uni	445 4,017 4,012 1,658 932 332 1,650 378 2,557 631 038 52 537 631 038 52 52 1,550 52 107 2,565 12,565	454 3546 3546 2033 847 300 1,670 1,765 329 2,638 612 050 612 050 612 050 123 319 1,426 12,741	1% 1% 22% 22% 23% 23% 23% 23% 23% 23% 23% 23	1,239 6,000 6,000 6,000 6,000 6,000 884 6,200 884 6,200 884 1,396 6,384 1,396 884 1,396 884 1,329 792 792 792 797 854 4,811 854 4,961 29,952	178% 87% 87% 132% 141% 268% 132% 132% 132% 20% 22% 132% 28% 132% 228% 474% 228% 474% 228% 132% 132% 132% 132% 132% 132% 132% 132	173* 857 857 1665 1665 1667 137 1667 137 1667 1667 1667 1667 1
- Northern Das Lines East Molb to Footocray - SITA Eastern Freeway Group	Sub notal 402 Sub sotal 301 302 303 304 305 306 306 307 300 307 300 313 315 318 319 360 Sub-total 246	Footocray to East Melbourne The Pines to City Box Hill to City Michael Sta to City Regrecod Sta to City City to Warsindyte Bridge North Ringwood to City Michael to City Deep Creek to City Davrole to City Davrole to City City to East Hill Templeatowe to City The Pines to City	445 4,017 4,017 1,858 932 1,852 1,850 378 2,877 6,71 0,08 2,877 6,71 0,08 2,877 6,71 0,08 1,852 2,999 1,525 12,565 6,058	454 3546 3546 2,033 847 300 1,670 1,765 329 2,530 612 050 612 050 1,233 919 1,426 12,241 1,2339	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 6,100 6,100 3,835 2,246 8,844 3,361 1,396 8,844 6,200 0,014 1,309 7,927 4,117 8,544 9,967 4,511 29,967 5,789	176% 176% 57% 57% 57% 57% 121% 121% 121% 126% 126% 126% 126% 126% 126% 126% 126% 126% 126% 126% 126% 126% 126% 126% 126% 127%	1734 897 897 1667 1897 1667 1367 1367 1367 1367 1367 1367 2397 2069 2069 2069 2069 2069 2069 2069 2069
- Northern Dus Lines East Multo to Footscray - SITA Eastern Freeway Group - National National	Sub notal 402 Sub sotal 301 302 303 304 305 306 307 308 307 309 309 301 305 306 307 308 309 309 309 309 313 315 318 319 360 Sub total Sub total Sub total	Footscrag to East Melbourne The Pines to City Box Hill to City Michain Stin to City Hingwood Stin Io City Oty to Warsendyte Bridge North Fringwood to City Michain to City Deep Creek to City Deep Creek to City Davide to City City to Templeatowe City to Box Hill Templeatowe to City The Pines to City City to Latrobe Uni Latrobe Uni to Externeick	445 4,017 4,017 1,288 932 322 1,650 378 5,01 030 5,01 030 5,00 1,525 12,585 5,059	454 3546 3546 2033 847 300 1,670 1,765 329 2,638 612 050 612 050 612 050 123 319 1,426 12,741	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 6,000 6,000 3,395 3,2146 884 884 6,200 0,04 4,1229 732 477 854 854 854 854 854 854 855 28,552 5,789	176% 176% 67% 67% 131% 141% 2563% 134% 134% 134% 134% 136% 136% 136% 136% 136% 136% 136% 136	1734 807 887 1667 28474 1199 1667 28474 1199 1667 309 1267 309 2267 2267 2267 2267 2267 2267 2267 226
- Northern Dus Lines East Multo to Footocray - SITA Eastern Freeway Group - National National Hoddle Street - National Johnston Street Group	Sub rotal 402 Sub total 301 302 303 304 305 306 307 308 307 308 309 313 315 318 319 360 Sub total 200	Footscray to East Melbourne The Pines to City Box Hill to City Michan Ste City City to Warrandyte Bidgo North Fringwood to City Michan to City Deep Creek to City Derovek to City Doroele to City City to Templectowe Dify to Bas Hill Templectowe to City The Pines to City City to Latrobe Uni Latrobe Uni to Externetick Donoester to City	445 4,017 1,858 902 1,850 378 2,557 631 039 858 2,557 100 100 1,555 5,059 5,059 5,059 5,059 5,059	454 454 3,546 3,546 3,546 3,546 3,546 3,546 3,546 3,546 3,546 3,30 1,765 3,26 3,26 3,26 3,26 3,26 3,26 3,26 3,26	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 6,000 6,000 6,000 6,000 6,000 8,0000 8,000 8,000 8,0000 8,0000 8,0000 8,0000 8,0000 8,0000 8,0000 8,0000 8,0000 8,000000	176% 176% 176% 175% 175% 175% 175% 175% 126% 100% 126% 126% 126% 126% 126% 126% 126% 126	1734 887 887 1667 1667 1367 1367 1367 1367 1367 136
- Northern Dus Lines East Multo to Footscray - SITA Eastern Freeway Group - National National	Sub notal 402 Sub sotal 301 302 303 304 305 306 307 308 307 309 309 301 305 306 307 308 309 309 309 309 313 315 318 319 360 Sub total Sub total Sub total	Footscrag to East Melbourne The Pines to City Box Hill to City Michain Stin to City Hingwood Stin Io City Oty to Warsendyte Bridge North Fringwood to City Michain to City Deep Creek to City Deep Creek to City Davide to City City to Templeatowe City to Box Hill Templeatowe to City The Pines to City City to Latrobe Uni Latrobe Uni to Externeick	445 4,017 4,017 1,288 932 322 1,850 378 5,01 030 5,01 030 5,00 1,525 12,585 5,059	454 3,546 2,033 847 3,00 1,570 1,765 3,299 2,638 612 050 71 2,039 2,638 612 050 71 2,039 2,638 612 050 71 2,039 2,638 6,129 5,149 5,149 5,149 5,149 5,1455,145 5,1455,145 5,145 5,145 5,145 5,145 5,145 5,145 5,1455,145 5,145 5,	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 6,000 6,000 3,395 3,2146 884 884 6,200 0,04 4,1229 732 477 854 854 854 854 854 854 855 28,552 5,789	176% 176% 67% 67% 131% 141% 2563% 134% 134% 134% 134% 136% 136% 136% 136% 136% 136% 136% 136	1734 807 887 1667 28474 1199 1667 28474 1199 1667 309 1267 309 2267 2267 2267 2267 2267 2267 2267 226
- Northern Dus Lines East Multo to Footocray - SITA Eastern Freeway Group - National National Hoddle Street - National Johnston Street Group	Sub rotal 402 Sub total 301 302 303 304 305 306 307 308 307 308 309 313 315 318 319 360 Sub total 200	Footscrag to East Melbourne The Pines to City Box Hill to City Michain Ste to City Hingwood Ste to City Oty to Wansendyte Bridge North Fringwood to City Michain to City Deep Creek to City Despole to City City to Templeatowe City to Box Hill Templeatowe to City The Pines to City City to Latrobe Uni Latrobe Uni to Externeick Dancester to City Dancester to City	445 4,017 1,858 902 1,850 378 2,557 631 039 858 2,557 100 100 1,555 5,059 5,059 5,059 5,059 5,059	454 454 3,546 3,546 3,546 3,546 3,546 3,546 3,546 3,546 3,546 3,30 1,765 3,26 3,26 3,26 3,26 3,26 3,26 3,26 3,26	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 6,000 6,000 6,000 6,000 6,000 8,0000 8,000 8,000 8,0000 8,0000 8,0000 8,0000 8,0000 8,0000 8,0000 8,0000 8,0000 8,000000	176% 176% 176% 175% 175% 175% 175% 175% 126% 100% 126% 126% 126% 126% 126% 126% 126% 126	173* 857 857 1651 2847* 1191 1367 1367 1367 1367 1367 1367 22057 22057 22057 22057 22057 22057 22057 22057 22057 22057 22057 22057 22057 2057
- Northern Bus Lizes East Mells to Footscray - SITA Eastern Freeway Group - National Notional Hoddle Street - National Johnston Street Group	Sub notal 402 Sub sotal 301 302 303 304 305 306 307 308 307 309 313 315 318 319 360 Sub-total 246 Sub-total 200 201	Footscrag to East Melbourne The Pines to City Box Hill to City Michain Ste to City Hingwood Ste to City Oty to Wansendyte Bridge North Fringwood to City Michain to City Deep Creek to City Despole to City City to Templeatowe City to Box Hill Templeatowe to City The Pines to City City to Latrobe Uni Latrobe Uni to Externeick Dancester to City Dancester to City	445 4,017 4,017 1,656 932 330 1,832 1,650 378 2,567 6,01 0,00 5,02 1,025 5,058 5,058 5,058 5,058 5,058 1,248 1,412	454 454 3,546 2,033 847 30 1,670 1,765 329 2,538 612 050 612 050 0 71 20 71 20 71 20 71 20 71 20 71 20 71 20 319 1,426 1,239 8,339 5,345 5,445 6,245 7,4457,445 7,4457,445 7,445 7,445 7,4457,445 7,445 7,4457	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 1,239 8,100 8,100 8,100 8,100 8,100 8,100 8,10 9,00 8,10 9,00 9,10 1,200 9,11 1,200 9,11 1,200 9,11 1,200 9,11 1,200 1,2	176% 176% 177% 177% 171% 171% 171% 171% 170%	173 857 887 1657 187 137 169 137 169 137 169 137 1257 10157 22857 2257 10157 2269 2059 2059 2059 2059 2059 2059 2059 357 39 527 39 527 39 527 39 527 39 527 39 527 39 527 527 527 527 527 527 527 527 527 527
- Northern Bus Lizes East Mells to Footscray - SITA Eastern Freeway Group - National Notional Hoddle Street - National Johnston Street Group	Sub notal 402 Sub sotal 301 302 303 304 305 306 307 308 307 309 307 308 309 309 309 309 309 309 309 309 309 309 309 309 309 309 309 309 309 3115 3115 3115 3119 360 Sub sotal Sub sotal 200 201	Footocrag to East Melbourne The Pines to City Box Hill to City Michael So to City Regeood Sta to City City to Warsindyte Bridge North Ringwood to City Mitchaen to City Deep Creek to City Davoile to City City to Templectawe City to Box Hill Templectawe to City The Pines to City City to Latrobe Uni Latrobe Uni to Elisteewick Dancester to City Dancester to City	445 4,017 1,288 932 322 1,650 378 2,657 6,71 0,00 1,525 12,585 5,059 1,248 1,248 1,248 1,248	454 454 3,546 3,546 3,546 3,5453,545 3,545 3,545 3,545 3,5453,545 3,545 3,545 3,545 3,5453,545 3,545 3,545 3,5455 3,54553,5455 3,5455 3,54555 3,5455553,54555555555555555	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 6,500 6,649 3,395 3,2148 884 884 884 884 6,200 0,014 1,329 732 407 854 451 28,552 5,789 2,205 2,75 2,7	176% 176% 67% 67% 131% 141% 2563% 134% 134% 134% 134% 137% 136% 136% 136% 136% 136% 136% 136% 136	173 857 1657 2847 1159 137 1367 1367 1367 22857 2087 2077 20
- Northern Bus Lizes East Mells to Footscray - SITA Eastern Freeway Group - National Notional Hoddle Street - National Johnston Street Group	Sub notal 402 Sub total 301 302 303 304 305 306 307 308 307 308 309 313 315 318 319 360 Sub total 246 Sub total 200 201 200 201 205	Footocrag to East Melbourne The Pines to City Box Hill to City Michael Sta to City City to Wanandyte Bridge North Filopeood Sta to City Michael Sta City Desp Creek to City Descole to City Davole to City City to Templeature City to Templeature City to Box Hill Templeatures to City The Pines to City City to Latrobe Uni Latrobe Uni to Elatorewick Doncester to City Dancester to City Dancester to City Dancester to City	445 4,017 4,017 1,656 932 330 1,832 1,660 378 2,567 6,01 038 22 0 1,025 1,525 12,566 5,058	454 454 3,545 2,033 847 3,045 3,045 3,045 3,045 3,045 3,045 3,045 4,0454,045 4,045 4,045 4,045 4,0454,045 4,045 4,045 4,0454,045 4,045 4,0454,045 4,045 4,0454,045 4,045 4,0454,045 4,045 4,0454,045 4,045 4,0454,045 4,045 4,0454,045 4,045 4,0454,045 4,045 4,0454,045 4,0454,045 4,045 4,0454,0454,045	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 1,239 6,100 6,490 3,355 2,246 8,844 3,361 1,366 1,366 1,366 1,366 1,366 1,370 772 4,511 2,377 4,511 2,357 5,789 5,789 5,789 2,356 5,789 2,356 5,789 4,208 4,20 4,20 4,20 4,20 4,20 4,20 4,20 4,20	176% 176% 176% 175% 175% 175% 175% 175% 120% 120% 124% 127% 126% 126% 126% 126% 126% 126% 126% 126	173* 857 867 1667 1867 137 1367 137 1367 1367 1367 1367 1367
- Northern Dus Lines East Multo to Footscray - SITA Eastern Freeway Group - National Hoddle Street - National Jokeston Street Group - National	Sub notal 402 Sub notal 301 302 303 304 305 306 307 308 307 309 313 315 316 319 360 Sub-total 246 Sub-total 200 201 202 201 202 203	Footscray to East Melbourne The Pines to City Box Hill to City Michain Stin to City Hingwood Stin to City Oty to Warsendyte Bridge North Fringwood to City Michain to City Desp Dresh to City Desp Dresh to City Davide to City City to East City to East Hill Templeatowe to City The Pines to City City to Latrobe Uni Latrobe Uni to Estorweick Doncester to City Dancester to City	445 4,017 4,017 1,258 932 32 32 1,650 378 5,07 6,01 0,08 2,567 5,08 2,567 1,008 1,525 5,059 1,525 5,059 1,248 1,412 2,714 2,014 1,127 2,714 2,014 1,127 2,714 2,014 1,127 2,714 2,014 1,127 2,714 2,014 2,017 2,014 2,017 2,00	454 454 3,546 3,546 3,546 3,546 3,546 3,546 3,346 3,346 3,346 3,346 3,346 3,346 1,766 1,244 1,538 4,538 4,538 1,596 1,446 1,210 3,109 2,100 3,546 1,54	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 1,239 6,500 6,600 3,395 2,248 844 3,361 1,396 844 1,329 732 4,127 854 4,511 28,552 5,789 2,236 2,237 6,00	176% 176% 176% 175% 175% 175% 175% 175% 126% 126% 126% 126% 126% 126% 126% 126	1733 889 889 1665 2947 1191 1391 1395 1395 22089 22099 22099 22099 22099 22099 22099 22099 22099 22099 22099 22099 22099 2000 2000000
- Northern Das Lines East Mult to Footscray - SITA Eastern Freeway Group - National Hoddle Street - National Johnston Street Group - National	Sub notal 402 Sub total 301 302 303 304 305 306 307 308 309 313 315 318 319 560 Sub total 200 201 200 201 205 207 Sub total 546	Footocrag to East Melbourne The Pines to City Box Hill to City Michael Sta to City City to Wanandyte Bridge North Filopeood Sta to City Michael Sta City Desp Creek to City Descole to City Davole to City City to Templeature City to Templeature City to Box Hill Templeatures to City The Pines to City City to Latrobe Uni Latrobe Uni to Elatorewick Doncester to City Dancester to City Dancester to City Dancester to City	445 4,017 4,017 1,856 932 1,850 378 2,527 631 508 50 50 50 50 50 50 50 50 50 50 50 50 50	454 454 3,546 3,546 3,546 3,546 3,546 3,546 3,546 3,29 2,658 6,129 3,19 3,19 3,19 3,19 3,19 3,19 3,19 4,206 1,241 5,339 6,339 1,566 1,446 1,210 3,210 2,168 5,720	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 6,000	176% 176% 176% 175% 175% 175% 175% 175% 120% 120% 124% 120% 126% 126% 126% 126% 126% 126% 126% 126	173* 89% 88% 1657 1387 1397 1367 1367 1367 1367 1367 1367 1367 136
- Northern Duc Lines East Multi to Footscray - SITA Eastern Freeway Group - National Hoddle Street - National Johnston Street Group - National	Sub notal 402 Sub notal 301 302 303 304 305 306 307 300 307 300 307 300 313 315 318 319 360 Sub-total 246 Sub-total 200 201 202 301 313 315 318 319 360 Sub-total 200 201 205 205 206 207 Sub-total Sub-total	Footocrag to East Melbourne The Pines to City Box Hill to City Michael So to City Regrecod Sta to City North Ringwood to City Mitchaen to City Deep Creek to City Danvale to City Danvale to City City to Templectave City to Templectave City to East Hill Templectave to City The Pines to City City to Latrobe Uni Latrobe Uni to Elstoerwick Dancester to City Dancester to City	445 4,017 4,017 1,656 932 332 1,650 378 2,667 6,01 038 22 0 1,62 20 1,525 12,566 6,058 6,058 6,058 6,058 1,412 1,127 2,704 6,110 938 6,110	454 454 3,545 2,033 847 30 1,670 1,765 329 2,538 612 050 612 050 050 050 050 050 050 050 050 050 05	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 1,239 6,100 6,100 6,100 6,100 3,355 2,246 8,844 3,361 1,366 8,844 6,230 0,014 1,329 7,72 4,11 2,957 7,72 4,12 5,789 5,789 5,789 5,789 5,789 4,120 5,789 4,120 5,789 5,78 5,789	176% 176% 176% 176% 171% 171% 171% 171%	173* 897 887 1667 12847* 1191 1367 1367 1367 1367 1367 1367 1367 136
- Northern Bus Lines East Multi to Footscray - SITA Eastern Freeway Group - National Hoddle Street - National Johnston Street Group - National Datensity Pde to Meth Uni - Dysens Rathdowne Street Group	Sub notal 402 Sub setal 301 302 303 304 305 306 307 308 309 307 308 309 309 309 309 309 309 309 309 313 315 318 319 560 Sub rotal 200 201 200 201 203 205 205 207 Sub rotal 546 Sub rotal 546 Sub rotal	Footscrag to East Melbourne The Pines to City Box Hill to City Michain Stin to City Heigenood Stin to City Oty to Wansindyte Bridge North Pingenood to City Michain to City Desp Creek to City City to East Hill Templectowe to City The Pines to City City to Latrobe Uni Latrobe Uni to Estoenweck Descenter to City Descenter to Melbourne Uni Descenter to Melbourne Uni Descenter to Latrobe Uni	445 4,017 4,017 1,555 932 32 1,650 378 5,57 6,71 0,00 1525 12,565 1,525 5,059 1,525 5,059 1,248 1,412 2,148 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 2,148 1,412 2,748	454 454 3,546 3,546 3,546 3,546 3,546 3,546 3,546 3,29 2,638 6,612 4,26 1,765 1,210 1,225 1,225 1,225 1,225 1,244 1,538 6,338 6,338 5,339 5,359 5,339	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 6,500 6,600 3,395 2,248 884 3,361 1,396 884 6,200 0,14 1,329 732 4,511 28,552 5,788 2,336 2,237 5,788 2,236 2,237 5,000 4,523 5,788 5,844 3,582	176% 176% 176% 176% 175% 175% 175% 175% 175% 126% 126% 126% 126% 126% 126% 126% 126	173 807 807 1657 2947 1197 1267 2067 1267 22067 22067 22067 22067 22067 22067 22067 2007 20
- Northern Bus Lines East Mells to Footscray - SITA Eastern Freeway Group - National Hoddle Street - National Jokeston Street Group - National Daesens Pde to Melb Uni - Dyson	Sub notal 402 Sub total 301 302 303 304 305 306 307 308 309 313 315 318 319 560 Sub total 200 201 203 204 205 205 205 205 205 205 205 207 Sub total 546 Sub total 246 205 207 Sub total 546 Sub total 251 254 254	Footocrag to East Melbourne The Pines to City Box Hill to City Michael Sta to City City to Wareardyte Bridge North Ringwood to City Mitchael Sta City Desp Creek to City Desp Creek to City Donole to City Davole to City City to Templestowe City to East Hill Templestowe to City City to East Hill Templestowe to City City to Latrobe Uni Latrobe Uni to Extremelok Dancaster to City Dancaster to City Dancaster to Melbourne Uni Dancaster to Melbourne Uni Dancaster to Melbourne Uni Dancaster to Melbourne Uni Dancaster to Melbourne Uni Part Melbourne to Latrobe Uni Part Melbourne to City City Part Melbourne to City Part Melbourne to City City Part Melbourne Uni City Part Melbourne Uni City City Part Melbourne Uni City City Part Melbourne Uni City City City City City City Part Melbourne City	445 4,017 4,017 1,856 932 332 1,832 1,850 378 2,527 631 039 50 50 50 50 50 50 50 50 50 50 50 50 50	454 454 3,546 3,546 3,546 3,546 3,546 3,546 3,546 3,29 2,658 6,129 3,19 3,19 3,19 3,19 1,426 1,241 5,339 6,339 6,339 1,546 1,446 1,210 3,210 2,168 5,710 2,168 2,1	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 6,000	176% 176% 176% 176% 175% 175% 175% 175% 175% 120% 120% 124% 127% 120% 120% 120% 120% 120% 120% 120% 120	173 877 1667 199 199 199 199 199 199 199 199 199 19
- Northern Bus Lines East Mells to Footscray - SITA Eastern Freeway Group - National Hoddle Street - National Johnston Street Group - National Ducents Pde to Nelb Uni Dynema Robdowne Street Group	Sub notal 402 Sub total 301 302 303 304 305 306 307 308 309 313 315 318 319 560 Sub total 200 201 203 204 205 205 205 205 205 205 205 207 Sub total 546 Sub total 246 205 207 Sub total 546 Sub total 251 254 254	Footscrag to East Melbourne The Pines to City Box Hill to City Michain Stin to City Heigenood Stin to City Oty to Wansindyte Bridge North Pingenood to City Michain to City Desp Creek to City City to East Hill Templectowe to City The Pines to City City to Latrobe Uni Latrobe Uni to Estoenweck Descenter to City Descenter to Melbourne Uni Descenter to Melbourne Uni Descenter to Latrobe Uni	445 4,017 4,017 1,555 932 32 1,650 378 5,57 6,71 0,00 1525 12,565 1,525 5,059 1,525 5,059 1,248 1,412 2,148 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 1,412 2,748 2,148 1,412 2,748	454 454 3,546 3,546 3,546 3,546 3,546 3,546 3,546 3,29 2,638 6,612 4,26 1,765 1,210 1,225 1,225 1,225 1,225 1,244 1,538 6,338 6,338 5,339 5,359 5,339	1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1% 1	1,239 6,500 6,600 3,395 2,248 884 3,361 1,396 884 6,200 0,14 1,329 732 4,511 28,552 5,788 2,336 2,237 5,788 2,236 2,237 5,000 4,523 5,788 5,844 3,582	176% 176% 176% 176% 175% 175% 175% 175% 175% 126% 126% 126% 126% 126% 126% 126% 126	173 877 1655 2947 179 133 1697 133 1697 1357 2067 2079 2097 2097 2097 2097 2097 2097 209

