Rowville

RAIL STUDY

STAGE 1 FEASIBILITY REPORT
FINAL DECEMBER 2012
DISCLAIMER
This report presents the results of an independent study and does not necessarily reflect the views of the Minister for Public Transport or Public Transport Victoria.

FINAL REPORT
This is the Final Report of Stage 1 of the Rowville Rail Study. It replaces the Draft Stage 1 Report that was released publicly on 9 March 2012, and includes changes in the light of submissions and comments received.
Foreword

Stage 1 of the Rowville Rail Study is now complete and has involved community and stakeholder involvement and initial studies into rail operations, design, patronage, environmental and social appraisal.

The Draft Stage 1 Report, released in March 2012, was widely read and reported on. We received many comments and a total of 247 submissions from individuals and stakeholders; most were strongly supportive although some questioned the details.

Much of the content of this Final Stage 1 Report is unchanged from the draft, however we have included more detailed commentary on the improvements that would be needed to the Dandenong line and into the city before Rowville train services could operate effectively. We have also made reference to the submissions received on the Draft Report and we have refined our recommendations for the next steps.

We believe that the Rowville rail line is worth pursuing further and we encourage the Government to maintain its commitment to doing so.

Our sincere thanks again to the study team, Public Transport Victoria, all the stakeholders and the community for their valuable contributions to the work.

William McDougall
Study Leader, Sinclair Knight Merz
Executive summary

Introduction

This report summarises Stage 1 of the Rowville Rail Study, which has investigated the feasibility of a suburban rail line from Huntingdale to Rowville.

History

The Rowville rail line was first proposed in 1969. Some planning was done in the early 1970s but a route was not protected. It was reconsidered as part of the Scoresby Transport Corridor EES in 1998, but was not part of the recommended package of work at the time. Knox City Council commissioned a prefeasibility study in 2004 which indicated that a single track, mostly elevated line could be built from Huntingdale to Rowville for $480 million (2004 prices, including train fleet).

Existing and future conditions

Melbourne’s rail services have seen substantial increases in patronage in recent years; more and more people are choosing to use public transport for commuting and other journey types.

Current services have struggled to keep up with demand and a number of improvement projects have been committed to or planned. Regional Rail Link and the the Melbourne Metro Rail Tunnel will provide capacity increases on rail in the west and inner Melbourne, and will increase inner city capacity to enable more trains to serve the eastern suburbs. This could include trains to Rowville, if a line was built.

The catchment area for the Rowville rail line has developed substantially in the last 40 years. The surrounding suburbs have grown or matured and the employment and education precinct around Monash University’s Clayton campus is the focus for substantial future growth, with continued growth elsewhere such as in Stud Park in Rowville.

Travel in the Rowville rail line area is primarily by car. Public transport use has increased with improved bus services, and cycling’s has increased too. However travel demands will continue to be mainly satisfied by car use with its attendant congestion, emissions, energy and safety issues.

Community and stakeholder input

The community and stakeholders have had significant input to the study so far. We held workshops and drop-in sessions and attracted online activity through our website (www.rowvillerailstudy.com.au), and social networks. Key stakeholder bodies have attended technical meetings and presentations.
The community is generally in favour of a rail line (many saying that it should proceed as quickly as possible), although some raised concerns about negative effects (e.g. noise, vibration and perceived social problems associated with railway stations and facilities). Others were keen to preserve road access and capacity along the route, as well as green areas and vegetation.

Many alternatives have been suggested to improve public transport in the area, such as bus rapid transit or light rail in the Wellington Road corridor, or different rail links such as to the Glen Waverley line. Extensions of the Rowville rail line concept further east, north (to the Belgrave line) or south (to Dandenong) have also been raised, as has the need to improve public transport to other centres.

Monash University has been a vocal supporter of the rail line. Knox City Council has provided strong supporting comments, and commissioned a separate study to quantify the wider economic benefits the rail line could bring. Monash City Council has been supportive whilst also expressing concern about some negative impacts, such as where the rail line might be on an elevated structure.

Submissions on the draft report
On 9 March 2012, the Draft Stage 1 Report was released for public comment. This final version of the report incorporates changes resulting from public and stakeholder feedback on that draft.

In total, 247 submissions were received in response to the Draft Stage 1 Report, and comments and queries were also made via social networks and the study web site. Several large, detailed submissions were received from individuals and stakeholders, mostly supportive of the concept but questioning the details, in particular whether Rowville train services would trigger the need for other rail improvements (e.g. Dandenong line and the Melbourne Metro Rail Tunnel). Full details are given in the Report on Public Submissions on the Draft Stage 1 Report.

A Rowville rail line concept

Rail operations
We examined different rail operating concepts and consider that the best solution is to provide frequent services between Rowville and the city. This would only be possible if the Dandenong line is upgraded between Huntingdale and Caulfield and more rail capacity is provided in central Melbourne (through implementing the Melbourne Metro Rail Tunnel).

Physical details
Our concept for the Rowville rail line follows the central median of North Road and Wellington Road from Huntingdale to Stud Road, then turns north to terminate at Stud Park. A shorter option was also investigated which terminates at the corner of Wellington Road and Stud Road (further work would be required to establish which option is best). Four new stations would be provided at Monash University, Mulgrave, Waverley Park and Rowville.
The design avoids any new level crossings and preserves the existing road environment without significant traffic impact. The route would be below ground from Huntingdale to Monash University, then it would be on a viaduct over Blackburn and Springvale Roads, returning to road level across the Monash Freeway. It would go into a tunnel again past Waverley Park, and onto an elevated structure across the Dandenong Creek and EastLink. East of there, it would again go below ground, turning north beneath Stud Road to a station in Stud Park. Optionally the rail line could stay at the surface and finish at the Stud Park/Wellington Road intersection instead. The preliminary alignment we have developed will need further refinement in future stages of developing the Rowville rail line.

Ecologically sustainable development and climate change adaptation principles could be embedded in the design from the outset, to safeguard the future of the line and to reduce its environmental footprint.

**Constructability**

Building the Rowville rail line would be complex in a live traffic environment; it would probably take around four years to build. It may be possible to stage the construction to provide train services to Monash University or possibly Mulgrave whilst the rest of the line is completed, but this would need more detailed planning. Construction impacts would need careful management; nearby residents, business and other facilities will be very sensitive to noise and vibration from construction activities.

Timing of construction would need to be coordinated with other projects, especially upgrading the Dandenong line and building the Melbourne Metro Rail Tunnel.

**Travel demand effects**

Our demand forecasting, using VITM (the Department of Transport’s *Victorian Integrated Transport Model*) suggests that the four stations on the Rowville rail line could attract about 68,000 users on a typical weekday in 2046, with about 16,000 of these in the morning peak (7-9am).

Monash University station would be the busiest on the line, followed by Rowville, Mulgrave and Waverley Park, whilst Huntingdale station would attract more users plus a lot of people transferring between trains.

City-bound Rowville trains arriving at Huntingdale station in the two-hour morning peak in 2046 would carry a total of about 6,000 passengers (with a train every ten minutes, that means an average of 500 per train, so they would effectively be standing room only). Similar loads are forecast in the opposite direction, because of the strong attraction of Monash University’s Clayton campus to students and staff in the inner suburbs.

Overall, VITM predicts that most of the 68,000 daily users of the Rowville rail line would be public transport users diverting from other services (particularly the bus services that the Rowville rail line would replace along Wellington Road, but also from Clayton, Springvale, Glen Waverley and Ferntree Gully stations). The Rowville rail line does not produce
noticeable traffic reductions on roads in the area, although VITM may underestimate the mode shift from car, because of arguably conservative assumptions about future changes (such as petrol prices).

**Project impacts**

The positive effects of the Rowville rail line include potential economic, social and operational benefits, together with wider economic effects and strong community and stakeholder support. However the full benefits depend critically on other projects (Dandenong line upgrade and the Melbourne Metro Rail Tunnel) proceeding beforehand. We have not undertaken a benefit-cost analysis at this stage, primarily because the concept design needs refinement before capital costs can be reliably estimated.

Negative effects include added noise, vibration and visual impact, especially where the rail line is above ground. The rail line would also be disruptive to build in the busy environment of Wellington Road. It would be important to mitigate these effects through sensitive design and construction.

**Findings**

We summarise the findings of Stage 1 of the study as follows:

- community support for a rail line is strong, as is support for continued improvements to other public transport;
- key stakeholders are supportive and are also concerned about local impacts;
- running Rowville-City trains requires improvements to the Dandenong line and through central Melbourne;
- building the rail line would be a complex project due to the surrounding urban environment;
- a key benefit would be to improve access to Monash University Clayton campus and the surrounding employment precinct; and
- the Rowville rail line could increase land values and pressure for development.

The State Government’s new metropolitan planning strategy (currently being prepared) might identify different long term development objectives for the area in the wider context of Melbourne’s future urban form.

The Rowville rail line is dependent on capacity improvements on the Dandenong line and into the city, which are more than a decade away. Therefore interim actions are needed to continue the progress already made in improving public transport in the area whilst the rail improvements are planned and implemented.

**Recommended actions**

Our recommendations for the next steps are as follows:

1) A range of measures should be developed to continue improving public transport in the
area in the interim period leading up to completion of the Rowville rail line.

2) The Dandenong rail corridor upgrade and the Melbourne Metro Rail Tunnel, upon which the Rowville rail line depends, should be delivered as early as possible.

3) A preferred Rowville rail line project scope should be confirmed in greater detail (taking the comments and submissions made on the Stage 1 Report into account where appropriate) and measures should be put in place as quickly as possible to protect it, using appropriate planning controls.

4) Should the Government proceed further with the Rowville rail line, the next stage of the work should include the following:
   - Conduct more detailed patronage analysis, taking into account future land use and transport changes in line with emerging Government plans and testing the sensitivity of the forecasts to different future assumptions on travel habits and preferences.
   - Establish the business case for the rail line, including a cost-benefit analysis, in the light of these reviews.
   - Assess the wider economic effects of the project, using the results of the economic study by the City of Knox as a starting point.
1. Introduction

In this first stage of the study we examined the feasibility of a rail line to Rowville. This report summarises our investigations and recommends the next steps.

Sinclair Knight Merz (SKM), supported by Mott McDonald, Hassell and Phoenix Facilitation, were appointed by the Department of Transport (now Public Transport Victoria) in June 2011 to undertake Stage 1 of the Rowville Rail Study. The study process (Figure 1) has involved:

- Initial community and stakeholder consultation and research into issues, options and desired outcomes for a Rowville rail line (Phases I and II);
- Analysis of engineering, operations and patronage implications and environmental and social effects (Phase III); and
- Releasing a first draft of this report and supporting documents for consultation and public comment, and finalising the report based on comments received (Phase IV).

Figure 1 – Study process

The rest of this report is structured as follows:

- Chapter 2 gives a brief history of the Rowville rail line since the late 1960s;
- Chapter 3 describes existing and future land use and transport conditions in the Rowville rail line area;
- Chapter 4 summarises community and stakeholder feedback we have gathered during the work so far;
- Chapter 5 discusses possible solutions to transport issues in the area;
- Chapter 6 describes how a Rowville rail line might look and operate;
- Chapter 7 gives some initial patronage estimates;
- Chapter 8 discusses the benefits and impacts of the project; and
- Chapter 9 gives our recommendations for the next Stage of the study process.

Appendices give details of stakeholders consulted and supporting reports.
2. History of Rowville rail line

A rail line to Rowville has been talked about for many years.
This Chapter briefly summarises some of the history.

2.1 Melbourne Transport Plan (1969)

As far as we can establish, a rail line to Rowville was first officially proposed in the 1969 Melbourne Transport Plan prepared by the Melbourne Metropolitan Board of Works. It showed a rail line via Rowville and Knox from Huntingdale to Ferntree Gully as well as City-East Doncaster and Frankston-Lyndhurst links and the City Loop (Figure 2).

Figure 2 – Extract from the 1969 Melbourne Transport Plan

Much has changed since 1969, but of the new route initiatives then proposed, only the City Loop (opening in 1988) and the Altona-Westona link (extended to Laverton to form a loop) were built. The Rowville, Dandenong and Lyndhurst-Frankston lines were not built, however other new routes (Cranbourne and South Morang extensions and the Regional Rail Link)
have been added to serve changing needs, and the Melbourne Metro Rail Tunnel (a new rail tunnel beneath the city, linking the western suburbs lines at South Kensington with the Dandenong, Frankston and Sandringham lines at South Yarra) will enable further growth in rail services through central Melbourne as the City Loop reaches capacity.

More detailed drawings were produced of route and station options for rail lines in the Rowville area in the years following the 1969 Plan. An example route diagram, including a line to Ferntree Gully and southwards to Dandenong, is shown in Figure 3. Such a line was never gazetted, although a route along Wellington Road and Stud Road has been shown at various times on local area structure plans.

**Figure 3 – Rowville area rail route diagram from the 1970s**

2.2 Scoresby Transport Corridor (1998)

In 1998 the Scoresby Transport Corridor EES recommended an integrated package of road and public transport initiatives over a broad corridor from Ringwood to Frankston. Public transport initiatives considered during this study included heavy and light rail extensions from Glen Waverley to Rowville and Huntingdale to Rowville. Neither option was adopted in the final recommended package of road and public transport initiatives on the basis that, at the time, they were considered unlikely to be viable due to the low density of development along the alignment for the Glen Waverley to Rowville rail extension and engineering feasibility and

NB Note the lack of development in the area at the time of this map (early 1970s). Land was never reserved for these or other routes.
cost implications for the Huntingdale to Rowville rail extension.

Instead, the recommended package included improved line haul express bus feeder services from Rowville to both Glen Waverley and Huntingdale Stations, with high standards of service frequency, coverage, travel time and reliability.

