

EXISTING CONDITIONS (2012)





3.0 EXISTING CONDITIONS (2012)

3.1 THE CITYWIDE CONTEXT

Melbourne is a growing city. In July 2011, the Australian Bureau of Statistics (ABS) estimated that the city is home to over 4.1 million people. Comprising around three-quarters of all Victorian residents, Melbourne's population has been growing more than any other Australian city for each of the last 10 years¹. This growth trend is expected to continue, with recent growth projections (shown in Figure 3-1) now expecting Melbourne's population to reach almost six million over the next 30 years².

Such an increase in population will always mean an increase in travel demand. As populations grow across any transport catchment, this results in an increase in individual journey numbers, which in turn increases pressure to bear upon transport infrastructure. This is a trend that has already been seen in Melbourne over the last 30 years, with a steady increase in the number of vehicle kilometres travelled since as far back as the 1960s³ (see Figure 3-2).

- 1 Australian Bureau of Statistics—Regional Population Growth, Australia, 2010-11
- 2 Victorian Government, Department of Planning and Community Development—Victoria in Future, 2012
- 3 Bureau of Infrastructure, Transport and Regional Economics (BITRE), 2012, Traffic Growth in Australia, Report 127, Canberra ACT

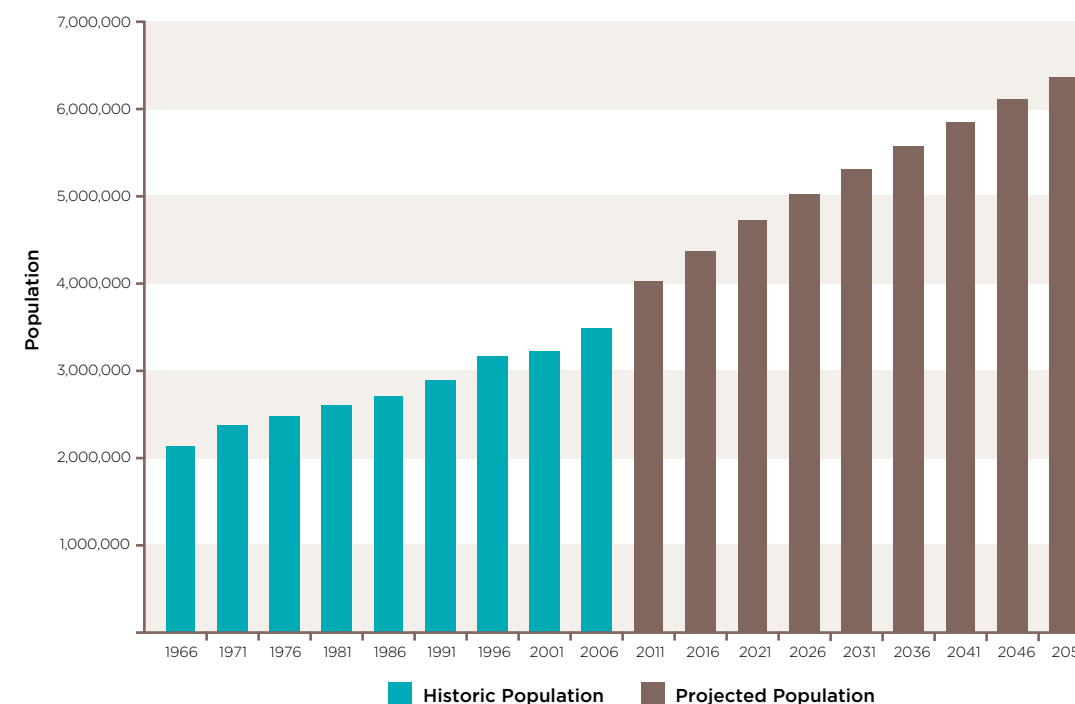


Figure 3-1: Population growth in Melbourne (source: ABS Census and Department of Planning and Community Development, Victoria in Future, 2012)

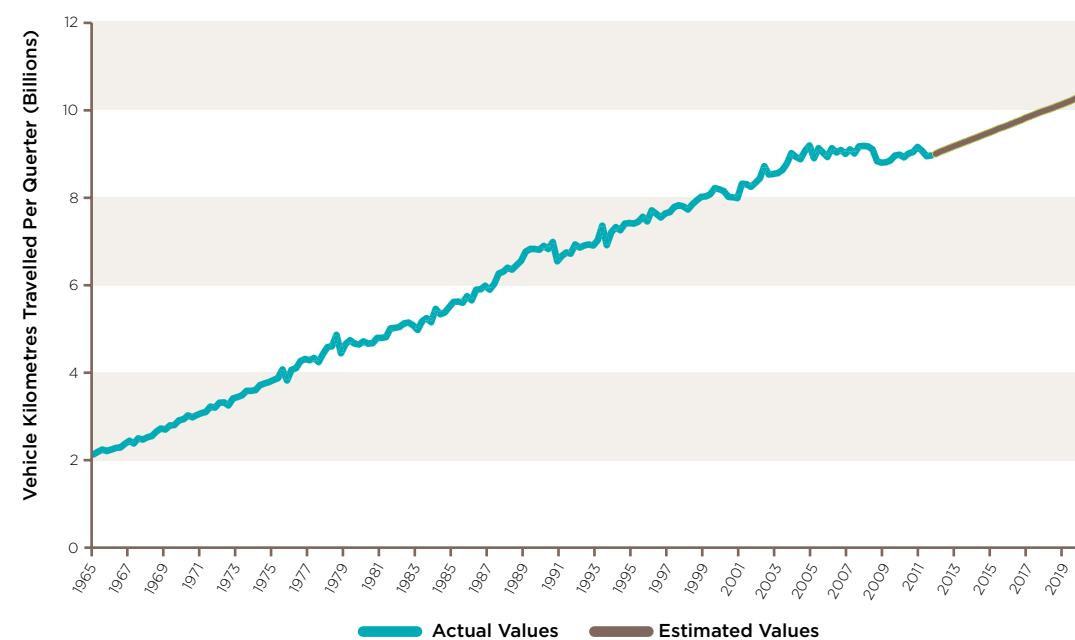


Figure 3-2: Travel demand in Melbourne (source: Bureau of Infrastructure, Transport and Regional Economics (BITRE), 2012, Traffic Growth in Australia, Report 127)

In recent years however, increasing traffic congestion, rising fuel prices and awareness of our carbon footprint as transport users, have also changed the manner in which we travel. Changing travel behaviours are also a response to our increasing understanding of the adverse impact that congestion can have upon the economic efficiency of the city. Recent estimates have placed the avoidable economic cost of congestion to Melbourne at almost \$4.5 billion per year and this is expected to rise to some \$6 billion by 2020 (see Figure 3-3).

Evidence has been showing that Melbourne's dependence upon the private motor vehicle has been slowly declining over the last 15 years or so, however the city's extensive train, tram and bus networks have all experienced continued, and at times rapid, growth in patronage over that timescale (see Figure 3-4). The decline in private motor vehicle use is expected to continue, with public transport expected to account for 20 per cent of all trips by 2020.

It is without doubt that ensuring that Melbourne is well placed to face future public transport demand is a significant challenge, which will require the interaction of a number of engineering, economic, land use and planning interventions. Any new proposal for a Doncaster rail line must therefore address these distinct, but related, issues within the context of the geographical areas that will be most influenced by the introduction of the new line.

Total public transport use in Melbourne has increased to almost 520 million trips per year, experiencing growth of almost 50 per cent over the last decade⁴.

⁴ Source: "Track Record" Annual Results—Metropolitan and Regional Patronage 2011, PTV

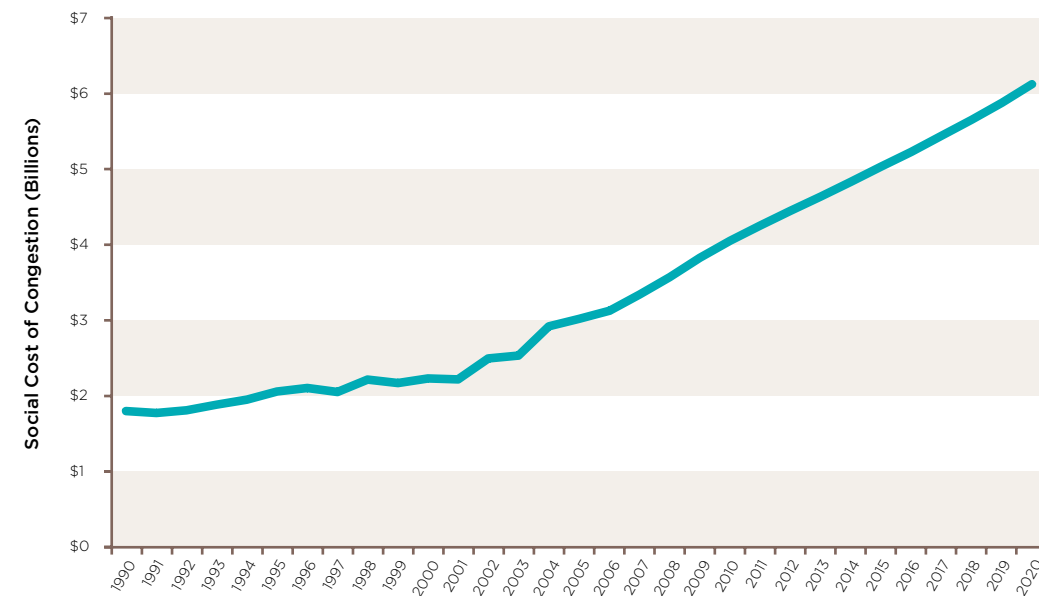


Figure 3-3: Estimated social cost of congestion in Melbourne (source: Bureau of Transport and Regional Economics (BTRE), 2007, *Estimated Urban Traffic and Congestion Cost Trends for Australian Cities*, Working Paper 71)

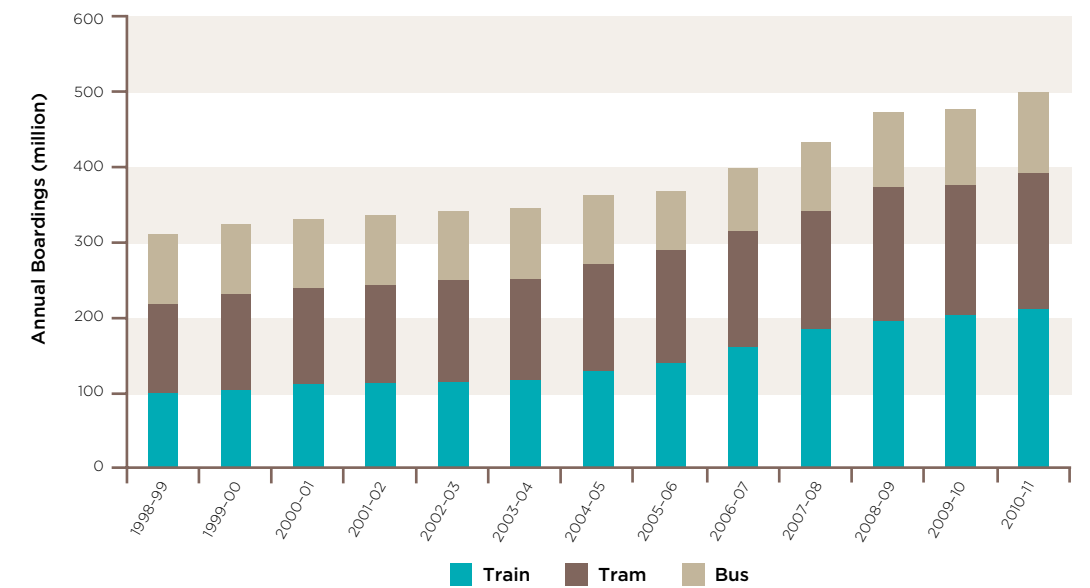


Figure 3-4: Public transport trips in metropolitan Melbourne (source: PTV, *Track Record Annual Results—Metropolitan and Regional Patronage 2011*)

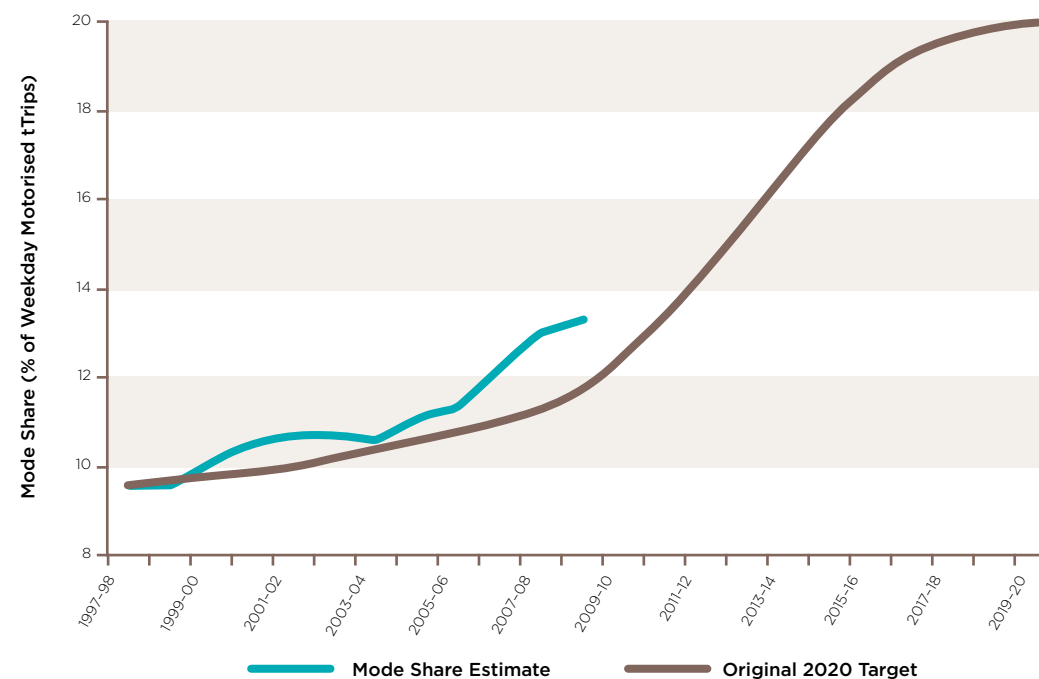


Figure 3-5: Expected public transport demand in metropolitan Melbourne (source: Victorian Integrated Survey of Travel and Activity, Department of Transport)

In the context of Melbourne's metropolitan train network, growth in public transport usage has resulted in train patronage almost doubling since 1998, while tram usage has increased by over 50 per cent in the same timescale. This trend is expected to continue over the next decade.