Table 2.8 : Change in Boardings by NCCC Service – Total Weekday

Under strategy A the above routes will carry more demand than all of Melbourne's 2 tram groups currently carry .

Bus

- By the 2021 base case there is little change expected in bus demand.
- Strategy A results in substantial bus growth (+80%) dominated by growth in demand on the NCCC related services; the Eastern Freeway group of services (+135%) and also the Johnston Street Group (+78%)

A.M. Peak Boarding Impacts - Study Area Services

Table 2.9 shows some of the spatial changes in study area bus route loadings for the A.M. Peak. It also shows the numbers of services offered in each case. This assists in understanding how service levels as well as patronage have changed.

Group	Base 2001	Base 2021	2021 St	rategy A
	Boardings/Vehicle Trips	Boardings/Vehicle Trips	Boardings/Vehicle Trips	% Change from 2021 Base
Eastern Freeway Group	4,261/91	4,280/91	9,605/228	+124%/+151%
Johnson Street Group	1,043/29	1,153/29	3,788/96	+142%/+131%

Table 2.9 : Changes in Key Study Area Bus Route Loadings – A.M. Peak

This indicates that:

- There is not much change between the 2001 and 2021 base case
- Demand increases considerably on both route groups in Strategy A, however only in the Johnson Street group is demand growth higher than the increased number of vehicle trips offered.

Table 2.10 shows the spatial changes in study area tram route loadings for the A.M. Peak. This indicates that:

- All tram corridors have growth between 2001 and 2021 associated with frequency increases
- For Strategy A, the highest growth is on the Royal Parade and Brunswick Street Trams (over 200%)
- The largest group by volume is the University Group; this has one of the lower growth levels for Strategy A (+71%) although this is still a considerable increase in growth. However this group has no service level changes in Strategy A.
- In <u>all</u> cases the growth in demand for Strategy A is higher than growth in service frequencies

• All tram services with no frequency growth in Strategy A have demand growth; some e.g. route 86 (Smith Street) have considerable growth (+123%)

Group	Base 2001	Base 2021	2021 Str	ategy A
	Boardings/Vehicle Trips	Boardings/Vehicle Trips	Boardings/Vehicle Trips	% Change from 2021 Base
96 – Nicholson Street	4,117 /34	5,458 / 42	14,349 /62	+163/+48
86 – Smith/Queens Pde	6,259 /36	8,864 /47	19,765 /47	+123/0
11 – Brunswick St / St Georges Road	4,859 /42	6,405 /53	19,338 /74	+202/+40
109, 23, 24 & 42 – Victoria Parade Group	6,157 /42	10,236 /42	27,896 /74	+169/+76
3, 5, 6, 8, 16, 64, 67, 72 – the University group	22,524 /188	29,169 /238	49,979 /238	+71/0
1,22 – Lygon Street	5,763 / 56	8,334 /72	20,142 /110	+142/+53
19 – Royal Pde.	5,848 / 38	7,159 / 48	24,383 /76	+236/+58
55, 68 – Royal Park	5,152 /47	7,850 / 58	9,508 / 58	+21/0
50,57 North Melbourne	2,776 /28	3,685 /37	5,966 /37	+62/0
59 Mt Alexander Rd	5,679 /44	6,828 / 53	18,727 /83	+174/+57

Table 2.10 : Changes in Key Study Area Tram Route Loadings – A.M. Peak (2 Hour)

Note: Only a.m. peak data to this detail is available at this stage

Table 2.10 also indicates that a.m. peak tram vehicle movements on Swanston Street are likely to total around to 80-90 per hour in one direction range. This is suggestive of average headways around the 40 second range for the full 2 hours of the A.M. Peak (in practice peak of the peak headways may be in excess of this). We doubt if these headways are feasible on Swanston Street. In practice since trams do not run with even gaps between arrivals a 40 second headway will imply 'platooning' of vehicles and shunting of trams between intersections as traffic lights change. It is likely that in these circumstances, practical headways will be determined by :

- the phasing of traffic lights on Swanston Street ;and
- the distance between traffic intersections (in terms of the number of trams which can be held there) ; and
- the length of tram stop boarding and alighting areas (in terms of number of trams that can be held there); and
- methods of organising the boarding and alighting of tram vehicles and the impacts this has on dwell times (current practice includes same door boarding and alighting and ad hoc loadings to individual vehicles). There is potential for separate door or side of vehicle loading and unloading and also for coordination of loading/unloading time by groups of vehicles to match traffic light sequences).

These results indicate the need for management of tram vehicle flows within Melbourne CBD. A number of potential options for managing this are identified later in this section.

2.6 Peak Maximum Load Impacts

Peak maximum load analysis is important in establishing the feasibility of the options tested. The modelling of demand does not constrain passengers to board vehicles if they are full as happens in the 'real world'. Hence the model allows overloaded vehicles and it is necessary to check this to ensure service design is reasonable.

Earlier analysis established that with Strategy A total a.m. peak all mode transit journeys increased by 23% whilst boardings increased by 48%. Trams were particularly highly impacted since M>Tram a.m. peak boardings increase by 105% and Yarra by 150%.

Tables 2.11 to 2.13 illustrate peak maximum load point demand volumes and the number of runs by service and option for study area buses, trams and train. It also shows the average maximum load per vehicle; the key measure of overloading.

It should be noted that modelling of maximum load demands for specific routes and services is an inexact science. It stretches the capability of any model to represent demand in a specific area for a specific time period with accuracy equivalent to the real world, hence identifying maximum load demand is particularly difficult.

Tables 2.11 to 2.13 illustrates maximum load demand per vehicle trip for bus, tram and train for the 2001 base case and also for the 2021 base case and strategy A. In this way we can assess the accuracy of the model by reference to its representation of 2001 base case loads and assess the potential impacts for Strategy A within this light.

2.6.1 Bus

There is a wide range of possible bus vehicle sizes enabling maximum passenger load capacities per vehicle ranging from 45 (standard bus) up to around 120 for an articulated or stretch rigid vehicle. Key findings for Bus in Table 2.11 are:

Bus 2001 Base

- There is a wide range of maximum loads per bus including some very low values. As noted we are not overly surprised by this; achieving accurate transit maximum loading is an inexact art rather than a science.
- In general bus loadings are within achievable bus vehicle capacities

Bus 2021 Base

- There is a mixed bag of impacts on maximum loads including:
 - A general increase in Rathdowne Street group loadings; these will probably be a concern for bus capacity planning since the modelled percentage change in max load is high (up to 182%)

- Hoddle Street, route 246 and 504 loadings are down
- There is a mix of impacts on the important Eastern Freeway and Johnson Street services
- In general bus max loads are within capacity thresholds

Bus 2021 Strategy A

- Strategy A impacts relative to the 2021 base case are also mixed:
 - All Johnson Street service maximum loadings are down suggesting some opportunity to save peak bus resources in this corridor
 - The impact on the Eastern Freeway group is mixed; overall some balancing of capacity within the group will be needed however there are no clear indications of overloading or underloading
 - Hoddle Street route 246, the East Melbourne-Footscray route 402 and the Clifton Hill-Brunswick route 504 all have consistent growth in Strategy A. This is probably lead to overloading concerns on these routes unless higher capacity vehicles are available.
 - Rathdowne street services, already under maximum load demand pressure in the 2021 base case, have further increases in Strategy A (in the peak direction). Again peak capacity may be a concern.
 - The new bus routes in Strategy A, which increase coverage of the Eastern Freeway service catchment, have relatively light maximum loadings. Some reductions in headways would probably be warranted.
- In general bus max loads are within capacity thresholds

Our overall impression of these results is that they suggest that bus frequency and capacities are appropriate to the demands forecast. As noted peak maximum load work is an inexact science and our conclusions must be viewed in this light. In practice more detailed route and service planning will be needed to adjust bus service design appropriate to this strategy as it is developed.

								S - BU				
Basic Number	Direction	No. of	2001 Base Lord at	Arringe	Net	2021 Base Leaf at	Annes	Charge in	200 No. of	1 Strateg Leal at	y A Antrage	Change in Ar
Intelling (Harden)	Difference in the second	Services	Var. Loui Point	Load per Vehicle	Seculars	Max Load Pelot	Lead per Vehicle	Av. Load per Vekiele	Services	Max Load Point	Load pro Vehicle	Load per Vehicle
Cigico Sill - Branowick Rd								fram 2001				frem 21 bas
								-				
Dur 304	Eathound Westbewest	5	58 34	11 5	3	31 21	6 4	-45% -13%	12	77 39	3	3 67
East Halb - Feeboray												
Ekar 400	Eathound Westwood	12	152 489	12 41	12	61 521	5 -48	40%	12	364 989	28 83	4379
Eastern Freeway Group												
Bus 301	Easthough	1	18	18	1	13	12	-33%	13	289	13	45
Eve 302	Westbound Eastbound	2	-463	47	10	307	.59 9	26%	12	532	44	-34
200.310	Wethward	â	225	29	1	217	2	-8%	12	234	28	-38
Bue 303	Westbound	2	13	8	2	11	6	-20%	12	365	31	4111
Bus 304	Easthound	1	40	40	1	34	- 94	-15%	10	292	- 28	-18
	Wethead	4	191	50	4	10	-40	-16%	P	30	4	3
Bue 304 7 stations 1	Easthound Westbound	2	54	37 54	2	-68 136	35 46	28%	1	72	38	-21
Bue 300	Easthound		204			1.00		-16.76		46	2	
Dias 305	Wetterard	1	- 6	45	1	51	.53	10%	3	131	24	-50
Bur 305 Vatation 1	Eathound	L	19	19	1	23	20	21%	1	12	13	-43
B., 241.0	Westborged	7	359	37	2	206	4	10%	3	287	- 10	-38
Diar 305 Variation 2 Diar 308	Eathound Wrathough	2 4	50	25	4	31	34	-24%	2	34	11	-37
Due 306 Valiation	Westward	2	22	35	1	- 104	-94	-4%	10	338	28	
Dia 307	Eathough	2	61	31	1	4	24	-21%	12	365	31	27
	Westward	8	224	28	1	267	30	19%	12	312	26	-32
Dur 301	Wetheast	7	256	37	7	231	36	-2%	12	2.10	23	-4)
Bus 309	Westbound	- 5	34	48	3	278	31	5%	12	615	50	8
Dog 313 Dog 313	Westbound Eastbound		27	34	1	20	- 19	37%	12	320	27	45
Don 316	Wetternd	3	63	31	1	21	25	21%	12	201	23	-14
Due 350	Easthound	6	173	29	1	121	29	-30%	12	234	19	.7
-	Westburgh	7	220	32	2	182	20	-15%	12	492	41	49
Nobility Devet												
Bue 346	Hethlowed	1	-44	44	1	41	40	-5%	1	80	88	90
Diar 346 Vielation	Nothboard Zeuthboard	9 12	367 863	21 大2	1	141 794	11	-16%	10	151 952	18 83	25
Johnston Street Group												
Box 300 7 statists	Eathough	4	10	75	4	141	30	27%	12	125		-711
ACCE AND I MEMORY	Westward	5	79	16	5	34	17	6%	12	139	13	-11
Diat 201	Tathound	-4	55	34	4	53	13	-5%	12	111	9	-29
	Westbound	4	- 89	22	4	- 10	- 20	-1%	12	215	11	-19
Dia 200	Westbound	3	71	24	1	10	29	23%	12	213	11	-37
Bog 200 Bog 207	Westbourd Eathound	- 2	31		2	73	18	-10%	13	122	14	-14
Box 207 Vistation	Wathout	3	64	21	1	71	24	11%	12	255	21	-11
Queens File - Melli Cisi												
Dor 546	Eathound Westbound	4	30 34	8	4	21	3	-36%	4	20 23	3 6	24
Raibleway Street Group				-								
Bur 150	N enhboand	7	309	16	,	133	22	42%	12	149	13	-45
3000 MIT	Suthboard	6	91	15	- i -	illi	28	107%	11	387	- 24	15
Bue 259 7 station 1	Nettbound	1	3	3	1	3	9	80%	1	1	3	-44
Pos 250 Variation 2	Suddread	1	11	- 11	1	31	34	102%	1	36	34	10
.Bor 19	Nothboard Zouthboard	5	10	10 14	3	103	21 31	17%	12	406	14 38	-31 96
New Bas Routin												
Bue 20A	Enthrough								12	182		
Bui 20A	Wetterad	1	1.1		r	r	1		12	289	17	
Dia 308	Earthough			-					12	147	u	
Pos 200	Westbound				· · · ·			·	12	183	16	-
Bur 30A Bur 30A	Eathound Weathound								12	276	20	[
Dia 300	Tathound			-				<u>, </u>	14	179	13	
Due XB	Wethough								13	206	24	
Bus 30C	Eathound	1	1		ь.	L	1		52	216	11	
Bue 300	Wethead	•	· · · · · ·			· · · · · · · · · · · · · · · · · · ·	· · · · ·		12	40		
Bus 300	Easthorand							·	12	56	5	-
Due 30D Bue 30B	Wethound Bashound								12	- IB 		[
Due 306	Wetherand			-				. 1	14	130	11	
Due Heckle 3/Virte									17	4	1	
	Westward	4	1						12	57	5	

Table 2.11 Modelled <u>Bus</u> Maximum Load Results for Strategy A

A.M. Peak Lasts for 2 Hours between 07:00 and 09:00

2.6.2 Trams

Reasonable maximum capacities for tram and light rail range from around 50 to 150 per vehicle (excluding high capacity multiple tram sets). Maximum load demand results for Tram are shown in Table 2.12. These suggest:

Trams 2001 Base

• Modelling of the existing maximum loads on tram services is generally within feasible capacity however we suggest that estimates are generally on the high side with specific services (19, 55, 59, 67, 42, 86) being much higher than actually occurs.

Trams 2021 Base

• Despite increases in capacity of tram services between 2001 and 2026, growth in maximum loadings suggests higher capacity is required for some routes (55, 59, 8, 109).

Trams 2021 Strategy A

- Despite further increases in peak capacity in Strategy A, maximum loading generally increases some considerably beyond reasonable existing capacity bounds:
 - Routes 19, 55, 11, 109 and 86 have average peak max loads between 200 and 300 per vehicle
 - Routes 1, 3, 57, 59, 67, 8, 23, 24, 70, 75 and 96 have average peak max loads in the 100-200 per vehicle range
- Should these loading forecasts eventuate, additional strategy measures would be necessary. Possible options include either:
 - Increased vehicle capacity (articulated tram sets); and/or
 - Increased frequency (additional trams/ hour); and/or
 - Suppression of demand (probably by fare increases).
- In addition to the loading issues identified, the model is also suggesting that combined vehicle movements on trams in Swanston Street will become very high making it difficult to maintain effective headways. In effect tram vehicle congestion will result in a slow service. Options worth considering to address such a problem should it eventuate include :
 - Upgrading to higher capacity transit modes e.g. Heavy rail
 - Double deck trams
 - Operation of trams in tunnels or with large amounts of traffic intersection grade separation
 - Spreading out tram operations from concentration on a single major thoroughfare (Swanston Street) to other options. Bifurcating routes to operate Swanston Street and Elizabeth Street and/or William Street would be a possible option here.

