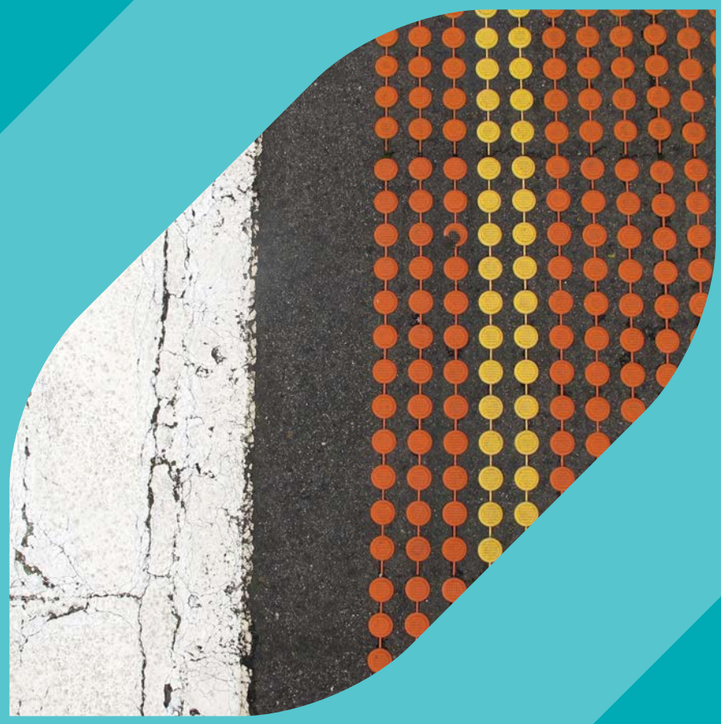
9.0 SUMMARY AND CONCLUSIONS



9.0 SUMMARY AND CONCLUSIONS

9.1 KEY FINDINGS

9.1.1 RAPID TRANSIT CORRIDOR THEME

Preferred Rapid Transit Alignment—Rapid Transit 1 (RT1)

The preferred Rapid Transit Alignment would commence at the current Doncaster Park-and-Ride facility, which would become a major transport interchange. The current DART bus service would terminate at this location and significant additional parking would be provided for road users. The rail alignment would then follow the Eastern Freeway corridor, using the central median where possible, before passing under the city-bound Eastern Freeway carriageway and connecting with the existing rail network to the north of Collingwood station.

New stations would be located at the Doncaster Park-and-Ride and along the Eastern Freeway near Bulleen Road and the Chandler Highway. The connections at Collingwood and beyond would use current rail and station infrastructure. The alignment accommodates the potential East-West Link and the Melbourne Metro Project, enabling all three projects to be developed independently.

There would be approximately 10 kilometres of rail running at surface level and two kilometres located in tunnels, all of which could be constructed using standard construction methods. The disproportionately high cost of tunnelling from the Doncaster Park-and-Ride to Doncaster Hill and the requirement for a deep underground station at this location makes this extension difficult to justify, with our modelling suggesting that only around 600 additional walk-up customers would use this station during the two-hour morning peak period if it were provided. Revised DART services could instead provide a high frequency (around two minute peak hour intervals), reliable and rapid connection from Doncaster Hill to the Doncaster Park-and Ride station for all other users.

Patronage

Modelling for the year 2031 suggests that this service could attract around 56,000 passengers per typical week day, with a maximum load of around 7,000 passengers per hour in the peak period. To put this in context, patronage is expected to be higher than the Glen Waverley line, a line that is slightly longer and has more stations than the proposed Doncaster rail line but provides a similar population density. At the assumed service level of 12 trains per hour, this represents around 600 passengers per train. This is well within the capacity of existing rail technology. With more trains, the service could comfortably deliver over 10,000 passengers per hour.