The Scoresby Transport Corridor proposals were later replaced by what was to become EastLink (a new tollway from Ringwood to Seaford with bypasses of Ringwood and Dandenong). The EastLink project incorporated public transport enhancements by upgrading four railway stations (Dandenong, Heatherdale, Kananook and Noble Park) with improved facilities.

2.3 City of Knox study (2004)

The City of Knox commissioned an independent prefeasibility study in 2004. The study, led by Professors Bill Russell and Peter Newman, considered seven light rail and heavy rail options for Rowville and suggested that a heavy rail line (on the route shown in Figure 4) could be built for around $413 million (plus $66 million for rolling stock), in 2004 prices.

The concept was for a single track line, mostly on a viaduct in the median of Wellington Road and with passing loops at the Monash and Waverley Park station locations, catering for 15-minute peak period service headways. Notably, the study assumed that these services could run (express) between Huntingdale and the CBD without further investment in train operating capacity on the Dandenong line and into central Melbourne, which would not be possible.

Figure 4 – Rowville rail line route from 2004 Prefeasibility Study
2.4 This study

The Baillieu Government commissioned the Rowville Rail Study after winning the 2010 State Election. We believe this is the first time that a State Government has looked seriously at the proposal since it was raised in the 1969 plan, 42 years ago. A consequence of this is that a route has never been gazetted or protected, and extensive development has taken place in the area since the early seventies.

2.5 Policy context

The State Government is developing a new metropolitan planning strategy to address future growth, development patterns and infrastructure needs in Melbourne, including transport.

The Transport Integration Act 2010 (TIA) provides a set of policy objectives for transport and land use, with a strong emphasis on integration, under the following headings:

- Social and economic inclusion
- Economic prosperity
- Environmental sustainability
- Integration of transport and land use
- Efficiency, coordination and reliability
- Safety and health and wellbeing

The intent of the TIA is to ensure that, through a series of objectives and decision-making principles, transport and land use decisions are made in an integrated context to ensure that real progress is made across all six of the above areas.

In the absence of a current metropolitan planning strategy, we have appraised the Rowville rail link against the headings of the TIA in order to understand and, as far as possible, quantify its effects to aid the decision-making process. The results of this appraisal are given in Chapter 8.
3. Existing and future conditions

What issues or problems would the Rowville rail line solve? This Chapter looks at land uses, travel patterns and transport provision now and in the future to illustrate the issues that the rail line could – and should – address.

3.1 Overall context

Melbourne is the nation’s fastest growing capital. Its population is expected to reach five million in less than twenty years. Most of Melbourne’s outward population growth is projected to occur in the north and west of the city, with the west expected to nearly double in population by 2030. Growth in jobs and services is expected to be focused in the CBD and south-east.

Increasing population, traffic congestion, petrol prices and environmental awareness has caused a substantial mode shift towards public transport in recent years. Train patronage has increased by 70% in the last decade and 50% in the last five years alone. This has resulted in rail demand approaching the capacity of the network, particularly through North Melbourne and Richmond stations. Access to the city loop from Richmond is congested with the number of train services serving all lines in the Caulfield and Burnley groups.

Increasing train services will also put increasing pressure on the many level crossings in Melbourne, adding to traffic delays and further compromising safety and reliability.

These issues are spread across the rail network in general but are particularly strong in the Dandenong rail corridor, especially as services have increased to serve the growth areas on the Cranbourne and Pakenham lines. The Dandenong line has only two tracks and ten level crossings between Dandenong and Caulfield stations, and as discussed later in this report, would need substantial improvement before further increases in rail services – including those for a rail line to Rowville – can be implemented.

3.2 Study area

The potential catchment of the Rowville rail line is very broad; people that might use the line could start or end their trips across a wide area. Rather than define a specific study area, we have chosen to keep the definition broad so that all potential effects of the rail line can be covered.

The statistical local areas (SLAs) that could potentially be served by the Rowville rail line are illustrated in Figure 5.
3.3 Land use

Land use in the vicinity of the Rowville rail line is illustrated in Figure 6.
Land uses along the Rowville rail line corridor are mixed:

- At the western (Huntingdale) end is an area of light industrial/commercial premises centred on North Road and including the Oakleigh Barracks (Army Reserve).
- From there to Dandenong Road (Princes Highway) is primarily residential land.
- Between Princes Highway and Springvale Road, Monash University (Clayton campus), CSIRO and the Australian Synchrotron are part of a growing technology precinct (the area was designated as a Specialised Activity Centre in *Melbourne 2030*) on the north side of Wellington Road, with residential development, student accommodation and light industrial/commercial land on the south side. Also in this area is a reserve for the extension of Westall Road from Princes Highway to Monash Freeway.
- From Springvale Road, across Monash Freeway and through to Dandenong Creek, land uses are predominantly residential, although there is a significant business park on the south east corner of Wellington and Springvale Roads, and a large Woolworths
distribution centre just east of Monash Freeway. The residential development is primarily low density, with the notable exception of the Waverley Park redevelopment of medium density houses and townhouses.

- From Dandenong Creek to EastLink, parklands provide a green corridor and flood plain between the developed areas.
- East of EastLink there is commercial development on the north side (with the Kingston Links golf course further north) and a large power terminal station on the south side. Major transmission lines run from there to the north-west (the main transmission line from the Latrobe Valley to central Melbourne).
- A large pub/hotel site, the Stamford, is on the north-west corner of Wellington and Stud Roads. North of this is largely residential development either side of Stud Road, with Stud Park shopping centre further north on the east side of Stud Road.

Residential land uses along the rail corridor would generate rail travel, especially commuting to and from central Melbourne. Much of the residential development is low density, although medium density housing exists at Waverley Park and a few smaller pockets.

Monash University and the surrounding technology-oriented land uses are major potential generators of patronage demand; students in particular would use the train to travel from home and also between campuses, especially Caulfield.

Many of the businesses in the corridor are potential generators of patronage demand from employees, although at present they also provide significant amounts of free, on-site parking.

### 3.4 Demography

Table 1 lists some demographic indicators in the area now and in 2046, according to projections released in 2008 (and used in our patronage forecasting for the Rowville rail line). New projections were released in 2012, and the State Government is preparing a new metropolitan planning strategy which could further influence future growth patterns.

<table>
<thead>
<tr>
<th>SLA (see Figure 5)</th>
<th>Households 2009</th>
<th>Households 2046</th>
<th>Change 2009-2046</th>
<th>Population 2009</th>
<th>Population 2046</th>
<th>Change 2009-2046</th>
<th>Employment 2009</th>
<th>Employment 2046</th>
<th>Change 2009-2046</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casey - Hallam</td>
<td>17,500</td>
<td>19,100</td>
<td>1,600</td>
<td>53,400</td>
<td>53,100</td>
<td>-300</td>
<td>15,900</td>
<td>19,900</td>
<td>4,000</td>
</tr>
<tr>
<td>Knox - North East</td>
<td>25,900</td>
<td>32,500</td>
<td>6,600</td>
<td>65,900</td>
<td>76,800</td>
<td>10,900</td>
<td>32,900</td>
<td>44,800</td>
<td>11,900</td>
</tr>
<tr>
<td>Knox - North West</td>
<td>16,700</td>
<td>22,200</td>
<td>5,500</td>
<td>47,100</td>
<td>59,300</td>
<td>12,200</td>
<td>18,800</td>
<td>26,400</td>
<td>7,600</td>
</tr>
<tr>
<td>Knox - South</td>
<td>13,400</td>
<td>17,100</td>
<td>3,700</td>
<td>42,900</td>
<td>50,000</td>
<td>7,100</td>
<td>20,900</td>
<td>29,600</td>
<td>8,700</td>
</tr>
<tr>
<td>Monash - South West</td>
<td>17,800</td>
<td>26,500</td>
<td>8,700</td>
<td>47,800</td>
<td>61,500</td>
<td>13,700</td>
<td>42,700</td>
<td>69,200</td>
<td>26,500</td>
</tr>
<tr>
<td>Monash - Waverley West</td>
<td>21,700</td>
<td>30,800</td>
<td>9,100</td>
<td>60,300</td>
<td>80,300</td>
<td>20,000</td>
<td>19,100</td>
<td>32,700</td>
<td>13,600</td>
</tr>
<tr>
<td>Monash - Waverley East</td>
<td>25,800</td>
<td>34,300</td>
<td>8,500</td>
<td>68,000</td>
<td>87,400</td>
<td>19,400</td>
<td>51,400</td>
<td>85,400</td>
<td>34,000</td>
</tr>
<tr>
<td>Area total</td>
<td>138,600</td>
<td>182,500</td>
<td>43,700</td>
<td>385,400</td>
<td>468,400</td>
<td>83,000</td>
<td>201,700</td>
<td>308,000</td>
<td>106,300</td>
</tr>
<tr>
<td>Melbourne total</td>
<td>1,527,100</td>
<td>2,512,800</td>
<td>985,700</td>
<td>3,995,500</td>
<td>6,170,800</td>
<td>2,175,300</td>
<td>2,004,800</td>
<td>3,159,500</td>
<td>1,154,700</td>
</tr>
</tbody>
</table>

Source: VITM 2011, based on Victoria in Future (VIF) 2008. Actual growth may vary subject to detailed planning of development in the area. A Rowville rail line could also encourage more growth in the area, over and above these figures.
According to the figures in Table 1, the area shown in Figure 5 contains around 390,000 people and 200,000 jobs, and continued growth could bring increases of over 80,000 people and 100,000 jobs by 2046. Much of the growth – especially in employment – is likely to be in the western half of the area (in the City of Monash).

Substantial growth is planned for the Monash University Clayton Campus and surrounding areas; this has been highlighted to us during the study and is summarised in Monash University’s *Transport Advocacy Document* (2011). Indicative growth figures from that report are summarised in Table 2.

### Table 2 – Monash Technology Precinct projected growth

<table>
<thead>
<tr>
<th>Site</th>
<th>Now</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monash University Clayton Campus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td>26,000</td>
<td>36,000</td>
</tr>
<tr>
<td>Staff</td>
<td>11,000</td>
<td>15,000</td>
</tr>
<tr>
<td>John Monash Science School secondary students</td>
<td>600</td>
<td>600+</td>
</tr>
<tr>
<td>Students and staff living on campus</td>
<td>1,200</td>
<td>4,000+</td>
</tr>
<tr>
<td>External visitors per annum</td>
<td>600,000</td>
<td>800,000+</td>
</tr>
<tr>
<td>CSIRO Clayton campus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research and support staff</td>
<td>1,200</td>
<td>4,000+</td>
</tr>
<tr>
<td>Higher degree research students</td>
<td>61</td>
<td>100+</td>
</tr>
<tr>
<td>Australian Synchrotron</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research and support staff</td>
<td>110</td>
<td>110+</td>
</tr>
<tr>
<td>Experimental teams and visiting researchers per annum</td>
<td>3,300</td>
<td>6,000</td>
</tr>
</tbody>
</table>

*Source: Monash University Transport Advocacy Document (2011)*

To further underline the significance of the western part of the Rowville rail line area, Figure 7 shows ‘effective job density’\(^\text{1}\) in Melbourne, as calculated by SGS Planning and Economics in 2011. It clearly shows the area around Monash University Clayton campus as the most significant employment node outside inner Melbourne.

Discussions with the Department of Planning and Community Development confirm the recognised significance of the area and the strategic importance of the larger ‘employment corridor’ between central Melbourne and Dandenong. The technology precinct around Monash University Clayton campus is a central part of this corridor. Opportunities for further growth in population and employment are under investigation between Caulfield and Dandenong.

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\(^\text{1}\) Defined as the ‘time taken by workers to access the pool of jobs available via different modes of travel.'
3.5 Travel patterns

Personal travel in the Rowville rail line area, in common with most of suburban Melbourne, is dominated by car use.