	IPARISO			2001 Base					0 - IR		1.6		
	Raute Number	Direction	No. of Sheekee	Load at Max. Load Point	Annuage Load per Vehicle	No.of Sections	1023 Base Load at Max. Load Point	Annage Load per Vehicle	Change in An Loud per Vehicle	No. of Services	Load at Max. Load Point	Arrenge Load pro Vehicle	Change in Au Load per Vehicle
• 14	h: Ball Servicer								Nom 2001				fiere 21 base
	Light Fiel Horb Rd	Bethoand				10	1,140	74 11		10	2,507	168 41	121%
	Treme	Wethcast				0	194		·	10	410	- 41	0.09
	Tran I.	Northbound Southbound	12	758 959	66 64	13	1048	71	27%	34	2.1.40	19	28%
	Tran 16	Northberged	13	726	.56	17	920	54	-3%	17	540		3%
		Southerad	12		26			- 25	30%		197		50%
	Tran 19	Hothburnd Southburnd	15 20	1,900	127 99	28	2,939 2,127	126	-1%	30 40	9,021 6,044	301	135%
	Tran D Variable 2	HotMotad		156	85	1	20	10	2%	6	1,539	217	192%
	Team 20	Notkinsail	12	107	.59	15	941	63	7%	34	1,664	69	1DN
	Tran 22 Vaciation I	Scathbarasil Northbarasil	18	300	- 39	17	713	1	9%	34	1,700	34	764
	Tran 3	Northbound	10	.580	.55	ú	603	32	- 25	17	1,274	107	87 %
		Southbound	8	330	4	ü.	34	53	25%		645	- 65	25%
	Tran 3 Variation 3	Southboard		.50	10	4	51		-13%	6	43	7	-17%
	Tran 3 Variation 2 Tran 5	Southbound Nonthbound	10	-4	-4	12	63	- 6 0 55	54%		101		255
	1 Parts 2	Southbound	1	290	34	11	401	40	2%	10	312	#	38%
	Team 55	Hotherad	12	1,299	202	15	2,720	183	60%	13	3,041	217	42%
		Southermd	24	1,197	66	18	2,68	12	28%	30	1,000	40	-27%
	Team 35 Variables 1 Team 37	Hotheraul Settleard	11	300	28 18	13	141	28	-4%	11 30	2,031	31	52%
	- 1988 - 17	Weathouse	15	607		17	Latt	7	52%		1,219	73	1%
	Tran 19	Northborund	IT	1,305	π	28	1.877	70	21%	30	3,294	130	16%
	Ware 19 19 19	Southbound		2,401	120	24	2.403		-17%	40	6,539		71%
	Tran 59 Variation 1 Tran 6	Nothbrund Nothbrund	T 12	50	т. 	9 13	71	55	10%	13 13	855		122%
	119012	Southbound		159	36	ŭ	598		22%	12	101	73	47%
	Transf Variation 1	Hothburned	2	12	6	1	13	5	-17%	1	39	11	102%
	1	Southborand	1	- 54	- 54	t	6	- 61	75%	1	39	39	30%
	Transf Variation 2 Transfil	Nothbound	2	110	- 55 59	1	136	40 42	-10%	3	1.00	61 84	28
	TENNIS	Hotherad Bratherad	Ť	40	32	13	104		10%	11	314	20	34%
	Transid Variation 1	Southborned	3	4	1	j j	4	- L	-39%	3	8	3	100%
	Trans 64 Vaciation 7	Southborned	1	79	79	1	Ø	Ð	62%	1	- 69	- 67	47%
	Tran-57	Northbound	13	1,100	85	17	1.43	-10	-2%	17	LINO	131	33%
	Tran-97 Vaciation 1	Southbound Southbound	- T -4	206	- 30	9	- 328	- 28	20%		- 351 - 69	- <u>6</u> 34	75%
	Tran-67 Vaciation 2	Southboraud	2	16	30	1	132	44	16%	1	100		32%
	Tran-69	Nottherand	12	191	70	15	1,140	71	4%	15	2,423	142	112%
		Southtorand	12	.512	-4	15	788	52	9%	25	1,533	164	99%
	Transfit Vaciation 1	Hotherad	5	149	21 21	1.1	112	28	- 5% 1%		414	34 32	102%
	Transfé Variation 7	Should show and Should be used	2	121	17		24	20	41%	4	312	70	192%
	Team 73	Sathyand		400	.50	13	788	60	29%	13	8.07	80	23%
		Wathoard	10	366		- 0	683	34	- 2%		1,009	50	64%
	Tran 72 Vaciation I	Bathoand					- 3		41%	1	79	79	108%
	Tism 79	Nothbroad Southbroad	10	313	35 29	12	38	28 33	15%	12	603	25 25	
	Trand	Nothberald	13	016	63	17	977	57	-8%	17	2,514	140	157%
		Southboraud	10	367	92	. 17	L374	8	37%	17	1,82	107	32%
	Tran 12	Hotherad	* 9	254	27	13	238	26	-30%	10	454	45	78%
	Tran 12 Variable 1	Southerned Southerned		10		14	13	4	-176	1	339	30	05%
-	Deservice 21	Notherad	114	6,640	-18	141	8,581	- 18		166	14,010	83	
	-	Scattered	112	4,734	40	141	1298	26		140	12,933		
	and a												
	Team II.	Nothborad	18	168	.59	17	1,110	78	19%	34	2,100	83	24%
		Southborned	34	1,448	- 69		3,177	73	6/%	40	10,084	2.80	26%
	Tran II. Vaciation I	Nothbound		3	3		4	4	33%	1	33	7	63%
	Tran 11 Variation 2 Tran 12	Nothbraid Nothbraid	- 4	98 511	25 39	28	371	2	9%	20	1,1,53		08%
		Southbarund	10	404	30	12	614		6%	ii	100	47	32%
	Tean 21	Wetthoand	4	246	62	4	238	- 11	42%		1,107	130	48%
	Tran-G Tran LIP	Rathond	1	100	100 12		120	128	20%	1	2,834	12	-32%
	Tran LIP	Settoard Wettoard	自由	990	12	13	1,533	11.8	79%	34	6,073	112 291	-1%
	Team 119 Variability 1	Weathingod	2	84	4	3	138	78	- 60%	4	3.11	1299	172%
	Tran 119 Variabore 2	Sethoard	3	120	40	1	287	39	123%		468	70	-42%
	Tren 24	Bathoard	2	100	50	2	78	19	-22%	1	53	47	19%
	Tran 24 Vaciation I	Westhours! Buthours!	- 4	- 27 70	71 16	4	73	73	1%	+	439	107	47 % 363 %
	Tran-4	Bathoand	- Í	315	29	13	441	34	20%	13	146	- 65	90%
		Wethousd		189	45		90	40	0%		1,307	45	48.%
	Tran-Il Vasidos	Bathcond.	2	90	-45	1		N	25%	1		44	-22%
	Tran.20	Eathound Wethound		-42 12	4	13	28	1	57% 32%	1) 1)	300 1,111	39 81	551% 907%
	Tran 71	Rethoand	10	604	66	12	363	12	0%		1,84	565	130%
		Weathcoard	ri	827	64	12	1,046	-62	-4%	11	2,618	1.36	154%
	Tran 79 Variation 1	Bethrand	1	- 8	- 8	1	3	3	0%	1	7	7	132%
	Tran 73	Bathoard	10	50		13	670	10	-1%	13	1,270	106	84%
	Turn 71 March 1	Westhound Testhoand	13	 14	-44	12	303	-48	19%	17	2,330	13	181% 1光用
	Tran 73 Vaciation 1 Tran 16	Bathoast Nothbaund	13	14	14	12	2718	20	135%	17	3,109	74	135%
		Southbaruad		1,119	95	2	1,592	- 10	-14%	20	5110	2.19	228/%
	Tran 16 Variation 1	NotMorcad	6	96	14	1	117	15	2%	1	213	27	82%
	With States and States and	Southbound			- 8	1	R	8	- 2%	1	211	211	322%
	Tran 26 Variation 2 Tran 26	Nothbound Nothbound	1	64 1,296	64 30	20	R 1611	я 11	6%	1 30	242	122	67%
	- 1999 10	Double-rand Double-rand		827	64	12	1,011	÷.	-4%	34	1,473	145	127%
	Tran 19 Vaciation 1	Hothlonasi	1	19	19	1	28	28	37%	1		30	13%
		Southbound	3	0	- 3 -	4		2	-10%	6	44	7	63%

Table 2.12 Modelled <u>Tram</u> Maximum Load Results for Strategy A

A.M. Peak Lasts for 2 Hours between 07:00 and 09:00

Train

Key maximum load demand results for train are shown in Table 2.12.

				2001 Base			2021 Base			200	21 Strategy	y A	
	Reute Greep	Direction	Ne. of Services	Lead at Max. Lead Point	Arrenge Load per Vekiele	No. of Services	Loud at Max. Loud Point	Antengo Load per Vekicle	Change in Av. Load per Vehicle from 2001	No.of Services	Lond wi Max. Load Point	Anterago Load per Vehicle	Change in Ar Load per Vehicle fram 21 bass
Bayside	Trains												
	Cautifield Occup	h. Dut	49 33	17,354 1,459	354 105	6) 42	25,141	399 123	13%	63 42	25,430	403 149	19
	Northern Group	ls. Out	64 47	23,944 3,590	374 76	73 15	40,413 1,401	554 98	43% 29%	1.00 78	44,179 6,340	433 14	-225
Hillside	Trains												
	Cirton Hill Group	la.	24	12,382	516	30	19,625	654	27%	45	18,396	409	-385
	Bunky Group	Out In	1.6	1,352	85 286	20	2,298	115	36%	30	2,220 21,720	34	-36%
		Out	33	4,911	149	41	7,542	174	17%	- 19	6,958	131	-32%

Table 2.13 Modelled Train Maximum Load Results for Strategy A

A.M. Peak Lasts for 2 Hours between 07:00 and 09:00

These suggest:

Train 2001 Base

- The highest average maximum load is 516 per train which is well within maximum 6 car set capacity (thought to be around 1,200)
- However these figures mask known existing loading problems on most rail groups; peak trains are currently very close to full capacity.
- This suggests the 2001 base values should be considered representative of existing maximum capacity per train set

Train 2021 Base

- Results suggest a considerable growth in peak train service frequencies; around 24% more inbound trains are run on all lines
- Total inbound peak rail demand increases by 55%
- Maximum loads per train also increase but not by as much as total rail demand. Nevertheless growth in rail maximum loads per train is considerable; 48% for Northern group and 27% for the Clifton Hill group
- Should growth rates of these size eventuate, additional capacity management measures will be required such as increasing train set capacities or increasing rail service frequencies.

Trains Strategy A

- Strategy A increases the inbound peak train frequencies from 191 per 2 hour peak (2001) to 308 (+61%). This results in a very large volume of train movements through the city loop in the Strategy A 2021 service:
 - Northern group has an average of 51 trains per peak hour

- Caulfield group has over 30 an hour
- Rail track and signaling infrastructure limits the volume of trains it is possible to safety move through a rail system on a given line. Currently thinking is that 30 trains an hour is a reasonable existing limit per rail group. The design of Strategy A rail services clearly presents additional challenges with regard to future rail service capacity management.
- Strategy A does not affect total peak rail demand much relative to the 2021 base service. However the considerable increase in train frequencies associated with Strategy A means that average maximum loads per train actually decline on most lines. Hence the strategy A service level may be warranted for 2021 base case services. The implication of this finding is that heavy rail service frequencies increases in Strategy A may be overly large for strategy A alone.

2.7 Summary of Overall Impacts

See Table 2.14.

Table 2.14 : Summary of Major Weekday Strategy Elements and Impacts : Strategy A

	Die 2.14 : Summary of Major Weekday Strategy Elements and Impacts : Strategy A									
	Strategy Elements									
services Improve	tial increases in public transport service frequencies – most study area services including some operating in the rest of Melbourne es station access improvements including improvements within Melbourne CBD ogrades – reliability, stops and through routing of the Elizabeth S tram group to St Kilda									
Improve improve	 Better study area East-West links – Eastern Freeway and Johnston Street bus route groups operate to 									
	Melbourne University plus Johnson and Elgin Street Busway									
Market	Impact (from 2021 Base)									
NCCC Trav										
Total Travel	 Transit journeys increase by 105K sourced from car 71%, walk/cycle, 22% Transit journey growth is from Through and External Travel markets (48% each) 									
Temporal Impacts	 A.M. Peak NCCC transit journey mode share increases from 32% to 41% Most transit journey growth and car travel decline occurs inter peak 									
Spatial Impacts	 Almost a third of transit journey growth is external travel from the South and almost a third is through travel North to South Theses are also the sources of equivalent car travel reductions 									
Metropolita	n Wide Travel ¹									
Total Travel	• Transit journeys increase by 327K sourced from car (75%) and walk (25%)									
	Transit journey mode share increases from 7% to 9%									
Temporal Impacts	 Transit journey growth at the expense of car follows through to each time period 60% of transit journey growth occurs in the inter-peak 									
	• Transit journey mode share increases most in the a.m. peak (to 11%)									
Individual S	Service Impacts									
Service Boarding	• Transit boardings increase by 827K (+54%) implying much transfer behaviour on new journeys. Tram boardings increase by 105%, Rail 21% and Bus 26%									
Impacts	• Strategy A more than doubles tram patronage; high growth in the Eastern Freeway and Johnson Street buses (135%/78%) also occurs, rail notably the Upfield line, also has considerable increased boardings (+63%)									
	• Transit boarding growth is highest in the peak (P.M. Peak 60%) . Yarra has 150% more a.m. peak boardings and M>Tram 105%									
Maximum Load Demand Impacts	• Strategy A impacts on peak tram maximum loads are very large and will require the development of additional strategy measures to managing overloading an tram congestion if realised in practice. Routes 19, 55, 11, 109 and 86 have forecast average maximum loads per tram in the 200-300 range with others in the high 100-200 range.									
	• These maximum loads are not sustainable and would require either larger capacity vehicles (usually articulated tram sets) and/or increased frequency									
	• Running trams at higher frequency or larger trams are not considered a reasonable									
	 option since trams will 'platoon' and queue slowing the service Other possible options include grade separation of all tram operations or upgrading to a higher capacity transit mode (e.g. heavy rail). Spreading tram routes over more streets may also assist e.g. bifurcating routes on Elizabeth, William and/or Swanston Street 									
	• Strategy A runs over 60% more peak direction trains than at present. Peak trains go to 51/hr on some groups. Measures to enable train volumes of this size will be required									
	• Strategy A does not increase train overloading; rather it increases train frequencies alleviating demand on the overloaded 2021 base network. In this context it can be argued that the Strategy A service frequencies are needed for the 2021 base case									

¹Strategy A service changes affect a much greater part of Metropolitan Melbourne than the NCCC area. This section examines total Melbourne travel market impacts

3 STRATEGY F DONCASTER AREA RAPID TRANSIT - LIGHT RAIL

3.1 Strategy Inputs

Strategy F involves the addition of a new rapid transit service on the Eastern Freeway termed the Doncaster Area Rapid Transit (DART). Key features are:

- Alignment The new transit route follows: Doncaster Shoppingtown along Doncaster Road, Eastern Freeway, Alexandra Parade, Nicholson Street, Elgin Street, Melbourne University and the CBD via Swanston Street to St Kilda Road, Fitzroy Street, the Esplanade and Acland Street. The St Kilda Road to St Kilda route segment is shared with other Melbourne trams services.
- Mode The Eastern Freeway rapid transit system has been added as a new mode and is considered to be a high performance light rail, that is half way between a train and a tram. Hence it uses transfer penalties and run specification constants which lay half way between the train and 109 tram modes.
- Right of Way
- It has a dedicated tram alignment on Eastern Freeway with no loss of road space for other vehicles (with a free speed of 100 km/h);
- There is no delay through Hoddle Street intersection;
- It uses a dedicated facility along Alexandra Parade, Nicholson Street and Elgin Street to Melbourne University with the removal of 1 traffic lane in each direction on Alexandra Parade (free speed of 35 km/h). Note that the Elgin Street Bus Way (between Nicholson St and Melbourne University) has been replaced with a tram fairway;
- Stations/Stops
- Premium stations have been provided at Doncaster Shoppingtown, Doncaster Road/Eastern Freeway, Bulleen Road and Chandler Highway:
- these listed 'premium' stations include high-standard Park/ride, kiss/ride provisions (car access terminal penalties as for Premium stations in Strategy A)
- other rapid transit stops, also regarded as 'premium' stations, are:
 - : at Hoddle Street/Alexandra Pde (with access to Victoria Park Rail Station),
 - : Nicholson Street/Johnston Street, and
 - : Melbourne University.
- All of the above Premium stations reflect the standard used in Strategy A, e.g.: interchange penalties reduced to 5 minutes, maximum walk interchange time of one minute, maximum wait time of 5 minutes
- The rapid transit system then stops at all CBD stops and all stops to St Kilda using the existing tram fairway and sharing the route with other trams.

- Service Levels Eastern Freeway Rapid Transit frequency of 4 minutes in the peaks and 5 minutes in the off peak, which relates to the tram route 109 frequencies in Strategy A.
- Bus Operating Strategy -
 - Existing (from Strategy D) Eastern Freeway buses become feeders for the rapid transit service, hence no buses actually use the freeway.
 - Buses that go to Doncaster Shoppingtown will now feed the Rapid Transit system, but still maintain their current routes unless they used the Eastern Freeway.

Strategy F like all NCCC strategy options include all the features of the strategies which precede them. This includes :

- Strategy A Transit service developments
- Strategy B/C Local Traffic Management and Cycling and Walking improvements within the NCCC area
- Strategy D CBD commuter parking price increases

3.2 Modelling Impacts

Since strategy F is a composite of earlier strategies, the individual results of this strategy have been compared against those of strategy D. In this way the relative impacts of strategy F can be compared against those of the others.

3.2.1 Strategic Travel Behaviour Changes

Table 3.1 presents a summary of the major weekday journey impacts suggested by the modelling.

	Shate	gy D (Sto	togy F Base	e Casse)	Strateg	у F Donca	ster Rapid	Transit	Difference (Number)					Difference (%)			
	Car	Public Transport	Walk	Total	Car	Public Transpert	Walk	Total	Car	Public Transport	Wolk	Total	Car	Public Transport	Walk	Total	
Tetal Jeamsys pr	er Weekday	1															
Total Melbourne			2,276,119	15,106,610	11,421,687	1,408,691	2,278,224	15,106 (802	-4,726	4,613	105	-8	0%	D%	0%	0%	
NCCC Contidor																	
Through	274,805	219,340	5,474	500,619	273,112	220,914	6,529	500,955	-1,693	1,574	155	- 36	-1%	1%	2%	0%	
Taltan	336,146	171,093	126,160	634,207	335,670	172,440	126,079		-460	547	-09	-10	0%	D%	0%	0%	
uttern .	46,D05	13,199	48,311	107,575	46,182	12,944	48,452	107,578	117	-255	141	З	0%	-2%	0%	0%	
TETAL	657,016	434,432	180,953	1,242,401	654,972	406,298	181,160	1,242,430	-2,044	1,868	207	29	0%	D%	0%	D%	
Mode Share by M	tarket																
Tatal Melboarne	76%	9%	15%		76%	9%	15%						0%	D%	-0%		
NCCC Corridor																	
Through	55%		1%		55%	44%	1%						0%	D%	0%		
TitRim	53%				53%	27%	20%						0%	0%	- 0%		
1001	43%	12%	45%		43%	12%	45%						0%	0%	- 0%		
TEINL	53%	33%	15%		53%	33%	15%						0%	0%	-0%		

 Table 3.1 : Strategy F: Total Journey Impacts by Mode

This indicates that:

Metropolitan Melbourne

• Total travel does not change. This is to be expected, the model has been set up to explore shifts in travel between modes not trip generation.

- Total public transport travel increases by 4.6K journeys. This appears to be totally sourced from reduced car travel.
- Transit mode share does not change (on a Metropolitan wide basis)

NCCC Area Travel

- NCCC public transport use increases by 1.9K sourced entirely from car drivers. In addition there is some increase in walking (0.2K trips).
- Most public transport travel growth is from through travel (1.6K). External travel increases by .5K whilst internal transit trips decrease (by 0.3K trips).
- NCCC car travel reduces by 2K
- The biggest volume of traffic reductions are through travel
- Reductions in NCCC car journeys total 2K, however represents less than half the traffic reduced as part of Strategy F for the whole Metropolitan model
- NCCC walk/cycle travel increases marginally

<u>Metropolitan wide</u> transit boarding impacts are illustrated in Table 3.2.

