Melbourne Metro Rail Project

MMR-AJM-UGSY-RP-CC-000009

South Yarra MM Platforms – Technical Options Study

MMRA

21 September 2015

Revision: P5

Reference: CMS332569

CONFIDENTIAL

Aurecon Jacobs Mott MacDonald
in association with Grimshaw

AJM Joint Venture

Document control record

121 Exhibition Street

Melbourne VIC 3000

PO Box 23061 Docklands VIC 8012 Australia

A person using AJM JV documents or data accepts the risk of:

a) Using the documents or data in electronic form without requesting and checking them for accuracy against the original hard copy version.

b) Using the documents or data for any purpose not agreed to in writing by AJM JV.

Document control						
Report title		South Yarra MM Platforms – Technical Options Study				
Document ID		MMR-AJM-UGSY-RP-CC-000009		**Contract No.**	CMS332569	
File path		http://cs.au.aurecongroup.com/cs/llisapi.dll/open/135712606				
Client		MMRA		**Client contact**	Daniel Cullen	
Rev	**Date**	**Revision details/status**	**Prepared by**	**Author**	**Verifier**	**Approver**
P1	16 March 2015	Draft Issue	M Stone	M Stone	P Stevens	D Anderson
P2	12 May 2015	Issue	M Stone	M Stone	P Stevens	D Anderson
P3	09 June 2015	Revised Issue – Title Adjusted	M Stone	M Stone	P Stevens	D Anderson
P4	25 August 2015	Revised Issue	M Stone	M Stone	P Stevens	D Anderson
P5	21 September 2015	Revised Issue	M Stone	M Stone	P Stevens	D Anderson
Current revision		**P5**				

Approval			
Author signature		**Approver signature**	
Name	Mark Stone	**Name**	David Anderson

Contents

Appendices

Executive summary

As part of the Melbourne Metro (MM) Rail Project, Melbourne Metro Rail Authority (MMRA) has instructed the AJM Joint Venture (AJM JV) to undertake an options study for the provision of dedicated Melbourne Metro platforms at or within proximity to the existing South Yarra Station to enable passengers to access rail services to the CBD travelling via the new Melbourne Metro rail tunnel.

The purpose of this study is to consider station location options with regard to a number of factors including: the cost differential between Melbourne Metro South Yarra Station platforms options and the project baseline (no station at South Yarra), customer experience, infrastructure required to support options, land acquisition impacts and a high level description of planning strategies including planning approval requirements. It should be noted that this study provides a comparative assessment only with no specific recommendation of a preferred outcome.

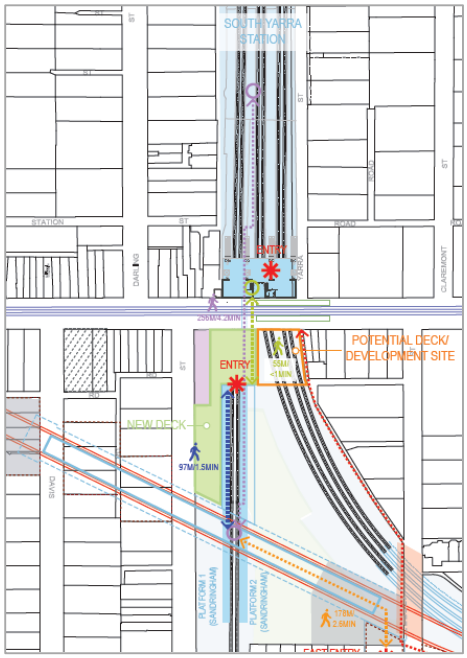
Options – Station and Alignment

The study relates to the development of concept general arrangement options for the provision of two new platform faces at South Yarra associated with the new Melbourne Metro lines connecting to the existing Dandenong rail lines south of South Yarra Station.

Each option is based on platform faces, suitable to accommodate a 234m long train. This approach preserves the opportunity to accommodate a 210m long train. The platform location for each of the options is shown in Figure 0-1.

The key features of each option are outlined in Table 0-1 over.