As shown in Table 3, well over 80% of journeys to work originating in the Rowville rail link area in 2006 were by car, and only 10% were by public transport.
3.5.1 Journeys to work

Table 3 – Journeys to work originating in the area (2006 Census)

<table>
<thead>
<tr>
<th>Journeys to work by mode of transport</th>
<th>Rowville</th>
<th>Wheelers Hill</th>
<th>Mulgrave</th>
<th>Clayton</th>
<th>Huntingdale</th>
<th>Oakleigh East</th>
<th>Oakleigh South</th>
<th>Total</th>
<th>Melbourne total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public transport</td>
<td>870</td>
<td>760</td>
<td>620</td>
<td>1,030</td>
<td>150</td>
<td>370</td>
<td>570</td>
<td>4,370</td>
<td>201,060</td>
</tr>
<tr>
<td>Car/motorcycle</td>
<td>13,830</td>
<td>7,430</td>
<td>5,950</td>
<td>2,810</td>
<td>500</td>
<td>1,780</td>
<td>2,880</td>
<td>35,180</td>
<td>1,127,190</td>
</tr>
<tr>
<td>Cycle</td>
<td>50</td>
<td>30</td>
<td>30</td>
<td>60</td>
<td>10</td>
<td>40</td>
<td>40</td>
<td>260</td>
<td>18,890</td>
</tr>
<tr>
<td>Walk</td>
<td>150</td>
<td>100</td>
<td>110</td>
<td>440</td>
<td>20</td>
<td>80</td>
<td>70</td>
<td>960</td>
<td>51,380</td>
</tr>
<tr>
<td>Other/not stated</td>
<td>390</td>
<td>280</td>
<td>220</td>
<td>140</td>
<td>10</td>
<td>70</td>
<td>130</td>
<td>1,230</td>
<td>47,400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15,290</strong></td>
<td><strong>8,600</strong></td>
<td><strong>6,930</strong></td>
<td><strong>4,480</strong></td>
<td><strong>690</strong></td>
<td><strong>2,340</strong></td>
<td><strong>3,690</strong></td>
<td><strong>42,000</strong></td>
<td><strong>1,445,920</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mode shares</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Public transport</td>
<td>5.7%</td>
<td>8.8%</td>
<td>8.9%</td>
<td>23.0%</td>
<td>21.7%</td>
<td>15.8%</td>
<td>15.4%</td>
<td>10.4%</td>
<td>13.9%</td>
</tr>
<tr>
<td>Car/motorcycle</td>
<td>90.5%</td>
<td>86.4%</td>
<td>85.9%</td>
<td>62.7%</td>
<td>72.5%</td>
<td>76.1%</td>
<td>78.0%</td>
<td>83.8%</td>
<td>78.0%</td>
</tr>
<tr>
<td>Cycle</td>
<td>0.3%</td>
<td>0.3%</td>
<td>0.4%</td>
<td>1.3%</td>
<td>1.4%</td>
<td>1.7%</td>
<td>1.1%</td>
<td>0.6%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Walk</td>
<td>1.0%</td>
<td>1.2%</td>
<td>1.6%</td>
<td>9.8%</td>
<td>2.9%</td>
<td>3.4%</td>
<td>1.9%</td>
<td>2.3%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Other/not stated</td>
<td>2.6%</td>
<td>3.3%</td>
<td>3.2%</td>
<td>3.1%</td>
<td>1.4%</td>
<td>3.0%</td>
<td>3.5%</td>
<td>2.9%</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

About 42,000 journeys to work originated in the Rowville rail line area in the 2006 Census. The use of public transport, walking and cycling for journeys to work generally increased from east to west across the area. Over 90% of journeys to work starting in Rowville were by private motorised vehicles, compared with 63% in Clayton (reflecting the high proportion of students in the population there).

It is to be expected that public transport’s share of journeys to work has increased somewhat since 2006, especially given the improved bus services since then.

3.5.2 Journeys to school or study

Another key feature of travel in the area is that generated by Monash University and other secondary and tertiary education facilities. During consultations the many problems with this aspect of travel have been well communicated to us, especially in relation to student travel to and from Monash University Clayton campus. Monash University’s advocacy document for the Rowville rail line spells out the substantial future growth that is being planned for in and around the Clayton campus, both in student numbers and employees.

3.5.3 Future travel growth

We have used VITM to assess future growth in travel with and without a Rowville rail line. The results are discussed in more detail in Chapter 7, however the model suggests that, with the population and employment growth assumptions from VIF 2008 (see Table 1), overall travel demand generated or attracted by land uses in the Rowville rail line area on a typical weekday could increase by about one-third between now and 2046.
VITM generally reflects ‘business as usual’ but does not allow for additional development potential generated by the Rowville rail line if it were to proceed. It includes some, but not all, of the development potential in the vicinity of the Monash University Clayton campus.

### 3.6 Existing transport provision

Generally, the area is well-provided with roads and associated footpath infrastructure. Public transport is bus-based, with some improvements (e.g. SmartBus) in recent years.

#### 3.6.1 Roads and traffic

Figure 8 illustrates the declared (major) road network in the Rowville rail line area.

**Figure 8 – Vicroads declared roads**

![Source: VicRoads](image)

In common with most of eastern Melbourne, arterial roads form a grid throughout the area, with some key road links (Princes Highway, Monash Freeway) running at an angle to the grid. Major roads in the immediate vicinity of the rail line include:

- Monash Freeway and EastLink Tollway
- East-west arterial roads – Princes Highway (Dandenong Road), North Road/Wellington Road, Ferntree Gully Road, Kelletts Road and Centre Road/Police Road
- North-south arterial roads – Dandenong Valley Highway (Stud Road), Jacksons Road, Jells Road, Springvale Road, Blackburn Road, Clayton Road and Huntingdale Road

Figure 9 shows the SmartRoads Network operating plans for the area. This outlines how the road space would ideally be managed at different times of day to provide priority between competing interests. The Wellington Road/North Road corridor is designated as a ‘Bus Priority Route’ and ‘Other Traffic Route’.
3.6.2 Public transport

Figure 10 illustrates existing public transport provision (from current PTV maps).

Clearly the Rowville area is not served well by rail; the Dandenong, Glen Waverley and Belgrave lines all skirt the area. Significant numbers of study area residents use these rail lines, especially for commuting. Many of them drive to and park at stations to do so.

Bus services in the area have been improved significantly in recent years, notably through the introduction of SmartBus routes, including:

- 900 on Wellington Road and Stud Road (Rowville - Caulfield)
- 901 on Stud Road (Frankston - Melbourne Airport)
- 902 on Springvale Road (Chelsea - Airport West)
- 703 on Blackburn Road (Middle Brighton - Blackburn)
Figure 10 – Existing public transport

Source: Public Transport Victoria
Across the whole metropolitan bus network, patronage increased by 34% to 106 million boardings over the five years to 2010/11. Growth on SmartBus routes has been greater than this (see Figure 11). In 2010/11, Route 900 carried about 5,500 passengers each weekday, a 135% increase since its introduction in 2006.

**Figure 11 – SmartBus route patronage growth comparisons**

In July 2011, a new express bus route was introduced between Huntingdale station and Monash University. Route 601 runs every four minutes on weekdays during the semester between 7am and 7pm and requires a pre-paid ticket. The service is very well used, and after a year-long trial it is now a permanent service.

### 3.6.3 Cycling

Figure 12 shows the Principal Bicycle Network (PBN) in the Rowville rail line area (note that the PBN is under review and could change significantly).

There is a reasonably continuous bike route along Wellington and North Roads, with links to service Monash University and other significant destinations along the way. However the paths that form this route are variously in the median, on the north or south sides of the road or part of the on road bus lane. There are several places where path continuity could be improved, and in general the facilities are poor. Cyclists do not have priority at road crossings and signals are not optimised to reduce cyclist delays.
3.6.4 Walking

Walking is the primary means for people to access public transport and should be encouraged in its own right for short journeys and as a leisure activity.

Walking conditions in the Rowville rail line area are a function of the street layouts; generally speaking, suburbs west of Monash Freeway are older and have a more permeable grid-type street layout, whilst those further east are more recent (and lower-density), with curvilinear street layouts with cul-de-sacs and a more strongly defined road hierarchy that is generally less conducive to direct walking routes. All major arterials (except the freeway and tollway) have footpaths and pedestrian crossing facilities at intersections.

In much of the area, the walking environment is adversely affected by high traffic volumes and speeds along major roads and significant section of industrial and business land uses.

3.6.5 Freight

Whilst freight is not a central focus of the rail study, there are significant truck movements generated by commercial and industrial land uses in the vicinity of Westall Road and Blackburn Road (and accessing Monash Freeway). The Woolworths distribution centre on Wellington Road west of Monash Freeway is also a significant generator of freight movement. Maintaining access for freight and commercial traffic could be a significant
influence on the design and operation of the rail link.

3.7 Summary

In summary, analysis of existing and future transport conditions suggests that the key ‘problems’ that a Rowville rail line may help to address are:

- limited transport choices, resulting in high dependence on car use for travel;
- high latent demand for rail travel that is evident in the strong growth of rail patronage in recent years;
- increasing traffic demand and the attendant delay, congestion and safety issues; and
- increasing energy use and emissions from transport.

The steadily increasing pressures on the road system due to growth of Melbourne in general will exacerbate existing traffic congestion.

The Rowville rail line area includes places that are increasingly important to the future growth and productivity of Melbourne, especially in and around Monash University Clayton campus. Their development potential would be enhanced by improved public transport accessibility and capacity, which in turn suggests that land developers should be expected to contribute to the cost of providing such improvements; perhaps it should be a precondition of planning approval for major developments.
4. Community and stakeholder views

4.1 Consultation process

As foreshadowed in the Government’s original announcement, the study included a comprehensive consultation process, designed to involve and consult with the community and stakeholders, gathering their views to help inform the planning and design work. In the process, we made a commitment to:

- effectively inform the community and stakeholders;
- encourage and enable community participation in the decision making process;
- monitor and report back on all feedback;
- respond to enquiries, feedback or complaints within 7 working days;
- publish and make available all public information; and
- upon request, endeavour to provide information in other formats for people with disabilities or arrange a suitable alternative.

This was achieved by providing a range of communication channels and choices for public and stakeholder participation and input, as given in Table 4.

Table 4 – Summary of consultation activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Participation/results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public forums</td>
<td>Three facilitated forums at the outset, at different locations along the rail line route to collect views on issues and desired outcomes from the study.</td>
<td>130 participants in total Strong community support for a rail line or other ways to improve public transport in the area. Concern and discussion about impacts and other issues.</td>
</tr>
<tr>
<td>Public meetings</td>
<td>Presentations at meetings arranged by others (Monash University, Metropolitan Transport Forum, local Members of Parliament).</td>
<td>Around 600 people in total across all meetings. Support from stakeholders and proponents of rail improvement generally, alongside concerns about high costs and the need for less costly alternatives.</td>
</tr>
<tr>
<td>Drop-in booths</td>
<td>‘Drop-in’ booths Huntingdale Station, Monash University and Rowville’s Stringybark Festival.</td>
<td>Around 1,700 people in total (majority at Huntingdale Station). Provided information, fliers and awareness. General support overall but some people doubted the need, especially given the potential cost.</td>
</tr>
<tr>
<td>Study website</td>
<td><a href="http://www.rowvilleralystudy.com.au">www.rowvilleralystudy.com.au</a>, Visitors could post and discuss ideas and make comments about the study, with links to social media (Facebook, Twitter).</td>
<td>7,500 website visits, 16,000 page views. 36 ideas submitted with 2,010 votes cast. Over 800 subscribed followers, 175 comments made 3,200 Facebook ‘likes’. Almost universal support for improved public transport in general and the Rowville rail line in particular.</td>
</tr>
<tr>
<td>Stakeholder workshops and inputs</td>
<td>Stakeholders were invited to several workshops and technical meetings and the study team attended a range of 1-1 meetings at stakeholder premises.</td>
<td>Two main workshops were held with 20 stakeholders. They also participated in 3 technical meetings and 14 individual separate meetings. Strong support in general, especially from local Councils. Valuable input into technical studies and comments on the study process overall.</td>
</tr>
</tbody>
</table>
Final Stage 1 Feasibility Report  
Community and stakeholder views

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Participation/results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guest articles</td>
<td>To expand the discussion and involve the community in the wider debate</td>
<td>Published articles by Professor Geoff Rose (Monash University), Jeremy Lunn (Public Transport Users Association) and Cr Jackie Fristacky (Metropolitan Transport Forum).</td>
</tr>
<tr>
<td>Draft report release and</td>
<td>Draft Stage 1 report was released in March 2012 and feedback was invited</td>
<td>247 individual submissions were received from the community and stakeholders.</td>
</tr>
<tr>
<td>submissions</td>
<td>from the public and stakeholders</td>
<td></td>
</tr>
</tbody>
</table>

The feedback received from the community and stakeholders during the study has helped shape the preferred options for a Rowville rail line. For example, the alignment was designed to minimise the impact on the existing road system, which was a key consideration raised during the community consultation. All major road crossings and access points were retained by designing the rail line to be below or above ground for much of the length.

More detail on the consultation process and outcomes is in the Public Consultation Report.

4.2 Summary of responses during the study

Among stakeholders, the commonly identified outcomes of the rail line included the opportunities of increased investment into public transport, increasing commercial and social development opportunities, reduced road congestion, improving access to destinations and urban renewal projects.

The single most important community theme raised was a strong and well-articulated desire to see the Rowville rail line built. This was reflected either in ‘lobbying’ type commentary (“just build it”), or frustration (“not another study”).

Through the online channels, community and stakeholder workshops several key themes of concerns have emerged. They provide a clear picture of the areas of greatest priority for the community, which include:

- **Integrated transport planning:**
  - Values raised included understanding behaviour and demand of travel users, accessibility, integrated transport hubs and avoiding impact on the road network.
  - Desired outcomes included network integration, meeting demand, reliability and access to the city and Monash University precinct, linking of activity centres, no impact on the operation of other rail services and Wellington Road operation.

- **Social amenity and environment:**
  - Values noted included retention of urban amenity, linking of activity centres, limiting environmental impacts, underpinning sustainable growth in the region
  - Outcomes included community acceptance and input, fit for purpose infrastructure and positive impact on residents.

- **Integrated land use planning:**
  - Values raised included rail stations as activity centres, no impact on Monash University buildings, a dedicated station at Monash University, integration of stations with existing urban area.
Outcomes included integrating the land use response, improved accessibility, assessment of economic benefits and land use growth potential.

The following sustainability issues were identified during the community workshops:

- reduction of energy use and carbon emissions;
- water conservation;
- green infrastructure and landscaping;
- economic growth and social enhancement;
- pleasant environment and comfort;
- reduction of environmental impacts; and
- good station design and identity.

Analysis of online comments provides an indicative basis to understand public feedback and input. Table 5 below summarises the number of comments from the public on the blog, Facebook and forum.