	Strateg	yD:	Strateg	gy F -	Change		
	Strategy F	Relative	Doncaste	r Rapid			
	Base Cas	e - 2021	Tran	sit			
Total PT Journeys	1,404,078		1,408,691		4,613	0%	
Total PT Boardings		%Total		%Total			
M> Tram	676,262	28%	708,845	29%	32,583	5%	
Yarra Tram	572,674	23%	562,824	23%	(9,850)	-2%	
Sub-Total Tram	1,248,936	51%	1,271,669	52%	22,733	2%	
M> Train	434,345	18%	435,387	18%	1,042	0%	
Connex	280,550	11%	278,255	11%	(2,295)	-1%	
Sub-Total Rail	714,895	29%	713,642	29%	(1,253)	0%	
Metro Bus	478,098	19%	460,211	19%	(17,887)	-4%	
Other	14,287	1%	14,344	1%	57	0%	
Total	2,456,216		2,459,866		3,650	0%	
Boardings per Journey	1.75		1.75		0.79		

Table 3.2 : Modelled Impacts on Transit Boardings – Strategy F

This indicates that for <u>Metropolitan wide travel</u>:

- Whilst total transit journeys increase by 4.6K, boardings increase by only 3.6K. This is suggestive of some existing multi-transfer journeys being replaced by direct no transfer journeys as a result of DART
- There are over 3.6K additional transit boardings per weekday.
- Tram boardings increase by 22.7K at the expense of rail and mainly bus (down 18K)
- M>Tram has the largest increase mainly because this is where the DART service is operated
- Interestingly Yarra tram boardings decline by almost 10K (or 2%)

• M>Train boardings increase slightly whilst Connex loses 2.3K

3.2.2 Temporal Distribution of Impacts

Table 3.3 shows the impacts on transit boardings by time period

Table 3.3 : Change in Transit Boardings by Time Period – Metropolitan Melbourne

		Strategy D : Strategy F Relative Base Case - 2021				Strategy F . Bencaster Rapid Transit				Change From Base Case							
Total PT Board	fings	A.M. Peak	Of Peak	P.M. Peak	Total	A.M. Peak	Of Peak	P.M. Peak	Total	A.M. Peak	Of Peak 3	P.M. Peak	Total	A.M. Peak	Of Peak	P.M. Pask	Total
hd> Tran		152,098	305.718	158.446	676,262	163,092	381,480	164,265	708,845	10,984	15.770	5.019	32,583	7%	4%	4%	5%
Varia Tran		127,948	312,420	132,362	672,674	124,341	300,725	129,758	563 SIN	-3.613	-3.703	-2,544	-9,850	-3%	-1%		-2%
	2sh Total Trees	280,042	679,146	290,749	1,249,936	287,433	690,213	294,023	1,271,968	7,391	12,067	3,275	22,730	3%	- 2%	1%	2%
MP Train.		127,542	198,139	108.684	434,345	127,965	198,781	108.661	435,387	413	642	-13	1,842	0%	0%	0%	0%
Connec		82,001	124,668	73,981	280,550	81,533	123,667	73,165	278,258	-480	-1.001	-828	-2,295	-1%	1%	-1%	-1%
	Date-Total Rail	229,543	322,687	182,685	714,005	209,485	322,338	151,016	713 (642	-85	-350	-839	-1,253	D46	0%	0%	0%
bdeten Rive		124,930	285,681	87,587	470,090	120,212	26,747	60.952	451,211	-4,610	-9,914	-1,255	-17 (007	-4%			
Oldere		7,293	3,462	3,632	14,297	7,278	3,682	3,564	14,344	-15	40	32	67	0%	1%	1%	0%
	Totel	621,808	1,299,966	584,442	2,496,216	624,511	1,271,800	963,996	2,458,858	2,783	1,834	-897	3,850	D16	0%	0%	0%
Time Period S	hare	A.M. Peak	Of Peak	P.M. Peak	Total	A.M. Peak	Of Peak	P.M. Peak	Total	A.M. Peak	Of Peak 3	P.M. Pauk	Total				
Id> Tran		22%	54%	25%	100%	23%	54%	25%	100%	34%	40%	10%	100%				
Yana Tran		22%	62.%	22%	100%	22%	55%	20%	100%	37%	30%	36%	100%				
	Jub Total Trees	22%	64%	23%	100%	22%	64%	23%	100%	33%	- 59%	14%	100%				
Mr Train		29%	45%	25%	100%	29%	42%	25%	100%	40%	62%	-1%	100%				
Conewe		29%	44%	25%	100%	29%	44%	25%	100%	20%		30%	100%				
	Sub-Total Rail	29%	4%	22%	100%	29%	2%	25%	100%	4%	22%	67%	100%				
Meiro Bua		26%				35%			100%	355	50%.]	19%	100%				
Older		61%	24%	25%	100%	51%	24%	25%	100%	-26%	70%	5 6%	100%				
	Total	25%	62%	25%	100%	25%	52%	25%	100%	74%	50%	-24%	100%				

This indicates that:

- Whilst total boardings increase by 3.6K most of this occurs in the a.m. peak and the remainder in the inter-peak. Overall p.m. peak boardings decline.
- Given the overall growth in transit journeys associated with DART, we suspect this means that multi-leg transit trips have declined as a result of DART in the P.M. peak
- By transit mode, tram has by far the highest boardings growth 22.7K. Most of this occurs in the a.m. and inter-peak periods
- In contrast the decline in rail (Connex) is highest in the p.m. peak.
- We hypothesize based on these results that DART attracts a.m. peak and interpeak demand from bus and mainly other trams. However in the p.m. it attracts a higher share of travel from rail mainly because there is a large group of commuters making a.m. trips by bus and p.m. return trips by rail to bus transfer trips
- By operator, M>Tram has the largest boardings growth by time period in the a.m. peak (+7% or 11K boardings)

3.2.3 Spatial Distribution of Impacts

Table 3.4 shows an analysis of changes in modal trip patterns between the Strategy D base case and the 2021 Strategy F case. This indicates that:

NCCC Public Transport Travel

- As noted the 1.9K per day increase in NCCC PT journeys is mainly sourced from through travel. By individual spatial area this indicates that:
 - Through travel growth is virtually all from between the East and the South. This accounts for 71% of transit journey growth in total
 - The other major transit growth comes from West-East through travel and also travel between NCCC an the East

NCCC Car Travel

• Car travel decline follows the above spatial patterns for public transport growth

NCCC Walk Travel

- Walk travel growth is the result of growth in through walk/cycle travel and also internal travel plus a small decline in external travel
- Growth in through walk/cycle travel is mainly between North-South and South-West
- Decline in external walk/cycle travel is mainly between NCCC and the South and North

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3.2.4 Transit Service Boardings Impacts

Total Daily Boardings Impacts

Table 3.5 shows the changes in transit boardings by individual NCCC related service.

This indicates that:

Rail

- Hillside trains decline whilst Bayside boardings increase.
- Biggest Bayside trains growth is on the Upfield line
- Biggest declines in Hillside Boardings is on the Clifton Hill group and also the Hurstbridge line.
- These figures are illustrative of a decline in the Doncaster Catchment rail travel and a transfer to DART

Tram

- DART achieves 68,721 boardings per weekday. This is above average for Melbourne tram by route but is well below the high performing tram services in terms of daily boardings (the Mont Albert tram group achieve 78% more boardings than DART.
- Most other tram services have boardings reductions as a result of DART. The biggest impacts are on Swanston Tram services particularly Swanston Street routes 22, 16 and 5.

Bus

- Study area bus boardings are down by 19%, these passengers are using DART.
- As expected, the Eastern Freeway group of routes has a decline in boardings of over 50%. Routes 313, 315 and 303 are particularly affected (over 70% decline in boardings, these using the DART system)
- Johnston Street group buses have a boardings increase of 16%. Route 205 has a very high boardings increase (+56%)
- The Rathdowne Street group of routes and the Hoddle Street route 246 also have a modest increase in boardings as a result of DART.