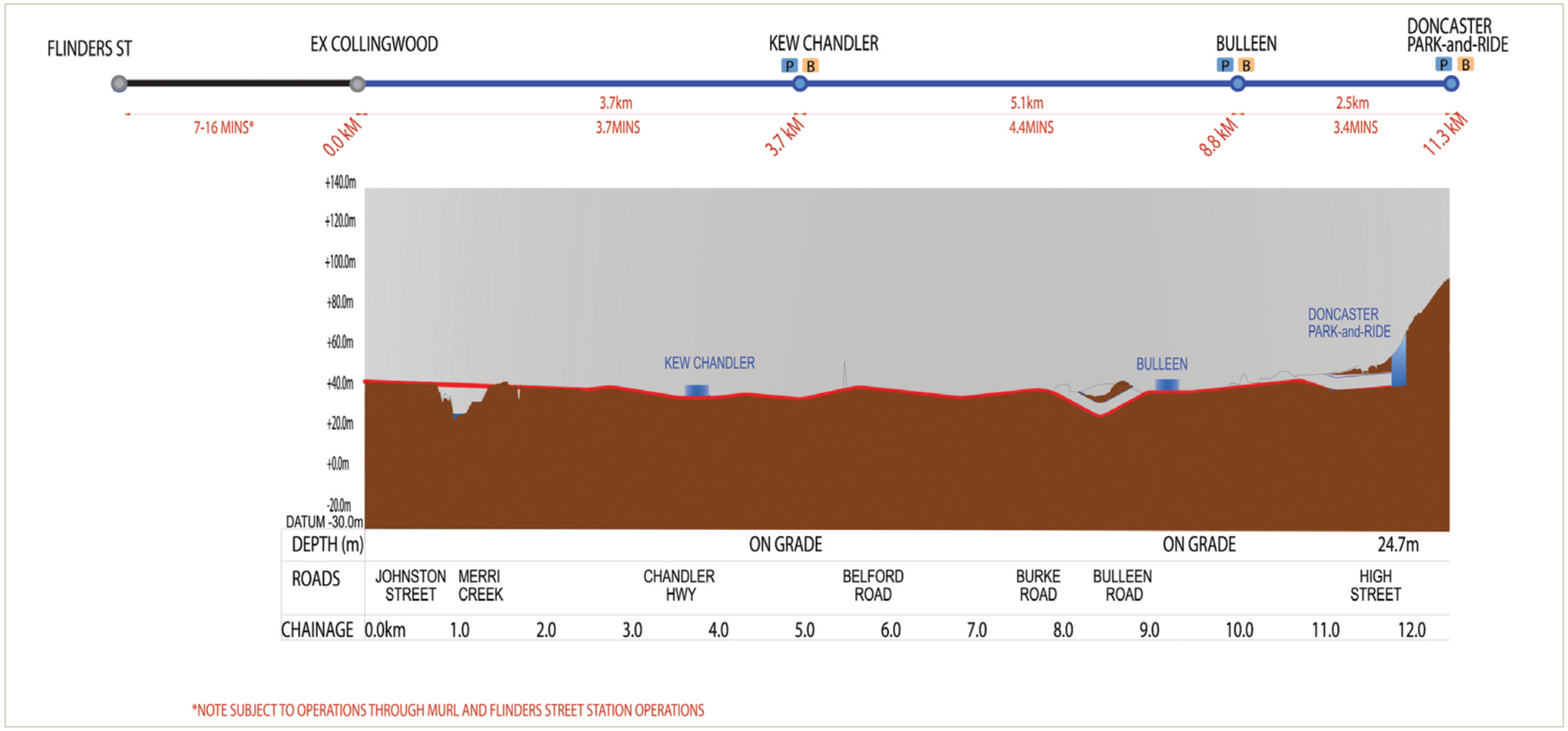


Figure 9-1: The preferred alignment—Collingwood to Doncaster Park-and-Ride

Patronage modelling suggests a very high demand for parking at stations along this route. For example, car parking at the Doncaster Park-and-Ride station, if completely unconstrained, could attract more than 6,500 parked cars on any week day. The current Doncaster Park-and-Ride car park accommodates around 400 vehicles. Similarly, new stations near Bulleen Road and Chandler Highway could attract around 500 cars each day.