### Table 5 - Comments received online by topic/theme during the study

<table>
<thead>
<tr>
<th>Topic/Theme</th>
<th>Comments</th>
<th>Likes/votes</th>
<th>Key messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>General support</td>
<td>225</td>
<td>794</td>
<td>Strong local community support to build a rail line with an emphasis on a short time frame.</td>
</tr>
<tr>
<td>Operations</td>
<td>122</td>
<td>392</td>
<td>Desire for a regular, direct connection to the CBD.</td>
</tr>
<tr>
<td>Social and economic benefits</td>
<td>84</td>
<td>49</td>
<td>Seen as an important public transport solution for future growth in the Monash University precinct.</td>
</tr>
<tr>
<td>Extensions and alternatives</td>
<td>61</td>
<td>24</td>
<td>Desire for future extension further east and consideration of north-south public transport services.</td>
</tr>
<tr>
<td>Integration and access</td>
<td>48</td>
<td>73</td>
<td>Stations should be designed for intermodal access and transport network integration.</td>
</tr>
<tr>
<td>Alignment</td>
<td>36</td>
<td>12</td>
<td>A number of alternative routes were suggested, but most supported the Wellington Road alignment.</td>
</tr>
<tr>
<td>Safety and amenity</td>
<td>34</td>
<td>25</td>
<td>Some concerns were raised about personal safety at stations, however several responses stated this will be outweighed by the benefits of a new station.</td>
</tr>
<tr>
<td>Sustainability and environment</td>
<td>34</td>
<td>39</td>
<td>Comments suggested rail provides a sustainable travel choice. There was a desire to maintain open ‘green space’.</td>
</tr>
<tr>
<td>Station location and design</td>
<td>25</td>
<td>13</td>
<td>Multi-use stations were seen as both positive and necessary along with intermodal integration, safety and blending in with the local urban landscape.</td>
</tr>
<tr>
<td>Other</td>
<td>56</td>
<td>41</td>
<td>Some comments related to the cost of a rail line and whether it was justifiable against other modes of public transport.</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>725</strong></td>
<td><strong>1,462</strong></td>
<td></td>
</tr>
</tbody>
</table>

Input varied in opinion and depth of comment, however the vast majority of comments provide strong support for constructing the rail line. This general theme of support was reflected in comments against all the different themes, for example:

“I strongly support the rail line to Monash University. I spent five years driving to Clayton Campus, as the existing bus services were inconvenient, over-crowded and often delayed. Given where I lived as a student, I would certainly have used the proposed rail line. This would have saved me a lot of money in petrol and parking fees.”
“Rowville and residents in surrounding areas are starved of decent public transport.”

“This was supposed to happen back in the 1970s when I was a student at Monash. Now I’m on staff and it’s still not happened. It would be life-changing for many people who either spend hours on several forms of transport to get to Monash, or decide not to bother coming to Uni. From the staff perspective, it’s also difficult to get international visitors to come to the campus when they have to negotiate a range of unpredictable stages of public transport from the CBD and inner city.”

“The Clayton campus would simply be more accessible and quicker to get to…”

“A central spine down Wellington Road to capture an underground tunnel could be integrated into the urban design of creating commercial opportunities with offices/retail, community centres i.e. Childcare, council facilities and connect the line to its immediate community.”

“Melbourne rail network desperately needs to be expanded and improved to provide better public transport services for its rapidly growing population. Huntingdale to Rowville rail line is absolutely necessary.”

“…..[T]here’s definitely a demand for a higher capacity mode of transport into the area! The buses are quite inconvenient and probably deter many people from taking public transport, as many prefer to drive!”

Specific comments were raised with varying degrees of support. Comments that generally received feedback or affirmation from others, included:

- Access to/from Monash University
- Concerns about impact of the rail line – noise, visual impact, vibration etc
- Questions over train stations – divided views on effects on property values (worries about security contrasted with desires for improved transport access and choice)
- Need for integration with other modes of transport primarily bus and dedicated bicycle access
- Need for direct services to the City as opposed to shuttle services/transfers
- Suggested alternatives or variations included:
  - Light rail or bus rapid transit – could be cheaper/less impact
  - Rail link from Glen Waverley to Rowville
  - Extensions beyond Rowville (e.g. to Ferntree Gully or Lysterfield)
  - Rail links to other places (e.g. Chadstone, the Alamein line, or along Eastlink)

4.3 Overall support during the study

Two hundred and twenty five comments were submitted in general support of the proposed rail line and 794 ‘likes’ and ‘votes’ were posted in response to some of them. The comments were typically short responses such as “do it”, “great idea”, “so overdue”, “in full support”, “a fantastic benefit” and “about time”. Other examples:

“As the years have passed its need has become more urgent. There have been so many feasibility studies. Let’s just get it done.”

“It is such a pain to get to Monash I am sure it puts a lot of people off coming here. I’d vote for a rail link any day!”
4.4 Response to the Draft Stage 1 Report

The Draft Stage 1 Report was prepared and released on 9 March 2012. Submissions were invited, to gauge community and stakeholder reaction to the Rowville rail link concept design before finalising Stage 1 of the study.

In total, 247 submissions were received from 239 people or organisations in response to the Draft Stage 1 Report. A significant volume of comments and queries was also made via Twitter, Facebook and Your Voice (on the study web site). All material was reviewed and analysed to assess which issues people felt strongly about, particularly in relation to possible options (for example, the two optional locations for a station at the Rowville end of the route) and suggestions for changes or improvements to the details presented.

Table 6 provides an overview of the comments received, including stakeholders and members of the community. More details are in the Report on Public Submissions on the Draft Stage 1 Report.

Table 6 – Summary of submissions on the Draft Stage 1 Report

<table>
<thead>
<tr>
<th>Subject area</th>
<th>Summary of submissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail alignment</td>
<td>Many acknowledged the need to achieve a cost-effective solution and balance underground tunnelling with above ground infrastructure.</td>
</tr>
<tr>
<td></td>
<td>Some emphasised the need to minimise traffic congestion and therefore keep major rail-road intersections grade-separated.</td>
</tr>
<tr>
<td></td>
<td>While most submissions agreed with the mix of underground and above ground infrastructure proposed in the Draft Report, some concerns were raised with above ground infrastructure including loss of open space, long-term operational noise and vibration and visual impact to adjacent residents.</td>
</tr>
<tr>
<td></td>
<td>A number suggested alternative alignments including non-CBD centric options and connections to the Glen Waverley line or Alamein Line instead of the Dandenong Line.</td>
</tr>
<tr>
<td>Rail operations</td>
<td>Submissions acknowledged the value that train services in Rowville would add to improving convenience, accessibility and travel time savings.</td>
</tr>
<tr>
<td></td>
<td>Concerns raised in relation to rail operations included car parking at stations, overcrowding of trains, train timetabling efficiencies and train frequency.</td>
</tr>
<tr>
<td>Station design and location</td>
<td>Most common topics raised in relation to station design and location include car parking, connection to other transport services and not contributing to further traffic congestion.</td>
</tr>
<tr>
<td></td>
<td>The majority indicated preference for a station at Stud Park instead of Wellington and Stud Roads, because it was seen to provide better connection to the existing bus interchange and local businesses.</td>
</tr>
<tr>
<td></td>
<td>Submissions generally supported the proposed upgrades to Huntingdale Station, and new stations proposed at Monash University, Mulgrave and Waverley Park.</td>
</tr>
<tr>
<td></td>
<td>A number of comments supported the idea of constructing an additional station or ‘park and ride’ facility at EastLink.</td>
</tr>
<tr>
<td>Integrated planning</td>
<td>A large majority highlighted the need to ease traffic congestion on major arterial roads and provide a more attractive mode of transport to a private vehicle.</td>
</tr>
<tr>
<td></td>
<td>Concerns were raised about the cost of the proposed solution and the reliance on other infrastructure improvements for the project to proceed (such as the Melbourne Metro Rail Tunnel).</td>
</tr>
<tr>
<td></td>
<td>A number of submissions, in particular stakeholders, highlighted the limited scope focusing only on heavy rail solutions.</td>
</tr>
<tr>
<td>Subject area</td>
<td>Summary of submissions</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Land use planning, environment and impacts | Many acknowledged the value of a new rail line in promoting land use change and growth, particularly around stations  
However, most common concerns raised were ongoing operational vibration and noise for adjacent residents, visual amenity of an above ground rail alignment and loss of open spaces, vegetation, flora and fauna.  
People acknowledged that a new rail line to Rowville would improve access to employment and social activities outside Rowville, in particular, in Melbourne’s CBD. It would also promote local job growth, business opportunities and strengthen the local economy.  
A number also noted improved social inclusion and accessibility as a result of a new rail line, including better access for young people, students, disabled and elderly residents to transport.  
A large number highlighted concerns about the timeframe for project completion and the project being delayed or never completed.  
Several public submissions expressed concern over the decision-making process, including the current lack of commitment and funding.  
A large number expressed frustration with “yet another government study” and a strong desire to see work commence on building the Rowville rail line without delay. |
| Sustainability and design               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Other                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

Several large or detailed submissions were received from individuals as well as those from key stakeholders like Knox City Council, Monash City Council, Monash University and others. Most of these were generally supportive of the concept but some questioned the details, in particular whether Rowville train services would trigger the need for other rail improvements or not (particularly improvements to the Dandenong line and the Melbourne Metro Rail Tunnel). This issue is discussed further in Chapter 6.

We have used the submissions to help finalise our recommendations for the next steps (see Chapter 9), and the feedback received will be a valuable input to continued work on the rail line.
5. Possible solutions

There are many possible solutions to improve transport in the subject area generally. This Chapter summarises these, drawing on comments made to us by the public and stakeholders during our study.

5.1 Rowville rail line overview

An initial concept for the Rowville rail line, inherited from the 2004 prefeasibility study and contained in the brief for our study, is illustrated in Figure 13.

Figure 13 – Rowville rail line initial concept

The rail line would link into the Dandenong line at Huntingdale, then run along the North Road/Wellington Road corridor past Monash University, Mulgrave, Wheelers Hill and Waverley Park to Rowville. Four rail stations are envisaged at Monash University, Mulgrave, Waverley Park and Rowville, with the possibility of a fifth at or near EastLink.

Ultimately, train services on the Rowville rail line would run to and from central Melbourne, thus reducing the need for passengers to change trains.

As the principal focus of this first stage of the study, we have investigated the overall implications of this route concept in some detail, as summarised in Chapter 6.

5.2 Alternatives to Rowville rail line

Although this first stage of the study is focussed on a rail link specifically between Huntingdale and Rowville along the Wellington Road corridor, previous studies and the many comments we have received from the community and stakeholders over recent months have raised other ideas and possibilities, which we summarise diagrammatically in Figure 14.
Suggestions have included:

- Light rail links along Wellington Road and North Road or Princes Highway, and out to Ferntree Gully; and
- Heavy rail links between Monash and Chadstone, along EastLink between Dandenong and Ringwood, from Glen Waverley to Knox, Ferntree Gully and Scoresby, and also a link from Oakleigh through Chadstone and on to the Alamein line.

We have not considered these ideas in this first Stage of the study because of our focus on the feasibility of the Rowville rail line, but many of them could be considered either as supplements or alternatives to the Rowville rail line as part of broader investigations into public transport improvements, ideally linked with ongoing work on the metropolitan planning strategy.
6. A Rowville rail line concept

Building a railway line to Rowville is a large project covering not only the engineering of the line itself, but also other initiatives to enable train services to the CBD, improve access and egress transport provision and integrate the project into surrounding land uses. This Chapter describes a concept and how it would perform.

In developing the rail line concept described in this Chapter we have taken into account the views of the community and stakeholders as well as considering the engineering design, transport services and operations requirements.

6.1 Train operations

A rail line to Rowville would ideally provide high-frequency, direct train services to and from central Melbourne (this idea was strongly supported by the community and stakeholders). However this cannot happen without increased rail capacity on the Dandenong line from Huntingdale to Caulfield and into central Melbourne, as explained below.

There are only two tracks between Dandenong and Caulfield; they carry all the Dandenong, Pakenham and Cranbourne services, as well as Bairnsdale V/Line trains and freight trains from the south east. During the morning peak these services presently total 18 trains per hour in each direction (see Table 7). Peak period trains on the Dandenong corridor are regularly crowded.

If the frequency of trains is increased without adding more tracks, express trains would have to be reduced in number, so Cranbourne and Pakenham passengers would probably experience longer travel times. Also more trains per hour will mean more frequent and/or longer closures on the four level crossings between Huntingdale and Caulfield\(^2\), which would increase the already lengthy delays to road traffic (including buses), cyclists and pedestrians.

The Dandenong line cannot provide much more peak passenger capacity than it does now without allowing for longer trains, re-signalling and/or additional tracks, and grade separation of level crossings to avoid excessive delays to road traffic. Furthermore, with ever-increasing train services on other lines as well, the capacity of the City Loop will soon be exceeded; the Melbourne Metro Rail Tunnel (a new twin-track rail tunnel and stations through the CBD, between South Yarra and South Kensington) is intended to address this.

6.1.1 Service frequency and stopping patterns

We have considered a number of train operating scenarios for the Rowville rail line:

- **Scenario 1: Rowville shuttle** – a shuttle service operating every ten minutes between Rowville and Huntingdale.

\(^2\) At Poath, Murrumbeena, Koomang and Grange Roads
• **Scenario 2: Diverted Dandenong services** – diverting services that terminate at Dandenong to Rowville instead (would only provide three trains per hour to Rowville).

• **Scenario 3: Full service** – a ten-minute frequency of trains on the Rowville rail line, added to the longer-term service plan for the Dandenong rail line (which assumes that the Dandenong line would be upgraded and the Melbourne Metro Rail Tunnel would proceed). From Huntingdale to the city, Rowville trains would probably run as limited express (stopping all stations to Caulfield, then running express to South Yarra).

Table 7 summarises the trains per peak hour that would be incorporated in the timetables under each of the scenarios, from advice to us by the Department of Transport.