3.2 THE LOCAL CONTEXT—STUDY AREA

It is the objective of Phase One of the Doncaster Rail Study to consider the impacts of providing a new heavy rail line from Melbourne’s CBD to Doncaster, in the City of Manningham. The influence that the proposed railway line will have upon travel behaviour will spread much further than this relatively limited area however, with a potential catchment of passengers that extends well beyond these two cities.

The study area chosen for investigation by the study team was therefore broad in nature, designed to be wide enough to encompass all potential effects that any proposed railway line may have, but not so broad as to dilute the ability of the study team to focus on local issues, needs and potential impacts on populations. Where appropriate, the wider effects of the proposed railway alignments were also considered in a more regional context.

The study area is bounded by the existing Hurstbridge railway line to the west and north-west until it reaches the suburb of Alphington. At this point, the northern boundary of the study area heads east, generally following the Yarra River to Templestowe and Warrandyte. The eastern boundary of the study area then runs south from Warrandyte to Ringwood, at which point the southern boundary of the study area is formed by the Lilydale and Belgrave railway lines heading westward towards Richmond.



Figure 3-6: The study area

The study area covers an area of around 127 square kilometres primarily comprised of all or part of the local government areas of the City of Manningham, City of Boroondara, City of Whitehorse and City of Yarra.

3.3 DEMOGRAPHICS

The following analysis describes the key demographic features of the four Local Government Areas (LGAs) that make up the study area. The demographic profiles have been largely based upon data that was made available from the 2006 census conducted by the Australian Bureau of Statistics, and the Victorian Government’s official population and household projections as contained within the *Victorian in Future 2012* report, published by the then Department of Planning and Community Development in April 2012. A further census was conducted in August 2011; however, this data was not available at the time of drafting this report.



3.3.1 CITY OF BOROONDARA

The City of Boroondara LGA is located in the inner-eastern suburbs of Melbourne, between 5 kilometres and 10 kilometres east of the Melbourne CBD. It incorporates the suburbs of Ashburton, Balwyn, Balwyn North, Camberwell, Canterbury, Hawthorn, Hawthorn East, Kew and Kew East, as well as parts of the suburbs of Glen Iris and Surrey Hills.

Boroondara encompasses a total land area of about 60 square kilometres and is a predominantly residential area, with some areas of commercial and educational land use. Key employment sectors include retail, health and education, with Boroondara featuring three major retail areas: the Burke Road shopping strip at Camberwell Junction, Glenferrie Road shopping area in Hawthorn and High Street retail area in Kew) This area also features numerous other neighbourhood and local centres. Two tertiary institutions are located within the city (Swinburne University of Technology and the University of Melbourne, Hawthorn Campus), alongside a number of elite schools and numerous other private and public schools.

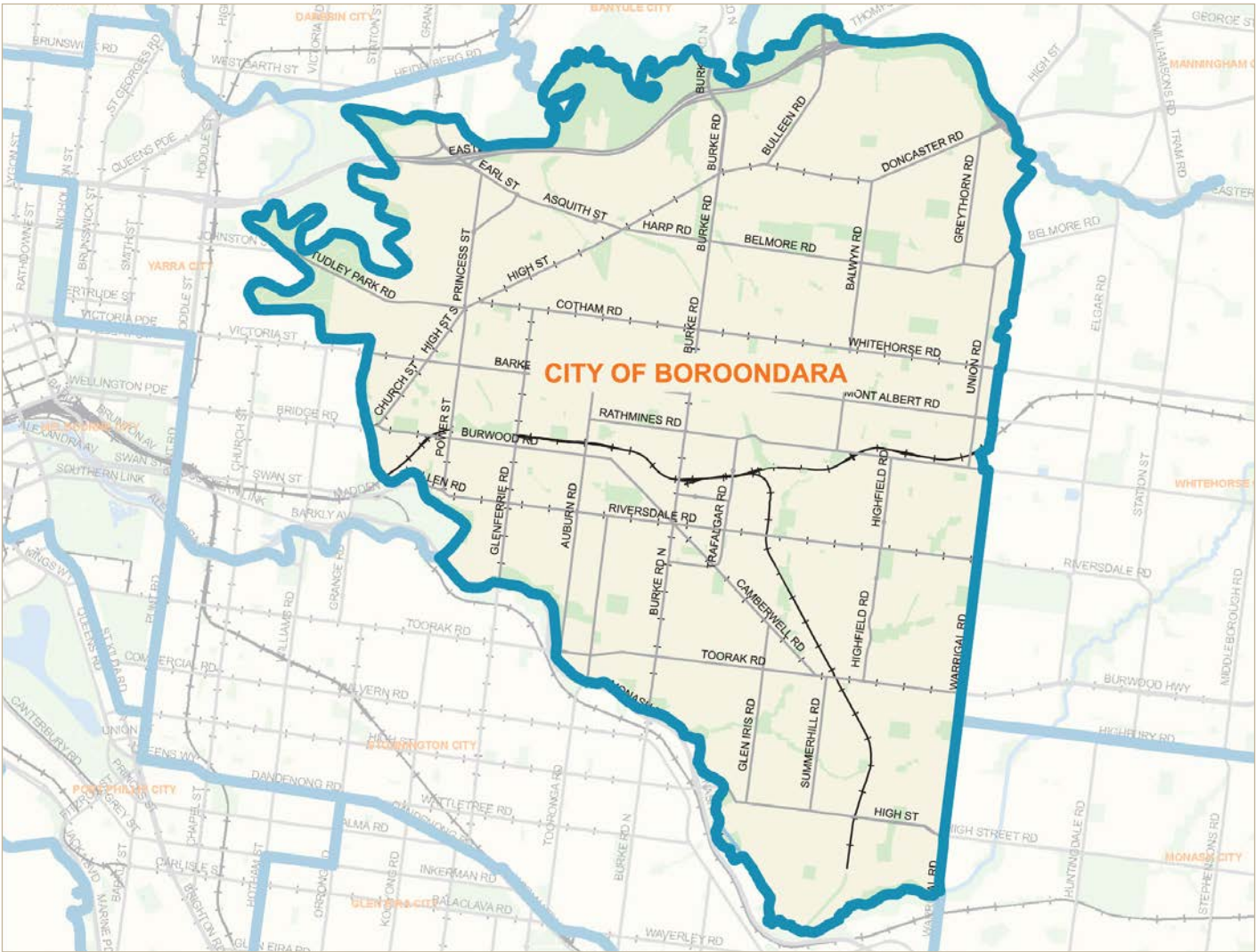


Figure 3-7: The City of Boroondara

Population

- in 2011 the population of Boroondara was estimated to be 170,439
- this population is expected to rise to 188,090 by 2031 (an expected growth rate of 0.49 per cent per year)

Employment

- a total of 77,013 Boroondara residents were in employment during 2006 (50 per cent of the population)
- in 2006, the largest employment category for Boroondara residents was ‘professional’, which accounted for 38 per cent of the workforce. This was followed by ‘managers’, with a further 18 per cent of the workforce falling into this category

- in 2006 the unemployment rate in the City of Boroondara was 3.9 per cent, lower than the state average at that time of 5.4 per cent

Economics

- in 2006 the median weekly household income in Boroondara was \$1,196, compared with \$1,027 in Australia
- 40 per cent of households within the LGA were considered ‘high income’ at this time (i.e. earning more than \$1,700 per week)

Housing

- there are currently estimated to be 63,216 households in Boroondara
- in 2006, 41 per cent of Boroondara residents owned their home, 30 per cent were in the process of purchasing a home and 26 per cent were renting





3.3.2 CITY OF MANNINGHAM

The City of Manningham LGA is located in Melbourne's north-eastern suburbs, about 12 kilometres from the Melbourne CBD. The city includes the suburbs of Doncaster, Doncaster East, Donvale, Park Orchards, Templestowe, Templestowe Lower, Warrandyte, Warrandyte South and Wonga Park, as well as parts of the suburbs of Nunawading and Ringwood North.

The City of Manningham is an urban and semi-urban area, largely consisting of traditional suburban blocks and low density housing. Generally, areas east of Mullum Mullum Creek are non-urban, while areas to the west are residential. Urban areas include the suburbs of Bulleen, Doncaster, Doncaster East, Templestowe and Templestowe Lower. Manningham encompasses a total land area of 114 square kilometres, including substantial green open spaces. Non-urban areas are mainly used for rural residential living, conservation and small-scale agriculture (viticulture and grazing).

Major features of the LGA include Warrandyte State Park, Ruffey Lake Park, The 100 Acres (Flora and Fauna Reserve), Westerfolds Park, Westfield Doncaster, Eastern Golf Club and various parklands along the Yarra River. Manningham is served by the Eastern Freeway and East Link.

Population

- in 2011 the population of Manningham was estimated to be 119,438
- this population is expected to rise to 135,927 by 2031 (an expected growth rate of 0.65 per cent per year)

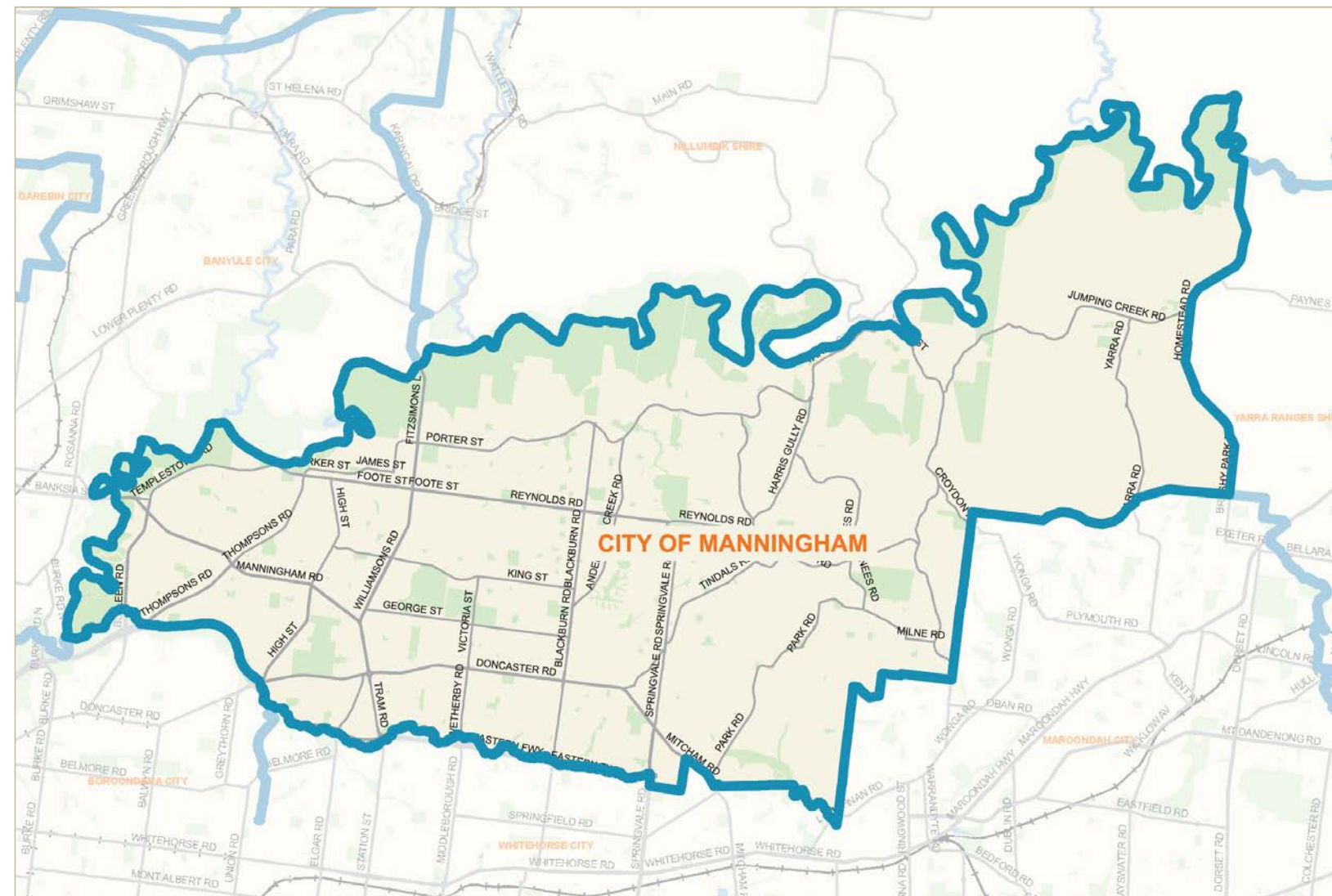


Figure 3-8: The City of Manningham

Employment

- a total of 52,751 Manningham residents were in employment in 2006 (48 per cent of the population)
- in 2006, the largest employment category for Manningham residents was 'professional', which accounted for 26 per cent of the workforce. This was followed by 'clerical and administrative workers', with a further 16 per cent of the workforce falling into this category
- in 2006 the unemployment rate in the City of Manningham was 4.2 per cent, lower than the state average at that time of 5.4 per cent

Economics

- in 2006 the median weekly household income in Manningham was \$1,217, compared with \$1,027 in Australia
- 32 per cent of households in Manningham were considered 'high income' at this time (i.e. earning more than \$1,700 per week)

Housing

- there are currently estimated to be 42,437 households in Manningham
- in 2006, 49 per cent of Manningham residents owned their home, 34 per cent were in the process of purchasing a home and 14 per cent were renting



3.3.3 CITY OF WHITEHORSE

The City of Whitehorse lies approximately 16 kilometres east of the Melbourne CBD and includes the suburbs of Blackburn, Blackburn North, Blackburn South, Box Hill, Box Hill North, Box Hill South, Burwood, Burwood East, Forest Hill, Mitcham, Mont Albert, Mont Albert North, Nunawading, Surrey Hills, Vermont and Vermont South.

The City of Whitehorse is predominantly a residential municipality located in Melbourne's eastern suburbs. While early development of Box Hill dates from the 1850s, the most significant growth period for the city occurred during post-war periods. Early development was focussed on the Lilydale/Belgrave railway line, with development spreading out to the north and south, particularly in the post war period.

Major features of the city include the largest high technology precinct in eastern Melbourne in the Tally-Ho area, the Melbourne Campus of Deakin University, Box Hill Training and Further Education (TAFE), large shopping facilities in the Box Hill Shopping Centre transport interchange and Forest Hill Chase. Natural features of interest within the area include Wattle Park and Blackburn Lake Sanctuary.