TRAIN				Nodel	lied Board	ings		
Line		Stations	7000	2021 D (Bas		2021 F -	DART	
				Na	% 2001	Ne	% 2001	% 2021
Boyside	Broadmeadows	Broadmeadows to Flinders St	30,276	56,693	67%	56,844	88%	01
	Frankoton	Modiallec to Franksten	44,053	63,752	45%	63,447	44%	01
	Pakentam	Flinders St to Pakenham	60,327	04,114	67%	04,190	67%	01
	Sandringham	Finders St to Sandtingham	25,587	41,473	58%	41,688	57%	15
	St Albana	St Albana to Flinders Street	25,858	77,219	199%	77,528	200%	01
	Stony Paint	Frankston to Sterry Point	1,111	2,269	104%	2,252	103%	-11
	Upfield	Upfield to Flagstaff	10,839	29,975	177%	30,201	179%	11
	Wenbee	Flinders St to Wenibee	19,569	64,161	220%	64,470	229%	01
	Williamsteve	Williamstown to Plinders 58	8,442	14,689	120%	14,781	122%	11
	Sub-total		215,042	434,345	102%	435,387	102%	
Hilside	Hilbide							
	Alamein	Conibervell to Alemein	6,296	12,215	94%	12,157	93%	01
	Belgrave	Finders St to Blackbarn	32,161	41,334	29%	40,967	27%	-13
	Epping	Epping - Parkarsent	25,505	51,929	BD%	51,384	70%	-12
	Glen Waverley	Flindets St - Glen Waverley	26,668	53,543	101%	53,834	102%	11
	Hurstbridge	Greensboreugh - Flinders St	28,154	53,797	91%	52,572	87%	-2
	Lilydaie	Parliament to Litydale	43,730	67,732	55%	67,241	64%	-11
	Sub-total	to a manager of sector and sector and	165,013	200,550	68%	278,255	60%	.1
	All Rail		380,025	714,895	88%	713.642	87%	0
	100 0.001		- and parts	111,400		1.120.000	1427 10	
TRAM ALCOC C.								
TRAM (NCCC Servic	:es)				Nodelled D			
Route No		Salvarbs	2000	2021 D (Bar	se Case)	202	1 F - DARI	
				Na	% 2001	Na	% 2001	
Secondors								
	Doncester erea	rapid transit				68,721		
	1	Sth Melbourne Beach to East Ca	16,254	60,737	261%	52,440	223%	-115
	96	Melb University to St. Kilds Seach	5,603	19,197	123%	15,743	83%	-107
	19	City to North Coburg	32,516	116,519	258%	114,922	253%	-19
	22	Arts Centre to Moreland	7,853	28,841	267%	24,431	212%	-151
	3	Melb University to East Malvern	12,039	29,838	148%	26,991	124%	101
	5	Melbourne University to Malvern	0,924	19,200	116%	16,894	07%	-135
	50	North Melbourne to City	1,595	3,805	139%	3,758	135%	-15
	55	West Coburg to Domain Rd	19,634	40.303	105%	40,136	104%	05
	57	City to West Marbymong	14,097	26.948	91%	26,416	87%	-21
	69	City to Airpet West	25,480	92,292	249%	91,009	244%	-19
	29							-119
	64	University to Glen Iris	13,710	31,396	129%	20,090	105%	
	67	University to East Drighton	11,546	23,803	101%	21,105	70%	-115
	BY CON	University to Carnegie	14,141	35,098	148%	32,245	128%	-87
	89	St Kilda Beach to Kew	14,417	44,410	206%	44,139	206%	-11
	72	Melbeurne University to Comber	19,591	43,935	124%	40,499	107%	-81
	70 & 79	North Richmand to Praksan	6,065 18,292	13,100	92%	13,295	93%	15
	8	Melbourne University to Toorak		44,439	173%	40,020	151%	-85
	82	Moenee Ponds to Footscray	3,764	7,233	92%	7,255	93%	05
	Sub-total		248,621	679,262	173%	708,845	185%	49
Yarra	11	City to West Preston	20,602	77,466	276%	72,793	253%	-61
	12	St Kilda to City	10,049	29,323	192%	20,710	106%	-25
	23/42/109	City to Mont Albert	25,385	125,051	374%	123,003	305%	-25
	24 & 4B	City to North Balwys	18,433	35,126	91%	33,527	82%	-59
	30 8.34	City to East Melbourne	2,758	9,467	243%	9,136	231%	-39
	70	City to Wattle Park	18,764	40.820	118%	40,530	117%	01
	76	City to East Burward	16,400	67,261	247%	66,772	244%	-19
	86	City to Bundsora	32,684	93.447	100%	92,346	185%	-15
	96	St Kilds to East Brunnwick	23,771	78,258	229%	79,883	236%	29
				r te janeter		13,124	-2%	-41
		MARKA CRO		13,602	276.1			-21
	City Circle	Within CBD	13,339	13,602	2% 264 8			
	City Circle Sub-total	Webs CBD	13,339 183,034	559,811	206%	549,992	200%	
	City Circle	Within CBD	13,339					21
	City Circle Sub-total All Tram	Within CBD	13,339 183,034	559,811 1,239,873	2064	549,992	200%	
BUS (NCCC Service	City Circle Sub-total All Tram		13,339 183,034 431,655	999,811 1,239,073	2064 1075 Aodelled (549,992 1,250,037 leardings	200%	21
BUS (NCCC Service Route Name	City Circle Sub-total All Tram	Webs CBD Salverb	13,339 183,034	559,811 1,239,873 8 2821 8	2064 1875 Andelled B 259	549,992 1,250,037 leardings 2021	200% 192%	21
Routo Name	City Circle Sele-total All Trans	Suborb	13,339 183,034 431,635 2000	559,811 1,239,073 8 2821 8 No	206% 187% Andelled B ase % 2001	549,992 1,250,037 leandings 2021 No	200% 192% A - PT im % 2001	21
Route Name Cilitan Hill to Brunewick Rd	City Circle Sub-total All Trans S) 534		13,339 183,034 431,655 2000 640	559,811 1,239,073 2821 B No 1,230	2064 1875 Aodelled B 259 % 2001 174%	549,992 1,250,037 1,250,037 1,250,037 No 1,257	200% 992% A - PT in % 2001 100%	21 ps 25
Route Name Clifton Hill to Brunewick Rd - Northern Bus Lines	City Circle Sub-total All Trans S) 534 Sub-total	Sultanto Moosee Ponds to Clifton Hill	13,339 183,034 431,625 2000 440 445	559,811 1,239,073 2821 B No 1,230 1,230	206/4 107% Acidelled D ase % 2001 174% 124%	549,992 1,290,037 1,290,037 1,200 1,200 1,200 1,200	200% 192% 4 - PT im % 2001 182% 180%	29 25 29
Routo Name Clifton Hill to Brunewick Rd – Northern Bus Lines East Mello to Footscray	City Circle Sath-total All Trans Sath-total Sath-total 402	Suborb	13,339 183,034 431,635 2000 840 445 4,017	559,811 1,239,073 2021 8 No 1,230 1,230 7,246	206% 107% Acatelled D ase % 2001 174% 104% 80%	549,992 1,250,037 1,250,037 1,250,037 1,250 1,259 7,197	200% 192% % 2001 100% 190%	21 p5 21 -1%
Route Name Cliftum Hill to Brunewick Rd - Northern Bus Lines East Mells to Footscray - SITA	City Circle Salt-total All Trans Sub-total Sub-total Salt-total Salt-total	Salverb Mossee Pands to Clifton Hill Featureay to East Melbourne	13,339 183,034 401,625 2000 445 445 4,017 4,017	559,811 1,239,073 2821 8 No 1,230 1,230 7,246 7,246	206% 107% Acatelled D ase % 2001 174% 104% 80% 80%	549,992 1,250,037 1,250,037 1,250 1,259 1,259 7,137 7,197	200% 987% % 2001 100% 1987% 79% 79%	21 25 21 -11 -11
Route Name Clifton Hill to Brunswick Rd - Northern Bus Lines East Mells to Fostscray - SITA Lastern Freeway Group	City Circle Salk-total All Trans S34 Salk-total 402 Salk-total 201	Salearb Moseee Ponds to Clifton Hill Featscray to East Melbourne The Pines to City	13,339 163,034 401,625 2000 445 4,017 4,017 1,655	559,811 1,239,073 2821 B No 1,230 1,230 7,246 7,246 4,077	206% 107% Acatelled D ase % 2001 174% 104% 80%	549,992 1,250,037 1,250,037 1,250,037 1,250 1,259 7,197	200% 982% % 2001 100% 1980% 79% 79% 40%	21 p5 21 -19
Routo Name Clifton Hill to Brunewick Rd – Northern Bus Lines East Mello to Footscray	City Circle Sale-social All Trans Sale Sale-social 402 Sale-social 301 302	Suiterb Mossee Ponds to Clifton Hill Featscray to East Melbourne The Pines to City Box Hill to City	13,336 189,034 431,225 2000 445 4,017 4,017 1,056 932	559,811 1,239,073 28218 No 1,230 1,230 1,230 7,246 7,246 7,246 4,072 2,352	206% 187% footelled B ase % 2001 174% 174% 80% 80% 80% 140% 153%	549,992 1,250,037 1,250,037 1,250 1,259 1,259 7,137 7,197	200% 952% % 2001 752% 980% 79% 40% 45%	21 25 29 -19 -19 -19 -405 -635
Route Name Clifton Hill to Brunswick Rd - Northern Bus Lines East Mells to Fostscray - SITA Lastern Freeway Group	City Circle Selb-total All Trans Sub-total 402 Selb-total 301 302 303	Salverb Mossee Pands to Clifton Hill Featurery to East Melbourne The Prines to City Box Hill to City Michain Stin to City	13,339 189,034 401,025 2000 840 445 4,017 4,017 1,055 9352 332	559,811 1,239,073 2821 B No 1,230 1,230 7,246 7,246 4,077	206% 107% foolefied 0 ase % 2001 174% 174% 80% 80% 80% 80%	549,992 1,298,037 1,298,037 1,298,037 1,299 1,299 7,197 7,197 7,197 2,449	200% 982% % 2001 100% 1980% 79% 79% 40%	21 25 29 -19 -19 -405 -405 -405 -405 -405
Route Name Clifton Hill to Brunswick Rd - Northern Bus Lines East Mells to Fostscray - SITA Lastern Freeway Group	City Circle Sub-total All Trans Sub-total 402 Sub-total 402 Sub-total 402 Sub-total 301 302 303 304	Suiterb Mossee Ponds to Clifton Hill Featscray to East Melbourne The Pines to City Box Hill to City	13,336 189,034 431,225 2000 445 4,017 4,017 1,056 932	558,811 1,239,073 2821 B No 1,230 1,230 7,246 4,077 2,362 958 3,900	206% 107% 5odelled 0 859 % 2001 174% 174% 80% 80% 80% 80% 157% 153% 153% 153% 113%	549,992 1,290,037 1,290,037 1,290,037 1,297 1,297 1,297 7,197 7,197 2,449 575	200% 982% % 2001 180% 79% 79% 40% 40% 45% 280% 16%	21 25 27 29 -11 -11 -11 -40 -405 -405 -405 -405
Route Name Clifton Hill to Brunswick Rd - Northern Bus Lines East Mells to Fostscray - SITA Lastern Freeway Group	City Circle Selb-total All Trans Sub-total 402 Selb-total 301 302 303	Salverb Mossee Pands to Clifton Hill Featurery to East Melbourne The Prines to City Box Hill to City Michain Stin to City	13,339 189,034 401,025 2000 840 445 4,017 4,017 1,055 9352 332	559,811 1,239,073 2021 8 No 1,230 1,230 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 9,58	206% 187% footelled fi ase % 2001 174% 174% 80% 80% 80% 140% 153% 2894%	549,992 1,250,037 1,250,037 Na 1,259 1,259 7,197 7,197 7,197 7,197 7,197 7,197 7,197 5,75 806	200% 952% % 2001 100% 79% 40% 40% 40% 40%	21 25 27 29 -11 -11 -11 -11 -11 -11 -11 -11 -11 -1
Route Name Clifton Hill to Brunswick Rd - Northern Bus Lines East Mells to Fostscray - SITA Lastern Freeway Group	City Circle Sub-total All Trans Sub-total 402 Sub-total 402 Sub-total 402 Sub-total 301 302 303 304	Salearb Moseee Ponds to Clifton Hill Featscray to East Melbourne The Pines to City Box Hill to City Michael Shi to City Ringwad Shi to City Ringwad Shi to City City to Warradyta Beldgo	13,336 189,034 401,625 2000 445 4,017 4,017 1,056 932 352 1,832	558,811 1,239,073 2821 B No 1,230 1,230 7,246 4,077 2,362 958 3,900	206% 107% 5odelled 0 859 % 2001 174% 174% 80% 80% 80% 80% 157% 153% 153% 153% 113%	549,992 1,250,007 1,250,007 1,250 1,250 1,250 1,250 7,197 7,197 7,197 2,449 575 896 2,127	200% 982% % 2001 180% 79% 79% 40% 40% 45% 280% 16%	25 25 29 -19 -405 -405 -405 -405 -405 -405 -715
Route Name Clifton Hill to Brunswick Rd - Northern Bus Lines East Mells to Fostscray - SITA Lastern Freeway Group	City Circle Sale-social All Trans 53 534 534 534 535 535 535 535 301 301 302 303 303 304 305	Sakerb Moseee Ponds to Clifton Hill Featscray to East Melbourne The Pines to City Box Hill to City Micham Sin to City Fingward Stin to City	13,336 169,034 401,625 2000 445 445 4,017 4,017 1,056 935 352 1,832 1,832 1,650	509,811 1,239,073 2821 8 No 1,230 7,246 7,246 7,246 4,072 2,362 958 3,900 2,115	206% 107% 50delled I 889 % 2001 174% 80% 147% 145% 145% 145% 145% 145% 145% 145% 145	549,992 1,250,037 1,250,037 1,250 1,250 1,250 1,250 1,259 7,197 7,197 2,449 575 896 2,127 805	200% 92% % 201 102% 93% 79% 47% 47% 55% 260% 65%	21 25 29 -19 -19 -405
Route Name Clifton Hill to Brunswick Rd - Northern Bus Lines East Mells to Fostscray - SITA Lastern Freeway Group	City Circle Sub-total All Trans 504 Sub-total 402 Sub-total 301 302 303 304 304 305 306	Sakerb Mossee Ponds to Clifton Hill Featscrey to East Melbourne The Pines to City Box Hill to City Michael Stin to City Pingweed Stin to City City no Waraedyte Bridge North Pingweed to City Michael City	13,339 188,034, 431,655 2000 640 445 4,017 1,655 200 1,832 1,832 1,832 1,832 3,570	559,811 1,239,073 1,239,073 1,230 1,230 1,230 7,246 1,230 7,246 1,230 7,246 3,900 2,115 953	206% 107% 6odelled I 269 5,2001 174% 174% 80% 145% 152% 2054% 115% 2054% 115%	549,992 1,290,037 1,290,037 1,290,037 1,290 1,290 1,290 7,197 7,197 7,197 2,499 575 596 2,127 905 415	200% 152% 16.2001 100% 190% 200% 200% 10% 63% 10%	21 25 25 -119 -405 -625 -655 -655 -655 -715 -665
Route Name Clifton Hill to Brunswick Rd - Northern Bus Lines East Mells to Fostscray - SITA Lastern Freeway Group	City Circle Sale-social All Trans 50 504 504 504 505 505 505 305 305 305 306 307 308	Selecto Mossee Ponds to Clifton Hill Featurey to East Melbourne The Pines to City Box Hill to City Michaen Stin to City Michaen Stin to City City to Warrandyte Bidgo North Ringweed to City Michaen to City Deep Creek to City	13,336 162,034 431,655 2000 440 4,017 4,017 4,017 4,017 4,017 1,655 3,55 1,855 1,855 3,770 2,657 6,51	559,811 1,239,073 2821 8 No 1,230 7,246 7,246 7,246 7,246 3,900 2,115 953 5,451 5,451 955	206% 107% 50delled D 899 % 2001 174% 80% 145% 145% 145% 145% 145% 145% 145% 145	549,892 1,290,037 1000000 1000000 1000000 1000000 10000000 100000000	800% 152% % 2001 702% 79% 40% 63% 10% 63% 10% 63% 10%	27 27 28 -11 -11 -11 -11 -11 -11 -11 -11 -11 -1
Routo Name Clifton Hill to Bronewick Rd - Northern Ban Lines East Mells to Footscray - SITA Lastern Freeway Group	City Circle Saib-sotal All Trans 50 504 504 504 504 504 504 504 504 504	Salverb Mossee Pands to Clifton Hill Featurery to East Melbourne The Press to City Box Hill to City Regevend Dri to City Regevend Dri to City Orly to Warrandyta Bridgo North Regevend to City Macham to City Deep Creak to City Deep Creak to City Donvale to City	13,336 169,034 431,625 2000 445 445 4,017 1,656 952 32 1,832	509,811 1,239,073 2821 8 No 1,230 7,246 7,246 4,072 2,362 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 3,900 2,115 968 3,9000 3,9000 3,9000 3,9000 3,9000 3,9000 3,9000 3,9000 3,9000 3,9000000 3,90000000000	206% 107% 500elled D 889 % 2001 174% 80% 167% 167% 167% 167% 167% 167% 167% 167	549,892 1,290,807 1,290,807 1,290 1,290 1,290 1,290 7,197 7,497 2,449 575 595 605 405 3,807 3,807 3,807 4,106 4,107	800% 192% 4 - PT in % 2001 192% 192% 192% 40% 195% 40% 40%	21 25 21 -11 -11 -11 -11 -11 -11 -11 -11 -11
Route Name Clifton Hill to Brunswick Rd - Northern Bus Lines East Mells to Fostscray - SITA Lastern Freeway Group	City Circle Sub-total All Trans 50 304 304 305 305 305 305 305 305 306 307 308 309 313	Salverb Mossee Ponds to Clifton Hill Featscriey to East Melbourne The Pines to City Box Hill to City Box Hill to City Michain San to City Ringweed Btn to City City to Waraadyte Bridge North Ringweed Dtn to City Michain San to City Donale to City Donale to City City to Transjestowe	13,336 163,034 2014,625 2000 440 44,017 1,650 3,017 1,650 3,017 1,650 3,017 6,511 8,368 8,56 8,56 8,56 8,56 8,56 8,56 8,56 8,	509,811 1,239,073 2021 B No 1,230 1,235 1,246 1,230 1,230 1,246 1,230 1,230 1,230 1,230 1,230 1,246 1,230 1,230 1,230 1,246 1,230 1,230 1,230 1,230 1,246 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,246 1,230 1,230 1,230 1,246	206% 107% Radelled 0 899 % 2001 174% 194% 145% 145% 145% 145% 145% 145% 145% 14	549,892 5,290,037 102000 1,290 7,787 7,997 2,449 875 886 2,127 805 446 3,237 5,44 3,537 5,44 3,537 5,44 5,44 1,06 5,44 5,44 1,544 1,544 1,574 5,467 5,4775 5,4775555555555	200% 192% % 2011 193% 295% 295% 40% 63% 10% 63% 10% 63% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10	21 25 25 -11 -11 -11 -11 -07 -07 -07 -07 -07 -07 -07 -07 -07 -07
Routo Name Clifton Hill to Bronewick Rd - Northern Ban Lines East Mells to Footscray - SITA Lastern Freeway Group	City Circle Sale-social All Trans Sale-social State-social 201 302 303 305 305 306 307 308 309 315	Subarb Mossee Ponds to Clifton Hill Featscray to East Melbourne The Pixes to City Box Hill to City Micham Stn to City Micham Stn to City City to Waraedyta Belge North Ringweed to City Mitcham to City Dery City Dorwale to City Dorwale to City Dorwale to City City to Templestewe City to Templestewe City to Hill	13,336 169,034 431,655 2000 445 4,017 4,017 4,017 4,017 4,017 1,655 1,855 3,710 2,657 6,531 8,388 6,56 5,60 2,60 2,60 2,60 2,60 2,60 2,60 2,60 2	559,811 1,239,073 289,073 1,230 1,230 7,246 7,246 7,246 7,246 7,246 7,246 3,900 2,115 963 8,851 965 2,059 952 4,072 2,305 8,405 9,653 8,405 9,653 8,405 9,653 8,405 9,653 8,405 9,653 8,405 9,653 8,405 9,653 8,405 9,653 8,405 9,653 8,405 9,653 8,405 9,653 8,405 9,653 8,405 9,653 8,405	206% 107% Sodelled I 899 % 2001 174% 107% 146% 153% 299% 146% 153% 43% 146% 146% 146% 146% 146% 146% 146% 146	549,992 1,290,877 1,290,877 1,290,877 1,290 1,259 7,197 7,197 2,449 5,544 1,076 5,544 1,076 167 167 107	800% 192% 5 2001 190% 5 2001 190% 5 2001 190% 6 20% 6 20% 7 20% 6 20% 7 20% 6 20% 7	21 27 28 -11 -11 -01 -01 -01 -01 -01 -01 -01 -01
Routo Name Clifton Hill to Bronewick Rd - Northern Ban Lines East Mells to Footscray - SITA Lastern Freeway Group	City Circle Sub-social All Trave 304 Sub-total 301 301 302 303 304 305 307 306 307 308 309 313 316	Salverb Mossee Pands to Clifton Hill Featurery to East Melbourne The Press to City Box Hill to City Michael Shi to City Regeveed Shi to City Orly to Warraedyta Bridgo North Regeveed to City Michael to City Deep Creak to City Donvale to City Donvale to City City to Templestowe City to Templestowe City to Don Hill Templestowe to City	13,336 169,034 431,625 2000 449 449 4,017 1,656 952 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,835 1,000 2,	509,811 1,239,073 2821 B No 1,230 1,230 7,246 4,077 2,362 958 3,900 2,115 968 3,900 2,115 3,900 2,115 3,900 2,115 3,900 2,059 9,952 4,077 2,059 9,953 3,900 2,059 9,953 3,900 2,059 9,953 3,900 2,059 9,953 3,900 2,059 9,953 3,900 2,059 9,953 3,900 2,059 9,953 3,900 2,059 9,953 3,900 2,059 9,953 3,900 2,059 9,953 3,900 2,059 9,953 4,077 2,059 9,953 4,077 2,059 9,953 4,077 2,059 9,953 4,077 2,059 9,953 4,077 2,059 9,953 4,057 4,	206% 107% Andelled I 209 % 2001 174% 145% 145% 145% 145% 145% 145% 145% 14	549,992 1,290,077 10000000 10000000 1000000000 100000000	200% 92% % 2015 1935 99% 205% 205% 205% 10% 45% 205% 205%	21 22 21 -11 -407 -407 -407 -407 -407 -407 -407 -407
Route Name Ditum Hill to Brunewick Rd – Northern Bun Lines East Melb to Footscray – SITA Lastern Freeway Group	City Circle Seb-social All Trans 53 534 534 534 534 534 534 534 534 534	Salverb Mossee Ponds to Clifton Hill Featscriey to East Melbourne The Pines to City Box Hill to City Michaen Shi to City City to Waraedyte Bridge North Regreed Stri to City Michaen So City Michaen to City Donvale to City Donvale to City Donvale to City Donvale to City City to Tonglestowe City to Don Hill Templestowe to City The Pines to City	13,336 163,034 2006 3000 445 445 445 445 4,017 1,055 32 1,850 327 1,850 377 2,027 2,027 651 858 858 858 858 858 200	509,811 1,239,073 2821 B No 1,230 1,235 1,246	206% 107% Radelled D 2001 174% 124% 145% 145% 145% 145% 145% 145% 145% 14	549,992 5,290,037 1,290,037 1,290 1,290 1,290 1,290 7,397 2,449 875 886 2,127 805 445 3,537 554 1,564 1,567 1,077 1,	200% 192% % 2011 193% 295% 295% 295% 205% 205% 205% 205% 205% 205% 205% 20	21 25 27 27 407 407 407 407 407 407 407 40
Route Name Ditum Hill to Brunewick Rd – Northern Bun Lines East Melb to Footscray – SITA Lastern Freeway Group	City Circle Sale-social All Trans Sale-social State-social 301 302 303 305 305 306 307 308 309 315 316 316 319 390	Salverb Mossee Pands to Clifton Hill Featurery to East Melbourne The Press to City Box Hill to City Michael Shi to City Regeveed Shi to City Orly to Warraedyta Bridgo North Regeveed to City Michael to City Deep Creak to City Donvale to City Donvale to City City to Templestowe City to Templestowe City to Don Hill Templestowe to City	13,336 169,034 401,625 2000 449 440 1,655 320 1,850 370 2,631 838 838 838 520 1,07 2,631 838 838 520 1,07 2,631 838 838 838 838 838 838 839 830 839 830 831 835 831 835 835 835 835 835 835 835 835 835 835	599,811 1,239,073 2821 B No 1,230 7,246 7,247 7,246	206% 107% 50defied 1 899 % 2001 174% 107% 107% 152% 152% 152% 152% 152% 152% 152% 152	549,992 1,290,437 1,290,437 1,290 1,290 1,259 1,259 7,797 7,197 2,449 5,544 1,269 4,05	200% 92% % 2011 100% 980% 40% 40% 50% 40% 40% 21% 20% 21% 21% 20% 41% 22% 41% 22% 41% 22% 41%	21 25 25 26 27 26 27 26 27 27 26 27 27 27 27 27 27 27 27 27 27 27 27 27
Route Name Clifton Hill to Branewick Rd – Northam Bas Lines East Meth to Fontscray – SITA – Sather Freeway Group – National	City Circle Sait-social All Trans 501 504 505 505 505 505 505 505 505 505 301 301 301 301 301 301 302 303 304 305 305 305 305 305 305 305 305 305 305	Salverb Mossee Ponds to Clifton Hill Featureiry to East Melbourne The Press to City Box Hill to City Michain Shi to City Ringwead Shi to City Orly to Warraedyta Bridgo North Ringwead to City Michain to City Deep Creak to City Donnale to City City to Tongle Hill Templetoxee to City City to Box Hill Templetoxee to City The Press to City City to Latrobe Uni	13,336 169,034 431,625 2000 449 4,017 4,017 1,655 32 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,835 1	509,811 1,239,073 2821 B No 1,230 1,230 7,246 4,077 2,362 958 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 963 8,451 905 8,451 8,451 905 8,451 8,451 905 8,451	206% 107% Andelled I 209 % 2001 174% 147% 147% 147% 147% 147% 147% 147	549,992 1,290,877 1000000 1000000 1000000 1000000 10000000 100000000	200% 927% % 2015 1935% 205% 205% 205% 205% 205% 205% 205% 20	21 21 21 21 41 407 407 407 407 407 407 407 407