Platform location Options 1 and 2



Platform location Options 3 and 4

Figure 0-1Platforms locations

Table 0-1 Options Investigated

Heading	Description
Option 1 – 2010 Alignment	• Provision of autonomous MM platforms located to the west of the existing South Yarra Station and south of Toorak Road • Track work is limited to the west of Chapel Street • No Paid to Paid connection between MM platforms and existing South Yarra Station (e.g. it is necessary to leave the paid zone to transfer between MM and the existing platforms).
Option 2 – "Flipped" Rail Arrangement	• Broadly similar to Option 1 but with the provision of rail/ rail grade separation located between South Yarra and Caulfield to allow Dandenong line and Frankston line tracks to swap alignment position to achieve a different track arrangement at the tunnel entrance. • No Paid to Paid connection between MM platforms and existing South Yarra Station
Option 3 – Unconstrained Chapel Street Option (north)	• Provision of MM platforms which are integrated with new relocated Sandringham platforms south of Toorak Road • The track geometry is not constrained by the existing Chapel Street road over rail bridge • East of Chapel Street, land impacts are predominantly to the north side of the rail reserve • Impact to the Jam Factory loading dock and car park access from Palermo Street • Paid to Paid connection provided between MM platforms and existing South Yarra Station
Option 4 – Unconstrained Chapel Street Option (south)	• Broadly similar to Option 3 but with land impacts to the east of Chapel Street predominantly limited to the south side of the rail reserve • Impact to Jam Factory loading dock and car park access from Palermo Street • Paid to Paid connection provided between MM platforms and existing South Yarra Station

Strategic and Land Use Planning

A review of relevant planning documents has highlighted the following items which are likely to influence future station outcomes at South Yarra.

Table 0-2 Strategic Planning Considerations.

Planning	Potential Impact
Planning Scheme Amendment C172	Rezoning of land within the Toorak Road/ Chapel Street Activity Centre which includes the area to the south of Toorak Road (currently Public Use Zone 4 Transport). Within the new Activity Centre Zone, the use of land for a railway station is prohibited.

The City of Stonnington's Structure Plan (Chapel revision), associated with Planning Scheme Amendment C172, has a number of strategic aspirations for the local area including the provision of new public space over the existing rail reserve to the south of Toorak Road, opposite the existing South Yarra Station, and also to the west of Chapel Street. The plan additionally proposes the

provision of an improved connection between Toorak Road and Chapel Street. Options 3 and 4 provide the greatest alignment with these aspirations.

Station Options

Four options to provide dedicated MM platforms at South Yarra have been investigated. These options have considered a range of criteria including passenger, stakeholder and community impacts and construction impacts.

It should be noted that all costs reported in this document are the cost difference (cost delta) between the project baseline, no station at South Yarra, and the relevant options. Costs are presented as raw costs (e.g. excluding risk and contingencies), P50 costs, P90 costs and nominal P90 costs. Nominal cost estimates include an escalation rate to reflect the future value of capital. Given the level of design work undertaken, nominal P90 cost estimates are considered the most appropriate figure to inform decision making.

Two station locations are identified for the four options; One station, which is common to Options 1 and 2 and another station, which is common to Options 3 and 4. These are discussed below.

Options 1 and 2

Options 1 and 2 both provide a station option located south of Toorak Road and 140m to the west of the existing South Yarra Station. Neither provide a paid to paid interchange connection with the existing South Yarra Station. Passengers are required to cross Toorak Road at street level to move between the two stations. This is not considered ideal from a customer experience/ connectivity perspective. It should be noted that a subterranean connection may be possible between the new platforms and the existing South Yarra Station. However, this has not been investigated as part of this study and any such underground connection would further increase the cost of these options.

Option 1 is estimated to have a nominal P90 total cost delta of $700 million. Option 2 is estimated to have a nominal P90 total cost delta of $808 million. The most significant difference between Option 1 and Option 2, from a cost perspective, is the provision of a rail/ rail grade separation at Caulfield.

Option 1 requires the demolition of the William Street Bridge (consistent with the project baseline). Due to raised track levels it is unlikely that the bridge can be reinstated for vehicular access. This will impact on local access including neighbouring residential and commercial properties. A pedestrian bridge is assumed at this location and has been costed as part of this report. Option 2 also requires the demolition of the William Street Bridge but it is possible to reinstate the bridge, albeit at a raised level. Reinstatement requires the regrading of William Street south of the rail reserve and is likely to impact access to require residential properties in this area or require additional land acquisition. Option 2 also requires substantial rail infrastructure and minor road works near Caulfield to provide a rail/ rail grade separation.

The station location, for both options, requires the acquisition of a number of properties, abutting the southern side of Toorak Road and in both Davis Avenue and Osborne Street, in order to construct the station box.

Options 3 and 4

Options 3 and 4 provide for a fully integrated South Yarra Station with access from MM platforms to the existing South Yarra Station platforms within the paid zone. From an interchange perspective this is preferable over Options 1 and 2. Options 3 and 4 provide access to the station from Chapel Street via Arthur Street, providing significant catchment benefits compared to Options 1 and 2.