Population

- in 2011 the population of Whitehorse was estimated to be 157,427
- this population is expected to rise to 172,317 by 2031 (an expected growth rate of 0.45 per cent per year)



Figure 3-9: The City of Whitehorse

Employment

- a total of 68,708 Whitehorse residents were in employment in 2006 (47 per cent of the population)
- in 2006, the largest employment category for Whitehorse residents was 'professional', which accounted for 29 per cent of the workforce. This was followed by 'clerical and administrative workers', with a further 16 per cent of the workforce falling into this category
- the unemployment rate in the City of Whitehorse was 4.6 per cent in 2006, lower than the state average at that time of 5.4 per cent

Economics

- in 2006 the median weekly household income in Whitehorse was \$1,101 compared with \$1,027 in Australia
- 27 per cent of Whitehorse households were considered 'high income' at this time (earning more than \$1,700 per week)

Housing

- there are currently estimated to be 60,403 households in Whitehorse
- in 2006, 42 per cent of Whitehorse residents owned their home, 33 per cent were in the process of purchasing a home and 22 per cent were renting





3.3.4 CITY OF YARRA

The City of Yarra is located immediately north-east of the Melbourne CBD and includes the suburbs of Abbotsford, Burnley, Carlton North, Clifton Hill, Collingwood, Cremorne, Fitzroy, Fitzroy North, Princes Hill and Richmond, as well as parts of the suburbs of Alphington and Fairfield. The character of Yarra reflects this varied history with a mixture of residential, industrial and commercial areas. The main industries include brewing and clothing manufacturing as well as machinery and equipment wholesaling. Commercial areas are concentrated along several of the main roads.

There is a mixture of housing types, with private homes, public and community housing and a variety of private rental properties existing throughout the city. Many of the traditional stock of rooming houses have been converted into private accommodation, hotels and backpacker accommodation in recent years. The city is known for its extensive community services infrastructure and it contains a highly multi-cultural population.

Major features within the Yarra LGA include the Yarra River, Yarra Bend Park, Edinburgh Gardens, Collingwood Children's Farm, Yarra Bend Public Golf Course, St Vincent's Hospital, Epworth Hospital, University of Melbourne (Burnley Campus), Northern Melbourne Institute of TAFE (Collingwood and Fairfield Campuses), Kangan Batman TAFE (Richmond Campus), Victoria Gardens Shopping Centre and shopping strips at Bridge Road (Richmond), Victoria Street (Richmond/Abbotsford), Brunswick Street (Fitzroy) and Smith Street (Collingwood/Fitzroy).

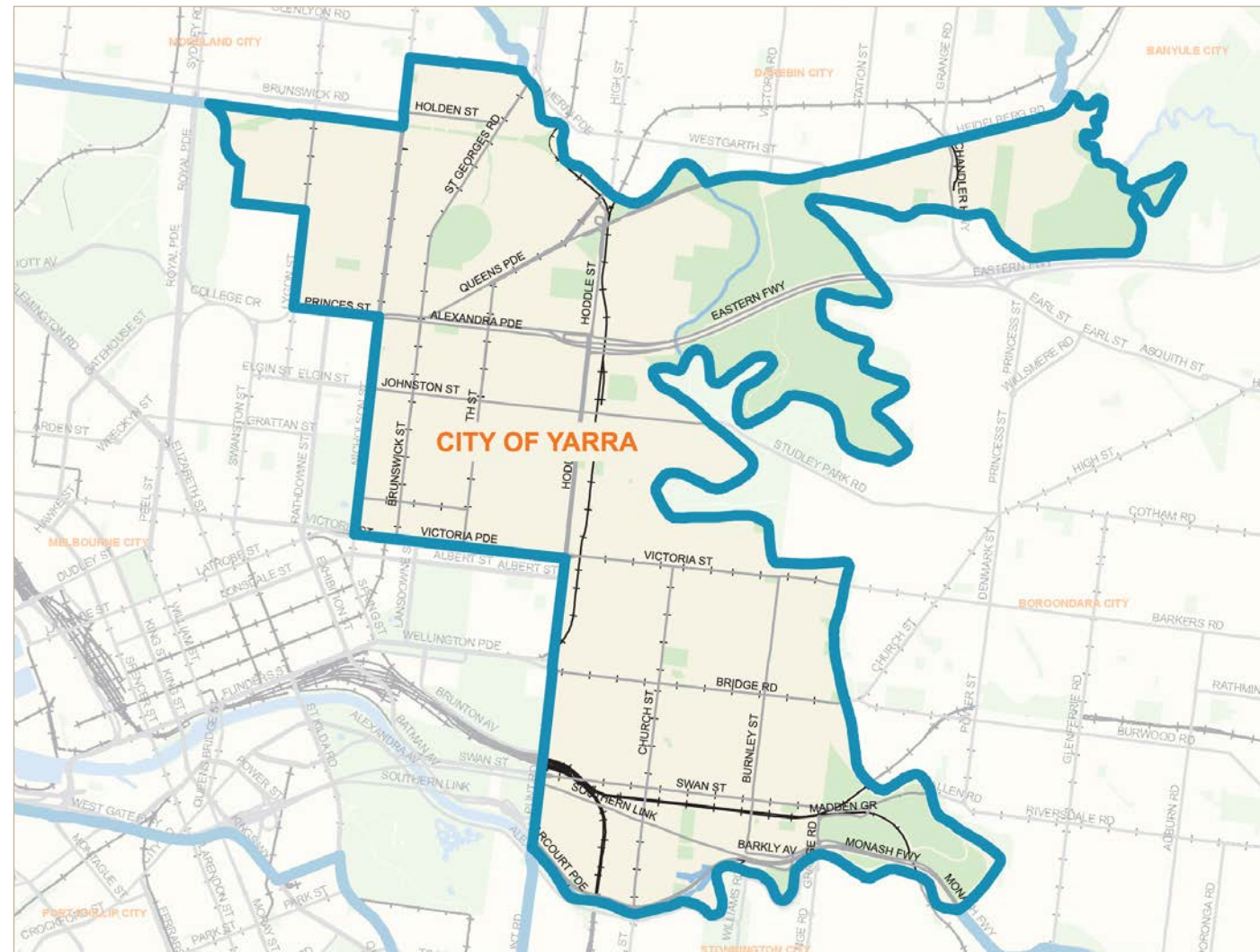


Figure 3-10: The City of Yarra

Population

- in 2011 the population of Yarra was estimated to be 80,309
- this population is expected to rise to 104,279 by 2031 (an expected growth rate of 1.31 per cent per year)

Employment

- a total of 38,443 Yarra residents were in employment in 2006 (55 per cent of the population)
- in 2006, the largest employment category for Yarra residents was 'professional', which accounted for 48 per cent of the workforce. This was followed by 'managers', with a further 14 per cent of the workforce falling into this category
- the unemployment rate in the City of Yarra was 5.1 per cent in 2006, lower than the state average at that time of 5.4 percent

Economics

- the median weekly household income in Yarra in 2006 was \$1,196, compared with \$1,027 in Australia
- 33 per cent of Yarra households were considered 'high income' at this time (i.e., earning more than \$1,700 per week)

Housing

- there are currently estimated to be 35,484 households in Yarra
- in 2006, 21 per cent of Yarra residents owned their home, 24 per cent were in the process of purchasing it and 52 per cent were renting

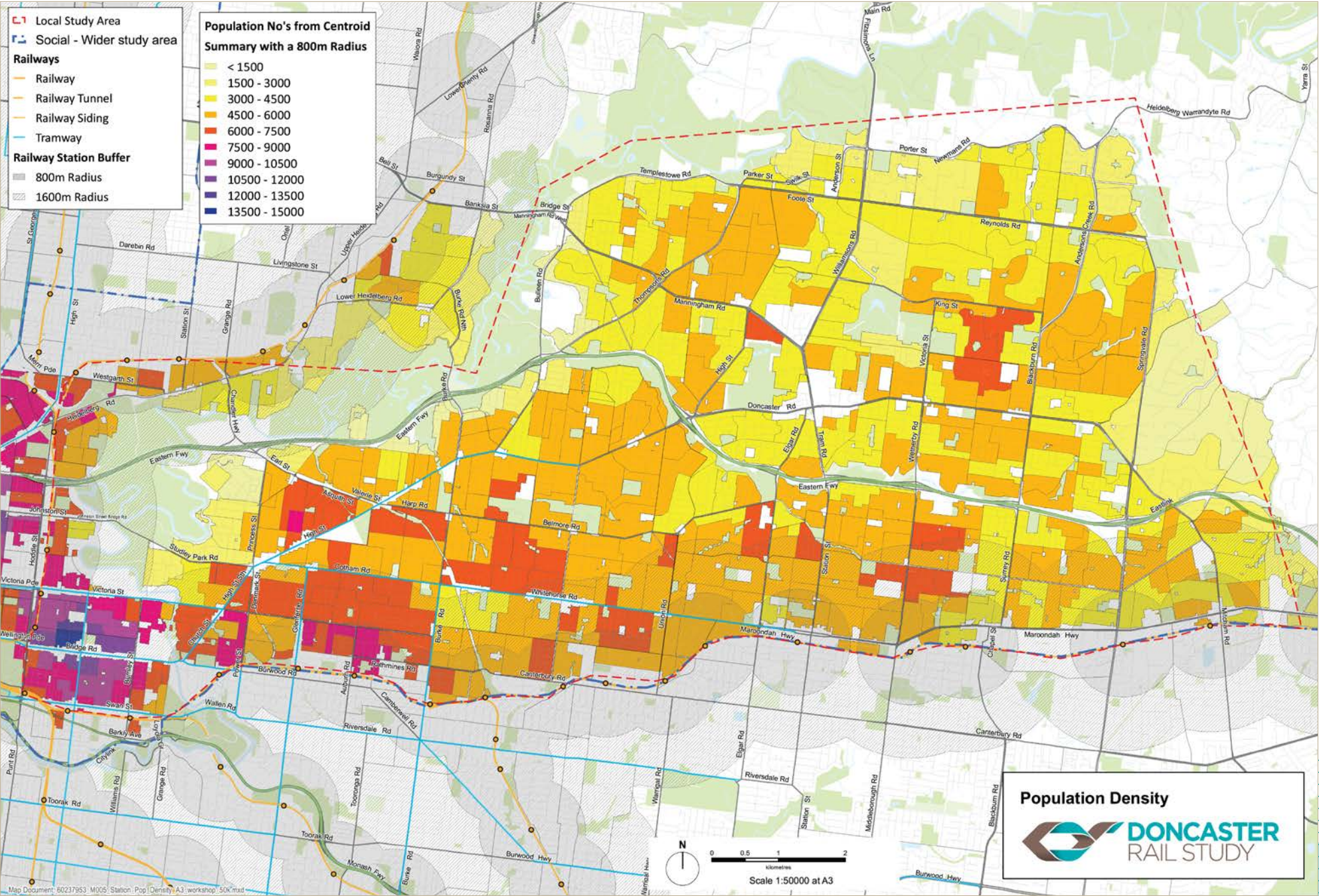


Figure 3-11: Population density throughout the study area

3.4 LAND USE

In considering the optimum heavy rail solution to Doncaster, the study team undertook an analysis of existing and future land use opportunities and constraints within the study area. This assisted the development of station locations that would maximise benefits that could be accrued from various potential rail alignments under consideration.

Within a land use context, the majority of the study area exists as an established urban environment (59 per cent of the study area is designated as 'Residential' land, compared with only seven per cent designated as 'Industrial and Business Zone' land). However, it is also characterised by a diverse range of land uses and development types. To the eastern extents of the study area, the topography is undulating and comprises significant tracts of open space and low density housing, however to the western end—particularly within the City of Yarra—significantly higher residential and employment densities can be found. Particular points of interest within the study area include areas of planned population increase at Doncaster Hill (see Figure 3-12): at Box Hill and Nunawading, around Ringwood station and along the Lilydale/Belgrave rail line.

Further details regarding the key land use opportunities area that could benefit from a Doncaster rail line are discussed below under the appropriate LGA designation.

3.4.1 CITY OF BOROONDARA LGA

The City of Boroondara's Municipal Strategic Statement identifies a number of relevant objectives that could be applicable for a Doncaster rail line, including the provision of an incentive to locate higher density residential developments close to existing commercial centres and public transport, as well as encouraging new offices to be located close to existing shopping strip areas. Other influencing factors include:

- Boroondara has a higher proportion and sizing of office spaces in neighbourhood areas than the average across Melbourne
- at a number of nodes, more intensive development has already occurred, or is now occurring
- there are positive strategic planning policy drivers to support further development intensification opportunities and
- there are a number of underutilised sites in and around a number of neighbourhood and local nodes with the LGA.

The potential intensification of office/employment and residential intensity at a number of activity nodes, which could be serviced by an improved public transport service, provides a potentially positive land use and transport outcome for the area and the rail line.

3.4.2 CITY OF MANNINGHAM LGA

Consistent with other middle ring suburban Melbourne locations, the City of Manningham is typically characterised by detached dwellings set upon conventional allotments. Manningham is also home to the second largest suburban office market in Melbourne holding around 28 per cent of all suburban office stock. This mixed development opportunity could result in a number of potential land use benefits for the Doncaster rail line:

- at Doncaster Hill, a planned, mixed-use urban village is being developed that is set to become the civic heart of Manningham. The 20-year strategy for the hill plans to attract 4,000 new residential apartments and five million extra visitors per year
- the existing Eastern Golf Course is earmarked for development, with over 2,000 new residents likely to reside there (subject to planning controls) and
- the municipality has an expected population growth over the coming 20 years, which will account for around 460 new dwellings per year across the LGA.

3.4.3 CITY OF WHITEHORSE LGA

Land use in the City of Whitehorse is predominantly residential in nature, but the city is also home to a number of significant entertainment, retail and office developments. The LGA holds the largest concentration of office space outside the Melbourne CBD and St Kilda Road areas, with major office centres at Box Hill, Tally-Ho and Greenwood office parks.

The Box Hill Principal Activity Centre is the preferred location for all major entertainment, retail and office developments within the LGA, with development in this area generally being of medium density, and favouring the re-development of former non-residential areas.