Clearly, providing car parking to service this massive demand is not feasible and more work is required to determine the optimal additional car parking that should be provided, alongside the provision of additional connecting public transport services like buses, which would reduce car dependency. However, our analysis suggests that a constraint on car parking will inevitably reduce the attractiveness of any rail option.

Land Use Change

Due to the location of the stations along the Eastern Freeway reservation, we do not expect there to be significant land use change in the study corridor. There is simply not enough land available, or existing housing stock that might attract development within easy walking distance of these stations.

Any multi-storey car parking development at stations along the route could ultimately be transformed into residential apartments if demand permits. However, in the short to medium-term, commuters would be expected to remain car-dependent, albeit making much shorter trips to get to stations rather than their final destination.

Community and Stakeholders

The strongest community support for this option is from within Manningham, with a common recognition that the Eastern Freeway central median was always intended for a rail alignment. While there is a strong desire for the rail alignment to continue along Doncaster Road or even further east, the lack of any available corridor, relatively steep topography and declining density of housing makes the expense of tunnelling and underground stations difficult to justify. Manningham residents value their DART bus service, with evidence of very significant growth in DART bus patronage. Concerns regarding additional noise from rail are acknowledged, as is the potential for land acquisition for construction or additional car parking.

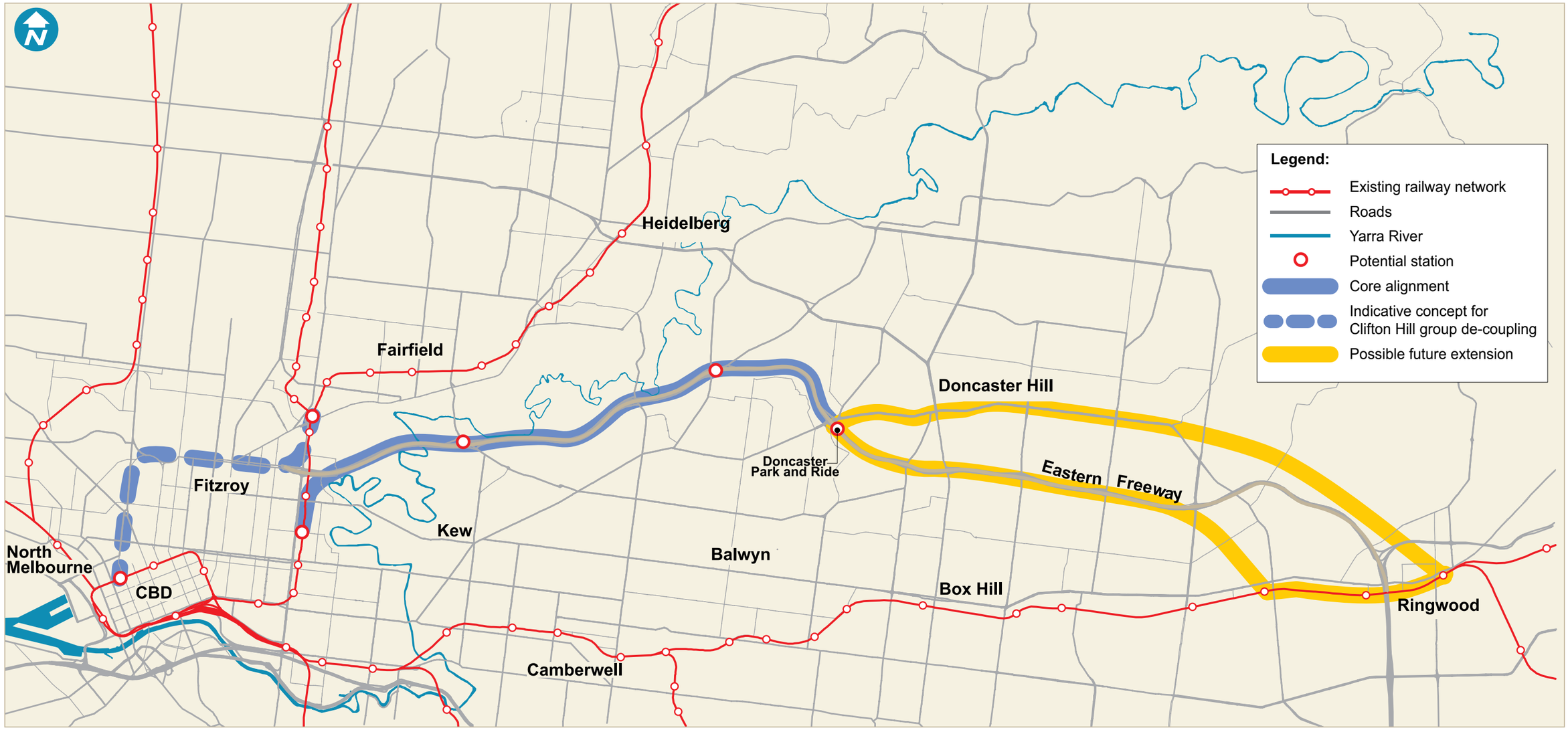


Figure 9-2: The preferred alignment—Rapid Transit Option

9.1.2 LOCAL ACCESS CORRIDOR THEME

Preferred Local Access Alignment—Local Access 1 (LA1)

The preferred Local Access Alignment commences at the current Doncaster Park-and-Ride, which would become a major transport interchange with the current DART bus service terminating at this location. Significant additional parking would be provided to attract commuters from the Eastern Freeway. Broadly following Doncaster Road, High Street and Victoria Street/Victoria Parade to the CBD, this alignment would be located entirely in tunnels, with a number of underground stations located along the alignment.