Both Options 3 and 4 require the demolition and reconstruction of the existing Chapel Street Bridge. This requirement is likely to impact the broader Chapel Street commercial precinct during construction.

A major differential between Options 3 and 4 is the scope of land impacts to the east of Chapel Street. Option 3 impacts predominantly on land to the north of the existing rail reserve; this includes a multi-level storey apartment building recently completed on the former Surrey Road Council Depot. Option 4 impacts predominantly on land to the south of the existing rail reserve; this includes the Jam Factory commercial development. It should be noted that both options impact on properties located to the north of the rail reserve and south of Palermo Street. Access to the Jam Factory loading dock and car park from Palermo Street will also be impacted by both options.

Option 3 is estimated to have a nominal P90 total cost delta of $958 million. Option 4 is estimated to have a nominal P90 total cost delta of $970 million. Option 4 involves a higher construction cost estimate as it requires partial rebuild of the northern edge of the Jam Factory. Option 3 requires permanent acquisition of a recently completed apartment building.

Summary

A summary of the differences between the proposed options is presented in Table 0-3 over.

A qualitative assessment of the options relative to each other has been undertaken using the Project Evaluation Framework. The key differentials are considered to be cost, customer experience and disruption.

In terms of cost Option 1 has the lowest construction and land cost estimate at $494 million and $206 million respectively. Costs increase through Option 2, Option 3 and Option 4.

Options 1 and 2 do not provide a direct paid to paid interchange between MM platforms and existing South Yarra Station platforms. Options 3 and 4 provide a direct paid to paid interchange which is considered preferable from a user perspective. Options 3 and 4 have the ability to increase the catchment of the station through the provision of a William Street entry. Again, from a user perspective this is considered preferable to Options 1 and 2.

Both Options 1 and 2 and Options 3 and 4 have varying impacts on residential properties, open space and commercial businesses.

Table 0-3 Options Summary

Consideration		Option 1 2010 Base Station Case	Option 2 Flipped Station Option	Option 3 Unconstrained Chapel St Station Option (North)	Option 4 Unconstrained Chapel St Station Option (South)
Construction Cost Delta (2015 $)		$335M	$395M	$427M*	$442M*
Land Acquisition (2015 $)		$131M	$144M	$213M	$200M
Total (2015 $)		$466M	$539M	$640M	$642M
Total P50 (2015 $)		$553M	$640M	$750M*	$751M*
Total P90 (2015 $)		$615M	$711M	$838M*	$849M*
Total P90 (Nominal)		$700M	$808M	$958M	$970M
Interchange Time		• Centre of Frankston platform to centre of MM platform: 400m/ 6.6 mins. • Centre of Sandringham platform to centre of MM platform: 390m/ 5.9 mins. • Gate line to gate line: 180m/ 3 mins.		• Centre of Frankston platform to centre of MM platform: 256m/ 4.2 mins. • Centre of Sandringham platform to centre of MM platform: 97m/ 1.5mins. • Gate line to gate line: 55m/ <1min.	
Speed		40 km/hr (on all lines)	45 km/hr (MM) 45 km/hr (Up V/Line/ freight) 50 km/hr (Frankston and Down V/Line/ freight)	50 km/hr (MM) 45 km/hr (V/Line/ freight) 50 km/hr (Frankston)	50 km/hr (MM) 45 km/hr (V/Line/ freight) 50 km/hr (Frankston)
Number of Station Entries		2	2	3	3
William Street Bridge		Unlikely to reinstate vehicular access (as per project baseline). Assumes pedestrian bridge provided.	Likely to reinstate but at a higher level. Potential impacts to surrounding properties.	Reinstated in current alignment.	Reinstated in current alignment.
Chapel Street Bridge		No impact		Demolished and reinstated with a second span. Disruption impacts to Chapel Street commercial precinct.	
Surrey Road Bridge		No impact		Bridge widened to include additional two tracks.	
Normanby Road, Caulfield North		No impact	Rail/ rail grade separation requires closure of road under rail connection between Normanby Road and Dandenong Road.	No impact	No impact
Customer Experience	Interchange/ Connectivity	• No Paid to Paid connection between MM and existing platforms.		• Direct interchange between platforms within the paid zone. • Good connectivity between MM and Sandringham line.	
	Travel Experience	• Creates two stations which may lead to commuter confusion for non-regular users. • Long walk times for interchange movements.		• Two entries for station, either side of Toorak Road, with third entry on William Street. • William Street entry provides full access to the MM platforms and South Yarra Station within the paid zone. • William Street entry increases the catchment of the station and improves access to the Chapel Street precinct, subject to a suitable urban design treatment.	
	Transport Integration	• Opportunity to relocate tram interchange to a position between the two station entries. • Engineering challenge to provide pedestrian crossing and tram stop.		• Improved opportunity to connect to No.78 Chapel Street tram.	
	Safety	• Passenger safety, reliant on surface (Toorak Road) connection, requiring interchange passengers to cross Toorak Road.		• Passenger interchange undertaken in a station environment e.g. no road interface.	
Land Use	Supports Land Use Policy	• Consolidated development site on Toorak Road provides opportunity for transport orientated development (by others).		• Potential opportunity to enhance Chapel Street precinct. • Decking west of Chapel Street provides an opportunity for over site development and integration between station entry at William Street and Chapel Street (by others).	
Stakeholder Impacts	Land Acquisition	• Requires acquisition of 82 titles, over 37 properties, when compared to the project base case.	• Requires acquisition of 97 titles, over 47 properties, when compared to the project base case.	• Requires acquisition of 239 titles, over 47 properties, when compared to the project base case. • Access to Stables Lane and Hopetoun Grove materially impacted.	• Requires acquisition of 94 titles, over 41 properties, when compared to the project base case. • Partial acquisition of Jam Factory.