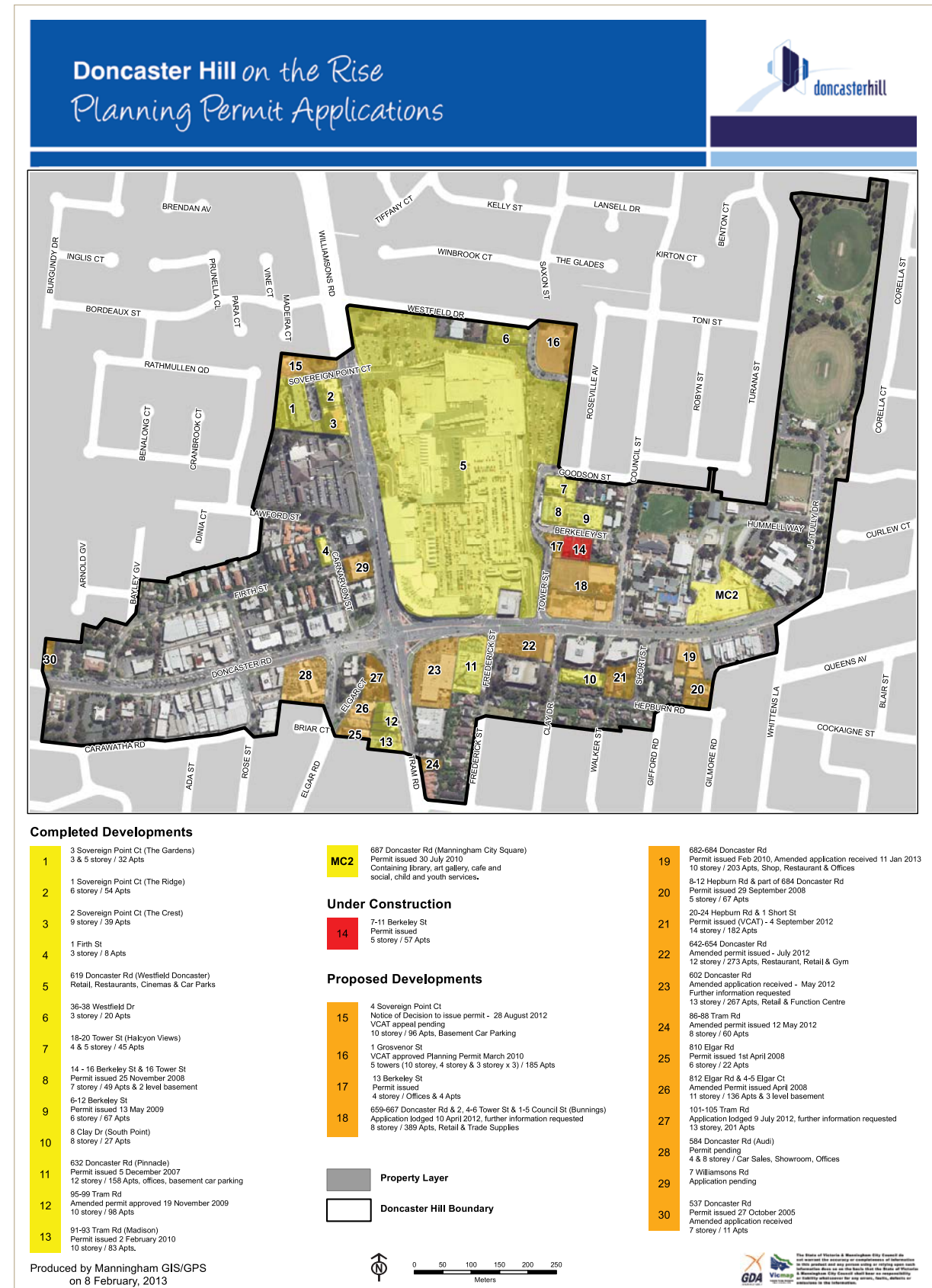


Figure 3-12: Existing and planned development at Doncaster Hill

3.4.4 CITY OF YARRA LGA

Like Boroondara, the City of Yarra has a Municipal Strategic Statement that recognises its role in accommodating predicted population growth and aims to locate new residential development at key strategic redevelopment sites. These development sites are generally located within close proximity to the identified Major Activity Centres (MACs) within the city at:

- Brunswick Street
- Smith Street
- Victoria Street and
- Swan Street.

The potential to support redevelopment of these sites through the provision of improved public transport linkages provides a strategic opportunity for the Doncaster rail line in servicing expanding populations and transport demand within the City of Yarra.

3.5 EXISTING TRAVEL PATTERNS

The provision of a new heavy rail connection between Melbourne’s CBD and Doncaster will have a significant impact upon long-term travel patterns for all modes of travel across the study area. When considering any proposed alterations to the existing transport infrastructure, however, consideration of people’s existing travel patterns within the current transport and land use system can provide a useful starting point.

In order to develop an understanding of these current demands, the study team analysed data from three main sources:

- **2006 Census Data** obtained by the Australian Bureau of Statistics. As stated in Section 3.3 of this report, the results of the recently conducted 2011 census were not available at the time that this analysis was undertaken. Data obtained during the 2006 census was instead used as the most relevant information available across the study area.
- The **Victorian Integrated Survey of Travel and Activity 2009 (VISTA 09)**. This is a survey of the day-to-day travel needs of Victorian people, undertaken by the Victorian Department of Transport. The last survey was undertaken between June 2009 and June 2010.

- **The Victorian Integrated Transport Model (VITM)**, as discussed above in section 1.6.3. Although VITM is a mathematical model and not a direct survey of travel behaviour, it is calibrated against the census and VISTA information described above, as well as various datasets of observed traffic counts, public transport boarding information and other traffic surveys undertaken between 2006 and 2010. This means that the model can provide a reliable indication of current travel patterns.

3.5.1 TRIP ANALYSIS

An analysis of the existing travel patterns throughout the study area undertaken by the study team has shown that:

- there is a high proportion of local travel to employment within each of the LGAs in the study area
- there is strong demand from the Doncaster area to the CBD, Southbank and onwards, towards Fisherman’s Bend
- locations further from the CBD have less travel to the CBD, with a preference for travel to surrounding outer districts. In general, the attractiveness of the CBD as a destination reduces as its distance away increases
- there is a relatively low level of travel towards the Doncaster area from central and inner-eastern Melbourne. This suggests that there is not currently a strong demand for counter peak travel within the existing transport and land use structures and
- travel to universities at La Trobe, Monash Clayton, and the University of Melbourne is a feature of local travel but the volume of trips is relatively small.

Typical modelled plots outputs of these travel demand patterns across the four LGAs, considered as part of this study, can be seen in Figure 3-13.

The most important aspect of these travel patterns that must be considered when assessing the impact of a Doncaster rail line is the strong demand for trips to the CBD. This demand is further evidenced in Figure 3-14, which shows where the residents of the LGAs within the study area travel when going to work each morning. This shows a clear demand for workers within the study area itself (local trips), followed in intensity by a high demand to reach the inner Melbourne areas.

The following table (Table 3-1) provides an indication of the number of people currently travelling to work in Melbourne from each of these four LGAs within the study area.

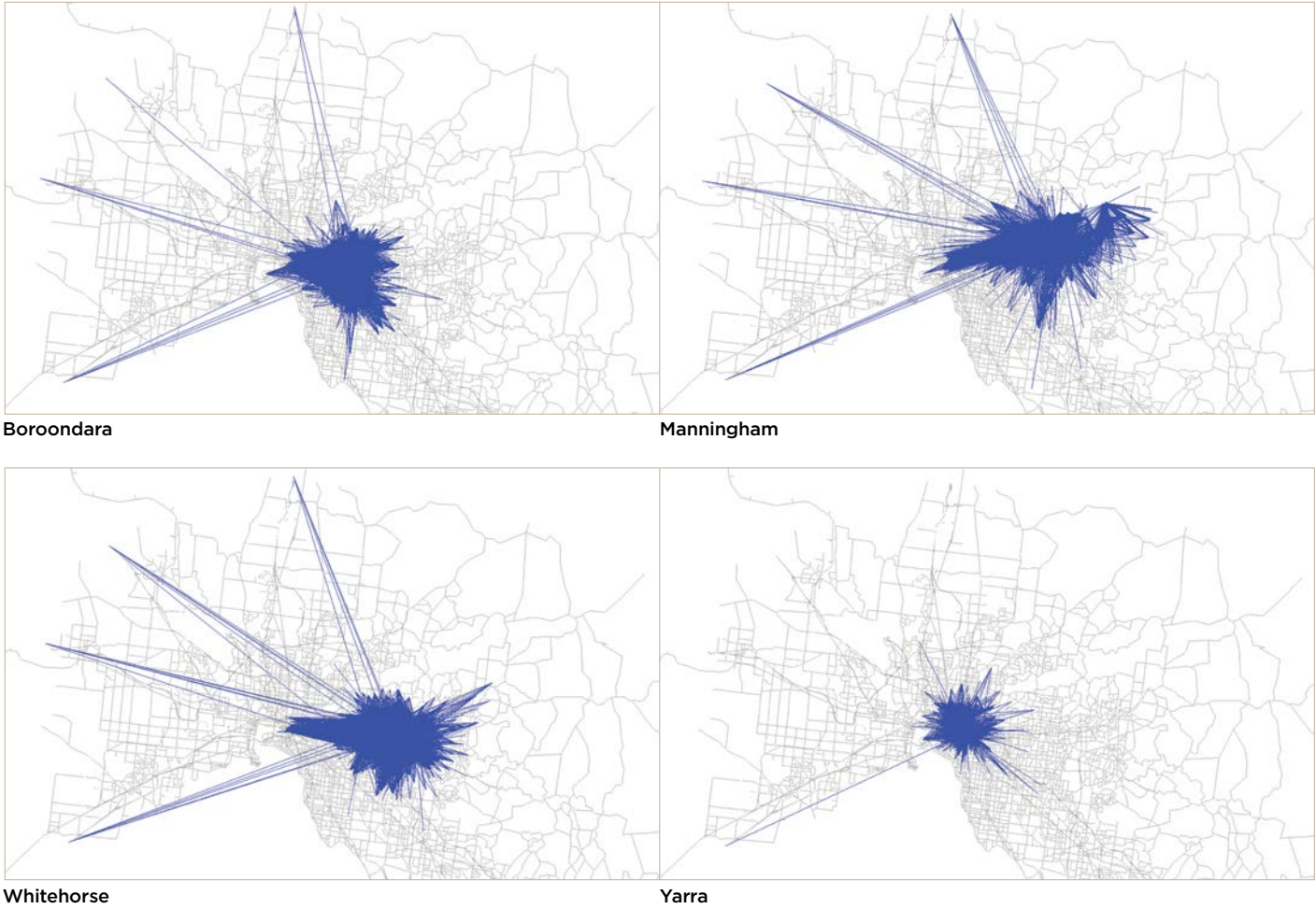
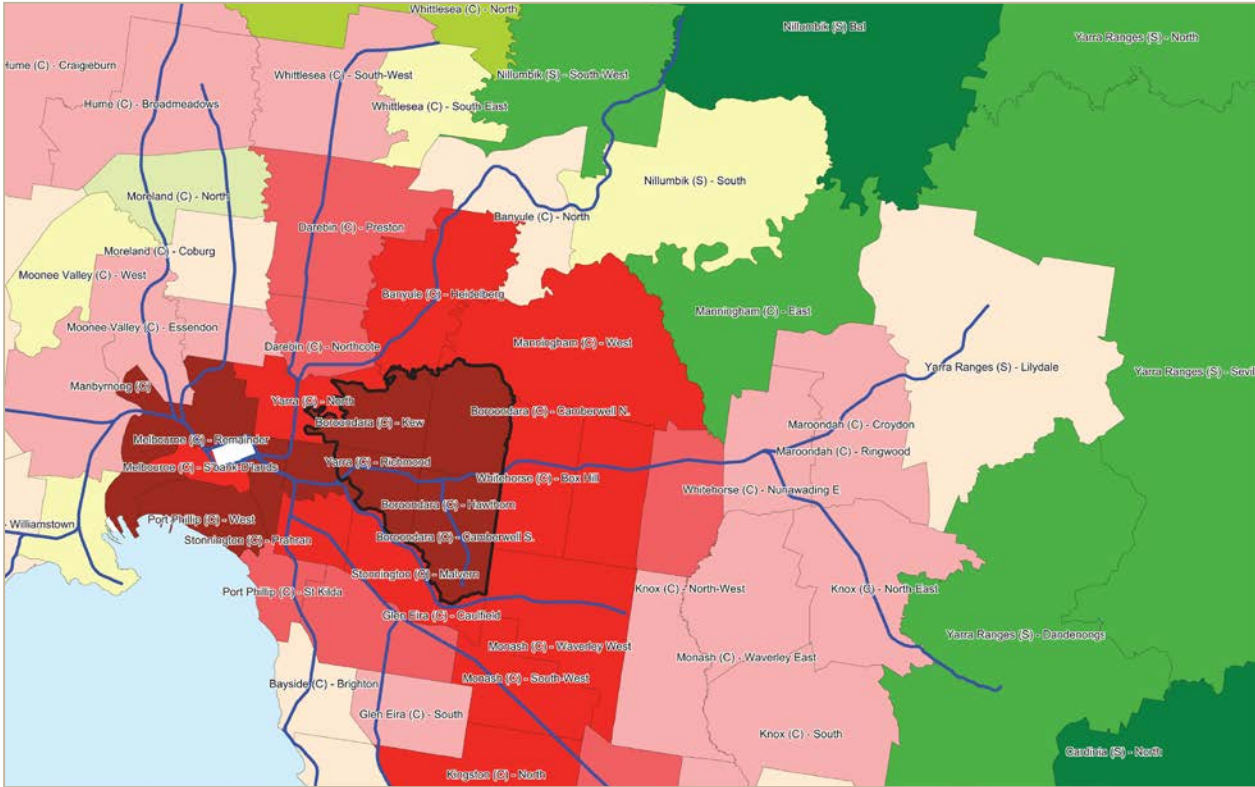