<table>
<thead>
<tr>
<th>Origin</th>
<th>Base case Existing services</th>
<th>Scenario 1 Rowville shuttle</th>
<th>Scenario 2 Divert Dandenong</th>
<th>Scenario 3 Full service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cranbourne</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Dandenong</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>0¹</td>
</tr>
<tr>
<td>Pakenham</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Rowville</td>
<td>-</td>
<td>6 (shuttle)</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>V/Line (to Flinders St)</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total Dandenong corridor</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>24</td>
</tr>
</tbody>
</table>

**NOTE:** 1. Dandenong trains extended to Cranbourne and Pakenham  
Source: Public Transport Victoria

Our observations on the three train operating scenarios are summarised in Table 8.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Scenario 1 Rowville shuttle</th>
<th>Scenario 2 Divert Dandenong</th>
<th>Scenario 3 Full service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of service</td>
<td>★★ Full frequency can be provided but only between Rowville and Huntingdale</td>
<td>★ Only limited frequency possible (3 trains/hour)</td>
<td>★★★ Full frequency can be provided</td>
</tr>
<tr>
<td>Capacity improvement between Huntingdale and central Melbourne</td>
<td>★★★ Not required</td>
<td>★★★ Not required</td>
<td>★ Required for Rowville services to be added to Dandenong line services</td>
</tr>
<tr>
<td>Reconfiguration of Huntingdale Station</td>
<td>★ Required for efficient transfers between Rowville and Dandenong trains</td>
<td>★★ Required to add Rowville rail line platforms</td>
<td>★★ Required to add Rowville rail line platforms</td>
</tr>
<tr>
<td>Passengers transferring between trains</td>
<td>★ Rowville passengers transfer between trains at Huntingdale</td>
<td>★★ Minimum level of transfers</td>
<td>★★ Minimum level of transfers</td>
</tr>
<tr>
<td>Community expectation of Rowville rail line services</td>
<td>★ Not met (not a direct service)</td>
<td>★ Not met (limited service, reduced Dandenong services)</td>
<td>★★★ Met (full service direct to City)</td>
</tr>
</tbody>
</table>

Scenario 1 (a shuttle service) would not be practical because all Rowville rail line passengers would have to change trains at Huntingdale. This would ideally require across-platform transfer to reduce transfer times, which means that Huntingdale station would be reconfigured differently to that envisaged for Scenarios 2 and 3 (and so would be costly to reconfigure later, if Scenario 1 was to be an initial stage in the process of development).
Secondly, in the morning peak the Dandenong, Cranbourne and Pakenham trains that Rowville passengers would be transferring onto would already be full.

Scenario 2 (diverted Dandenong services) could only provide a limited service (3 trains per hour in the peak). It could be seen as an interim stage that would provide a service to Rowville without the need for capacity improvements (and/or reconfiguration of service patterns) between Huntingdale and the City, but it would probably not make sense to invest in a rail line to Rowville without being able to run a high-frequency service; the demand for Monash University alone means that the 20-minute rail service would probably have to be supplemented with shuttle bus services as well. Furthermore, removing peak train services from Dandenong would not be popular with the community.

Scenario 3 is our preferred service option. It is the only option that would enable a full service to Rowville, Monash University and all the way into central Melbourne. As a minimum, and in conjunction with service improvements on the Cranbourne and Pakenham lines, it would probably require an additional track from Huntingdale to Caulfield (and/or improved signalling capacity) and grade separation of four level crossings. With attendant increases in service levels on other lines, Rowville services would contribute to the need for increased rail capacity in central Melbourne (i.e. the Melbourne Metro Rail Tunnel) as well.

**6.1.2 Coordination with other rail services**

It would be important to consider coordination between Rowville and other train services, to reduce the inconvenience associated with transfers for people who want to travel to and from destinations across the rail network as a whole. Transfers between Rowville and other train services would probably occur most at Huntingdale, Caulfield, South Yarra, Richmond, Flinders Street and Southern Cross.

Future passenger movement patterns would need to be estimated and analysed in more detail to help ensure that train timetabling allows for convenient transfers wherever possible.

**6.1.3 Coordination with feeder bus services**

Bus services would need to be reconfigured to serve Rowville rail line stations. This would probably result in:

- truncation of the 900 SmartBus at Monash University, instead of Stud Park;
- alterations to other SmartBus routes (e.g. 703, 902) to ensure that they are well-coordinated with Rowville rail services;
- removal of the 601 shuttle bus service between Huntingdale station and Monash University; and
- redesign of coverage, frequency and timing of local bus services in all suburbs served to cater for the access and egress legs of Rowville train users.

As part of this, it would be important to ensure that bus/rail interchange facilities are well-designed at new Rowville rail line stations, particularly Monash University and Stud Park.
6.1.4 Implications for the rail network

In the Draft Stage 1 Report we stated that frequent train services to Rowville could not be provided before improvement works are carried out to the Dandenong Line between Huntingdale and Caulfield, and also until the Melbourne Metro Rail Tunnel is built to provide more rail capacity through central Melbourne. This section provides more information about these issues, prepared in consultation with Public Transport Victoria.

Dandenong rail line

The Dandenong rail line currently carries 18 trains in the busiest hour (16 Metro and 2 V/Line), inbound in the morning weekday peak. This level of service is close to the current capacity of the line which is limited by a number of factors, including:

- timetable coordination with Frankston line services;
- timing, running times and inner area routing of V/line services;
- the rolling stock available to run train services simultaneously;
- the minimum time between trains that the signalling system can handle;
- the capacity of the electrical power supply; and
- road traffic congestion at level crossings.

Addressing the most immediate power supply and rolling stock constraints would only provide sufficient capacity for next 3-5 years. Beyond these short term measures, a submission has been made to Infrastructure Australia for further capacity increases requiring major investment, including:

- grade separations to avoid worsening and unacceptable road congestion;
- further power supply upgrades;
- higher capacity signalling to enable trains to run closer together safely; and
- longer trains with increased passenger capacity.

Together these improvements would deliver more than double the present passenger capacity on the Dandenong line, sufficient up to at least 2030 (depending on the rate of demand growth).

The Melbourne Metro Rail Tunnel

The City Loop can only accommodate current six-car train lengths due to the length of the underground station platforms, which cannot be easily extended. It would not therefore be possible to operate Dandenong rail line services through the City Loop if they used longer trains. It is also very difficult to extend Richmond station for longer trains without a major rebuild (planning for the Richmond Station precinct is continuing to investigate provision for future extension and widening of platforms).
The Melbourne Metro Rail Tunnel (Figure 15) would provide a new rail route between the Dandenong line just east of South Yarra and the Sunbury line west of South Kensington. Dandenong line trains would operate through the new rail tunnel and stations would be purpose-built for longer trains. This would free up more space in the City Loop for increased services on other lines as well.

Without the Melbourne Metro Rail Tunnel, it would be possible to operate longer trains direct to Flinders Street Station, but only at 16 trains per hour due to track and signalling constraints (compared to 24 trains per hour for the Melbourne Metro Rail Tunnel). Longer trains could carry up to 1,500 passengers each, which would cause significant crowding on platforms 6 and 7 at Flinders Street Station due to the limited platform space and stair/escalator capacity. This may meet the interim capacity requirements of the Dandenong rail line (without a Rowville rail line) but would not provide a long term solution.

Minimum requirements for Rowville services
If the Rowville rail line was built today and provided a 10-minute train service, it would increase the peak train frequency on the Dandenong line from 18 to 24 trains per hour from Huntingdale through to the CBD. This increase would probably require:

- grade separation of level crossings to avoid increased delays to road traffic;
- a power supply upgrade to enable more trains to run simultaneously; and
- improved signalling to permit two minute headways between Huntingdale and Caulfield.

Some upgrading of the City Loop and/or Flinders Street Station to increase train and
passenger capacity may also be required.

By 2021, demand on the Dandenong line alone is expected to need 28 six-car trains per hour. Longer trains would reduce this requirement but is in turn dependent on building the Melbourne Metro Rail Tunnel. Once complete, the Dandenong line upgrades and the Melbourne Metro Rail Tunnel would provide additional capacity which could be used by Rowville trains.

In the very longer term, the Dandenong line may again reach capacity (with or without a Rowville rail line). To accommodate long term growth it is proposed that works undertaken along the corridor (e.g. grade separations, station improvements) should create room for more tracks to be built in the future.

6.2 Physical details of the rail line

The Rowville rail line would provide a high quality heavy rail link to Monash and Knox communities. Whilst modern conventional buildings generally have a 50-year lifespan, the new rail line and its related infrastructure would function significantly beyond this timeframe, to 100+ years. It is extremely important to consider sustainable outcomes and mitigating environmental impacts, especially ongoing impacts like noise, vibration and visual intrusion. It is also essential to pre-empt required adaptation of buildings and infrastructure in the future against possible alterations such as changes in climate. At this initial stage, sustainability initiatives have been considered and frameworks have been developed for both Environmentally Sustainable Design (ESD) and Design for Climate Change (DfCC). If the project proceeds, these would provide the basis for successful, environmentally sustainable outcomes during further design stages, up to completion of construction and into operation.

6.2.1 Rail alignment

Example rail alignment layout diagrams are included as part of the supporting Preliminary Rail Design Report. It should be noted that these initial concept diagrams could change significantly through further investigation and optimisation.

Design standards

Generally speaking the rail link would be designed to the following engineering standards:

- Twin rail tracks throughout
- No new level crossings
- No effect on road access arrangements and traffic capacity (unless absolutely necessary)
- Maximum vertical grade 2% (1 in 50)
- Minimum design speed 80km/hour
- Allowance for 230m long platforms (to accommodate longer trains in the longer term)
- Fully compatible with the rest of the suburban rail system (broad gauge, 1500V DC power supply, compatible signalling, etc)
- Grade separated connection to the Dandenong line at Huntingdale
In addition to this the project as a whole would need to include the following:

- Integrated design of coordinated bus feeder services and bus stop facilities
- Passenger access provision in line with the latest Disability Discrimination Act (DDA) requirements (including lifts, ramps and stairs)
- Provision for secure bicycle parking and adequate bicycle access paths
- Well-designed and safe pedestrian access, especially in the environment of Wellington Road
- Use of sustainable design, materials, energy use and other factors as an intrinsic part of the project

Overall, the rail line and its facilities would need to be designed to the latest industry standards and to cater for long term future demands.

**Summary description**

Figure 16 illustrates possible horizontal and vertical alignments for the rail line in summary form.

**Figure 16 – Illustrative alignment for the Rowville rail line**

Figure 17 shows some illustrative cross sections of how the rail line might look where it would be above or below ground, or in a ‘retained cutting’ open to the air above. There are extensive lengths of retained cut, tunnel and elevated structure.
A preliminary outline design for the route is described as follows:

- **Huntingdale Station** – At Huntingdale the Rowville tracks would merge with the Dandenong tracks north-west of the station, then go below ground with a new platform for Rowville trains beneath the existing platform.

- **Huntingdale to Monash University** – from Huntingdale the tracks would be below ground, curving east from beneath the Dandenong line to align with the median of North Road. From there to Monash University the rail line would stay below ground, probably in cut-and-cover tunnel but with sections in a retained cutting (i.e. open to the air above). It would pass beneath Princes Highway.

- **Monash University to Monash Freeway** – Monash University station would be underground, in the median of Wellington Road. Just east of there, the rail line would move above ground and pass over Blackburn Road and Springvale Road on a viaduct in the median of Wellington Road. Mulgrave station would be above ground, just east of Springvale Road. East of Springvale Road the rail line would come closer to ground level again, and would cross Monash Freeway at the same level as Wellington Road itself (on a structure between the twin bridges that take the road over the freeway).

- **Monash Freeway to Jacksons Road** – east of Monash Freeway the rail line would move underground again to keep the vertical gradients within the design standard. Waverley Park station would be below ground. Near Jacksons Road (around halfway down the hill between Waverley Park and the Dandenong Creek Valley) the rail route would emerge from the ground again onto a viaduct structure.
- **Jacksons Road to Rowville**—three main route options were considered between Jacksons Road and Rowville (see Figure 16):
  - Route A passes through the northern part of Kingston Links golf course and skirts the north side of the residential area and into Stud Park from the north-west;
  - Route B runs through the southern part of Kingston Links golf course just north of the commercial properties on the north side of Wellington Road; and
  - Route C (the preferred route) is along Wellington and Stud Roads.

All options would be on elevated structure across the valley area, then underground on the east side of the valley through to an underground terminus station at Stud Park (with each route there would be a further option of a station just west of Stud Road instead). These options are discussed in more detail below.

Each of the options includes provision for an upgraded, continuous shared bicycle and pedestrian path along the route.

**Route options at Rowville end**

Impacts of the three potential alternative routes A, B and C (see Figure 16) identified at the Rowville end of the rail line have been assessed to help determine which appears to be the best solution. Preliminary desktop investigations were undertaken in land use and statutory planning, surface water, groundwater, contaminated land, flora and fauna, cultural heritage and noise and vibration. Table 9 summarises the results.