Consideration		Option 1 2010 Base Station Case	Option 2 Flipped Station Option	Option 3 Unconstrained Chapel St Station Option (North)	Option 4 Unconstrained Chapel St Station Option (South)
	Business Disruption during Construction	• Impact on Toorak Road commercial precinct.		• Impact on Chapel Street commercial precinct. • Impact on Jam Factory loading dock and car park access from Palermo Street.	• Impact on Chapel Street commercial precinct. • Impact on Jam Factory building plus an impact on loading dock and car park access from Palermo Street.
	Local Access / Local Infrastructure Impacts	• Local access issues associated with William Street Bridge removal (consistent with project baseline). Assumes a pedestrian bridge is provided.	• Reinstatement of William Street Bridge at higher level. Likely to impact on local residential access. • Rail/ rail grade separation at Caulfield requires closure of Normanby Road.	• Chapel Street Bridge works over a long timeframe (e.g. approximately 1 year). To maintain local access a half/ half construction methodology is desirable to retain tram and local access.	
	Broader Precinct Impact	• Broad impact on Toorak Road commercial and adjoining residential precinct to the south.	• Broad impact on Toorak Road commercial and adjoining residential precinct to the south. • Rail/ rail grade separation at Caulfield will remove many existing trees along the embankment and bring tracks closer to adjacent properties.	• Broad impact on Chapel Street commercial precinct. • Additional tracks on Surrey Road Bridge will result in tracks being closer to adjacent properties.	
	Community Assets	• Visual impact of Frankston line and V/Line Up flyover. E.g. tracks raised 2m from existing. • Lovers Walk, may not be possible to re-instate.	• Visual impact of V/Line flyover. • This option has least impact on Lovers Walk (e.g. unaffected by construction). • Visual impact of Caulfield rail/ rail flyover.	• Opportunity to create of a pedestrian link along south side of rail reserve connecting to Chapel Street. • Lovers Walk, may not be possible to re-instate.	

* Option 3 and 4 – P90 real cost estimate for decking (by others) on either side of Chapel Street Bridge has been estimated at $40M and decking at Toorak Road has been estimated at $7M.

1 Introduction

1.1 Overview

As part of the Melbourne Metro (MM) Rail Project, Melbourne Metro Rail Authority (MMRA) has instructed the AJM Joint Venture (AJM JV) to undertake an options study into providing dedicated Melbourne Metro platforms at or within proximity to the existing South Yarra Station to enable passengers to access services to the CBD travelling via the new Melbourne Metro rail tunnel or via Richmond, Flinders Street and the City Loop. This report documents this study and contains the following sections:

- Section 1 – Introduction
- Section 2 – Baseline Concept
- Section 3 – Strategic and Land Use Planning
- Section 4 – Options Considered

1.2 Purpose

The purpose of this study is to consider achievable station location options and arrangements to provide:

- A high level understanding of the cost differential between the proposed station options and the project baseline, no station at South Yarra
- A high level understanding of the location of the station and rail alignment and infrastructure required to achieve the station location
- An understanding of any land impacts associated with the proposed options
- A high level description of planning strategies including planning approval requirements
- This study provides a comparative assessment only with no specific recommendation of a preferred outcome

1.3 Options

The following options (refer to Table 1-1 over) were investigated.