Route Name Diftee Hill to Branewick Rd – Northern Bes Lines East Mells to Fontscray – SITA Lastern Freeway Group – National	City Circle Seb-social All Trans 53 53 53 54 542 545-5454 302 303 305 305 305 305 305 305 305 305 305	Salverb Mossee Ponds to Clifton Hill Featscriey to East Melbourne The Pines to City Box Hill to City Michaen Shi to City City to Waraedyte Bridge North Regreed Stri to City Michaen So City Michaen to City Donvale to City Donvale to City Donvale to City Donvale to City City to Tonglestowe City to Don Hill Templestowe to City The Pines to City	13,336 163,034 2000 3000 445 445 445 445 4,017 1,055 32 1,850 327 1,850 377 2,027 2,027 2,027 1,850 3,070 4,019 1,550 5,019 1,525 1,525 5,019	509,811 1,239,073 2821 B No 1,230 1,407 1,246 1,407 1,953 1,451 1,955 1,451 1,905 1,055 1,495 1,415 1,495	206% 107% Radelled D 2001 174% 124% 157% 157% 259% 145% 145% 145% 145% 145% 145% 145% 145	549,992 1,290,077 1,290 1,290 1,290 1,290 1,290 7,397 2,449 875 886 2,127 805 446 3,575 456 3,577 554 1,575 457 3,577 554 1,575 467 575 467 575 575 575 575 575 575 575 5	200% 192% % 201 193% 80% 40% 40% 40% 40% 40% 40% 40% 40% 40% 4	21 21 21 31 407 407 407 407 407 407 407 407 407 407
Route Name Difton Hill to Branewick Rd - Northern Ban Linen East Meth to Footscray - SITA Eastern Freeway Group - National	City Circle Seb-social All Trans Sub-social Sub-social 301 302 303 305 305 305 305 305 305 305 305 305	Suberb Mossee Ponds to Clifton Hill Features to Day The Press to Day Box Hill C day Micham Stin to City Micham Stin to City Micham Stin to City On to Warwardyta Bridge North Ringweed to City Micham to City Dorvale to City City to Tensilestowe City To Tensilestowe City To Tensilestowe City To Tensilestowe City To Tensilestowe City To Tensilestowe City To City City to Davide Uni Latrobe Uni to Elsteenwick	13,336 169,034 401,655 2000 440 440 4,017 4,017 4,017 4,017 4,017 1,055 332 1,855 370 2,637 6,370 8,388 6,50 1,555 12,065 5,059 5,059	559,811 1,239,073 2821 B No 1,230 7,246 7,477	206% 107% Sodelled I 209 % 2001 174% 80% 145% 145% 145% 145% 145% 145% 145% 145	549,992 1,290,437 1,290,437 1,290 1,290 1,290 7,797 7,197 2,449 5,545 886 2,127 805 445 3,557 445 3,557 445 3,557 445 3,557 445 3,557 455 445 5,549 6,486 6,486 6,485	200% 192% % 2011 193% 99% 40% 40% 40% 40% 40% 209% 10% 41% 22% 41% 22% 41% 22% 41% 22% 7% 7% 7% 7% 7%	21 22 21 -11 -11 -11 -11 -11 -11
Route Name Clifton Hill to Bronowick Rd – Northern Ben Lines East Mells to Fontscray – SITA Lestern Freeway Group – National Nodelle Street – National Johnston Street Group	City Circle Sait-sotol All Trans 50 504 505 505 505 505 505 505 505 505	Salverb Mossee Ponds to Clifton Hill Featuring to East Melbourne The Press to City Box Hill to City Michan Shi to City Michan Shi to City Michan Shi to City Michan Shi to City Michan to City Michan to City Deep Creak to City Donvale to City Donvale to City City to Tonglestil Templestives to City The Press to City The Press to City The Press to City City to Latrobe Uni Latrobe Uni to Elatenwick Doncaster to City	13,336 169,034 431,625 2000 449 4,017 4,017 4,017 1,655 32 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,835 1,246	509,811 1,239,073 2821 B No 1,230 7,246 4,077 2,362 958 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,059 952 4,975 6,041 6,141 5,541 6,541 5,545 2,555 3	206% 107% Andelled I 209 % 2001 174% 147% 147% 147% 147% 147% 147% 147	549,992 1,290,877 1,290,877 1,290 1,299 7,397 2,489 575 886 2,127 605 405 3,297 5,154 6,055 405 3,297 5,154 6,496 6,496 6,496 6,496 6,496	200% 922% % 2015 73% 2015 73% 2015% 2005% 2005% 2005%	21 27 21 31 407 407 407 407 407 407 407 407 407 407
Route Name Difton Hill to Branewick Rd - Northern Ban Linen East Meth to Footscray - SITA Eastern Freeway Group - National	City Circle Seb-social All Trans 2014 Sub-social 2014 2015 2014 2015 2015 2015 2015 2015 2015 2015 2015	Salverb Mossee Ponds to Clifton Hill Featscriey to East Malbourne The Pines to City Box Hill to City Michaen Shi to City City to Waraedyta Bridge North Ringvesd Stin to City Mitchan to City Deep Create to City Denvale to City City to Tensilestewe City to Lakebe Uni Latebe Uni to Elstemwick Doncester to City	13,336 163,034 431,035 401,035 440 445 4,017 1,005 449 4,017 1,005 321 1,035 321 1,035 321 1,035 327 1,035 2,037 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,005 1,005 2,005 1,005 2,005 1,005 2,005 1,005 2,0	509,811 1,239,073 2821 B No 1,230 1,953 1,651 1,953 1,651 1,654	206% 107% Radelled I 2001 174% 124% 157% 157% 157% 157% 157% 157% 157% 157	549,992 1,290,077 1,290 1,2	200% 192% 192% 192% 193% 201% 193% 203% 203% 203% 203% 203% 203% 203% 20	21 21 21 31 407 407 407 407 407 407 407 407 407 407
Route Name CIBan Hill to Branowick Rd – Northam Bas Lines East Melh to Fontscray – SITA Lastern Freeway Group – National Nodelle Street – National Johnston Street Group	City Circle Sale-social All Trans 50 504 504 504 504 505 506 506 301 302 303 304 305 305 305 305 306 307 308 309 319 309 310 309 309 310 309 310 309 300 300 300 300 300 300 300 300 30	Salverb Mossee Ponds to Clifton Hill Featuring to East Melbourne The Press to City Box Hill to City Michan Shi to City Michan Shi to City Michan Shi to City Michan Shi to City Michan to City Michan to City Deep Creak to City Donvale to City Donvale to City City to Tonglestil Templestives to City The Press to City The Press to City The Press to City City to Latrobe Uni Latrobe Uni to Elatenwick Doncaster to City	13,336 169,034 431,625 2000 449 4,017 4,017 4,017 1,655 32 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,832 1,835 1,246	509,811 1,239,073 2821 B No 1,230 7,246 4,077 2,362 958 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,059 952 4,975 6,041 6,141 5,541 6,541 5,545 2,555 1,255 1	206% 107% Andelled I 209 % 2001 174% 147% 147% 147% 147% 147% 147% 147	549,992 1,290,877 1,290,877 1,290 1,299 7,397 2,489 575 886 2,127 605 405 3,297 5,154 6,055 405 3,297 5,154 6,496 6,496 6,496 6,496 6,496	200% 922% % 2015 73% 2015 73% 2015% 2005% 2005% 2005%	2 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
Route Name CIBan Hill to Branowick Rd – Northam Bas Lines East Melh to Fontscray – SITA Lastern Freeway Group – National Nodelle Street – National Johnston Street Group	City Circle Seb-social All Trans 2014 Sub-social 2014 2015 2014 2015 2015 2015 2015 2015 2015 2015 2015	Salverb Mossee Ponds to Clifton Hill Featscriey to East Malbourne The Pines to City Box Hill to City Michaen Shi to City City to Waraedyta Bridge North Ringvesd Stin to City Mitchan to City Deep Create to City Denvale to City City to Tensilestewe City to Lakebe Uni Latebe Uni to Elstemwick Doncester to City	13,336 163,034 431,035 401,035 440 445 4,017 1,005 449 4,017 1,005 321 1,035 321 1,035 321 1,035 327 1,035 2,037 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,035 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,057 1,005 2,005 1,005 2,005 1,005 2,005 1,005 2,005 1,005 2,0	509,811 1,239,073 2821 B No 1,230 1,953 1,651 1,953 1,651 1,654	206% 107% Radelled I 2001 174% 124% 157% 157% 157% 157% 157% 157% 157% 157	549,992 1,290,077 1,290 1,2	200% 192% 192% 192% 193% 201% 193% 203% 203% 203% 203% 203% 203% 203% 20	2 27 27 27 27 27 27 27 27 27 27 27 27 27 2
Route Name Clifton Hill to Bronowick Rd – Northern Ben Lines East Mells to Fontscray – SITA Lestern Freeway Group – National Nodelle Street – National Johnston Street Group	City Circle Sale-social All Trans 50 504 504 504 504 505 506 506 301 302 303 304 305 305 305 305 306 307 308 309 319 309 310 309 309 310 309 310 309 310 309 309 310 309 309 310 309 309 310 309 309 310 309 309 310 309 310 309 309 310 309 309 310 309 309 310 309 309 310 309 309 310 309 309 310 309 309 310 309 309 310 309 309 310 309 309 310 309 309 310 309 309 310 309 309 310 309 309 309 300 300 300 300 300 300 30	Suberb Mossee Ponds to Clifton Hill Featscray to East Melbourne The Press to City Box Hills City Micham Stri to City Regressed Stri to City Ony to Warsedyte Bislgo North Regressed to City Micham to City Donvale to City City to Tonglestowe City City to Tonglestowe City City to Latobe Uni Latrobe Uni Latrobe Uni Doncaster to City Doncas	13,336 169,034 401,655 2000 440 440 4,017,	599,811 1,239,073 1,230,073 1,230 7,246 7,247 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,246 7,247 7,246 7,246 7,246 7,247 7,246 7,246 7,247 7,246 7,246 7,247 7,246 7,246 7,247 7,246 7,246 7,246 7,247 7,246	206% 107% Sodelled I 899 % 2001 174% 80% 145% 145% 145% 145% 145% 145% 145% 145	549,992 1,290,437 1,290,437 1,290 1,290 1,290 7,797 7,197 2,449 5,449 5,449 5,449 4,05 4,05 4,05 1,006 1,	800% 92% % 2011 100% 980% 40% 40% 40% 40% 40% 209% 10% 40% 21% 20% 21% 20% 21% 20% 21% 53% 40% 22% 54% 54% 54%	27 27 28 37 407 407 407 407 407 407 407 407 407 40
Route Name CIBan Hill to Branowick Rd – Northam Bas Lines East Melh to Fontscray – SITA Lastern Freeway Group – National Nodelle Street – National Johnston Street Group	City Circle Sait-social All Trans 50 504 505 505 505 505 505 505 505 505	Salverb Mossee Ponds to Clifton Hill Featuring to East Melbourne The Press to City Box Hill to City Michan Shi to City Michan Shi to City Michan Shi to City Michan Shi to City Michan to City Michan to City Donvale to City Donvale to City Donvale to City City to Templester City to Don Hill Templesterve to City The Press to City The Press to City The Press to City Don active to Melbourne Uni	13,336 163,034 431,655 2000 445 4,017 4,017 4,017 4,017 1,650 321 1,850 321 1,850 321 1,850 3270 2,827 6,311 8,388 8,588 8,588 9,200 1,525 1,525 1,525 1,525 1,525 1,525 1,225	509,811 1,239,073 2821 B No 1,230 1,246 1,205	206% 107% Acade liced II 2001 174% 1074% 1074% 1074% 147%	549,992 1,290,437 1,290,437 1,290 1,290 1,290 1,290 7,397 2,449 875 886 2,127 805 445 3,537 5,544 1,565 45,549 6,446 6,436 6,436 6,436 3,204 1,205	200% 192% % 201% 193% 295% 295% 295% 295% 295% 295% 295% 295	2 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
Route Name Clinan Hill to Branewick Rd – Northern Bas Lines East Meth to Footscray – SITA Lastern Freeway Group – National Notional	City Circle Selb-social All Team Sol Sol Solb-team 301 301 302 303 304 305 305 306 305 306 307 308 309 319 308 309 319 316 316 316 316 316 316 316 316 316 316	Suberb Mossee Ponds to Clifton Hill Features to Day The Press to Day Box Hills City Michan Strito City Michan Strito City Ory to Warwardyta Bisloo North Ringwead to City Michan to City City to Davasetyta Bisloo Dorvale to City City to Tonglestowe City to Davale Hill Templestowe to City City to Latobe Uni Latobe Uni to Elstenwick Dorcaster to City Dorcaster to City	13,336 169,034 401,655 401,655 401,655 401 4,017 4,010	559,811 1,239,073 2821 B No 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 2,345 3,900 2,115 953 2,059 852 2,956 2,059 852 2,956 2,9	206% 107% Sodelled I 899 % 2001 174% 80% 145%	549,992 1,290,437 1,290,437 1,290 1,229 7,797 2,449 5,449 5,449 5,449 4,55 445 3,237 3,237 4,544 1,066 1,075 5,549 6,486 3,209 4,204 4,204 4,204 5,104 1,024 1,024 1,025 1,	800% 92% % 2011 102% 980% 40% 40% 40% 40% 40% 200% 10% 40% 20% 21% 98% 41% 22% 10% 41% 22% 10% 41% 22% 10% 41% 22% 10% 41% 22% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10	21 27 28 30 40 40 40 40 40 40 40 40 40 40 40 40 40
Route Name Clinan Hill to Branowick Rd – Northern Bas Lines East Meth to Fostscray – SITA Lastern Freeway Group – National Roddle Steet – National Jahnston Street Group – National	City Circle Sait-sotol All Trans 50 504 504 505 505 505 505 505 505 505	Salverb Mossee Ponds to Clifton Hill Featuring to East Melbourne The Press to City Box Hill to City Michan Shi to City Michan Shi to City Michan Shi to City Michan Shi to City Michan to City Michan to City Donvale to City Donvale to City Donvale to City City to Templester City to Don Hill Templesterve to City The Press to City The Press to City The Press to City Don active to Melbourne Uni	13,336 169,034 431,625 2000 440 440 4,017 4,017 1,055 32 1,832 1,525 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,226 1,227 1,227 1,226 1,227 1,227 1,227 1,226 1,227 1,227 1,227 1,226 1,227 1,227 1,226 1,227 1,2	509,811 1,239,073 2821 B No 1,230 7,246 4,077 2,362 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,059 952 4,975 4,975 4,965 3,900 2,059 952 4,975 4,975 4,965 3,900 4,955 3,006 4,255 2,988 3,900 4,255 2,988 3,900 4,955 3,006 4,255 2,988 3,900 4,255 3,006 4,255 2,988 3,900 4,955 3,006 4,255 2,988 3,900 4,955 3,006 4,255 2,988 3,900 4,955 3,006 4,255 2,988 3,900 4,955 3,006 4,955 4,9	206% 107% Andelled I 200 174% 174% 107% 147% 1	549,992 1,290,437 1,290,437 1,290 1,299 7,137 7,499 7,137 2,449 575 886 2,127 6,456 3,327 5,559 6,456 5,559 6,456 5,559 6,456 5,559 6,456 5,559 6,456 5,559 5,559 6,456 5,559 5,5	200% 192% % 201% 1935% 205% 206% 206% 206% 206% 206% 205% 205% 205% 205% 205% 205% 205% 205	21 27 27 27 37 407 407 407 407 407 407 407 40
Route Name CDBase Hill to Branewick Rd – Northern Bas Lines East Mells to Fostscray – SITA Lastern Freeway Group – National Roddle Street – National Johnston Street Group – National Oscens Price to Mells Uni – Dysees	City Circle Seb-social All Trans All Trans Sub-social Sub-social 301 301 303 305 306 305 306 305 306 305 306 305 306 305 306 309 313 316 316 316 316 316 316 316 316 316	Subarb Mossee Ponds to Clifton Hill Featscray to East Melbourne The Pixes to City Box Hill to City Micham Stn to City Micham Stn to City City to Warandyta Belge North Ringwead to City Mitch an to City Dervale to City Oty to University Dorvale to City City to Tonsplications City Office City to Dio Hill Templeatowe to City Oty to Dio Hill Templeatowe to City Oty to University City to Dio Hill Templeatowe to City Oty to University Dorvale to City City to Latebe Uni Latisbe Uni to Esteenwick Dorcaster to City Dorvale to City	13,336 163,034 431,655 2000 445 4,017 4,017 4,017 1,650 321 1,850 320 1,850 320 1,255 30 1,255 30 1,255 30 1,255 30 1,255 30 1,255 30 1,255 30 1,255 30 1,275 30 1,275 30 1,275 30 1,275 30 1,275 30 1,275 30 1,275 30 1,275 30 1,275 30 2,270 1,275 30 1,275 1	509,811 1,239,073 2821 B No 1,230 1,2,246 1,230 1,2	206% 107% Andelled I 2001 174% 194% 145% 145% 145% 145% 145% 145% 145% 14	549,992 1,290,437 1,290,437 Nu 2,299 7,157 2,449 875 886 2,127 805 445 3,357 5,144 1,546 1,546 1,547 6,436 6,436 6,436 6,436 6,436 6,436 6,436 5,554 4,024 8,757 1,549 1,5	200% 192% 192% 192% 192% 2011 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 192% 202% 202% 202% 202% 202% 202% 202% 2	21 21 21 21 21 407 407 407 407 407 407 407 407
Route Name Cithan Hill to Branowick Rd – Northern Bas Lines East Meth to Footscray – SITA Lastern Freeway Group – National Nodelle Street – National Johnston Street Group – Notional Openers Pete to Meth Uni - Dyname	City Circle Seb-social All Team 50 504 504 504 504 504 504 505 505 506 303 305 305 305 305 305 305 305 305 305	Suberb Mossee Pands to Clifton Hill Featurely to East Melbourne The Press to City Box Hills City Michael Shi to City Ringward Shi to City Ringward Shi to City Michael Shi to City Ringward to City Michael Shi to City Donvale to City Donvale to City City to Tongli Hill Templestowe to City City to Tongli Hill Templestowe to City City to Latobe Uni Latobe Uni to Elistemwick Doncaster to City Donvale to City Doncaster to Kity D	13,336 169,034 401,655 2000 440 440 4,017 4,017 4,017 4,017 4,017 4,017 3,025 3,025 1,055 1,055 1,055 1,055 1,046 1,046 1,045 1,046 1,045 1,046 1,045 1,046 1,045 1,046 1,045 1,046 1,0451	559,811 1,239,073 2821 B No 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 2,346 3,900 2,115 953 2,059 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 4,005 2,956 3,000 4,005 2,956 3,000 4,005 2,956 3,000 4,005 2,956 3,000 4,005 2,956 3,000 4,005 2,956 3,000 4,005 2,956 3,000 4,005 2,956 3,000 4,005 2,956 3,000 4,005 2,956 3,000 4,005 2,956 3,000 4,005 2,057 4,005 2,057 4,005 4,005 4,005 5,54 5	206% 107% Sodelled I 899 % 2001 174% 104% 145%	549,992 1,290,437 1,290,437 1,290 1,290 1,290 1,290 7,797 2,449 5,449 5,95 445 3,297 3,297 3,297 3,297 3,297 4,49 4,544 1,066 1,075 5,549 6,486 3,399 4,204 5,549 3,399 4,204 5,549 3,399 4,204 5,549 5,5	800% 92% % 2011 102% 980% 40% 40% 40% 209% 10% 40% 22% 10% 22% 10% 22% 17% 22% 17% 22% 17% 22% 17% 22% 17% 22% 17% 17% 17% 17% 17% 17% 17% 17% 17% 17	21 27 27 27 -117 -407 -4
Route Name Citian Hill to Branowick Rd - Northern Ban Lines East Mells to Fontscray - SiTA Lastern Freeway Group - National Notional Johnston Street - National Johnston Street Group - National	City Circle Sait-social All Trans 50 504 505 505 505 505 505 505 305 305 305 305	Salverb Mossee Ponds to Clifton Hill Featurey to East Malbourne The Press to City Box Hill to City Michael Shi to City Michael Shi to City Ony to Warradyta Bridgo Morth Ringweid Shi to City Michael Shi to City Donvale to City Donvale to City Donvale to City City to Box Hill Templestowe to Dity The Press to City Don aster to Malbourne Uni Donvale to City Milbourne Uni to Heidelberg Port Melbourne to Latrabe Uni Port Melbourne to Latrabe Uni Port Melbourne to Latrabe Uni Port Melbourne to City Don Stare Uni Don Stare Uni Don Stare Uni Donvale to City Don Stare Uni Donvale to City Don	13,236 163,034 2000 440 440 440 440 440 440 1,007 1,000 1,007 1,000 1,007 1,000 1,00	559,811 1,239,073 2821 B No 1,230 7,246 4,077 2,362 968 3,900 2,115 968 3,900 2,115 968 3,900 2,115 968 3,900 2,059 963 4,975 4,975 4,975 4,965 4,774 4,776 4,7776 4,776 4,776 4,7776 4,7776 4,7777 4,7776 4,7777 4,7776 4,7777 4,7776 4,7777 4,7777 4,7777 4,7777 4,7777 4,7777 4,7777 4,7777 4,7777 4,7777 4,7777 4,77777 4,7777 4,7777 4,7777777 4,7777777777	206% 107% Andelled I 200 174% 174% 107% 147% 1	549,992 1,290,077 1,290,077 1,290 1,299 7,397 2,489 575 886 2,127 6,055 405 3,297 2,489 6,055 405 3,297 5,194 1,066 1,076	800% 92% 94 2015 1925 1935 1935 1935 1935 1935 1935 1935 193	21 27 28 28 28 28 28 28 28 28 28 28
Route Name Clifton Hill to Bronowick Rd – Northern Bes Lines East Meth to Fontscray – SITA Lestern Freeway Group – National Notified Street – National Johnston Street Group – National Openers Pelo to Meth Uni - Dypone	City Circle Sait-social All Trans 50 504 505 505 505 505 505 505 305 305 305 305	Suberb Mossee Pands to Clifton Hill Featurely to East Melbourne The Press to City Box Hills City Michael Shi to City Ringward Shi to City Ringward Shi to City Michael Shi to City Ringward to City Michael Shi to City Donvale to City Donvale to City City to Tongli Hill Templestowe to City City to Tongli Hill Templestowe to City City to Latobe Uni Latobe Uni to Elistemwick Doncaster to City Donvale to City Doncaster to Kity D	13,336 169,034 401,655 2000 440 440 4,017 4,017 4,017 4,017 4,017 4,017 3,025 3,025 1,055 1,055 1,055 1,055 1,046 1,046 1,045 1,046 1,045 1,046 1,045 1,046 1,045 1,046 1,045 1,046 1,0451	599,811 1,239,073 2821 B No 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 1,230 2,346 3,900 2,115 953 2,059 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 852 2,956 3,000 8,000 2,956 3,000 8,000 2,956 3,000 2,956 3,000 4,000 2,956 3,000 4,000 2,956 3,000 4,000 2,956 3,000 4,000 5,441 5,544 5,	206% 107% Sodelled I 899 % 2001 174% 104% 145%	549,992 1,290,437 1,290,437 1,290 1,290 1,290 1,290 7,797 2,449 5,449 5,95 445 3,297 3,297 3,297 3,297 3,297 4,49 4,544 1,066 1,075 5,549 6,486 3,399 4,204 5,549 3,399 4,204 5,549 3,399 4,204 5,549 5,5	800% 92% % 2011 102% 980% 40% 40% 40% 209% 10% 40% 22% 10% 22% 10% 22% 17% 22% 17% 22% 17% 22% 17% 22% 17% 22% 17% 17% 17% 17% 17% 17% 17% 17% 17% 17	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