**Table 9 – Summary environmental appraisal of route options at Rowville end**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Route A (Kingston Links north)</th>
<th>Route B (Kingston Links south)</th>
<th>Route C (Wellington &amp; Stud Rds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning and land use</td>
<td>★★★★</td>
<td>★★★</td>
<td>★</td>
</tr>
<tr>
<td>Surface water</td>
<td>★★★★</td>
<td>★★★</td>
<td>★</td>
</tr>
<tr>
<td>Groundwater</td>
<td>★★★</td>
<td>★★★</td>
<td>★</td>
</tr>
<tr>
<td>Ecology</td>
<td>★★★★</td>
<td>★★★</td>
<td>★</td>
</tr>
<tr>
<td>Cultural heritage</td>
<td>★★★</td>
<td>★★★</td>
<td>★</td>
</tr>
<tr>
<td>Noise and vibration</td>
<td>★★</td>
<td>★★</td>
<td>★</td>
</tr>
<tr>
<td>Contaminated land</td>
<td>★</td>
<td>★★</td>
<td>★</td>
</tr>
</tbody>
</table>

Route C has the lowest associated risks from a social and environmental viewpoint. There are moderate environmental risks associated with Route B and particularly high risks with Route A in land use planning, surface water and ecology. Other considerations such as constructability and cost may be significant, but we consider that Route C should be the preferred solution. We have therefore produced a concept design for this route only, with two options for the location of a Rowville station (at Stud Park, or at the intersection of Stud Road and Wellington Road).
6.2.2 Station locations and layouts

A preliminary assessment of station locations, possible layouts and facilities is given in the *Station Layout and Urban Design Report*.

All the stations would be either above or below ground and would therefore need access from ground level using stairs, ramps and lifts as appropriate. Stations would be designed to the latest standards of access, passenger convenience and security.

**Huntingdale**

With the envisaged alignment of the rail lines, Huntingdale station could require a second pair of platforms to be built beneath the existing Dandenong line platforms, as illustrated in Figure 18.

*Figure 18 – Huntingdale station cross section*

With this reconfiguration it could prove worthwhile to consider remodelling the wider area around the station. New and redesigned parking would probably be necessary, and the complex and confusing road layout in the area could be improved. A new urban design for the area would benefit the community greatly.

This concept for Huntingdale Station is designed assuming that the Rowville rail line would tie into the existing two Dandenong line tracks. We consider that the concept should be reviewed to accommodate possible additional Dandenong line tracks in the future; in doing so the station layout could change considerably.

**Monash University**

The station at Monash University would be underground, beneath the median of Wellington Road, with access from both the northern and southern sides of the road. The southern part of the campus, currently dedicated to car parking, is to be redeveloped as part of future expansion of the University. The redevelopment could be configured to accommodate a new station forecourt area, designed integrally with a new bus station.

Figure 19 shows a preliminary cross section for Monash University station, and Figure 20 is an impression looking north towards the campus centre along a potential pedestrianised ‘spine’.
Mulgrave
In our preliminary concept design, Mulgrave station is the only one that would be above ground. This would be a substantial structure and access/egress would need careful planning. Figure 21 shows a possible cross section and Figure 22 illustrates what the station could look like in its surroundings.

Feedback on the Draft Stage 1 Report included suggestions that either:

- the rail line and station should be underground through Mulgrave to reduce its impact on the surroundings (this is likely to add considerable cost to the project, so may not be feasible); or
- the Mulgrave station concept should be reviewed to move it closer to or to straddle Springvale Road, to improve passenger accessibility from either side.

These suggestions should be considered in Stage 2 of the study.
Waverley Park

Waverley Park station would be underground; it would probably be the deepest station on the route. Figure 23 illustrates a possible cross section beneath Wellington Road. Although only one access is shown, it would probably be desirable to have one on each side of the road for maximum user convenience.
The Stud Park option for Rowville station would be underground in the area north of the existing library and shopping centre, where in the latest City of Knox structure plan a bus station would be located. The station would be beneath the bus station with an access at the surface facing towards Main Street. Figure 25 shows a cross section and Figure 26 illustrates what it could look like in the surroundings of Stud Park.
Rowville (Wellington Road/Stud Road option)

Instead of building the Rowville rail line to Stud Park, another option would be to terminate the line at the corner of Stud and Wellington Roads. The concept we have developed for this option would involve aligning the rail line along the southern side of Wellington Road after crossing EastLink, with the station located just west of Stud Road, opposite the Stamford Hotel. This area contains a creek bed, substantial mature vegetation and substantial power lines in an easement leading to the major terminal station just to the west.
Figure 27 shows a schematic layout for a station in this location. The platforms would be alongside Wellington Road, with a bus interchange and a large park-and-ride facility further south. The main vehicular access to the station could be via a new entrance road opposite Bergins Road. The aim would be to retain as much of the existing vegetation as possible to screen the site from housing areas on the opposite sides of Stud and Wellington Roads. The vegetation is of relatively high value (possibly classified as Valley Grassy Forest) and any removal would require Ministerial approval and offset planting beforehand.

Although this option would provide a lower-cost alternative to Stud Park Shopping Centre as the location for a Rowville station, the majority of submissions on the Draft Stage 1 Report that commented on this issue were in favour of the Stud Park alternative. A preliminary, summary comparison of the two station options is given in Table 10; this should be explored in more detail in Stage 2 of the study to enable a decision to be made between them.

Figure 27 – Rowville station layout (Wellington/Stud Roads option)
Table 10 – Summary comparison of Rowville Station options

<table>
<thead>
<tr>
<th>Consideration</th>
<th>Stud Park option</th>
<th>Wellington/Stud Roads option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to rail station</td>
<td>Good access (all modes) via transport hub at Stud Park</td>
<td>Requires connecting bus services and other modes to improve access to Stud Park and surrounding suburbs</td>
</tr>
<tr>
<td>Construction</td>
<td>Requires tunnel beneath Stud Road and into Stud Park, and underground station</td>
<td>Shorter scheme saves around xxx metres of tunnel construction and station is at the surface</td>
</tr>
<tr>
<td>Land</td>
<td>Little or no land required due to use of road reservations and underground alignment</td>
<td>Land required for rail line, station, bus/car parking and access road on south side of Wellington Road</td>
</tr>
<tr>
<td>Transport improvement</td>
<td>Station is close to centre of catchment area</td>
<td>Station is less well located, but train travel times would be a couple of minutes shorter</td>
</tr>
<tr>
<td>Physical impacts</td>
<td>Less impact on surroundings due to tunnel</td>
<td>More impact on surroundings due to surface level rail</td>
</tr>
<tr>
<td>Construction</td>
<td>Significant construction impacts due to tunnelling activities</td>
<td>Less construction impact because of being at ground level</td>
</tr>
</tbody>
</table>

Note: Further work is required to weigh up all the differences between the options before choosing between them.

6.3 Sustainability considerations

Sustainability and climate change adaptation would be applicable to all aspects of the project.

6.3.1 Environmental sustainability

Environmentally sustainable design (ESD) initiatives would ensure that the project design is as efficient and sustainable as possible. They would focus on best practice sustainable design, environmental impacts and government policies in the following categories:

- pollution
- carbon emissions
- energy
- climate change
- water
- indoor/outdoor environmental quality
- community, culture and heritage
- economic growth
- management & operation
- materials and waste
- biodiversity & vegetation

The Sustainability Considerations Report provides details of the methodology followed, key sustainability initiatives considered to date, a proposed integration framework for the next phases of the project, and how to establish, monitor and report on sustainability targets.

In summary, the key sustainability initiatives considered so far include:

- cooling and heating energy of underground stations reduced by including innovative
passive thermal, daylight and ventilation design;
- stations designed to minimum 5 star environmental performance rating for energy efficiency;
- optimised vertical alignment to reduce train energy use;
- sustainable material use, waste, and drainage including water sensitive urban design;
- rainwater harvesting, recycling of grey water and reduced potable water use;
- tri-generation systems and harvesting solar energy (heating and cooling generated by tri-generation plants at stations could be used by surrounding buildings);
- climate change adaptation taking into account flooding, extreme weather events and continuity of train operations;
- reduced whole of life carbon footprint, such as embedded carbon, re-use and flexibility;
- interface with bicycle routes and walkways to encourage active transport;
- designs that support operating efficiency and low maintenance;
- urban design elements with visually-pleasing results for community and neighbourhoods; and
- safety and visual comfort, lines of sight, wayfinding and minimisation of noise pollution.

6.3.2 Climate change adaptation

Projected climate change effects in Melbourne are:
- increased temperatures and/or humidity with more frequent heat waves;
- increased intensity and duration of droughts plus associated decrease in soil moisture;
- increase in extreme storm events including rainfall, flooding and high winds; and
- sea level rise and storm surges.

These effects should be fully considered and allowed for in more detailed design processes.

6.4 Constructability

Building the rail line in the North Road/Wellington Road corridor will have significant impacts on road users (vehicular traffic, cyclists and pedestrians) and the surrounding residential, educational and business-related land uses. The Preliminary Rail Design Report discusses constructability issues and impacts, with the following main findings:

- **Construction timing and possible staging** – a 4-year construction period is expected, taking into account the complications of the site and the extensive engineering required. It could be possible to build the rail line in two stages, with the first stopping at Monash University.
- **Noise and vibration impacts** – vibration effects are likely to be strongest in the harder siltstone geology east of Dandenong Creek. There are techniques to mitigate these effects during construction, but community concern would be high at all times. The Australian Synchrotron and nearby biomedical facilities in Blackburn Road will require particular care and attention.
- **Tunnelling and access arrangements** – cut and cover tunnelling techniques are likely to be employed given the lengths and depths anticipated. Temporary land would be
required at or close to the tunnel portal locations, which would appear to be possible. Access to and from the temporary areas for spoil removal and materials delivery would require careful traffic and access management techniques, given the high levels of traffic on the affected roads. Maintaining traffic flows on Monash Freeway and Eastlink in particular would be a high priority given their regional significance.

- **Viaduct sections** – standard construction techniques would lend themselves to the limited space available in the Wellington Road environment. However, the exposed nature of the elevated sections would require special visual, dust, noise and vibration controls as well as access arrangements for construction workers.

- **Stations** – underground stations in Wellington Road would require temporary lane closures and/or diversions to enable cut-and-cover construction, and the high water table would probably entail waterproofed, retained temporary cuttings. The preliminary concept for Huntingdale station presents some significant challenges but a feasible staging method has been identified.

- **Temporary land** – areas for construction work sites appear to be available, subject to detailed planning and negotiation. As with the main construction areas, access to temporary land would need to be carefully considered given the heavy traffic in the area.

The constructability review has established that building the rail link would involve substantial engineering challenges with associated impacts and issues to be addressed. All issues appear to be manageable using well-established techniques, but the complexity and scale of the project should not be underestimated.

### 6.4.1 Timing

As stated above it is expected that construction of the rail line would take four years. If a decision is made to proceed, then we expect that at least another three to four years would be required before construction starts, to develop a detailed design, obtain necessary approvals, acquire land or property and tender for the construction contract. This suggests that the earliest achievable opening year would be 2020.

It would be important to coordinate the project with other initiatives, especially upgrading the Dandenong line and implementing the Melbourne Metro Rail Tunnel because without these it would not be possible to run a fully-fledged service on the Rowville rail line in any case. We consider that the Dandenong line upgrade should be given a high priority because of its benefits for Cranbourne and Pakenham services and improved conditions for road traffic at the level crossings along the route, as well as making Rowville rail line services possible.

Given that the Rowville rail line may not therefore be operational for another ten years or so, it is also important to continue to improve other public transport in the area. A significant first step has been made by making the Huntingdale-Monash University shuttle bus service permanent, but other initiatives could include:

- upgrading the passenger facilities at Huntingdale station (they are substandard and need urgent, substantial improvement given the large numbers of people interchanging
between trains, buses and other modes); and

- continually improving other bus services throughout the area to increase their frequency and/or coverage, and to ensure that they can be adapted to accommodate the Rowville rail line when it is built.

We have not studied these interim measures in any detail; we suggest that Public Transport Victoria should do so and initiate the required actions to maintain the momentum of public transport improvement in the area.
7. Travel demand effects

This Chapter gives a guide to the potential effects of the Rowville rail line on travel demand. The methods used provide a reasonable overall indication of the effects, but the results should be interpreted with caution at a detailed level.

7.1 Background and assumptions

Travel demand effects of the Rowville rail line have been assessed using the Department of Transport's Victorian Integrated Transport Model (VITM). VITM includes representation of the land use (population and employment), roads and public transport networks in and around Melbourne. It uses established techniques to estimate travel demand, mode choice and route choice before 'assigning' the travel to the transport network to provide estimated volumes of people and vehicles.

The version of VITM we used was validated against observed information from 2008/9 and its performance can be summarised as follows:

- modelled traffic volumes generally show good agreement with observed volumes in all time periods except the off-peak (6pm-7am) which is underestimated by about 20%;
- train boardings generally show good agreement on the Dandenong and Glen Waverley lines, although some individual stations are under- or over-estimated;
- bus boardings are underestimated on all routes through the Rowville area.

We suggest that traffic and rail volumes can be treated with reasonable confidence whilst bus patronage is likely to be underestimated in the results presented in this report.

When using the model in future years (2021 and 2046 were modelled):

- official land use predictions are used as the basis for changes in population and employment. In the version of VITM we used, these figures have come from Victoria in Future (VIF) 2008 forecasts released by the Department of Planning and Community Development (DPCD). These forecasts are subject to change with the new metropolitan planning strategy, but they include most of the expected 'business-as-usual' development in the area (including significant growth at Monash University Clayton campus). However as stated in Chapter 3 they would not include possible flow-on development effects of the Rowville rail line itself; the City of Knox has undertaken an economic study that attempts to quantify some of these effects and could be used as a guide in further patronage forecasting analysis.
- Estimates are made of future relative changes in key variables like fuel prices, parking costs and public transport fares.
- Future year transport networks include committed or expected improvements to transport elsewhere in Melbourne so that the effect of the Rowville rail line can be separated from the effects of other initiatives.
We have used the transport model with capacity-constraint on roads, but not on public transport. This arguably means that it could forecast more patronage than the modelled public transport services can physically carry; the response would be to ensure that adequate services are provided to meet the predicted demand.