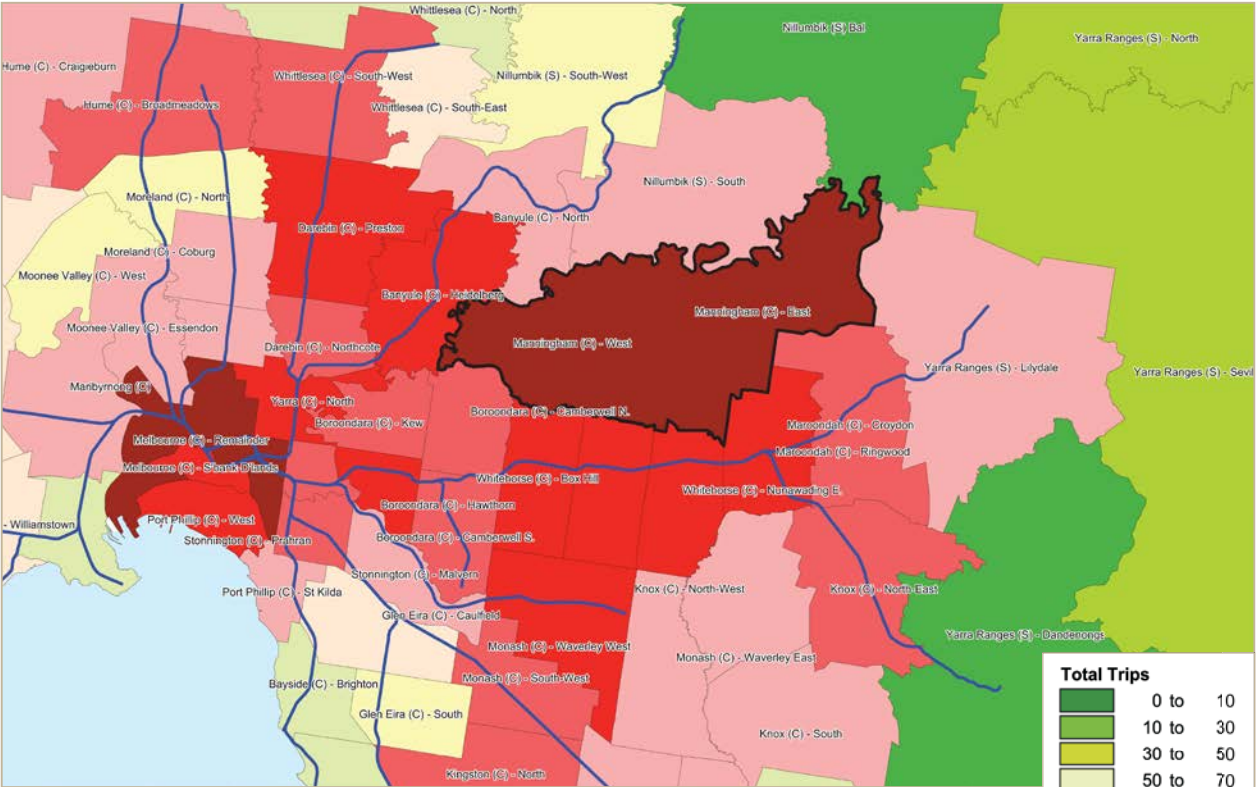
Figure 3-13: VITM modelled output showing individual ‘journey to work’ trips made from within the LGAs in the study area during a weekday morning peak period (7.00 am to 9.00 am)

SOURCE	TRAVEL FROM BOROONDARA LGA TO MELBOURNE LGA	TRAVEL FROM MANNINGHAM LGA TO MELBOURNE LGA	TRAVEL FROM WHITEHORSE LGA TO MELBOURNE LGA	TRAVEL FROM YARRA LGA TO MELBOURNE LGA
ABS Census Journey to Work Data—2006	17,179	7,725	10,232	12,764
VISTA 09 Journey to Work Data—2009/2010	18,300	7,300	13,800	18,800

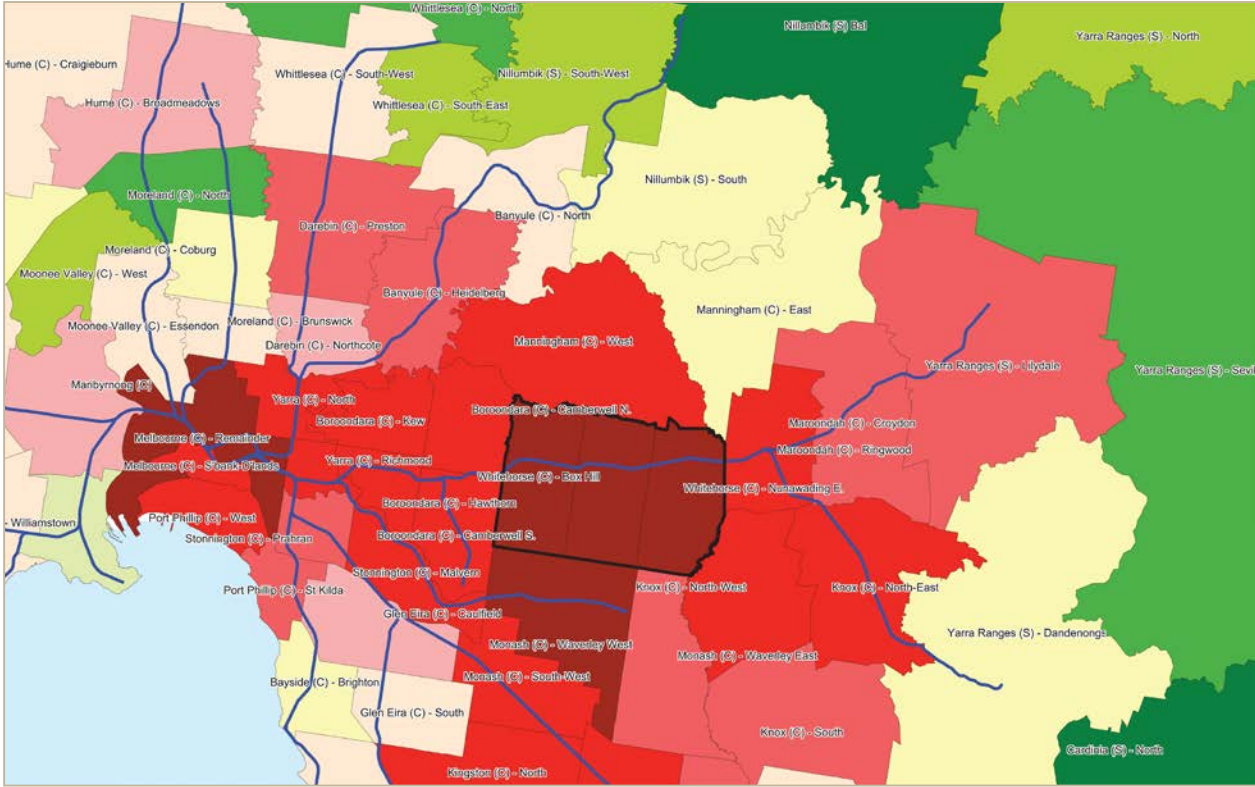
Table 3-1: Journey to work statistics throughout the study area



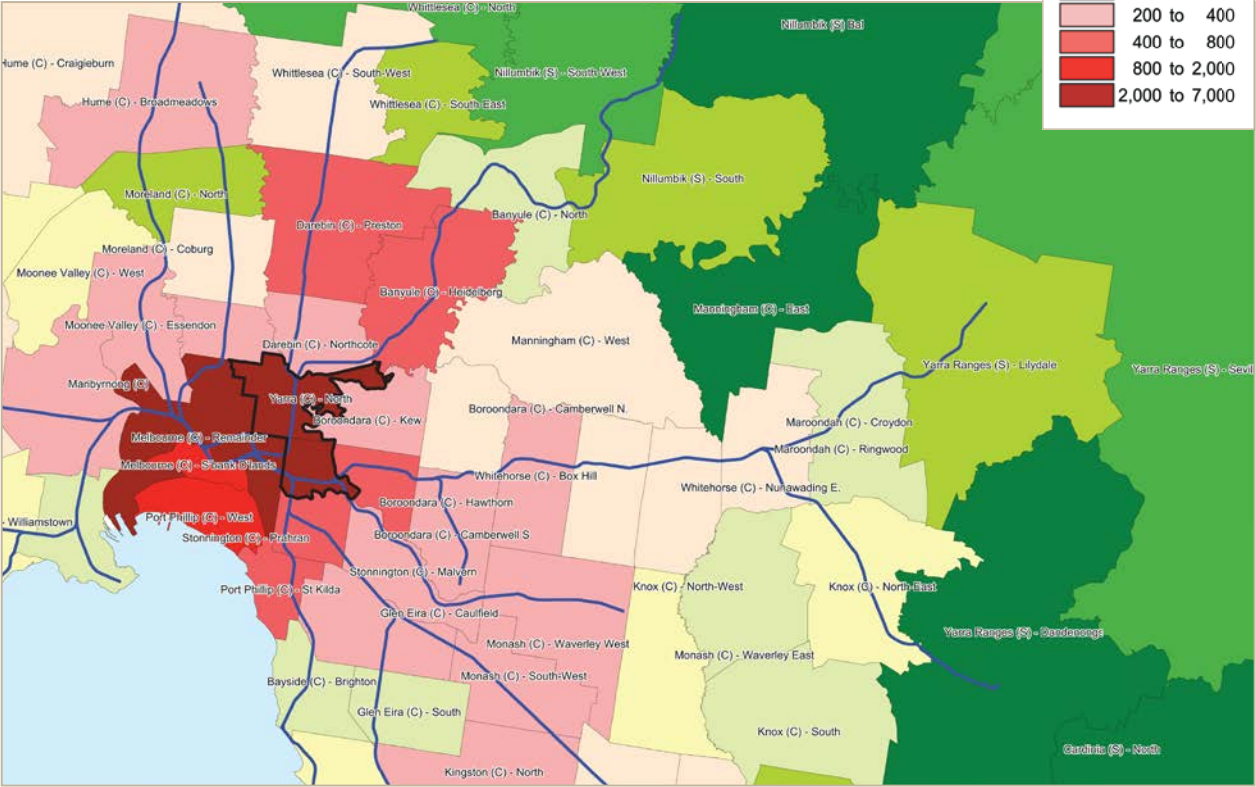
Journey to Work Destinations from Boroondara LGA



Journey to Work Destinations from Manningham LGA



Journey to Work Destinations from Whitehorse LGA



Journey to Work Destinations from Yarra LGA

Figure 3-14: Travel destinations for 'journey to work' trips made from within the LGAs in the study area during a weekday morning peak period (7.00 am to 9.00 am)

3.5.2 PUBLIC TRANSPORT MODE SHARE

The study area is one of the few suburban areas of Melbourne not directly serviced by heavy rail. Our analysis has shown that the area uses public transport less often than other municipalities (see Figure 3-15 on the following page).

More detail regarding the study area are shown in Table 3-2 (derived from 2006 ABS Census Data).

Generally, low public transport use has the effect of increasing car reliance and consequently, car ownership. This is demonstrated across the study area, with car ownership found to be significantly higher here than in similar areas at the same radial distance from the Melbourne CBD (refer to Figure 3-16 on the following page).

The reasons for high or low levels of car ownership are a complex mix of demographic, socio-economic and geographical factors, however it is highly likely that a real or perceived lack of public transport options for residents across the study area has a significant role to play in the high car ownership levels observed here. This difference can be seen if a comparison is made between the car ownership levels of the Manningham West–Doncaster Statistical Local Area (SLA), and that of Whitehorse–Box Hill SLA. Both areas are of a similar distance from the CBD and have a similar socio-economic profile, but Box Hill has a heavy rail connection where Doncaster does not.

This difference in car ownership can be seen in Figure 3-17, with 53 per cent of Box Hill households owning one car or less, compared with only 35 per cent of Doncaster households owning a similar number. Similarly, 20 per cent of Doncaster households own three or more cars, compared with only 11 per cent of Box Hill households.

LOCAL GOVERNMENT AREA (LGA)	2006 CENSUS STATISTICAL LOCAL AREA (SLA)	NUMBER OF JOURNEY TO WORK TRIPS TO MELBOURNE LGA	PERCENTAGE OF TRIPS USING PUBLIC TRANSPORT
Boroondara	Camberwell North	3,957	44%
	Camberwell South	5,105	53%
	Hawthorn	4,741	56%
	Kew	3,376	41%
	TOTAL	17,179	49%
Manningham*	Manningham East	747	34%
	Manningham West	6,978	39%
	TOTAL	7,725	39%
Whitehorse	Box Hill	3,979	57%
	Nunawading East	2,914	60%
	Nunawading West	3,339	58%
	TOTAL	10,232	58%
Yarra	Yarra North	8,483	43%
	Richmond	4,281	53%
	TOTAL	12,764	46%

Table 3-2: Public transport mode share for journey to work trips in the study area

* It is likely that the significant patronage uplift in bus services since 2006, and the introduction of the DART services will have increased the proportion of Manningham residents using public transport. This is evidenced within the VITM patronage modelling for 2011, which suggests that the public transport mode share may now be closer to 45 per cent.