This option would represent around 14 kilometres of tunnel and eight new underground stations. Construction would consist of two parallel tunnels, with stations constructed underground to minimise surface impacts. The stations would require some local land acquisition.

Due to the high cost of tunnel construction, underground stations, land acquisition and compensation, the cost of this alignment is very high. From an engineering perspective it is technically feasible to construct using standard technology, however on a unit cost per kilometre of heavy rail, this alignment would be prohibitively expensive and as such this option can not be the preferred option. As noted in section 7.7, using an alternative 'metro style' rolling stock in smaller tunnels could significantly reduce construction costs and further work should be undertaken to ascertain if the benefits of this option could be accrued for significantly less cost using such technologies.

Patronage

Modelling for the year 2031 suggests that this service could attract around 76,000 passengers per typical week day, the highest patronage of all alignments considered. We forecast around 5,500 city-bound passengers per hour in the peak period and a strong counter peak flow, with nearly 3,500 passengers per hour heading outbound in the same period. Kew Junction is a particularly attractive destination, with around 1,500 passengers expected to egress from this station in the peak hour.

Land Use Change

Providing a high-quality, high-frequency CBD rail service through this already developed corridor would provide a catalyst for transformational land use change. This would enable the population growth within these municipalities to be concentrated in and around station locations, consistent with the Local Government structure plans and policies. Our analysis suggests that an additional 80,000 people could be attracted to live within walking distance of the stations along this route by 2031, in itself generating an additional 7,000 trips per day over and above the 76,000 modelled. Concentrating population growth in and around station locations will help preserve the neighbourhood character and amenity in the remaining parts of the municipality. Community feedback reinforced the importance of this.