Table 1-1 Options Investigated

Heading	Description
Option 1 – 2010 Alignment	Provision of new Melbourne Metro lines and new platforms (for a 234m long train) arrangement 140m to the west of the existing South Yarra Station and south of Toorak Road. In this option track modifications are constrained to the west of Chapel Street.
Option 2 – "Flipped" Rail Arrangement	Broadly similar to Option 1 but with rail works to include the provision of grade separated rail/ rail cross-over structure located between South Yarra and Caulfield stations to allow the Dandenong line to swap onto the existing Frankston line alignment and the Frankston line to swap onto the existing Dandenong line alignment to achieve a modified track arrangement at South Yarra.
Option 3 – Unconstrained Chapel Street (north)	Provision of new platforms positioned under new Sandringham line platforms relocated to the south of Toorak Road, suitable for a 234m long train. In this option track modifications are not constrained to the west of Chapel Street allowing the MM platforms to be located in a position that provides optimal connectivity to the existing South Yarra Station platforms. This may involve a significant interface with Chapel Street commercial precinct. In this option land impacts, to the east of Chapel Street, are predominantly limited to the north side of the rail reserve. Access to the Jam Factory loading dock and car park from Palermo Street is impacted.
Option 4 – Unconstrained Chapel Street (south)	As per Option 3 but with land impacts predominantly limited to the south of the rail reserve.

All options investigated preserve the opportunity to accommodate a 210m long train as a 234m long train has been used for the development of the options.

Both Options 3 and 4 are considered unconstrained options; the track geometry for these options is not limited by the existing Chapel Street road over rail bridge. This results in land impacts to the east of Chapel Street, adjacent to the rail corridor, but provides for the optimal location of MM platforms to achieve a direct interchange with new Sandringham platforms located to the south of Toorak Road and Frankston line platforms retained within the existing South Yarra Station.

Drawings of the four options are included in Appendix A. Each option has been assessed against a Project Evaluation Framework that has been developed for the Melbourne Metro Rail Project (MMRP). This assessment is included in Appendix B.

The four options have been developed based on the following desired operational outcomes:

- Straight platforms
- 234m trains
- Minimum platform width of 3m
- Equitable access for all users

2 Baseline Concept

2.1 Concept Summary Report 2015

The 2015 Concept Summary Report (CSR) has a tunnel portal only at South Yarra, which will connect the MM tunnels to the existing surface tracks without the creation of platforms to service the MM line at South Yarra. The Eastern Portal arrangement is presented below in Figure 2-1.

Opportunities for passengers to connect to the MM service occur at Caulfield and Melbourne Central/ CBD North for the Frankston line only, and at Flinders Street Station/ CBD South Station, for both the Frankston line and Sandringham line.

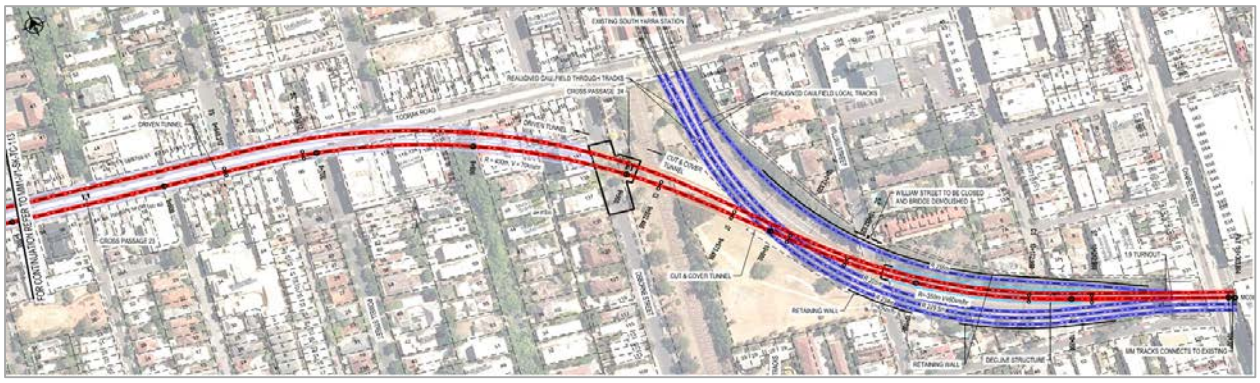


Figure 2-1 South Yarra - Eastern Portal

2.2 Previous Investigations

The creation of dedicated MM platforms at South Yarra Station has previously been considered. An arrangement was developed and documented in the 2010 Concept Development Report (CDR). This arrangement is illustrated in Figure 2-2 below.