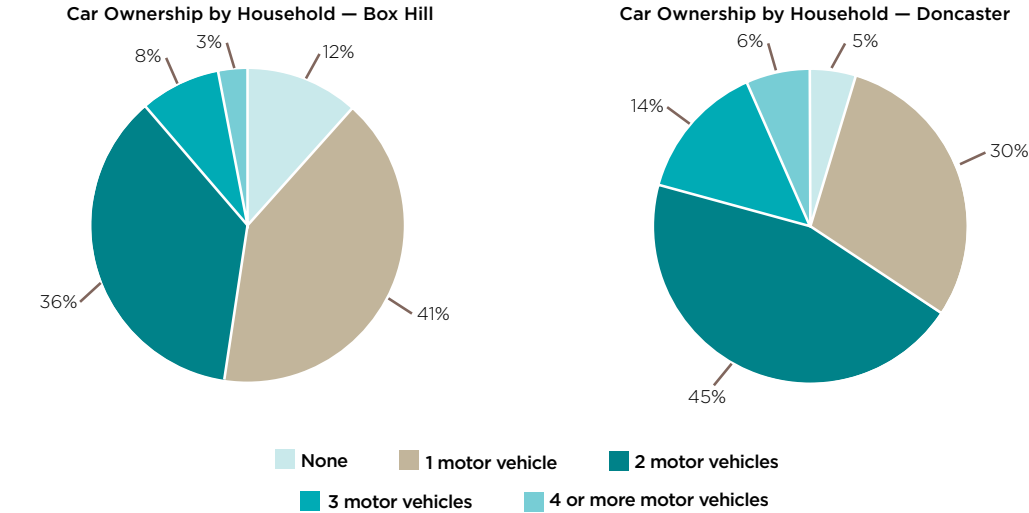


Figure 3-17: The effect of direct access to a heavy rail line could influence levels of car ownership (source: ABS 2006 Census Data)



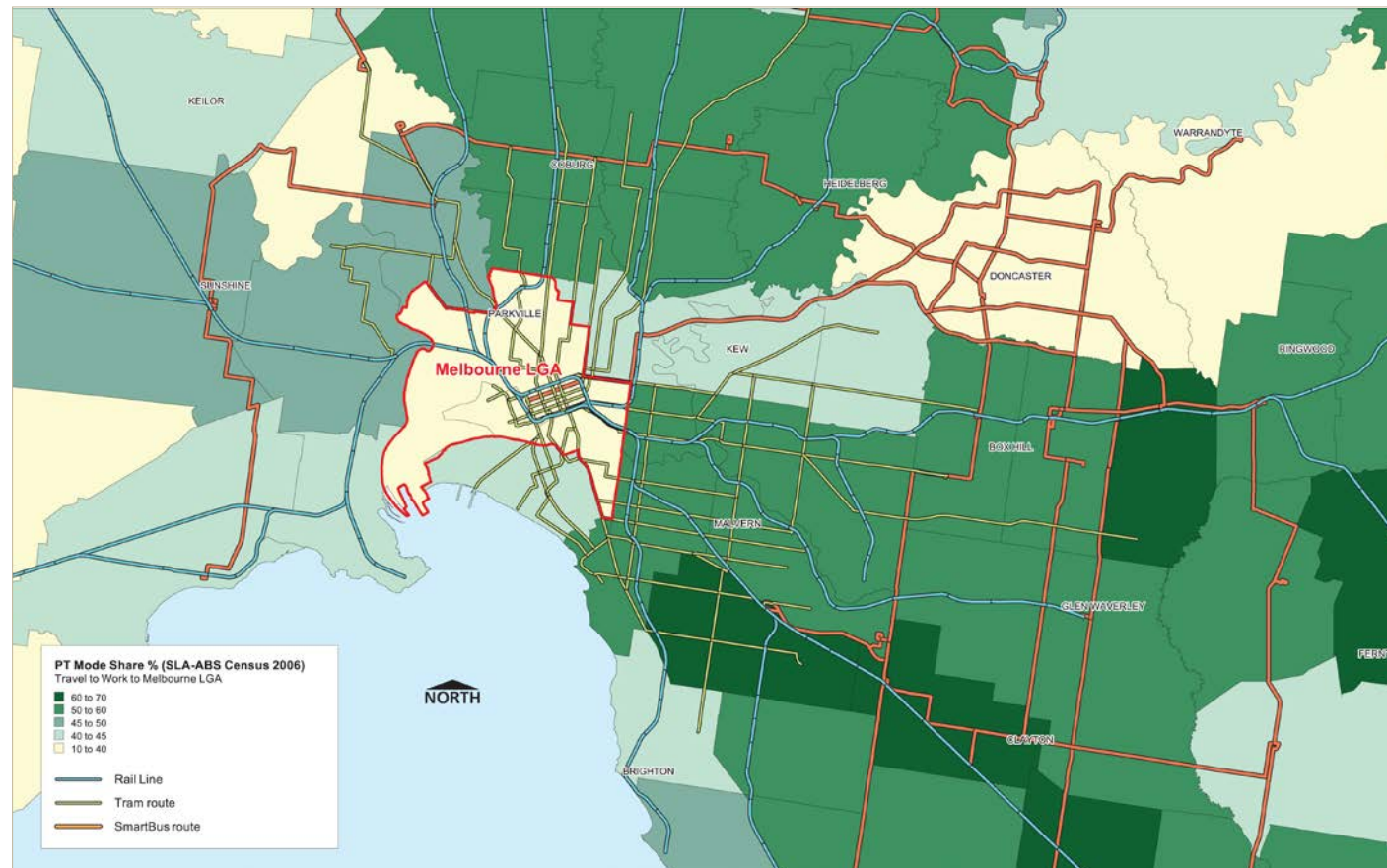


Figure 3-15: Public transport mode share for journey to work trips travelling to the Melbourne LGA

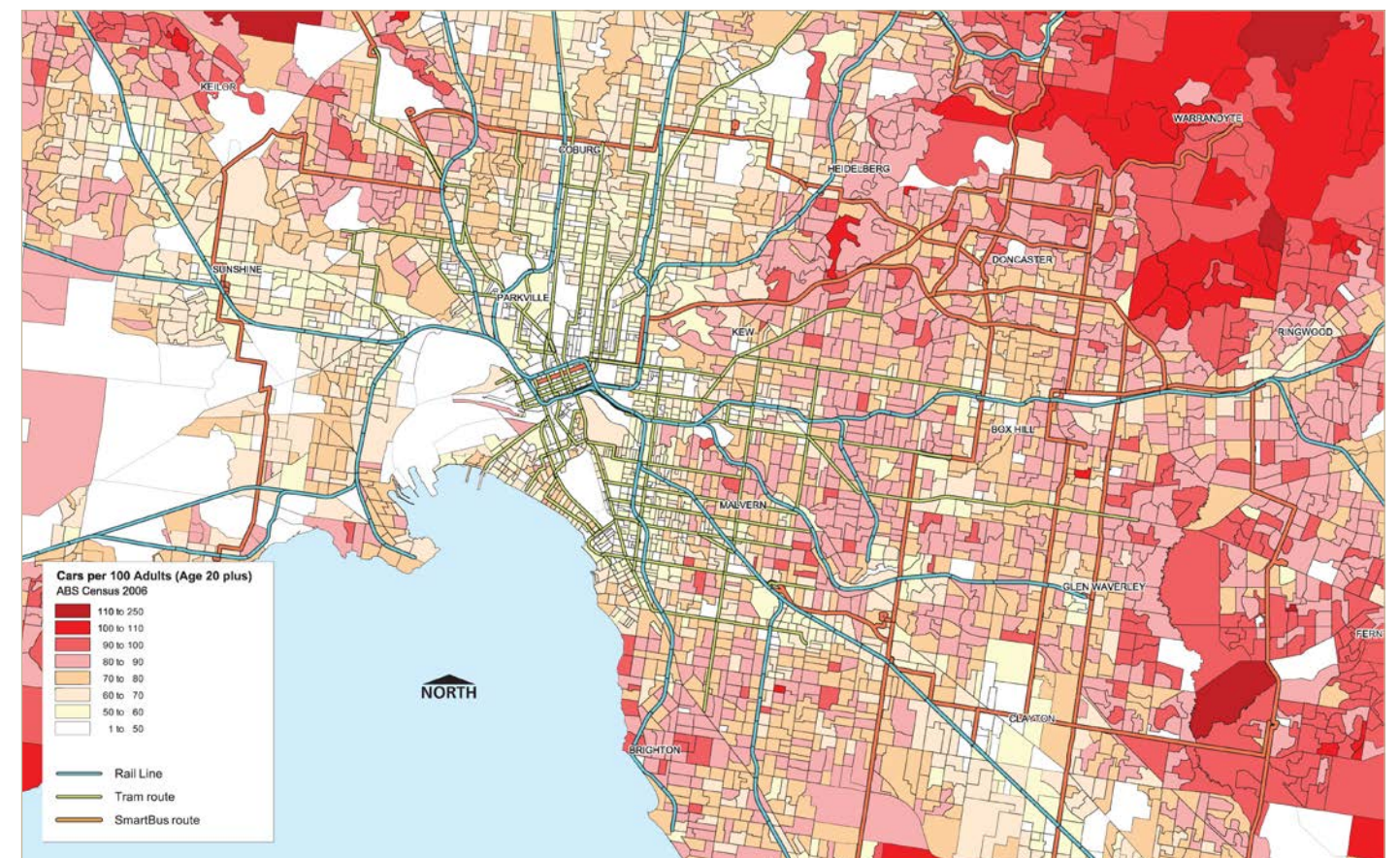


Figure 3-16: Car ownership levels across Melbourne (source: ABS 2006 Census Data)

3.5.3 BUS PROVISION

When considering the types of public transport currently available throughout the study area, it is known that established bus networks generally reflect underlying public transport travel demand and can therefore be used as a strategic guide to the location of key destinations and activity areas.

A map of the bus network in the study area is provided in Figure 3-18, which shows a level of accessibility for the service, based upon a nominal 400 metre (five minute) access distance. The figure demonstrates a high level of accessibility through an extensive bus network, which operates across the study area on a two-tiered hierarchy of service provision.

The trunk network is currently provided by seven SmartBus routes: four operating radially to the CBD and three orbital services. These SmartBus services are supported by an extensive network of other bus services, which operate a mixture of CBD-oriented radial services, principal network links between activity centres, local routes that provide coverage across the suburban area and night-time services.

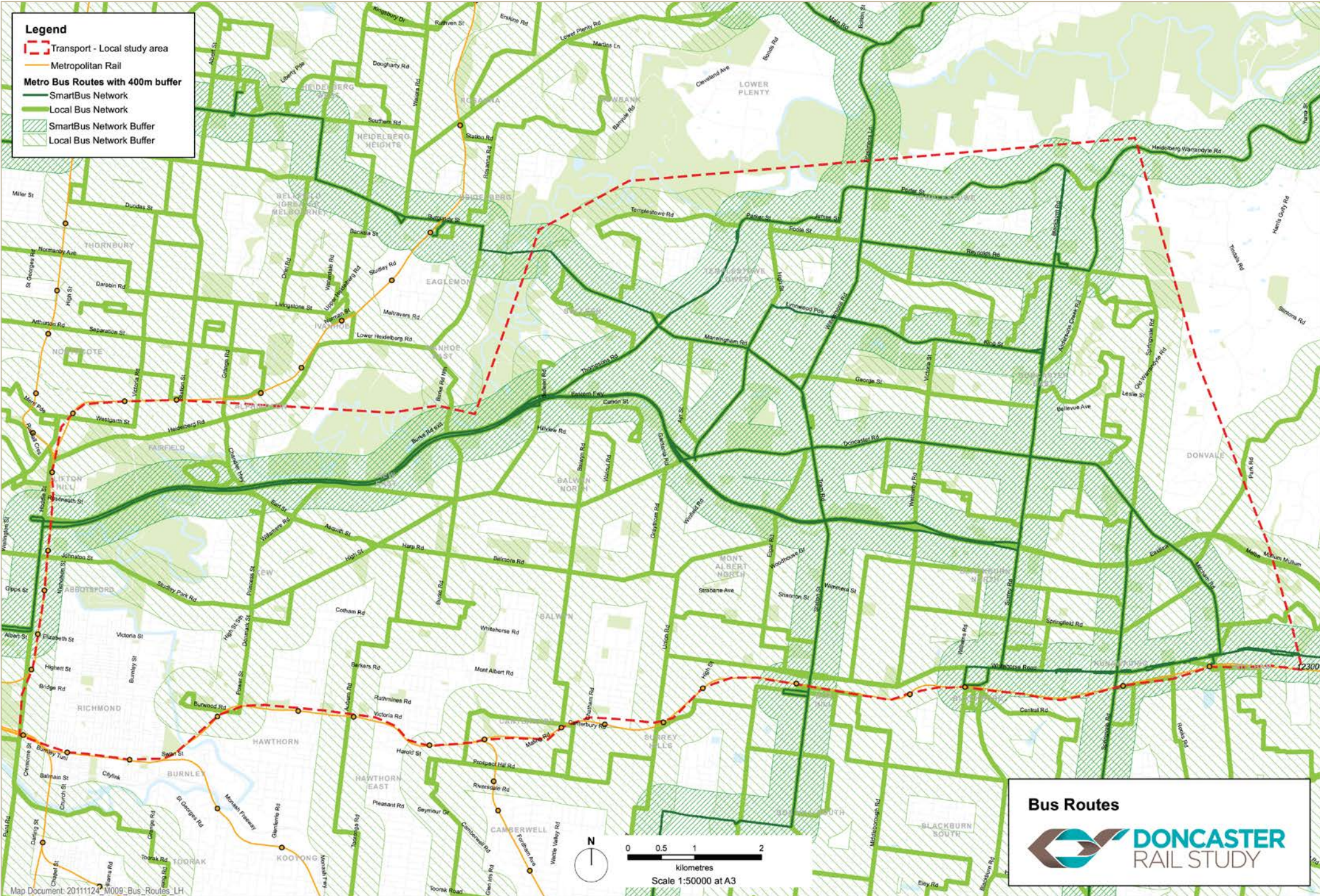


Figure 3-18: Bus accessibility throughout the study area

Level 1, Route Buses

The Level 1 network is provided by seven SmartBus routes, three operating as orbital services moving around Melbourne, as well as four operating radially from within the Manningham LGA to Melbourne's CBD. These services are known as the *Doncaster Area Rapid Transit*. These four routes are considered by many to form the strategic backbone of the public transport network in Manningham.

An overview of DART patronage figures for 2011-2012 across the four existing routes is shown in Table 3-3.

The DART service has experienced significant growth since the introduction of the first service in 2010, with the four routes now carrying well in excess of three million passengers per year: significantly more than the '300 series' buses that it replaced upon introduction.