Table 3.5 : Change in Boardings by NCCC Service – Total Weekday

18000

16000

14000

12000

Load Arriving at Stop

Passenger

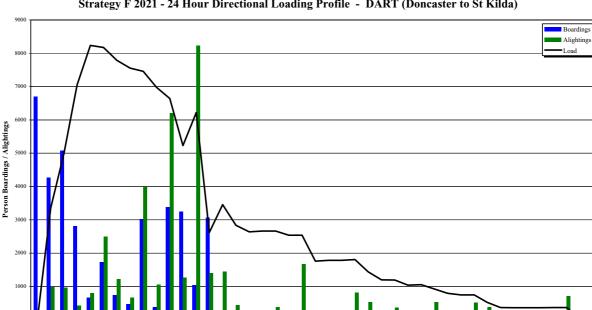
4000

2000

3.2.5 DART Boardings Performance

Figure 3.1 illustrates a loading profile for all day boardings for city bound DART services.

Figure 3.1 : DART Load Profile – City Bound Services Per Day



3

133 143

131

137

1/130

139



This indicates that:

 $\frac{3^{Wanston}S_{\ell}/Lonsdate_{S_{\ell}}}{1}$ Swatston St / Collins St thian Ave / Swanston St

Swanston St/Burke St

-^a Trobe St/Swanston St +

Bulken Kel Sin Chirather Huy, Sin Houkle, Si Sin Johnsion Si urne Uni (Faranday, Si) Grantan Si

There is a clear demarcation between the demand performance of the Doncaster to CBD and the CBD to St.Kilda route sections.

15 5

Blud

Most of the service has its market between Doncaster and the CBD. A daily maximum of over 16,000 passengers per day occurs as the service passes Hoddle Street towards the city

Public Transport Stop Name (from VLC-Zenith Model)

- Between the CBD and St.Kilda, DART has broadly a guarter of the utilisation of the Doncaster section.
- There is little through travel between the route sections; each are relatively self contained from a service design viewpoint. The St.Kilda route section is covered by many other tram routes.
- We conclude from this analysis that there would be a good basis to operate DART at between Doncaster and Flinders Street and to withdraw the St Kilda sections. Such a design modification would require substantial tram turnarounds within the CBD; a suitable location and design would be required.

- The busiest DART stops are:
 - CBD stops including Flinders Street Station, Bourke and Latrobe Streets along Swanston Street
 - Doncaster Shopping Town
 - The Doncaster Road, Bulleen Road and Chandler Highway Freeway interchange stations
- NCCC DART stops have more modest usage. Of these the Johnston Street station is busier than the University

3.2.6 Peak Maximum Load Impacts

Table 3.6 illustrates peak maximum load point demand volumes and the number of runs by service and option for study area trams.

As noted earlier, modelling of maximum load demands for specific routes and services is an inexact science. It stretches the credibility of any model to represent demand in a specific area for a specific time period with accuracy equivalent to the real world, hence identifying maximum load demand is particularly difficult.

Tables 3.6 and 3.7 illustrates maximum load demand per vehicle trip for bus and tram for the 2001 base case and also for the 2021 strategy D base case and strategy A. In this way we can assess the accuracy of the model by reference to its representation of 2001 base case loads and assess the potential impacts for Strategy F within this light.

Tram

- DART achieves an average maximum load per tram of 240. This is well within the capacity range of the high capacity vehicles proposed for the service (i.e. multi-articulated sets)
- A scan of the maximum loadings on other tram services shows a continuance of the high loadings (in the 200-300 plus range) for selected tram services as identified in strategy A. Strategy F, appears to alleviate some of this problem compared to the strategy D loadings, however the strategy D maximum loads are slightly higher than those identified in strategy A i.e. a tram overloading issues remains despite the small amount of relief being made as a result of DART.

			2001 Base		_	1031 Base				1. Strateg		
Rante Number	Direction	No. of Services	Load at Max-Load	Arrenge Loadger	Tis.of Sections	Load at Man, Load	Annuage Local per	Change in Ar. Load	No. of Sections	Load at Max. Load	Autorage Local per	Change in A Load per
			Paint	Vehicle		Polat	Vehicle	ger Tablete		Paint	Yorking-	Vekiele
r Light Rail Services								flaw 2001				tion 21 bas
Dersenher Apre.	Dut.	1							30	2,008. T_197	67 740	
Rapid Toscell Light Rail Hoth Rd	Eathound				B	1,577	172	-	13	2,506	167	-35
	Wethoand		-		13	-84	-4	-	35	201	38	-65
thes France												
Tren.1	Nothborné	12	716	- 11	34	2.546	96	47%	34	2.150	90	-87
	Southhouse	13	819	64		434	145	125%		3726	125	-139
Tism.16	Northbound Southbound	13	736	24	12	1,052 980	62 59	11%	17	10	.53 -40	-145
Tean. 19	Hothbound	15	1,80	127	38	5,214	309	144%	30	9,562	369	3%
Team 19 Tealstrian 2	Southhoused Hothhoused	20	1,771 136	- 18 13		6,754 1,590	169	201%		. 6,894 1,650		15
True 22	Nothboast	12	307	- 29	34 34	1,592 1,005	66	12%	34	1,406	60 62	-10%
True 22 Valuation 1	Southboard, Hothboard	4			1	2	45 0	-67%	- 34	1,636	- 0	-204
Team 2	Hothboard	80	380 330	8	13	1,347 700	112	54% 70%	12	1,382. 581	113	
True 2 Faculture 1	Southboard Southboard	****			11 			-32%		-ei	59	10%
True 2 Pagation 2 True 3	Southbound Hostabound	1	41 北公	41 56	12	35 974	36 31	110%	1	73	12	-165
	2nathroad	*	270	34	1.0	400	49	07%	30	534	.52	-17%
Tran.35	Hostakowal Southkowal	12	1,383	110 66	13	4,510	2299 40	189%	15	4,226	280 40	-34
Then 35 Presidents 1	Monthly manual	11	302	28	13	738	36	100%	Тİ	727	56	DN
2 ngs 71	Settimed Weithrand	45 18	1,171	0	22	1,200	112	43%	20	1,290 1,296	115	24
Tree 39	Notible rand.	17	1,003	22	38	3,840	128	67%	30	4013	114	41
Tran. 22 Tatabary I	Zeathhouse Heathhouse	30 T	2,411	128		7,754	275	61%	40	1,00 201	187	24
Tren.6	Nothboard	12	675	77	13	1,475	97	71%	13	LIR	99	- 41
Tran.d Pariation 1	Southhouse Nothhouse	10	150	- 34	13	388	- 81 13	125%	3	100	13	-143
	Southhouse	. i	34	34		-55	蒂	199%		74	74	-164
Tren 6 Patistien 2 Tren 64	Notibloand Notibloand	2	330	22	13	204	- 65 52	24%	3	100	- 65 - 85	-60
	Southboard	Ť	264			.50	- 65	66%	9	- 65	.55	-154
Tran.64 Fastation 1 Tran.64 Fastation 2	Southhoun4 Southhoun4	- 2	4	-1		5	- 2	162%		54 1	- 2	-163
Tren.67	Nothbound	13	1,100	10	17	1,998	118	39%	π	1,968	112	-19
Trend Theighton I.	Southhouse Southhouse	T	7	- 2	3	- 620 70	-69 4	137%		- 60 77	- 69 13	104
Tees.67 Fasiation.2	Southboand	2	16		1	1.00	65	75%	3	1.07	- 56 127	-164
Tran.69	Northbound Southbound	12	111 202	73	13	1,409	161 105	1221%	13- 13-	2,382	157	-25
Tean d9 Tasistion 1	Hothbound	T 5	349 121	21		500	- 56 27	161%		40	54 52	-35
True do Fasistino 2	Southboard. Southboard	1	17		·····	72		353%	···· • • ····	70	77	-01 DN
Tean 12	Eathcard Wethound	9 10	412 366	8 2	13	1,015	15 100	20%	12 12	EN HLL	78 96	-104 -54
Tran. 12 Valuation 1	Enthqued	1	- 37	20			16	101%		20	12	-45
Taun. 12	Hotthound Southbound	10 9	215	3	13	693 644	55 54	47%	12	7.1 61	59 50	-15
True 2	Hotstound	12	116	61	13	1,120	160	192%	17	2.68	158	-15
Tran 52	Southboard. Hostaboard	11	34	59 27	1.5	1,900	112	90%	17	1,771.	104 50	-75
	2cuthcoud	9	250	28	13	-63	34	28%	12	348	14	-111
Tran 32 Facilities 1 Distantion 20.	Strathformal Histofried	2	12 6,641	2	3	24	<u>×</u>	22%	3	23	2	-41
	2cablemat	112	4,04	4	1 ALL	11,878	87	114%	340	1214	76	-139
Trans												
Tren 11	Hothhouse	13	748	78	34	2,172	91	63%	34	3,274		41
Tren 11 Fasistino I.	Southbound Nothbound	34	1,048	- 69	- 41	36,943	- 200 - 6	300%	40	9.79g 13	244	-515
Tree 11 Teleties 2	Nothbound	4		23	1	40		117%	1	30	-60	23%
Tren 12	Nothboust Southbound	13	311 434	29 22	17	1,14	- 62 - 55	60% 58%	. 30	1.200	42	-104
Ten 35	Wetboard	- 4	346	61		1.349	171	178%	1	1,278	1.59	-25
Tom 42 Tom 109	Earthroad Earthroad	13	300	71	34	179	- 85 118	-15% 63%	34	2726	- 52 - 114	-45
	Worthound	13	965	21	34	7,916	330	332%	34	T.548	30	-38
Tree 309 Validies 1 Tree 309 Validies 2	Westboard Earthound	2	3,20	4	- 4 1	- 363	 05	414%	- # 6	40	- 214	-19
Tren.14	Eatboard	2	300	28	3	106	.55	6%	2	KI .	47	-125
True 34 Fasistino 1	Wettrand	4	30	73 10	4	-493	124	72%	- +	- 41	72	-145
Tean-40	Eathcard	11	315	35	13	1964	66	132%	10	101	65	-25
True 40 Yanatiso	Wethouse Eathroad	2	369	41 41		1.96		-1%		1,444 j0		-75
True 10	Earthound Weathound	11	42	;	13 13	585 1,546	45	1079%	11 11	551 1.255	-42	-65 -125
Tean.10	Rettoard	11	664	- A	13	1,026	169	154%	12	2140	179	65
	Westbound	- 10	127	H	E	1,996	. 172	102%	13	2,965	174	15
True TO Fasiation 1 True 15	Rettrand	10	3	3	12	1,287	6 207	100%	1	1,278	100	-15
	Westhoand	12	:01	64.	13	1,699	159	261%	17	2,758	142	29
Tran 35 Testation 1 Tran 36	Sectorani Hotherani	1	18	14	13	3,159	12 223	857% 85%	1	2,571	210	-64
	2nathennel	15	1,389	RI	31	1,941	298	222%	30	5,726	287	-41
Trans 201 Federations 1	Hinthleimand. Steathleimand.		34	14 31		204	26 238	20%	1	201	28	-41
Team 30 7 setabless 2	Nothbound	1	64	64	1	147	147	130%	1	130	110	-6/1
7 sen 36	Netlidened. Zealidened	17 13	1,194 111	70 64	30 34	4,141 4,078	138	96% 196%	30	4208	114	34
Then 96 Taxiables I	Healthbound.	1 3	19 13	19	3	40 50	57	66% 73%	1	#1 73	31	34

Table 3.6 Modelled Tram Maximum	Load Results for Strategy F
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Bus

Maximum load demand results for Bus are shown in Table 3.7. These suggest:

- A mixed bag of impacts
- Almost all of the Eastern freeway group of routes have maximum loads below prevailing 2001 levels. This suggests that modelled frequencies are generous
- In contrast the Johnston Street group have maximum loadings above prevailing 2001 levels and which are generally above those in the 2021base
- Overall however maximum loads per vehicle are within prevailing capacity bounds for buses.

Train

Analysis of the impacts of DART on train services has identified only minor changes to total boardings.

3.3 Summary of Overall Impacts

See Table 3.8.

			2001 Base		2021 9	Strategy D			203	21 Strateg	уF	_
Route Number	Direction	Ne. of Sections	Load at Max, Load	Average Load per	No.of Services	Lead at Max Load	Annuage Load per	Change in As. Load	No. of Services	Lead at Max. Lead	Average Loadper	Change in As Load per
			Point	Vehicle		Polari	Whiele	per Vehiele		Polat	Whicle	Yeldcle
								from 2001				from 21 base
Office Hill - Broarwick Rd												
Pitar 304	Earfoound Weathound	3	.98 24	1	12 12	41 15	5 7	-55% 46%	12 12	70 15	6 7	15%
East Malls - Features												
Bug 402	Earthound Westhound	12	153 489	13 41	12 12	342	20 94	138%	12	279	32 94	5%
Eastern Freeway Group												
Due XX	Barfoound	1	18	18	12	232	19	7%	12	177	15	-24%
	Weathound	10	463	47	12	369	47	2%	12	417	34	-29%
Eus 300	Earthound	3	18	*	12	166	14	64%	12	138	1)	-8%
Dog 303	Weathound Weathound	1	205	29	12	245	22	-25% 259%	12	1.19	10	-35%
Bue 304	Earfoound	1	40	40	10	286	29	-29%	10	303	30	6%
	Westbound	4	298	50	9	389	-64	-10%	9	213	24	-47%
Dur 304 Twistion 1	Earthound Weathound	3	54 160	27	2 3	71	36 40	31%	2	3T 21	29 7	-20%
Bag 303	Barfoound		104	~	9	45	-40	-27.10	- 9	34	6	
Pus 305	Weathough!	1	46	45	5	149	29	-36%	5	6	1	-96%
Dur 305 Variation 1	Earthound	1	19	19	1	15	15	-21%	<u> </u>	2	2	-87% -53%
Ene 300 Faciation 2	Weathound Eastbound		- 159	25		229	33	-12%		117	<u>13</u>	-0.5%
Pog 306	Weath-stand.	4	129	25	10	385	39	11%	10	239	24	-30%
Due 301 Teristion	Weethound	2		44		76		-14%	2	13		-83%
Bug 307	Barfoound Weathound	2	61. 224	31 22	12	349	29 25	-5%	12	315	28 20	-10%
Pug 301	Weathound	2	256	17	12	289	24	-34%	12	210	19	-19%
Due 308	Werthound	3	34	42		706	.59	22%	12	471	39	-33%
Bug 313 Dag 313	Westbound Eastbound		22	14	12	368	<u>R</u>	127%	12	46	4	-00%
Dur 316	Weathound	1	63	21	12	201	23	12%	12	196	16	-30%
Eug 334	Earfoound	1	171	29	12	218	23	-20%	12	1,18	13	-45%
	Westbound	2	225	12	12	534	46	42%	12	336	28	-39%
Noddle Street												
Pos 14 Pos 24 Variation	Northbrand Northbrand	1	-44	-44 21	1 10	230	74 23	68% 10%	10	81	91.	23%
	Southbrand	. 12	163	72	12	340	77	10%	12	167	ñ	-9%
Johnston Street Group												
Dur 201 Twistion	Earfoound	4	111	28	12	1.38	12	-52%	12	1.18	10	-14%
	Weethound		77	16	12	190	18	0%	12	316	28	66%
Bus 301	Eastbound Weathound	4	55 29	14 22	12	125 224	10 19	-24%	12	146	12 28	17%
Dug 203	Weathound	1	π	34	12	219	20	-16%	12	36	3	-77%
Bug 201	Weetbound	2	R	16	12	178	15	-4%	12	260	22	461
Ens 207 Exa 207 Variation	Seefboand Weathound	4	81	20	12	144 266	12	-42%	12	164	14 31	16%
Queens Pile - Malk Uni	WATESTER					200		4.2		10	А	412
Das 546	Earfoound	4	33	1	4	34	6	-27%	4	19	3	-21%
1.1.7	Weathound	4	34	,	4	30	š	-41%	4	10	5	-10%
Radidowne Street Group												
Dus 251	Horthburnd	,	308	16	12	141	12	-25%	12	249	21	77%
	Scettered.		91	13			33	128%		373		-2%
Even 251 Variation 1 Day 251 Variation 2	Northbrand Southbrand	1	5	1		3	- 5	215%		7	2	40%
Dog 251	Northburnd	3	88	10	12	133	15	-17%	12	116	16	6%
	Scetherad	3	70	14	12	430	35	150%	12	411	34	-2%
New Bas Routes									1			
Eus 20A	Bestoound				12	111	9	-	12	115	10	-
Dur 20A Dur 20B	Weathound Earthound			-	12	217	11	1 1	12	255	21	[
Eve 30B	Westhough				- 12	211	13		12	240	- 10	
Pus XA	Restloyed	h			12	317	26	-	12	141	13	-
Dur XA	Weathound.			-	12	107	9		12	46	4	-
Dee XIB Des XIB	Earfoound Westhound			-	. 12	215 318	18		12	133	11.	-
Post Act	Earthound			-	12	219	20	-	12	1.67	34	-
Due 30C	Weathound				12	327	-44	-	12	47	4	-
Bee 30D Bas 30D	Earformal Weathought				12	10 84	3	t I	12	18	2	1
Pus XD Dur XXE	Earthound .			-	12	#1 64		F	12	23	2	
ALC 100							~					
Dur XE Dur Hedde Structors	Westhound Earformed				12	134	0	-	12	21	2	-

Table 3.7 : Modelled	l <u>Bus </u> Maximum L	Load Results for	Strategy F
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Table 3.8 : Summary of Maior Weekday	Strategy Elements and Impacts : Strategy F
rabio olo i caninary or major freekaay	

	Strategy Elements
MelbourneHigh frequ	capacity light rail system operating Doncaster Shoppingtown, Eastern Freeway, NCCC, e Uni, Swanston Street to St Kilda termed DART (Doncaster Area Rapid Transit) ency, high quality priority and stops (stations) uses cut to operate at 3 Freeway station interchanges
Market	Impact (from 2021 Strategy D Base Case)
Total Metropolitan travel	 Transit journeys increase by 4,613 sourced from car travel No impact on transit journey mode share Transit boardings increase by 3,650 implying DART reduces overall transfers between transit modes
Total NCCC Travel	 Transit journeys increase by 1,866 sourced from car Transit journey growth is mainly from Through and some External Travel
Temporal Impacts– NCCC	 Transit boarding increases are concentrated in the a.m. peak and inter-peak Interestingly P.M. transit boardings decline. We suggest that a group of commuters travel in by bus and out by rail but for strategy F they use DART in both directions
Spatial Impacts– NCCC	 Through travel between East and South accounts for 71% of NCCC journey growth Car travel decline also follows this pattern
Service Boarding Impacts	 DART achieves 68,721 boardings per weekday. Most other tram services have boarding declines Bus have general boarding declines notably the Eastern Freeway group (-50%). Some selected NCCC bus routes have modest boarding growth. Rail has a mixed bag of low boarding impacts
DART Loadings	 Most DART usage is between Doncaster and the CBD. This suggests the operation should be cut back to a Doncaster-CBD service Key DART stations are the CBD stops, Doncaster Shoppingtown and the Freeway interchange station. NCCC stops have lower order usage to these stations
Maximum Load Demand Impacts	 DART achieves an average maximum load of 240 well within the scope of the high capacity LRT service designed. Other tram services maintain excessively high maximum loads. Strategy F acts to slightly alleviate the tram maximum issues identified in Strategy A. However these
	 Singhty aneviate the train maximum issues identified in strategy A. However these issues are increased in the strategies implemented since strategy A. Bus has a mixed bag of maximum load impacts. The Eastern Freeway Group are all well under-loaded and may warrant reductions in service levels as feeder bus services. Other services have no maximum load issues

4 STRATEGY F2 DONCASTER AREA RAPID TRANSIT – HEAVY RAIL

4.1 Strategy Inputs

Strategy F2 involves the addition of a new rapid transit service using heavy rail on the Eastern Freeway termed the Doncaster Area Rapid Transit (DART). Key features of the F2 heavy rail option are indicated in Table 4.1.