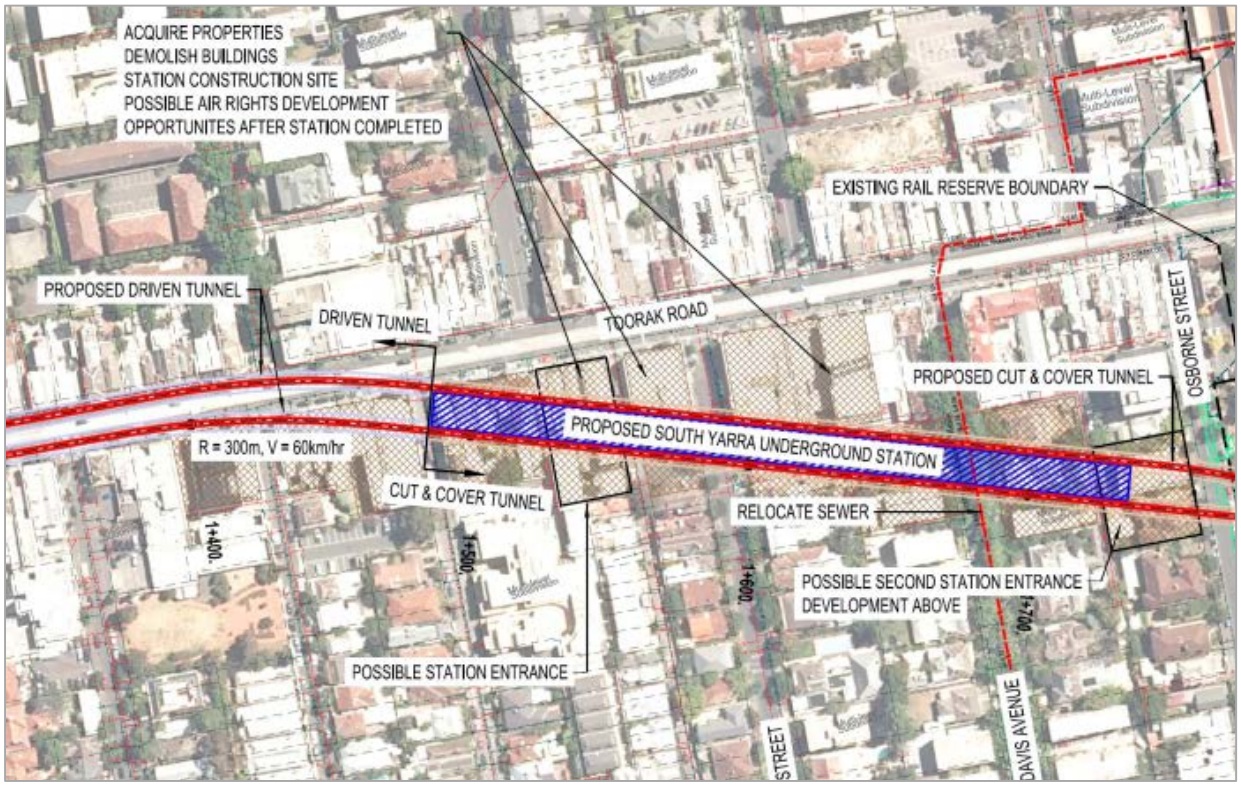


Figure 2-2 2010 CDR MM South Yarra Station Option

In this option, the station box was located to the south of Toorak Road to avoid open cut construction (and major disruption) across Toorak Road. The station would be constructed in open cut, with the rail alignment to the east of the platforms passing under the existing Sandringham lines and connecting to the existing Dandenong Up and Down tracks on the west side of Chapel Street. This is a similar point of connection to the current baseline (CSR 2015) MM alignment e.g. no station solution. This option did not provide a direct paid to paid passenger interchange.

A 2012 memo “Alternative North Melbourne Alignment with inclusion of South Yarra Station” also considered the provision of dedicated MM platforms at South Yarra. The provision of an underground station to serve MM, located under the existing Sandringham line was considered as part of this investigation. This included the relocation of the Sandringham platforms to a position directly above the new MM underground station. The primary benefit of this option was the creation of a direct paid link between the underground MM station and the relocated Sandringham platforms. This arrangement is shown on Figure 2-3.

A notable impact associated with the 2012 station option alignment was the need to connect the new MM rail alignment east of the Chapel Street road bridge, in the rail corridor between the Jam Factory and Hawksburn Station.