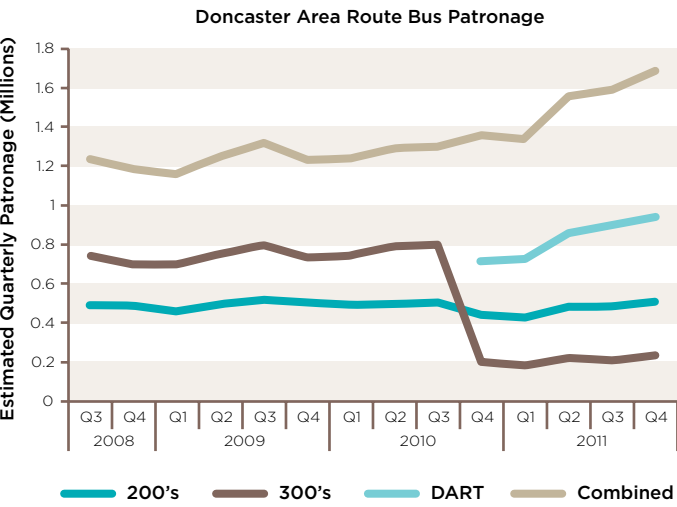


Figure 3-20: Bus patronage across the Doncaster area (source: PTV Market Intelligence Factsheet 17 May 2012)

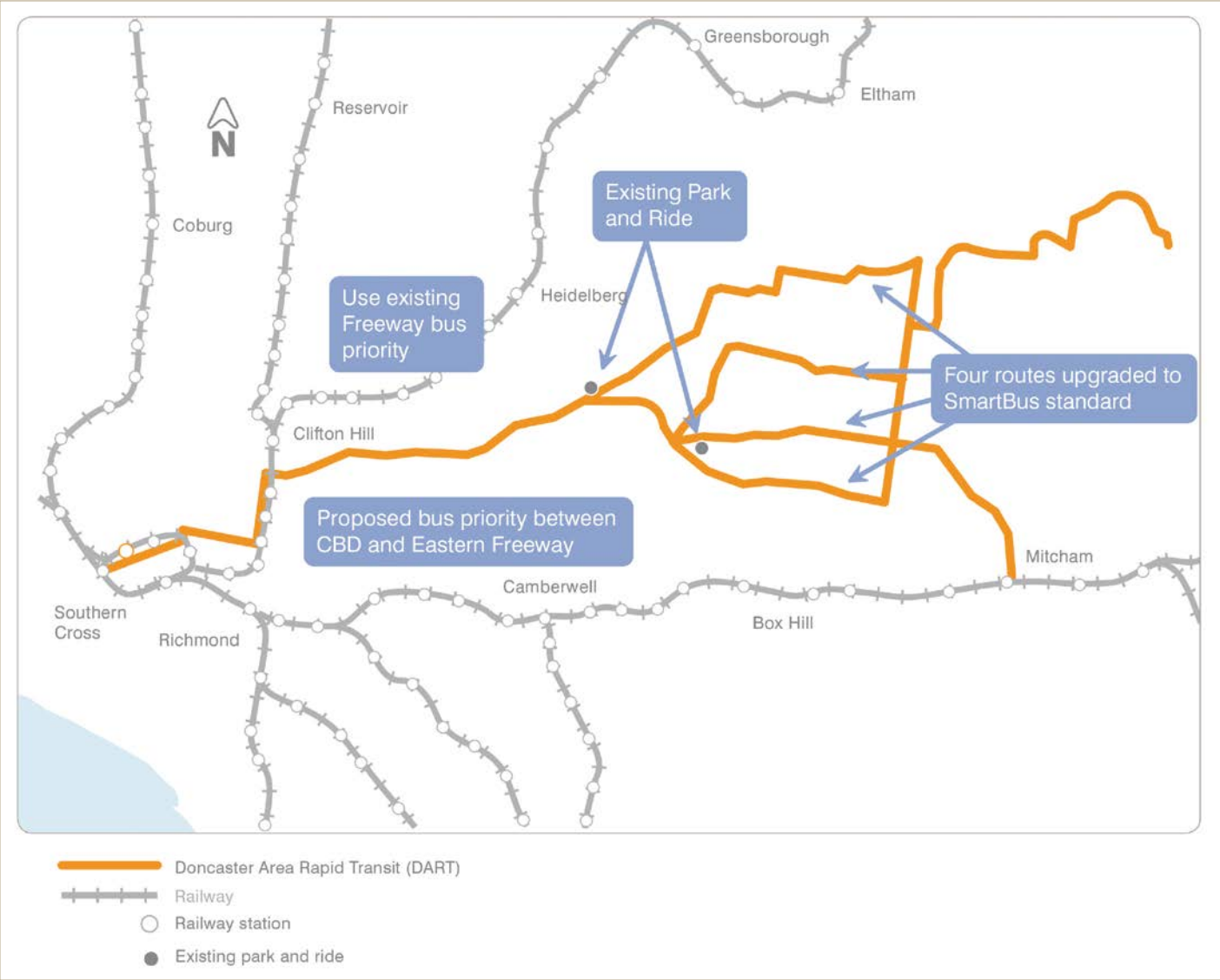


Figure 3-19: The DART SmartBus network

	ESTIMATED AVERAGE WEEKDAY BOARDINGS	ESTIMATED AVERAGE SATURDAY BOARDINGS
905 The Pines—City via Templestowe	2,700	1,100
906 Warrandyte—City via Blackburn Road	3,000	1,300
907 Mitcham—City via Doncaster Road	3,700	1,700
908 The Pines—City via King Street	2,000	1,000
Average daily patronage	11,400	5,100

Table 3-3: DART patronage in 2011/2012



Level 2, Local Buses

The extensive network of local bus services across the study area include operation of a mixture of CBD-oriented radial services, principal network links between activity centres, local routes to provide coverage across the suburban area and night-time services.

These ‘Level 2’ buses generally operate for shorter timespans than the SmartBus services, running on a wide range of timetables that total between two and 18 hours of service per week day. Many buses operate on reduced services over the weekend. The frequency of these services is also substantially less than the SmartBus standard, with highly variable service frequency.

WEEKDAY DAYTIME SERVICE FREQUENCY (APPROXIMATE)	NUMBER OF ROUTES
15 minutes or better	9
16 to 30 minutes	24
31 to 60 minutes	3
Other (limited trips; does not operate during daytime)	9

Table 3-4: Bus Frequency throughout the Study Area

3.5.4 TRAM PROVISION

There are two tram routes running in an east-west alignment through the study area, which could potentially interact with a new Doncaster rail line:

- **Routes 42 and 109**—these trams provide CBD access via Collins Street, also travelling along Cotham and Whitehorse Roads, terminating at Box Hill. Current PTV estimates expect patronage on the 109 to be 15.6 million trips per year.
- **Routes 24 and 48**—these trams provide CBD access via Latrobe and Collins Streets, travelling along High Street and Doncaster Road with a terminus at Balwyn Road. Patronage on the 48 is estimated to be 6.0 million trips per year.

These routes do not currently penetrate far enough into the study area to be in a position to offer a viable alternative for commuter-type travel within the morning peak period. In addition the transit times to the CBD are largely in excess of comparable private vehicle (car) options.



Figure 3-21: Existing tram routes shown with 400 metre walk up catchment ‘buffer’ shown in green

3.6 RAIL NETWORK CAPACITY

Currently, the Melbourne metropolitan rail network is organised into four key groups incorporating 15 separate rail lines, as follows:

- **Burnley group**—Lilydale, Belgrave, Alamein and Glen Waverley
- **Clifton Hill group**—Hurstbridge and South Morang lines
- **Northern group**—Sunbury, Craigieburn and Upfield rail lines
- **Caulfield group**—Cranbourne and Pakenham lines
- **Cross-City group**—Werribee, Williamstown, Frankston and Sandringham lines

Suburban services either run express, limited express or stopping all stations. Additionally, services may run direct to/ from Flinders Street Station, via the Melbourne City Loop to terminate at Flinders Street Station (anti-clockwise), or run direct to Flinders Street Station before running through the City Loop (clockwise). Country services generally run a limited express service through suburban areas to terminate at Southern Cross Station. Under current operating conditions, suburban rail groups and country services use the same infrastructure, introducing operational constraints.

The study team undertook an analysis of the existing rail operations and infrastructure to consider the potential to connect a future Doncaster rail line into either the Clifton Hill group or the Burnley group. For this analysis, the existing (2012) rail network infrastructure was assumed to remain, with certain assumptions made with regard to incremental improvements of the network between now and the year that a Doncaster rail line could open (which was assumed to be no earlier than 2021 for the purposes of this analysis, as described earlier in Section 1.6.1).

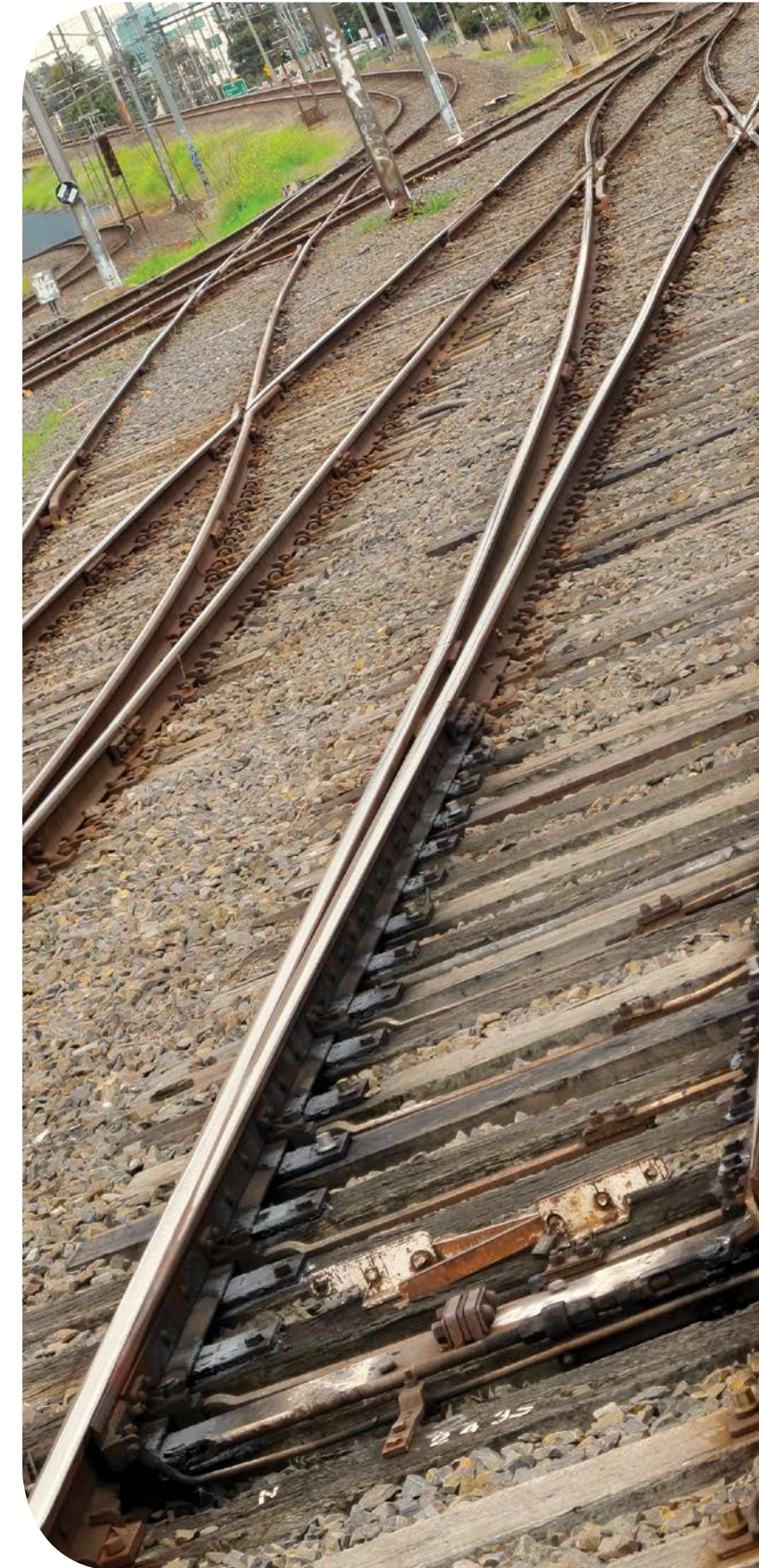
The infrastructure improvement projects assumed have been completed and operational by this date included:

- Regional Rail Link (RRL)
- Sunbury Electrification
- various other signalling improvements and minor upgrading works
- a number of new X'Trapolis trains are expected to have been brought into service on certain lines, with increased average passenger loadings of 900, rather than the current 800 and
- High Capacity Signalling (HCS) will have been introduced onto the Clifton Hill group.

The impact of the proposed Melbourne Metro Project was also considered and further analysis of the potential impact of this project is included below.



Figure 3-22: Current metropolitan rail network



3.6.1 CLIFTON HILL GROUP

The existing layout of the Clifton Hill group is shown in Figure 3-23.

Historically, the Clifton Hill group has been mooted as the most appropriate connection point for any new Doncaster rail line and since the publication of the 1969 Melbourne Transport Plan (discussed in Section 2.0 of this report), a connection at Victoria Park station has been viewed by many as the optimum alignment for the new railway.

Currently, 17 trains travel between Clifton Hill station and Flinders Street station during the morning peak hour of 7.50 am to 8.50 am. Through the introduction of HCS, some operational changes and the strict management of train dwell times at stations, it is the opinion of the study team that by 2021 the safe operating capacity of this line could be increased to a maximum of 26 trains per hour.

Patronage levels on both the South Morang and Hurstbridge lines (which make up the Clifton Hill group) are also expected to increase during the 2012 to 2021 period. It is expected that the current timetable will have to be adjusted to provide a five minute service on both of these lines (i.e. 12 trains per hour on each line) in order to meet this increased demand. This is expected to bring the total number of trains passing through Clifton Hill station to 24 trains per hour in 2021, a level of service that would then be comparable with the Piccadilly Line on the London Underground.

South Morang is in the LGA of Whittlesea, a major growth suburb for Melbourne with a population in 2011 of 163,500. This is expected to grow by around 3.6 per cent each year to a forecast 287,600 by 2031, making this area more than twice the predicted size of Manningham at the same time. For this reason it is likely that the current configuration of the Clifton Hill group will form a constraint upon future patronage growth on the South Morang line. It is the view of the study team that in order to remove this constraint, these lines will need to be separated at some point in the future, giving the South Morang line its own, dedicated route into the CBD. It is recommended that further work be undertaken as part of Phase Two of the study to ascertain the optimum form and timing of this required separation, or ‘de-coupling’.

If a Doncaster rail line were to be included into this group without significant infrastructure changes, the safe operational capacity of this line would dictate a peak frequency from Doncaster of no more than two trains per hour. This is considered by the study team to fall far below the minimum required frequency for the new infrastructure to operate effectively and provide a realistic travel choice for the community.

The implementation of the Melbourne Metro project is not expected to have a significant impact upon the operational characteristics of the Clifton Hill group.