Overall we consider that VITM appears to produce plausible levels of patronage on the Rowville rail line in our tests. However it appears that most of the patronage comes from diversion of trips from other rail lines, rather than mode shift from car which we believe could be underestimated, especially if future changes in fuel prices, public attitudes and the like are much larger than currently assumed in the model. Sensitivity testing could shed more light on this, but it is questionable whether VITM (or any other model of its type) would produce reliable results if key parameters were changed dramatically.

7.2 Rail line patronage

In the rest of this Chapter we describe the patronage and demand effects of the Rowville rail line, with full services to and from the city, in 2046 (thus assuming that the Dandenong line upgrade and the Melbourne Metro Rail Tunnel would have been completed, amongst other things).

According to our patronage modelling, if the Rowville rail line was in place, in 2046 about 68,000 passengers could use the four stations on the line on an average weekday. Table 11 compares this with modelled patronage on other rail lines in eastern Melbourne.

Table 11 – Modelled patronage on Rowville and other eastern Melbourne rail line sections

<table>
<thead>
<tr>
<th>Rail line</th>
<th>Number of stations</th>
<th>Modelled 2046 weekday station usage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>Lilydale to Ringwood</td>
<td>4</td>
<td>83,000</td>
</tr>
<tr>
<td><strong>Rowville to Huntingdale</strong></td>
<td>4</td>
<td>68,000</td>
</tr>
<tr>
<td>Ringwood to Camberwell</td>
<td>12</td>
<td>193,000</td>
</tr>
<tr>
<td>Dandenong to Caulfield</td>
<td>12</td>
<td>171,000</td>
</tr>
<tr>
<td>Caulfield to South Yarra</td>
<td>5</td>
<td>50,000</td>
</tr>
<tr>
<td>Sandringham to South Yarra</td>
<td>11</td>
<td>98,000</td>
</tr>
<tr>
<td>Frankston to Caulfield</td>
<td>19</td>
<td>151,000</td>
</tr>
<tr>
<td>Pakenham to Dandenong</td>
<td>7</td>
<td>54,000</td>
</tr>
<tr>
<td>Epping to Clifton Hill</td>
<td>14</td>
<td>100,000</td>
</tr>
<tr>
<td>Glen Waverley to Burnley</td>
<td>12</td>
<td>85,000</td>
</tr>
<tr>
<td>Belgrave to Ringwood</td>
<td>8</td>
<td>52,000</td>
</tr>
<tr>
<td>Cranbourne to Dandenong</td>
<td>4</td>
<td>25,000</td>
</tr>
<tr>
<td>Hurstbridge to Clifton Hill</td>
<td>17</td>
<td>94,000</td>
</tr>
</tbody>
</table>

Source: VITM modelling of Rowville rail line

The modelling results suggest that the Rowville rail line would have high usage levels compared to other sections of the rail network in Melbourne’s east on a per-station basis. Other rail line sections with similar predicted usage levels in 2046 are Lilydale to Ringwood,
Ringwood to Camberwell and Dandenong to Caulfield. It would appear to attract much higher usage levels than the Glen Waverley, Cranbourne or Pakenham lines.

7.3 Station usage

Estimated daily station usage in 2046 is summarised in Figure 28 for Rowville rail line stations and others in the vicinity (on the Dandenong, Glen Waverley and Belgrave lines).

In summary:

- Monash University would be the busiest station on the Rowville rail line, with around 23,000 train users a day, comparable with Caulfield or Oakleigh stations;
- Mulgrave Park and Rowville would attract around 17,000 train users, similar to Glen Waverley or Springvale stations; and
- Waverley Park would be the least busy station with about 10,000 users a day, similar to Noble Park or Mount Waverley stations.

Some stations on adjacent rail lines would see reduced usage due to the Rowville rail line. In particular:

- usage of Huntingdale and Clayton stations would drop as people travelling to and from Monash University would no longer need to use buses from these stations; and
• reduced usage is also apparent at Glen Waverley and Ferntree Gully stations.

7.3.1 Boarding and alighting patterns

Modelled passenger boardings, alightings and train loads on Rowville rail line trains in the morning and afternoon peaks are illustrated in Figure 29.

Figure 29 – Rowville rail line peak period load profiles in 2046

![Rowville rail line peak period load profiles in 2046](image-url)
In the 2-hour morning peak, the total departing load city-bound from Monash University station could be around 6,000 passengers, or 500 per train; this would mean that, with present train configurations, all seats would be occupied and there would be standing room only. Due to the significance of Monash University, the trains arriving there from the city direction would be carrying similar loads (500 passengers or more per train).

These movement patterns would be reversed in the afternoon peak. Nearly 9,000 passengers – nearly half of which would board at Monash University – would be on city-bound trains leaving Monash University station in the 3-hour afternoon peak – this also equates to around 500 per train on average. Similar levels of usage would occur in the outbound direction as well, with a significant proportion of passengers travelling through to Rowville station.

7.3.2 Access and egress modes

Figure 30 shows the modelled transport modes of access to Rowville rail line stations.

The modelling suggests that car access would be greatest at Huntingdale and Rowville, whilst walk access would be predominant at Monash University. Clearly it would be important to establish commuter car parking at Rowville, Mulgrave and Huntingdale. It would not be
feasible to provide parking for all of the demand indicated by the model (especially at Rowville), although some would be ‘kiss-and-ride’ rather than park-and-ride. However access by other modes (especially bus and bicycle) could be further improved to reduce the amount of access by car.

The high proportion of car access suggested by the model is also probably overstated due to VITM’s underestimation of the shift from car to public transport in general, which would apply to access trip legs as well.

7.4 Mode shifts

Table 12 summarises changes in travel by time period due to the Rowville rail line in 2046.

<table>
<thead>
<tr>
<th></th>
<th>Morning peak (7-9am)</th>
<th>Inter peak (9am-3pm)</th>
<th>Afternoon peak (3-6pm)</th>
<th>Off peak (6-10pm)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car trips</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To/from Rowville</td>
<td>-2,500</td>
<td>-3,600</td>
<td>-3,600</td>
<td>-3,200</td>
<td>-12,900</td>
</tr>
<tr>
<td>Melbourne-wide</td>
<td>-2,500</td>
<td>-5,000</td>
<td>-4,400</td>
<td>-3,400</td>
<td>-15,300</td>
</tr>
<tr>
<td>PT trips</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To/from Rowville</td>
<td>2,900</td>
<td>4,000</td>
<td>3,800</td>
<td>2,500</td>
<td>13,200</td>
</tr>
<tr>
<td>Melbourne-wide</td>
<td>2,500</td>
<td>4,300</td>
<td>3,700</td>
<td>2,300</td>
<td>12,800</td>
</tr>
<tr>
<td>Total trips</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To/from Rowville</td>
<td>400</td>
<td>400</td>
<td>200</td>
<td>-700</td>
<td>300</td>
</tr>
<tr>
<td>Melbourne-wide</td>
<td>0</td>
<td>-700</td>
<td>-700</td>
<td>-1,100</td>
<td>-2,500</td>
</tr>
</tbody>
</table>

The model overall produces 13,000 more public transport trips and 15,000 fewer car trips on an average weekday when the Rowville rail line is added. A significant proportion of the 68,000 daily Rowville rail line users are predicted to transfer from the Dandenong, Glen Waverley and Belgrave lines, as shown below. However in our estimation the transferring passengers would probably not give rise to significant reductions in crowding on those other lines; most of them would be using park-and-ride so it is likely that they would be replaced by other users if parking space at stations is freed up.

As stated earlier we consider that VITM tends to underestimate the potential shift from car to public transport that could result from a public transport improvement like the Rowville rail line in future years.

7.4.1 Load and relief effects

**Public transport**

Figure 31 shows the change in passenger flows on public transport routes in the area due to the Rowville rail line, in the 2-hour morning peak in 2046.
Rowville rail line patronage would be partly derived from rail passengers who would otherwise use the Dandenong, Glen Waverley and Belgrave lines, giving rise to some patronage relief to these lines. There would also be significant reduction in patronage on connecting bus routes to these lines, offset by increases on the bus services that would access the Rowville rail line. Patronage on the Dandenong line between Huntingdale and Caulfield would increase by over 2,000 passengers. We have allowed or some notional feeder bus service level increases in the modelling of the Rowville rail line, but more detailed patronage modelling and planning work would be necessary to come to a better view of this.

**Road traffic**

Figure 32 shows the modelled change in road traffic volumes on roads in the vicinity of the rail link, for an average weekday in 2046.

The changes are small (generally much less than 1,000 vehicles a day, in an area where multi-lane arterial roads typically carry 40,000 vehicles a day or more) and widespread rather than being concentrated on a particular route. The most significant decreases occur on roads in and around the Monash University precinct. Some traffic reduction is apparent on Monash Freeway west of Springvale Road but this is offset by increases on Ferntree Gully Road, which is probably in turn the result of traffic reductions that allow more traffic onto that route in the model. Slight increases are apparent on EastLink and some of the other north-south roads, which could be explained by the traffic accessing Rowville rail line stations. There is a
slight reduction in traffic on Stud Road and also on Princes Highway (Dandenong Road).

Figure 32 – Modelled change in road traffic volumes due to Rowville rail line (2046 average weekday)

7.5 Conclusions on demand modelling

The demand modelling predicts levels of patronage at Rowville rail line stations that are broadly comparable with those on other, existing rail lines. However we consider that it could underestimate the possible mode shift from car. It also gives quite large estimates of access to train stations by car.

Further work to enhance and improve the demand forecasting model would be advisable to explore these issues in more detail.
8. Costs, benefits and impacts

8.1 Capital costs

At this interim stage of the work we consider that the design has not progressed sufficiently to provide a reliable capital cost estimate. The concept design should be further refined and optimised, with the benefit of community input, before a full capital cost estimate is prepared.

However we would point out that the capital cost would be substantially more than that given in the City of Knox’s 2004 report ($480 million including rail fleet, which would translate to around $800 million in 2011 prices). The main reasons for this are that the 2004 study:

- only costed a single-track line (we have allowed for a twin track line);
- had a greater proportion of the line above rather than below ground (elevated structures are less costly than tunnels);
- assumed a 15-minute service headway that would only require 4 new trains (we have assumed a 10-minute headway which would require 5 new trains); and
- appears to have been very conservative on the costs of stations, access, etc.

The rail line would be complex to build in a busy six-lane road environment, and it would require grade separation at eight major crossing roads, including two freeways, which would result in its being above or below ground virtually all the way.

8.1.1 Funding sources

Funding for the project, if it were to proceed, would probably come mainly from Government sources. However the rail line could significantly enhance land and property values in station catchments. It would also encourage or precipitate redevelopment, especially at key locations like Monash University and Stud Park. Planning approvals for such redevelopments should be conditional on developer contributions and/or tax increment funding to help fund station works; landowners and developers should be expected to contribute to the costs in this way.

8.2 Operating costs

When fully operational with services to and from the city, the Rowville rail line would incur additional public transport operating costs; that is the additional cost of rail operations, track and station maintenance, partially offset by some savings in bus operating costs (due to reconfiguring bus routes to feed to the stations rather than running in parallel to the line).

8.3 Economic appraisal

We have not finalised an economic appraisal at this stage, for two reasons:

1) As stated above we consider that the concept design should be refined with the benefit
2) The City of Knox has only recently completed an economic effects study that could provide information to assist the economic appraisal.

8.4 Wider economic benefits

The main reason for building the Rowville rail line is to realise economic, environmental and social benefits, most of which are usually accounted for in a transport user economic appraisal. However these calculations do not fully capture wider effects, which can include:

- **A move to more productive jobs** – the Rowville rail line will make central Melbourne employment more accessible to Rowville rail line area residents. Jobs in that area are more productive (i.e. contribute more to Australia’s Gross Domestic Product) than jobs elsewhere in Melbourne. Added to this, the improved accessibility that the rail line would provide could encourage more productive businesses to locate in the rail line catchments.

- **Agglomeration benefits** – a shift of employment to areas of denser employment results in more flow-on effects as businesses benefit from being in closer proximity to each other. These so-called agglomeration benefits are also typically more significant in major centres like central Melbourne and the Monash University technology precinct.

There are established methods available to estimate these benefits in economic terms. They originate in the UK, where wider benefits have been estimated on major projects for at least the last 5 years. However they depend on detailed information on job productivity that is not readily available, and we have not calculated them at this stage of the study.

Added to the above is the potential for additional development around the Rowville rail stations, which could create more public transport patronage. The additional development could be substantial (and indeed is already anticipated around Monash University, for example), however the quantum of transport user benefits associated with it is difficult to estimate with certainty as it depends on where that development might occur if the rail line was not built. However it too could add significantly to the economic benefits of the project.

The City of Knox’s economic study (undertaken by SGS Economics and Planning and released in June 2012) has estimated that the Rowville rail line could give rise to:

- an additional ~1,350 households and ~1,100 jobs in the area by 2046 (over and above base projections similar to those in Table 1 herein);
- support for about 5,600 jobs in Victoria during its construction; and
- additional annual output (direct and value-added) from the Victorian economy of about $970 million by 2046.

These results suggest that the long-run wider economic effects of building the rail line could be significant. The economic study report should be considered as a possible input to a business case for the rail line in Stage 2 of the study.
8.5 Environmental and social effects

The Environment and Planning Investigation Report presents details of the main environmental and social effects of the rail line, summarised as follows:

- **Surface water** – the eastern end of the route presents some inherent hydrological risk in crossing of watercourses along the Wellington Road corridor; detailed design would need to be carried out in close consultation with Melbourne Water.

- **Groundwater** – management measures would be required during construction of underground sections of the project, including grouting, dewatering, retaining walls and various stabilisation techniques where groundwater is encountered.