Design Area	Specification
Alignment	 Stations as follows: Doncaster Shoppingtown Bulleen Road Eastern Freeway Chandler Highway Eastern Freeway Victoria Park then all stations on the Clifton Hill group to the City Loop
Mode	Heavy Rail
Right of Way	 Underground between stations 1 and 2 Freeway median between stations 2, 3 and 4 Existing rail right of way for other station sections Free operating speed is 110 kph on the new rail sections
Stations/Stops	 All new stations are Premium stations. Victoria Park also converted to Premium Station status Designated park and ride/ kiss and ride stations (car access terminal penalties as for Premium stations in Strategy A) at: Doncaster Shoppingtown Bulleen Road Eastern Freeway Chandler Highway Eastern Freeway All of the above Premium stations and also Victoria Park reflect above the standard used in Strategy A, e.g.: interchange penalties reduced to 2 minutes, maximum walk interchange time of one minute, maximum wait time of 3 minutes
Operating Strategy	 Two thirds of trains operate all stops Doncaster to Victoria Park and then express to Parliament/Flinders Street Station. Travel time benefits of express sections are the same as existing express trains Remaining third operate all stops
Service Levels	• LRT frequencies were 4 minutes in the peaks and 5 minutes in the off peak. The Heavy rail option is at least equivalent to this or higher if this is consistent with 2020 heavy rail frequencies on other lines
Bus Operating Strategy	 Existing (from Strategy D) Eastern Freeway buses become feeders for the rapid transit service, hence no buses actually use the freeway. Buses that go to Doncaster Shoppingtown will now feed the Rapid Transit system, but still maintain their current routes unless they used the Eastern Freeway i.e. the Johnston Street Group still operates

4.2 Modelling Impacts

Since strategy F2 is a composite of earlier strategies, the individual results of this strategy have been compared against those of strategy D. In this way the relative impacts of strategy F2 can be compared against those of the others.

4.2.1 Strategic Travel Behaviour Changes

Table 4.2 presents a summary of the major weekday journey impacts suggested by the modelling.

	Strategy D (Strategy F Base Case)			Strategy F2 Descaster Rapid Transit Heavy Rail				Difference (Number)				Difference (%)				
	Car	Public Transport	Walk	Total	Car	Public Transpet	Walk	Total	Car	Public Transpart	Walk	Total	Car	Public Transport	Walk	Total
Tetal Journeys pr	er Weekday	1														
Total Helbourne	11,428,413	1,404 (078	2,276,119	15,106,610	11,417,730	1,411,321	2,277,553	15,106 (604	-8,683	7,243	1,434	-6	0%	1%	0%	0%
NCCC Contidor									-							
Drough	27.4,805	219,340	5,474	500,619	272.875	221,777	6,528	501,180	-1,930	2,437	54	561	-1%	1%	1%	0%
Taltan	336,146	171,093	126,160	634,207	334,006	173,266	126,568	633,920	-2,060	1,373	400	-207	-1%	1%	0%	0%
uithin	46,D05	13,199	48,311	107,575	45,964	13,068	48,174	107,206	-101	-131	-137	-302	0%	-1%	0%	D%
TUTAL	657,016	434,432	180,953	1,242,401	652,925	408,111	181,270	1,242,306	-4,091	3,679	317	-95	-1%	1%	0%	D%
Mode Share by M	larket															
Tetal Melbourne	76%	9%	15%		76%	9%	15%		1				0%	D%	- 0%	
NCDC Corridor																
Through	55%	44%			54%		1%						0%	D%		
Töltön	53%	27%			53%	27%	20%						0%	D%	0%	
(IEN)	43%	12%	45%		43%	12%	45%						0%	0%		
TEINE	53%	33%	15%		53%	33%	15%						0%	D%	0%	

This indicates that:

Metropolitan Melbourne

- Total travel does not change. This is to be expected, the model has been set up to explore shifts in travel between modes not trip generation.
- Total public transport travel increases by 7.2K journeys. This is 56% more total journey growth than with option F, the light rail service
- Transit mode share does not change (on a Metropolitan wide basis)

NCCC Area Travel

- NCCC public transport use increases by 3.7K a 95% increase in transit journey growth compared to option F, the light rail service.
- Most public transport travel growth is from through travel (2.4K). External travel increases by 1.4K whilst internal transit trips decrease (by 0.1K trips).
- NCCC car travel reduces by 4K double that with the light rail option
- The biggest volume of traffic reductions are through and external travel
- NCCC walk/cycle travel increases marginally

<u>Metropolitan wide</u> transit boarding impacts are illustrated in Table 4.3.

	Strategy D :	Strategy	Strateg	y F2 -	Chang	е	
	F Relative B	ase Case ·	Doncaste	r Rapid			
	202	1	Tran	sit			
Total PT Journeys	1,404,078		1,411,321		7,243	1%	
Total PT Boardings		%Total		%Total			
M> Tram	676,262	28%	676,226	27%	(36)	0%	
Yarra Tram	572,674	23%	564,581	23%	(8,093)	-1%	
Sub-Total Tram	1,248,936	51%	1,240,807	50%	(8,129)	-1%	
M> Train	434,345	18%	434,966	17%	621	0%	
Connex	280,550	11%	332,328	13%	51,778	18%	
Sub-Total Rail	714,895	29%	767,294	31%	52,399	7%	
Metro Bus	478,098	19%	467,274	19%	(10,824)	-2%	
Other	14,287	1%	14,329	1%	42	0%	
Total	2,456,216		2,489,704		33,488	1%	
Boardings per Journey	1.75		1.76		4.62		

Table 4.3 : Modelled Impacts on Transit Boardings – Strategy F2

This indicates that for <u>Metropolitan wide travel</u>:

- Whilst total transit journeys increase by 7.2K, boardings increase by 33.5K. This is suggestive of a great deal of multi-modal transit journeys being created by the Heavy Rail DART system. It contrasts strongly with the reduction in transfer behaviour apparent with the LRT design for DART which reduced transfers overall.
- There are 33.5K additional transit boardings per weekday.
- Heavy rail boardings increase by 52.4K at the expense of bus (down 10.8K) and tram (down 8.1K)
- M>Train has the largest increase mainly because this is where the DART heavy rail service is operated in the model
- Interestingly Connex also have a small increase in boardings, presumably passengers at the edge of the DART catchment who were displaced as a result of the cutting of buses associated with DART who decided to use the Ringwood line as an alternative path.

4.2.2 Temporal Distribution of Impacts

Table 4.4 shows the impacts on transit boardings by time period

	Strategy D :	Strategy F	Relative B	ase Case -	Strategy	F2 - Donc	aster Rapio	Transit			Cha	nge From	Base Case	
		20												
Total PT Boardings	A.M. Peak	Off Peak	P.M. Peak	Total	A.M. Peak	Off Peak	P.M. Peak	Total	A.M. Peak	Off Peak	P.M. Peak	Total	A.M. Peak	Off Peak
M> Tram	152,098	365,718	158,446	676,262	152,554	365,464	158,208	676,226	456	-254	-238	-36	0%	0%
Yarra Tram	127,944	312,428	132,302	572,674	125,367	307,958	131,256	564,581	-2,577	-4,470	-1,046	-8,093	-2%	-1%
Sub-Total Tram	280,042	678,146	290,748	1,248,936	277,921	673,422	289,464	1,240,807	-2,121	-4,724	-1,284	-8,129	-1%	-1%
M> Train	127,542	198,139		434,345	127,818	198,025	109,123		276	-114	459	621	0%	0%
Connex	82,001	124,558		280,550	95,216	150,425	86,687	332,328	13,215	25,867	12,696	51,778	16%	21%
Sub-Total Rail	209,543	322,697	182,655	714,895	223,034	348,450	195,810	767,294	13,491	25,753	13,155	52,399	6%	8%
Metro Bus	124,930	265,661	87,507	478,098	122,963	258,518	85,793	467,274	-1,967	-7,143	-1,714	-10,824	-2%	-3%
Other	7,293	3,462	3,532	14,287	7,334	3,460	3,535	14,329	41	-2	3	42	1%	0%
Total	621,808	1,269,966	564,442	2,456,216	631,252	1,283,850	574,602	2,489,704	9,444	13,884	10,160	33,488	2%	1%
Time Period Share	A.M. Peak	Off Peak	P.M. Peak	Total	A.M. Peak	Off Peak	P.M. Peak	Total						
M> Tram	22%	54%	23%	100%	23%	54%	23%	100%						
Yarra Tram	22%	55%	23%	100%	22%	55%	23%	100%						
Sub-Total Tram	22%	54%	23%	100%	22%	54%	23%	100%						
M> Train	29%	46%		100%	29%	46%	25%	100%						
Connex	29%	44%		100%	29%	45%	26%	100%						
Sub-Total Rail	29%	45%	26%	100%	29%	45%	26%	100%						
Metro Bus	26%	56%		100%	26%	55%	18%	100%						
Other	51%	24%	25%	100%	51%	24%	25%	100%						
Total	25%	52%	23%	100%	25%	52%	23%	100%						

Table 4.4 : Change in Transit Boardings by Time Period – Metropolitan Melbourne

This indicates that:

- Total boardings increase by 33.5K. This is spread across all time periods. Interestingly this contrasts with the time period pattern for the Light Rail version of DART (F2), where P.M. boardings declined. For the light rail option we hypothesized that p.m. peak DART light rail boardings were derived from rail and the other time periods bus and tram. The heavy rail version of DART is abstracting from mainly bus and tram in all time periods.
- Boardings growth is highest for rail in the inter-peak compared to the peak. This pattern is mirrored by higher declines in bus boardings at this time

4.2.3 Spatial Distribution of Impacts

Table 4.5 shows an analysis of changes in modal trip patterns between the Strategy D base case and the 2021 Strategy F2 case. This indicates that:

NCCC Public Transport Travel

- As noted the 3.7K per day increase in NCCC PT journeys is mainly sourced from through and external travel. By individual spatial area this indicates that:
 - Through transit travel growth is mainly from between the :
 - East and the South 38%
 - North and South 20%
 - East and West 19%
 - East and North 8%
 - The heavy railway option opens up more opportunities for inter-regional travel growth than the light rail option. Possibly because the heavy rail design integrates better with other heavy rail services

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Table 4.5 : Analysis of Spatial Changes in Modal Travel – 2021 Strategy F2 vs Strategy D Base Case

 External transit travel growth is mainly from the South and East to and from NCCC. Again this is a wider impact than the light rail option and is due to better inter-regional connectivity provided by operating DART as heavy rail and hence better connecting with other regional rail services.

NCCC Car Travel

• Car travel decline follows the above spatial patterns for public transport growth

NCCC Walk Travel

- Modest Walk travel growth is the result of growth in external and through walk/cycle travel and also a decline in internal walk travel
- Most Walk/Cycle travel growth is from the South and North to NCCC

4.2.4 Transit Service Boardings Impacts

Total Daily Boardings Impacts

Table 4.6 shows the changes in transit boardings by individual NCCC related service. It shows the results for option F2 and also compared them with option F, the light rail version of DART.

This indicates that:

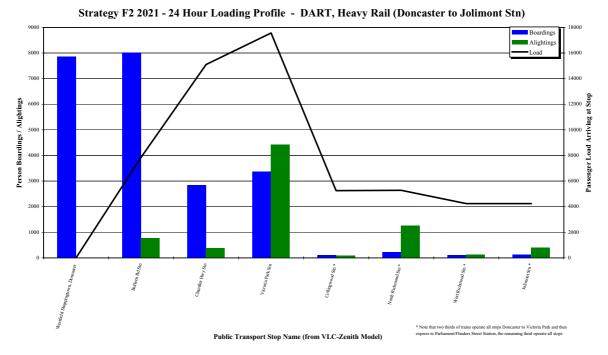
- DART heavy rail carries 50.6K boardings per weekday compared with the light rail which carries 68.7K i.e. 18.1K less boardings or 26% less carryings. This contrasts from the journey growth and boardings growth of the two schemes with the heavy rail option having a much greater impact.
- It is not appropriate to use the direct boarding performance of the LRT or heavy rail options as a measure of success. The LRT runs broadly twice the distance that the LRT does and hence has more than double the catchment potential for boarding attractions.
- With 50.6K boardings per weekday, the DART heavy rail would be carrying more than any current Melbourne rail lines does at present.
- Rail boardings are higher and tram boardings lower under option F2 compared to F due to DART being heavy rail rather than a tram service
- Interestingly bus boardings are higher under F2 than F, the Johnson Street group of bus services in particular do better under F2. In contrast the Eastern Freeway group of bus routes do worse under F2 than F; this group is cut to feed DART under both options. It appears that bus feeding to light rail has higher loadings than bus to heavy rail. This may be rationalised by the fact that walk access to LRT is likely to be better than to Heavy rail.

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	likebourie University to 100 uk	9,30	44,439	177%	80,001	151%	41,008	17/96	2,818	7
0 Rati-Antal	Illiconee Pands & Fodkaray	2,264	7,222	57h	1,255	157%	7,212	172%	36,963	
Terre .		210,001	10,00	5.078	110,01	121.98	110,111	15479		
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Table 4.6 : Change in Boardings by NCCC Service – Total Weekday

4.2.5 DART Boardings Performance

Figure 5.1 illustrates a loading profile for all day boardings for city bound DART heavy rail service.





This indicates that:

- A maximum daily load of 18,000 pass Victoria Park towards the CBD. This is more than twice the loading of the LRT service (at 8,000 at the same location).
- The busiest DART stops are:
 - Bulleen Road
 - Doncaster Shopping Town
 - Victoria Park
- It is significant that Victoria Park is a major interchange point to other regional transit services. The data suggests that about a fifth of the inbound daily market is using DART to access this transfer point.

4.2.6 Peak Maximum Load Impacts

Analysis of peak maximum loadings on the DART heavy rail service indicates that the heavy rail maximum loading is at Victoria Park station. Average peak maximum loads are 244 per train which is relatively low for a heavy rail service. This is suggestive that only 3 car sets may be required even in the peak.

Maximum loading result conclusions for other services are similar to option F.

4.3 Summary of Overall Impacts

See Table 4.6.

Table 4.5 : Summary of Major Weekday Strategy Elements and Impacts : Strategy F2

	4.5 . Summary of Major Weekday Strategy Elements and Impacts . Strategy F2
	Strategy Elements
Eastern Fre Clifton Hil High freque express Vio	v rail system operating to the following stations Doncaster Shoppingtown, Bulleen Road eeway, Chandler Highway Eastern Freeway, Victoria Park Station than all stations on the l group into the city loop ency, slightly faster running than the LRT DART including two thirds of trains running ctoria Park to Parliament/Flinders Street uses cut to operate at 3 Freeway station interchanges
Market	Impact (from 2021 Strategy D Base Case)
Total Metropolitan travel Total NCCC Travel	 Transit journeys increase by 7.2k compared to 4.6K with DART as a light ril service Transit boardings increase by 33.5K implying much interchanging in new transit journeys. This contrasts with the DART LRT option which reduces transfer overall Transit journeys increase by 3.7 compared to 1.9K with the DART LRT service Transit journey growth is mainly from Through and External Travel
Spatial Impacts- NCCC	 Transit boarding increases are spread through all time periods DART heavy rail has a wider regional impact on transit journey growth and associated car travel decline than the LRT option. LRT only really impacted on travel between East and South whilst the Heavy rail includes this effect and also impacts other through travel and external travel corridors mostly those associated with the South and North. This impact is probably caused by the easier integration with regional heavy rail services provided by DART heavy rail compared to DART LRT
Service Boarding Impacts	 DART heavy rail achieves 50.6K boardings which is 26% less than those for LRT. However the heavy rail option has almost half the catchment of the LRT, hence the relative boardings performance is no a good indicator of overall success With 50.6K boardings per weekday, the DART heavy rail would e carrying more than any exiting rail line in Melbourne In general bus does better in boarding terms than with DART LRT mainly because the Johnson Street group has higher loadings. In contrast the Eastern Freeway group of bus routes, which are cut to feed DART stations, do better under LRT since it is easier to transfer to LRT than heavy rail
DART Loadings	 DART heavy rail has a maximum inbound daily loading of just under 18,000 passengers. This is more than double the inbound daily load of the LRT. Bulleen Road and Shoppingtown are the major suburban commuter stations with Victoria Park playing an important interchange role for about 20% of all DART travel.
Maximum Load Demand Impacts	 DART heavy rail achieves an average maximum load of 244 well within the scope of a rail service and arguably very low for rail. It is suggestive that 3 car sets could be deployed on the service rather than the standard 6 car sets used elsewhere Other loading estimates provide similar results to thise identified in option F DART light rail

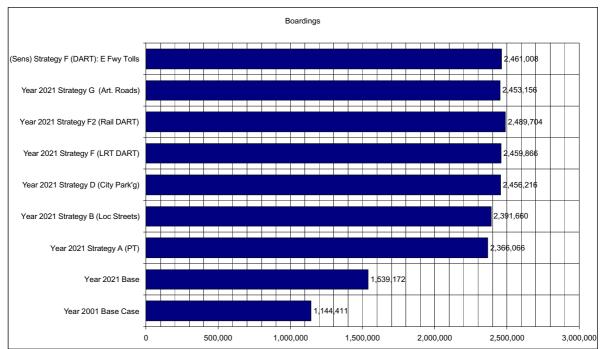
5 OVERVIEW OF OTHER STRATEGY IMPACTS ON TRANSIT

5.1 Introduction

This section summarises some of the key findings from the analysis presented.

5.2 Transit Boardings

Figure 5.1 shows the impact of the available strategy modelling results on total transit boardings.





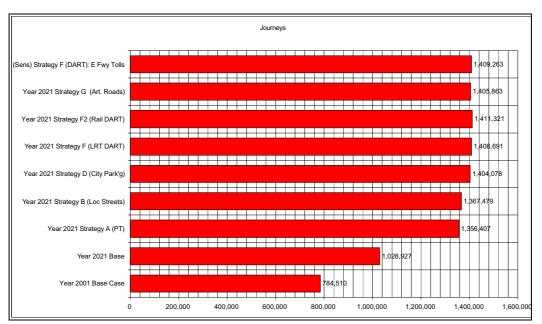
Note: All strategies are cumulative except strategy F2 which includes strategies A, B, and D but not F. Strategies G and E including strategy A to F but not F2. Strategy F2 is a variation of strategy F

This indicates that:

- Strategy A has by far the largest impact on transit usage followed by developments between the 2001 base and the 2021 base case
- For all other strategies the impacts on boardings are generally positive, however they are marginal compared to the strategy A impacts
- Of the strategies other than strategy A, strategy D has had the largest of the very marginal positive impacts on boardings
- Strategy F2, DART Heavy rail has a bigger transit boarding growth impact than its alterntive strategy F (DART LRT).

5.3 Transit Journeys

Figure 5.2 shows the impact of the available strategy modelling results on total transit journeys. The conclusions from this analysis is exactly the same as for transit boardings.





Note: All strategies are cumulative except strategy F2 which includes strategies A, B, and D but not F. Strategies G and E including strategy A to F but not F2. Strategy F2 is a variation of strategy F

5.4 NCCC Transit Mode Share

Figure 5.3 shows the impact of strategy options on NCCC transit mode share.

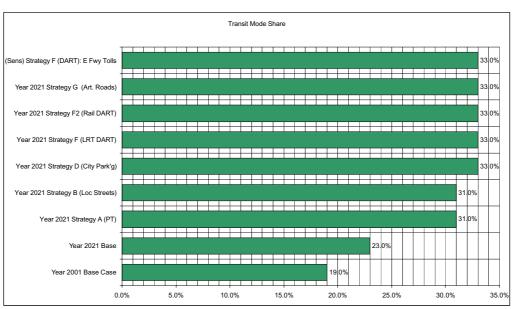


Figure 5.3 : NCCC Transit Mode Share by Strategy

Note: All strategies are cumulative except strategy F2 which includes strategies A, B, and D but not F. Strategies G and E including strategy A to F but not F2. Strategy F2 is a variation of strategy F

This indicates that:

- The pattern of the boarding and journey results is almost identical to NCCC transit mode share impacts
- However strategy A stands out even more as the major influence since the change in transit share between 2001 and 2021 base case is modest, whilst the strategy A improvements in mode share are relatively large (an increase of 8%)
- The heavy rail DART service has little overall mode share impact compared to its LRT counterpart (the differences are a fraction of a percent).