Figure 3-23: Current Clifton Hill group

	CURRENT CAPACITY (2012)	CURRENT SERVICE LEVEL (2012)	PREDICTED FUTURE CAPACITY (2021)	PREDICTED SERVICE LEVEL (2021)	CAPACITY FOR ADDITIONAL SERVICES (2021)
Number of trains per hour in peak hour	22	17	26	24	2

Table 3-5: Available train paths along the Clifton Hill group

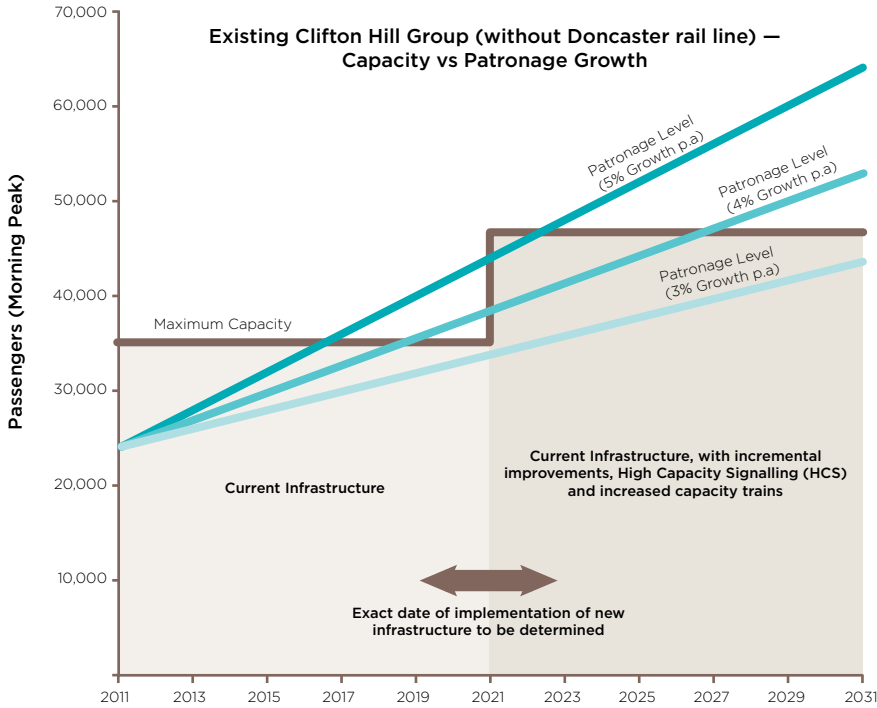


Figure 3-24: Capacity on the Clifton Hill group compared with expected patronage levels



3.6.2 BURNLEY GROUP

The existing layout of the Burnley group is shown in Figure 3-25.

Burnley group services operate both direct to/from Flinders Street Station and anti-clockwise through the City Loop. Similar to the Clifton Hill group, a mixture of express and stopping all stations services currently use the line, which can introduce operational constraints. The Burnley group currently operates on a three-track system between Burnley and Box Hill stations. As the services utilise both the City Loop and direct routes into Flinders Street Station, the capacity on this group is significantly greater than that of the Clifton Hill group (which must run via the City Loop to enter or exit the city).

It can be seen in Table 3-6 that the Burnley group of lines has significant scope for the growth of services, including a Doncaster rail line.

The potential impact of the Melbourne Metro Project will be more significant on the Burnley group than the Clifton Hill group, as the current operational plan for Melbourne Metro trains would see the existing Sydenham/Sunbury lines connected, via a new tunnel, to the Pakenham/Cranbourne lines. It is expected that the new tunnel would segregate these lines from the existing network between the northern end of the new tunnel in the vicinity of South Kensington to South Yarra.

The introduction of these additional train paths along the new tunnel will free up capacity for services between South Yarra station and Flinders Street Station. The study team understands that these train paths will likely be required to cater for a redistribution of existing services from the Caulfield group, freight and country trains, so will not be available for use by services originating from Doncaster.

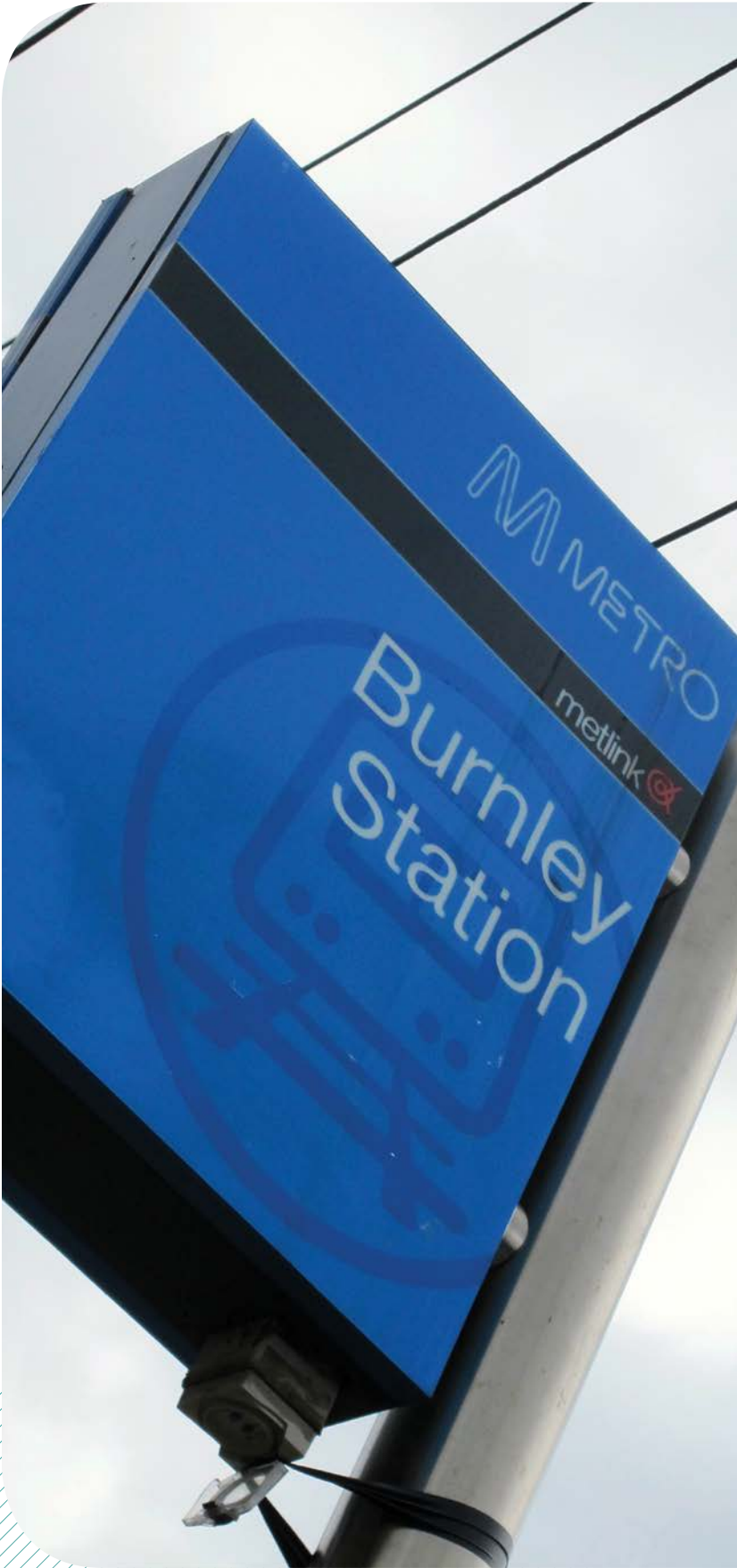


Figure 3-25: Current Burnley group

	CURRENT CAPACITY (2012)	CURRENT SERVICE LEVEL (2012)	PREDICTED FUTURE CAPACITY* (2021)	PREDICTED SERVICE LEVEL (2021)	CAPACITY FOR ADDITIONAL SERVICES (2021)
Number of trains per hour in peak hour	40	31	50	32	18

Table 3-6: Available train paths along the Burnley group

* It is assumed in this analysis that HCS would have been installed on the Burnley group prior to the introduction of any new Doncaster rail services



3.7 EXISTING ENVIRONMENTAL CONDITIONS

3.7.1 ENVIRONMENTAL ISSUES

The study team undertook an environmental assessment across a range of environmental categories throughout the study area, including: air quality and noise impacts, hydrology and groundwater impacts, flora and fauna impacts, Aboriginal cultural heritage and historical heritage impacts. The methodology for the assessment generally involved a consideration of both construction and operational impacts of various route alignments, with consideration given to the most likely forms of construction at various locations. The assessment methodology then sought to address the relative impacts that could be expected at grade or at depth, with respect to surface construction methods and the 'cut-and-cover' or 'bored tunnel' approaches to tunnelling.

Desktop studies were carried out throughout the study area, reviewing existing records, reports and aerial imagery. Industry databases were reviewed for evidence of flora and fauna and historical heritage. These investigations included both state-wide and locally based information sources.



3.7.2 HISTORICAL HERITAGE

The study team undertook a heritage assessment desktop study, which involved a review of heritage values throughout the study area. This assessment included a review of identified heritage sites recorded on heritage overlays for respective local planning schemes, with some of the sites also recorded on the Victorian Heritage Register in accordance the *Heritage Act 1995*.

As with the environmental assessment, a general assessment was undertaken across the study area, with consideration given to the most likely forms of construction at various locations. This assessment focussed largely upon the likely tunnel construction methods, with cut-and-cover tunnelling expected to have a greater impact on the ground surface and heritage values than bored tunnel construction. In addition, a preliminary review of potential station locations was undertaken, alongside a review of potential sites that could be used for works areas.

3.7.3 ABORIGINAL CULTURAL HERITAGE

The Aboriginal Cultural Heritage assessment considered areas across the study area that may be defined as areas of cultural heritage sensitivity. This included registered cultural heritage places and land within 50 metres of these places, unless the land had already been subject to significant ground disturbance.

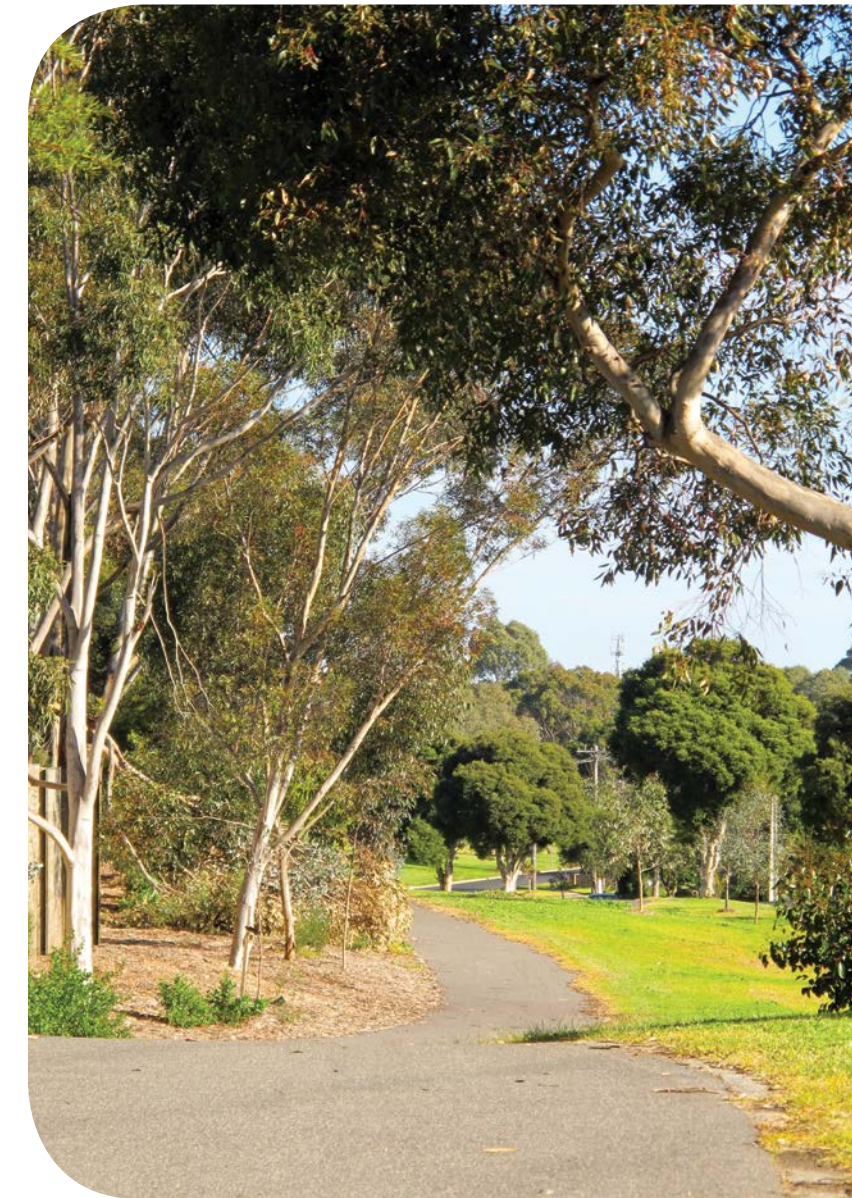
A review of previous investigations of Aboriginal cultural heritage within the vicinity of waterways associated with the study area, including the Yarra River and Merri Creek, was also undertaken to identify previously recorded Aboriginal cultural heritage sites.

The main areas of cultural heritage sensitivity that the study team expect to be encountered through the study area will be associated with waterways. The assessment therefore considered the proximity of proposed rail works to waterways, assuming that land within 200 metres of waterways will contain areas of cultural heritage sensitivity unless that land has previously been subject to significant ground disturbance. These locations have been identified by the study team as requiring further investigations.

3.7.4 SUMMARY

More details on the outcome of these environmental assessments can be viewed later in this report, where the environmental effects of individual route alignments are discussed in more detail. Some general conclusions from the analysis are listed below.

- For **air quality**, no additional adverse impacts are considered likely as a result of the Doncaster rail line. The study team would in fact expect air quality benefits to accrue from the reduction in the rate of growth of motor vehicle traffic that is generally associated with improved rail transport opportunities.
- No significant **flora and fauna impacts** are expected, with the key areas of sensitivity being in the vicinity of existing watercourses.
- Along the Eastern Freeway corridor, there are no expected increases to **noise impacts** beyond those currently generated from freeway traffic. Elsewhere in the study area, the rail line is expected to be largely located inside tunnels, and so no increases in noise impacts are expected.
- No particular **hydrological impacts** have been identified. All tunnel options would likely involve tunnelling below groundwater levels and so no adverse impacts are expected.
- There are some potential impacts on **Aboriginal cultural heritage**, associated with any parts of the proposed alignments and/or construction sites being in proximity to Merri Creek and the Yarra River. Both of these areas are of Aboriginal cultural heritage significance and will require further investigation.
- The main potential impact identified for sites of **historical heritage** is associated with any options that pass under the Carlton Gardens/Exhibition Buildings precinct. Care would also be required to be taken in this vicinity to ensure that any tunnel shafts or station structures do not impact views to the Exhibition Buildings Dome.



The study team undertook an environmental assessment across a range of environmental categories throughout the study area, including: air quality and noise impacts; hydrology and groundwater impacts; flora and fauna impacts; Aboriginal cultural heritage; and historical heritage impacts.



4:PE:5

METRO

Next Train	Destination	Time to Depart
10:02	10:02	10:02
10:02	10:02	10:02

2:34:48

2