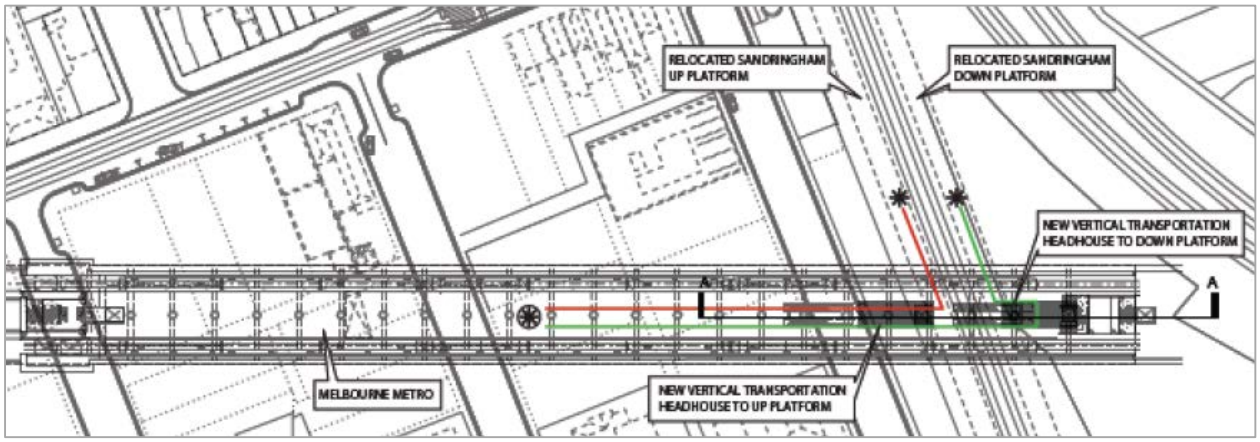


Figure 2-3 New South Yarra Underground Station (MM Platforms) including relocated Sandringham Platforms

These two concepts have informed the development of options in this report.

3 Strategic and Land Use Planning

3.1 Overview

A summary of the key items from the Stonnington Planning Scheme is presented in Appendix C. This includes the following items.

- State Planning Policy Framework
- Local Planning Policy Framework
- Zones, overlays and other planning provisions

In addition to the existing policy and provisions of the Stonnington Planning Scheme, there are also a number of Planning Scheme Amendments which are currently being considered by Council or are under review by Planning Panels Victoria. These Planning Scheme Amendments are presented in Appendix C and summarised as follows:

- Amendment C172 – rezoning of land within the Toorak Road / Chapel Street Activity Centre which includes changing Lovers Walk from its current zoning of Public Use Zone 4 (Transport) to Public Park and Activity Zone (PPRZ). Within the new Activity Centre Zone (ACZ), the use of land for a railway station is prohibited.
- Amendment C204 – application of the local Heritage Overlay to 21 William Street, South Yarra. This site directly adjoins the rail reserve

Planning considerations specific to each option are discussed in the next section.

4 Station Options Considered

4.1 Option 1 – 2010 Alignment Base Station Case

4.1.1 Overview

This scheme includes the provision of new straight platforms (suitable for a 234m long train) arrangement at South Yarra Station.

In this option, track alignment modifications are constrained to the west side of Chapel Street. This constraint is driven by the decline grade of the portal and tunnel structure, which in turn limits track geometry, meaning that the station box cannot be constructed under the existing Sandringham line, reducing the connectivity between the new station and the existing South Yarra Station.

Land acquisition, south of Toorak Road, to build the station requires the acquisition of a number of properties, abutting the southern side of Toorak Road and in both Davis Avenue and Osborne Street, in order to construct the station box.

4.1.2 Station Arrangement

This option investigates the potential location for a new station entry to service dedicated Melbourne Metro underground platforms, located on the south side of Toorak Road 140m to the west of the existing South Yarra Station. A new north facing 'village square' is also proposed immediately adjacent to this new station entry.

The station entrance has been relocated to the north-west corner of Davis Avenue to avoid any impact to the Her Majesty's Apartments residential development, which is currently under construction.

The station box is arranged in an island platform configuration suitable for a train length of 234m.

The intent of the City of Stonnington's *Chapel reVision* document is addressed including maintaining the existing sight lines to the former Post Office building from Toorak Road and Yarra Street and provision of a village square along Toorak Rd albeit not in Council's desired location.