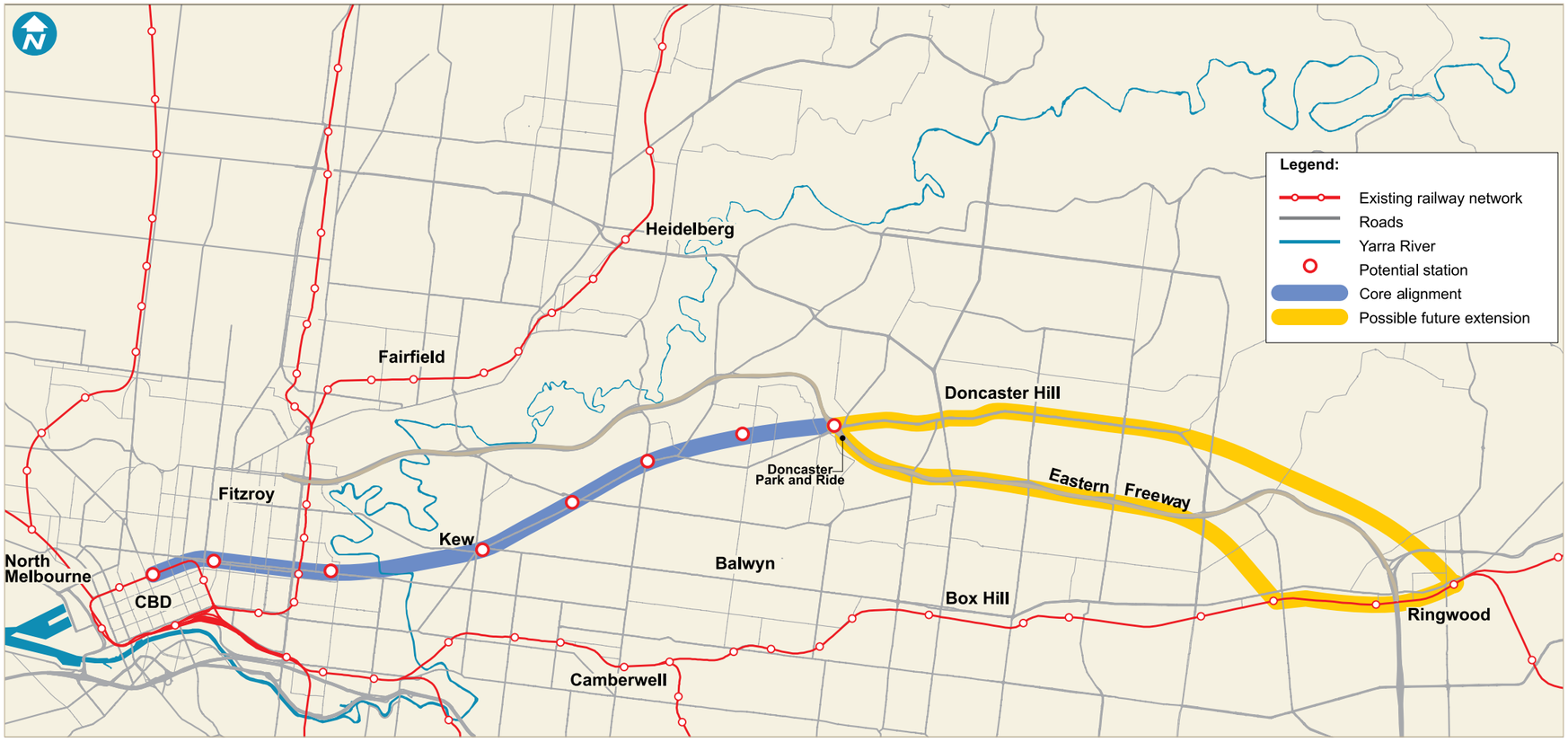


Figure 9-3: The preferred Local Access Option

Community and Stakeholders

There is strong recognition from the community that this option would ultimately delivery the most benefits including attracting the most customers, encouraging higher public transport use and stimulating land use change. Generally, feedback reflected concerns on the likely high construction costs and questioned why the use of this alignment is required when there is already a tram servicing a similar route.

9.1.3 NETWORK IMPLICATIONS

Our forecasts highlight a strong growth in public transport mode share for city-bound trips across Melbourne. Currently, around 48 per cent of all city -bound trips are made on public transport and this is forecast to grow to 66 per cent by 2031. The physical number of trips undertaken on public transport was around 310,000 per week day in 2011 and is estimated to grow to nearly 600,000 per week day in 2031.

Conversely, the number of city-bound private vehicle trips is forecast to slightly decline, from around 335,000 trips per weekday in 2011 to 295,000 in 2031. While city-bound vehicles are forecast to decline, congestion across the Melbourne road network is forecast to become worse. The average modelled network travel speed for all trips is expected to reduce from 42.3 kilometres per hour in 2011 to 39.1 kilometres per hour in 2031.