- **Ecology** – street trees in Wellington Road provide nesting and feeding sites for birdlife, but the main ecological concerns would be related to the Dandenong Creek Valley and its watercourses, which are known to contain platypus and rare fish (Dwarf Galaxias) with remnant native vegetation (trees and grasses) as well. The Wellington Road alignment would have little overall impact, however.

- **Cultural heritage** – a rail alignment along Wellington and Stud Roads would not present significant risks to known aboriginal or European heritage sites, but ongoing research and monitoring would be required.

- **Contamination** – there are moderate risks of encountering contaminated land and groundwater, especially at Huntingdale (railway land) and generally along Wellington Road. Past and present industrial land uses would require close attention.

- **Noise and vibration** – impacts on residential areas and sensitive commercial/industrial sites (especially the Australian Synchrotron and nearby bio-medical facilities) would need full assessment and mitigation during both construction and operation of the rail line. Track isolation and acoustic barriers would be required on elevated track sections in particular. The rail line would generate different types of noise to existing traffic activity, creating public reaction.

8.6 Initial appraisal

Table 13 provides a summary of the overall results of our initial, high-level appraisal of the Rowville rail line, using a framework based in the objectives of the Transport Integration Act 2010 (TIA).

The appraisal illustrates the effects of the Rowville rail line compared with the consequences of not proceeding.
<table>
<thead>
<tr>
<th>TIA Objective</th>
<th>Sub-objective</th>
<th>Measure(s)</th>
<th>Without Rowville rail line</th>
<th>With Rowville rail line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social and economic inclusion</td>
<td>Improved accessibility to transport in general</td>
<td>Range and quality of transport choices in study area</td>
<td>Limited choice of transport modes to residents and businesses in the area would continue</td>
<td>Rail line would bring significant improvement to transport choices</td>
</tr>
<tr>
<td></td>
<td>Improved access to transport for disadvantaged people</td>
<td>Range and quality of transport choices in study area</td>
<td>Continued dependence on car and/or taxi transport as the main resources for disadvantaged people</td>
<td>Rail line would be designed for full accessibility and would increase transport choices for disadvantaged people</td>
</tr>
<tr>
<td></td>
<td>Reduced community severance</td>
<td>Impact of project on community severance in corridor</td>
<td>Wellington Road and other arterials have some influence on community severance, exacerbated by traffic levels</td>
<td>Rail line and stations would provide increased opportunities to link communities either side</td>
</tr>
<tr>
<td></td>
<td>Improved user information/understanding</td>
<td>None</td>
<td>Public transport primarily bus-based, which is inherently more complex and less easy for users to understand</td>
<td>Rail line would enable cleaner travel options for many travellers, simplifying overall understanding of transport choices</td>
</tr>
<tr>
<td></td>
<td>Improved transport user satisfaction</td>
<td>Results from community engagement polling</td>
<td>Community feedback indicates significant frustration and concern about limited transport choices</td>
<td>Strength of community support for the rail line suggests that user satisfaction would improve considerably</td>
</tr>
<tr>
<td></td>
<td>Improved accessibility to markets for goods and services</td>
<td>None</td>
<td>Access to central Melbourne limited by continuing traffic growth and delays</td>
<td>Rail line would open up the area through direct links to central Melbourne employment and market opportunities</td>
</tr>
<tr>
<td>Economic prosperity</td>
<td>Increased wider economic activity</td>
<td>Agglomeration, labour market and flow-on effects into the economy</td>
<td>Access to Monash employment precinct in particular would be worsened through continuing traffic growth</td>
<td>Rail line would offer significant opportunities to develop Monash employment area and other areas along the route</td>
</tr>
<tr>
<td></td>
<td>Improved value for money (economic viability)</td>
<td>Present value of benefits</td>
<td>Not yet calculated</td>
<td>Not yet calculated</td>
</tr>
<tr>
<td></td>
<td>Improved travel demand</td>
<td>Present value of costs</td>
<td>Base case</td>
<td>Base case</td>
</tr>
<tr>
<td></td>
<td>Improved ports and intermodal facilities and access thereto</td>
<td>Benefit-cost ratio</td>
<td>Not yet calculated</td>
<td>Not yet calculated</td>
</tr>
<tr>
<td></td>
<td>Improved global competitive advantage</td>
<td>Linked to wider economic activity</td>
<td>No appreciable effect</td>
<td>Potential impact from removal of trees in Wellington Road reserve</td>
</tr>
<tr>
<td>Environmental sustainability</td>
<td>Improved biodiversity</td>
<td>Effect on natural areas, flora and fauna</td>
<td>See wider economic activity comments above</td>
<td>See wider economic activity comments above</td>
</tr>
<tr>
<td></td>
<td>Reduced energy use</td>
<td>Transport energy use</td>
<td>Net energy use would be reduced due to the greater energy efficiency of rail</td>
<td>Net energy use would be reduced due to the greater energy efficiency of rail</td>
</tr>
<tr>
<td></td>
<td>Reduced greenhouse emissions</td>
<td>Emissions from transport</td>
<td>Net emissions would be reduced due to the greater emissions efficiency of rail transport</td>
<td>Net emissions would be reduced due to the greater emissions efficiency of rail transport</td>
</tr>
<tr>
<td></td>
<td>Improved response to climate change adaptation</td>
<td>Effect of project on resilience to climate change</td>
<td>Increased flooding incidence from storm events would cause road closures</td>
<td>Provided the rail line could be effectively flood-proofed, it would help keep transport moving during storm events</td>
</tr>
<tr>
<td></td>
<td>Increased protection for green wedges, rural areas and/or public open space</td>
<td>Amount of relevant land affected (either removed or added)</td>
<td>No appreciable effect</td>
<td>Rail line might affect small areas of open land but would mostly be in the median of Wellington Road</td>
</tr>
<tr>
<td>Integration of transport and land use</td>
<td>Reduced travel demand</td>
<td>Change in travel demand (person-km and person-hours) with the project</td>
<td>Reduced net vehicle operating costs (tbc)</td>
<td>Reduced net vehicle operating costs (tbc)</td>
</tr>
<tr>
<td></td>
<td>Reduced private vehicle use</td>
<td>Change in private car use (vehicle-km and vehicle-hours)</td>
<td>Reduced person-km of travel (tbc)</td>
<td>Reduced person-km of travel (tbc)</td>
</tr>
<tr>
<td></td>
<td>Improved access to activity centres, regional cities and/or Central Melbourne</td>
<td>Typical peak period travel times to a selection of relevant places</td>
<td>Rail line would offer reduced travel times to many key destinations including CBD, Monash Uni, Caulfield, etc</td>
<td>Rail line would offer reduced travel times to many key destinations including CBD, Monash Uni, Caulfield, etc</td>
</tr>
<tr>
<td></td>
<td>Improved rural and regional transport</td>
<td>T rail times would increase due to increasing road congestion</td>
<td>Rail line would enable clearer travel options for many travellers, simplifying overall understanding of transport choices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fit with relevant local area objectives or plans</td>
<td>Compatibility with local authority structure plans</td>
<td>Not applicable</td>
<td>Rail line not protected in planning schemes historically but new plans (eg Monash, Stud Park) are accounting for it now</td>
</tr>
<tr>
<td>Efficiency, coordination and reliability</td>
<td>Reduced transport user costs</td>
<td>Transport user costs (vehicle operating costs, PT fares)</td>
<td>Base case</td>
<td>Base case</td>
</tr>
<tr>
<td></td>
<td>Reduced journey times</td>
<td>Average journey times for typical journeys</td>
<td>Base case</td>
<td>Base case</td>
</tr>
<tr>
<td></td>
<td>Increased journey reliability</td>
<td>Reliability of typical or example journeys</td>
<td>Increased travel reliability</td>
<td>Rail line would offer increased travel reliability and reduced travel times over road-based transport</td>
</tr>
<tr>
<td></td>
<td>Improved response to transport disruptions</td>
<td>Reduncancy of the transport network</td>
<td>Over-reliance on road transport increases the sensitivity to disruptions</td>
<td>Rail line would provide an alternative to road transport which improves the redundancy of the transport system overall</td>
</tr>
<tr>
<td>Safety and health and wellbeing</td>
<td>Reduced injuries and fatalities</td>
<td>Transport injuries and fatalities</td>
<td>Base case</td>
<td>Transport accidents would be reduced overall through transfer of trips from road to rail</td>
</tr>
<tr>
<td></td>
<td>Reduced noise/visual impacts</td>
<td>Noise exposure levels at properties</td>
<td>Base case</td>
<td>Increased noise and visual impacts especially where rail line is above ground, subject to mitigation measures</td>
</tr>
<tr>
<td></td>
<td>Improved air quality</td>
<td>Noxious emissions from transport</td>
<td>Increasing noxious emissions and air quality issues due to increasing traffic and delays</td>
<td>Mode shift to rail results in lower emissions overall although effect on air quality may not be significant</td>
</tr>
<tr>
<td></td>
<td>Increased use of healthy transport</td>
<td>Change in walking and cycling passenger-km</td>
<td>Base case</td>
<td>Increased use of public transport would result in more walking and cycling for access, and increased cycling facilities as part of the project would also encourage more cycling</td>
</tr>
</tbody>
</table>
8.1 Conclusions

The positive benefits of the Rowville rail line include potential economic, social and operational benefits, together with wider economic effects and community and stakeholder support. However the full benefits depend critically on other projects (Dandenong line upgrade and the Melbourne Metro Rail Tunnel) proceeding as well, to enable good train services between Rowville and the city. We have not undertaken a benefit-cost analysis at this stage, primarily because the concept design needs refinement before capital costs can be reliably estimated.

Negative effects include added noise, vibration and visual impact, especially where the rail line is above ground on a viaduct; community concern could be significant in this respect. The project would also be disruptive and difficult to build in the busy environment of Wellington Road. It would be important to mitigate these effects as far as possible through sensitive design and construction techniques.
9. Findings and recommendations

9.1 Summary of findings

We summarise the findings of Stage 1 of the study as follows:

- Community consultation confirms that support for a rail line is strong, although many suggestions for alternatives were also made.
- There was also strong support for continued improvement to other public transport in the interim (i.e. before the rail line opens).
- Key stakeholders are generally supportive and are also concerned about local impacts, both positive and negative. Monash University in particular is a strong advocate for the rail line as it will serve existing and future development at the Clayton campus.
- Running Rowville train services direct to the City would require improvements on the Dandenong line from Huntingdale to Caulfield and adds to pressure for rail capacity improvements in central Melbourne as well.
- The Rowville rail line would be a complex engineering project. The details we have outlined are based on minimising the impact on the existing road system.
- Based on the preliminary design concepts, construction of a Rowville rail line is possible but has significant complications due to the surrounding urban environment and the lack of historical protection of a route.
- A key benefit of the Rowville rail line would be to improve public transport access to Monash University Clayton campus and the surrounding employment precinct. It could also be argued that proposed further development in this area should only proceed if such improvements occur.
- The Rowville rail line could generate significant economic benefits to the community; the economic impact study by the City of Knox provides some initial insight into this.
- If the rail line is pursued further it should be recognised that it will likely increase land values and pressure for development, and structure plans for the areas affected should be revised accordingly.

An important issue overall is that the Metropolitan Planning Strategy currently being developed might identify different long term development objectives for the area in the wider context of Melbourne’s future urban form.

The Rowville rail line is dependent on capacity improvements on the Dandenong line and into the city, which are more than a decade away. Therefore interim actions are needed to continue the progress already made in improving public transport in the area whilst the rail improvements are planned and implemented.
9.2 Recommended actions

Our recommendations for the next steps are as follows:

1) A range of measures should be developed to continue improving public transport in the area in the interim period leading up to completion of the Rowville rail line.

2) The Dandenong rail corridor upgrade and the Melbourne Metro Rail Tunnel, upon which the Rowville rail line depends, should be delivered as early as possible.

3) A preferred Rowville rail line project scope should be confirmed in greater detail (taking the comments and submissions made on the Stage 1 Report into account where appropriate) and measures should be put in place as quickly as possible to protect it, using appropriate planning controls.

4) Should the Government proceed further with the Rowville rail line, the next stage of the work should include the following:
   - Conduct more detailed patronage analysis, taking into account future land use and transport changes in line with emerging Government plans and testing the sensitivity of the forecasts to different future assumptions on travel habits and preferences.
   - Establish the business case for the rail line, including a cost-benefit analysis, in the light of these reviews.
   - Assess the wider economic effects of the project, using the results of the economic study by the City of Knox as a starting point.
Appendices

A. Stakeholders consulted

Stakeholder organisations consulted or briefed during the study include:

- Australian Synchrotron
- Bicycle Victoria
- Bus Association of Victoria
- CSIRO
- Department of Planning and Community Development
- Department of Transport
- Eastern Transport Coalition
- Environment Victoria
- Ethnic Communities Council of the South East (ECCOSE)
- Kim Wells MP
- Knox City Council
- Metro Trains Melbourne
- Metropolitan Transport Forum
- Monash City Council
- Monash University
- Nick Wakeling MP
- Public Transport Users Association
- Public Transport Victoria
- Royal Automobile Club of Victoria
- Victorian Council of Social Service (VCOSS)
- VicRoads

We thank all stakeholders and the wider community for their invaluable assistance.

B. List of supporting reports

Supporting reports to this document are as follows:

- Preliminary rail design report
- Travel demand modelling report
- Sustainability considerations report
- Environment and planning investigation report
- Station layout and urban design report
- Public consultation report
- Concept timetabling and operations report
- Report on public submissions on the Draft Stage 1 Report

All these reports are available via our website [www.rowvillerailstudy.com.au](http://www.rowvillerailstudy.com.au)

C. Risk register

A summary risk register has been prepared and provided separately to Public Transport Victoria.