The current DART service carries over 10,000 passengers daily and demand is growing strongly. Our modelling suggests that virtually all of the expected growth in city-bound trips will be on buses and not in cars, provided that DART continues to add more buses as demand requires. All of our heavy rail options effectively transfer this bus patronage to the new train line, however we expect negligible further forecast mode shift from car to train.

9.2 PREFERRED ALIGNMENT

9.2.1 RAPID TRANSIT OPTION

An alignment based upon the Rapid Transit 1 (RT1) Option, providing a connection from the Doncaster Park-and-Ride to the CBD, using the Eastern Freeway alignment and connecting to Collingwood station, has been found to be the most viable of the route options considered.

Capacity constraints imposed by the current configuration of the Clifton Hill group must be addressed, however, before a rail connection to Doncaster could work effectively.

Even without a rail connection to Doncaster, we believe that the Clifton Hill group will reach capacity and require de-coupling, i.e., the separation of the South Morang line from the Hurstbridge line, at some point in the medium to long-term. Providing a dedicated rail line from South Morang to the CBD enables the Hurstbridge and Doncaster lines to be combined with adequate capacity to provide a frequent, reliable rail service with long-term growth potential.

The high costs of tunnelling and limited additional patronage lead us to conclude that a connection to Doncaster Hill is not warranted at this stage. The current DART bus services should instead be reconfigured to feed the new Doncaster Park-and-Ride station. DART would provide a connection between Doncaster Hill and the park-and-ride at a peak frequency equating to a bus every two minutes.

There is overwhelming local community and public support for a rail connection to Doncaster, with the speed, frequency and reliability of service being the most important operating characteristics to those who provided us with feedback. The Rapid Transit Theme has the highest levels of support of the three under consideration, with 61 per cent of respondents rating this as their first choice.

Compared to the current DART bus service, travel time from the Doncaster Park-and-Ride to the CBD would reduce from the current 35 minutes to around 25 minutes. Assuming a peak hour frequency of 12 trains per hour (i.e. a train every five minutes), this service is forecast to attract around 56,000 daily boardings in 2031. For relative comparison, this exceeds the forecast patronage on the Glen Waverley line at this same time.

WHY RAPID TRANSIT 1?

Rapid Transit 1 is our preferred heavy rail alignment from Doncaster to the CBD because:

- In the medium to long-term, the Clifton Hill group requires de-coupling to create a new dedicated CBD access for the South Morang line regardless of any options considered for Doncaster. Doing this creates an ideal opportunity to connect a new Doncaster rail line to this group near Collingwood Station, providing adequate train paths for a fast, frequent and reliable service with capacity for growth.
- This alignment can deliver most of the patronage and travel time benefits of Local Access 1 (LA1) Option, at about half the cost.
- The prohibitive cost (estimated to be close to $1 billion) of extending a tunnel from the Doncaster Park-and-Ride station to Doncaster Hill for a relatively very small number of passengers is not justifiable, particularly when these same passengers would have access to a fast bus service to the same park-and-ride station.

WILL A FUTURE DONCASTER RAIL LINE BE AFFECTED BY EAST WEST LINK?

Proceeding with the East West Link project will not preclude the future construction of a Doncaster rail line.

East West Link and a Doncaster rail line are considered to be compatible projects and serve complementary transport functions. A future Doncaster rail line will provide CBD access for public transport customers while the East West Link project will deliver a city bypass for both private vehicles and freight traffic.

Based on the current East West Link reference design, the proposed additional traffic lanes along the Eastern Freeway between Hoddle Street and Yarra Bend Road (highlighted in green in Figure 1-7) would be constructed within the existing freeway boundary, and would utilise the existing freeway median.

The Doncaster Rail Study Team worked closely with the Linking Melbourne Authority in developing possible rail alignments, to ensure both projects would be compatible. The Doncaster rail alignment moves out of the freeway median at a more easterly point to ensure both projects can be designed and constructed independently; however, there is no significant additional cost associated with this more easterly deviation.

Importantly, East West Link itself provides opportunities to enhance the future use of the DART service to provide shorter term improvements to DART journey time and service reliability along the Eastern Freeway.

9.3 RECOMMENDATIONS FOR STUDY DURING PHASE TWO

9.3.1 FURTHER ANALYSIS OF THE PREFERRED ALIGNMENT OPTION

The study team has identified the following areas where it is believed that further work should be undertaken to develop the preferred alignment based on the RT1 Option described previously in this report:

- Selectively update the demographic data to include the information from the 2011 census where this was not originally available, including a review of the Journey to Work data to ensure it remains consistent with the VITM assumptions modelled.
- More work is required to understand the South Morang de-coupling requirements including:
  - A better and more detailed understanding of the patronage demand along this group of rail lines in the short, medium and long term.
  - A better and more detailed understanding of the rail operational capacity constraints and limitations of the lines, as well as the options for providing additional capacity including High Capacity Signalling or alternative rolling stock.
  - Exploration of the optimal allocation of available train paths between South Morang/Hurstbridge and a potential Doncaster rail line to determine the timing and need to invest in the comprehensive de-coupling and
  - An evaluation of options for a new South Morang alignment, including potential new station locations, interfaces with the existing rail network, costs, benefits and timing.
- A variation to the RT1 Alignment should be considered that would exit the Eastern Freeway median near Chandler Highway and follow an alternative alignment to a connection with the Hurstbridge line near Fairfield station. A future interchange with the de-coupled South Morang line could then be provided at Clifton Hill station, offering the potential benefit of a faster connection that services the strong demand for the Parkville area.
- Consideration should be given to the opportunity to enhance the future use of the DART bus service along the Eastern Freeway, including opportunities to integrate with the East West Link project to improve journey time and travel time reliability.
- Further work is required to ensure a frequent bus connection and the level of service and traffic capacity between Doncaster Hill and the Park-and-Ride facility where the preferred alignment terminates.
- Further assessment of required local public transport service modifications should be undertaken to determine services required to feed the stations. This would include public transport integration with the preferred alignment, particularly focusing on tram routes 48 (North Balwyn) and 72 (Camberwell). A forecast of the likely impact that this would have upon patronage numbers should also be developed.
- Additional work is required to assess how car parking at each of the stations would work, including calculation of realistic car park provisions for each location.
- Re-assess the need for a station at Burke Road that includes consideration of the additional travel time against the added patronage benefits this would offer.
- More specific engineering along the Eastern Freeway alignment should be undertaken, alongside further work around station locations to determine a right-of-way boundary, enabling the protection of the preferred alignment rail corridor. This would involve undertaking the planning and obtaining the approvals to secure the land reservation.
- Opportunities should be explored that would allow the Hurstbridge and Doncaster rail lines to be combined into a stand-alone rail group, thereby enabling a potential design-construct-operate-maintain Public-Private-Partnership to effectively facilitate investment from the private sector.
- An economic evaluation should be undertaken that includes costs, benefits and wider economic benefits of this option to support potential funding submissions.

9.3.2 ALTERNATIVE WAYS TO DEVELOP THE LOCAL ACCESS 1 OPTION

The LA1 Option provides the highest patronage, has the shortest travel times, facilitates long-term transformational land use change potential, is independent of the Clifton Hill group capacity constraints and has the greatest potential for long-term growth in both patronage and service levels. However, being fully underground solution, it is prohibitively expensive. We believe that many of these benefits could be delivered for less cost by using smaller rolling stock in smaller tunnels, shorter and more frequent services with smaller stations, driverless trains and modern signalling.

For these reasons, the study team believe the following additional work should be undertaken in Phase Two of this study.

- Opportunities should be explored that use alternative rolling stock with modern rail technology (e.g. driverless trains) to reduce both capital and operating costs. This would provide an understanding of the benefits of a more frequent rail service (albeit with a smaller capacity per vehicle)
- Mechanisms for capturing the land value uplift and development contributions should be explored to help support station developments
- Opportunities should be explored that could facilitate the delivery of LA1 through a design-construct-operate-maintain type Public Private Partnership to effectively facilitate private sector funding and development for a new Doncaster rail line
- An economic evaluation should be undertaken that includes costs, benefits and wider economic benefits of this option, and a comparison made with the updated work on RT1.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