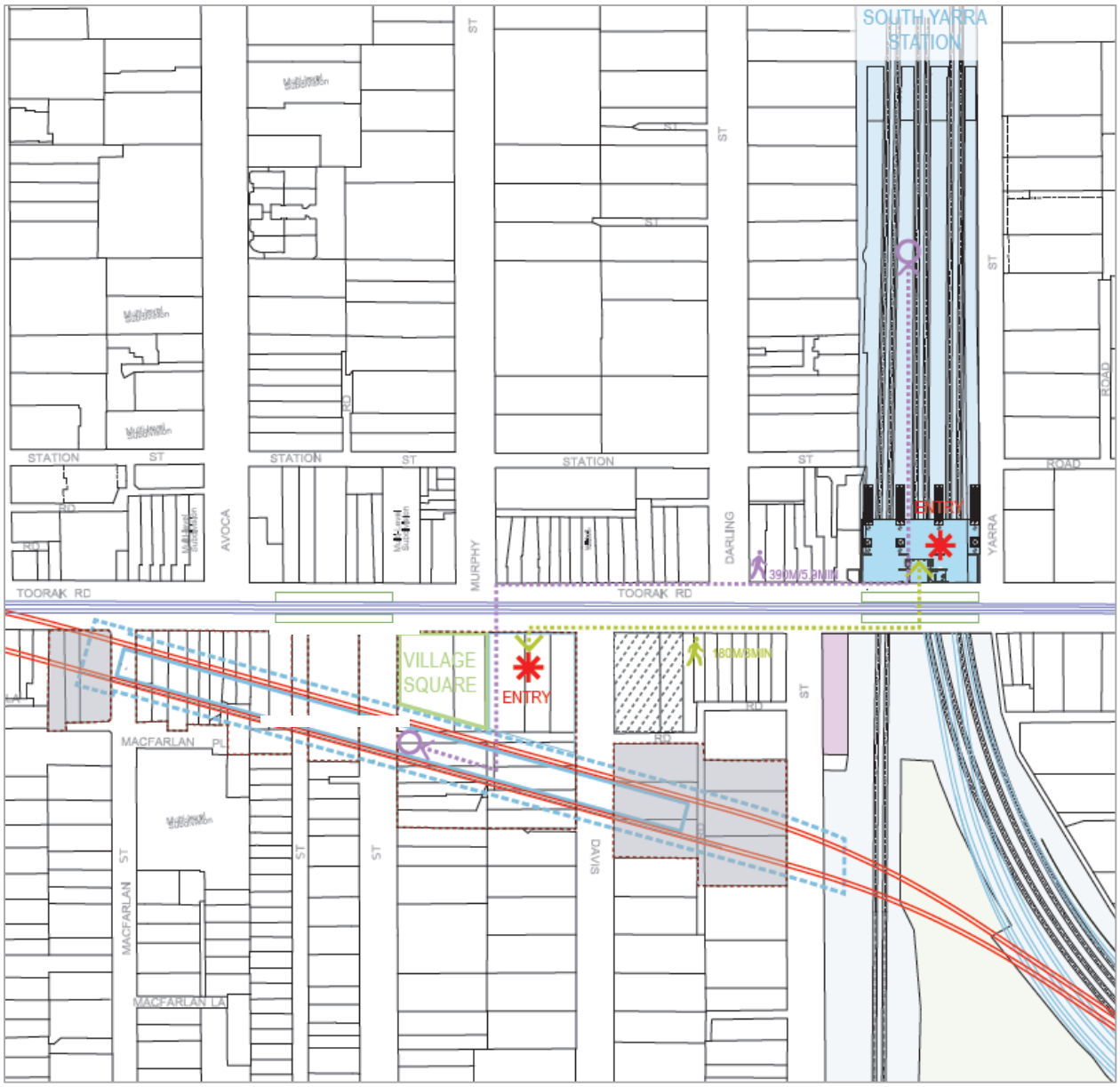


Figure 4-1 Option 1 Station Arrangement

4.1.3 Customer Experience

A 140m travel distance from the existing station entrance to the new station entry along Toorak Road would result in increased interchange times between MM platforms and other lines serviced by South Yarra Station (Sandringham and Frankston lines), when compared to the current configuration where all platforms are within the one station. Visual connection between the two stations is not achievable. It is possible to integrate the connection of the two station entries with a relocated and enhanced tram stop on Toorak Road. This arrangement would promote more efficient interchange between modes. It should be noted that the provision of a new tram stop is not included in the cost estimate for this option.

Quality way finding and station legibility are critical for a favourable customer experience particularly with regard to the separated nature of the station entries. Transfer times between various modes of transport may increase overall travel times if passengers are waiting to cross Toorak Road resulting in low customer satisfaction. The introduction of interchange passengers to street level may result in congestion with other pedestrians utilising the street.

The travel distance and time for the following travel paths are provided below.

- Centre of Frankston platform to centre of MM platform: 400m/ 6.6 mins
- Centre of Sandringham platform to centre of MM platform: 390m/ 5.9 mins
- Gate line to gate line: 180m/ 3 mins

4.1.4 Network Operations

A graphical representation of rail operations for this option is shown below in Figure 4-2.

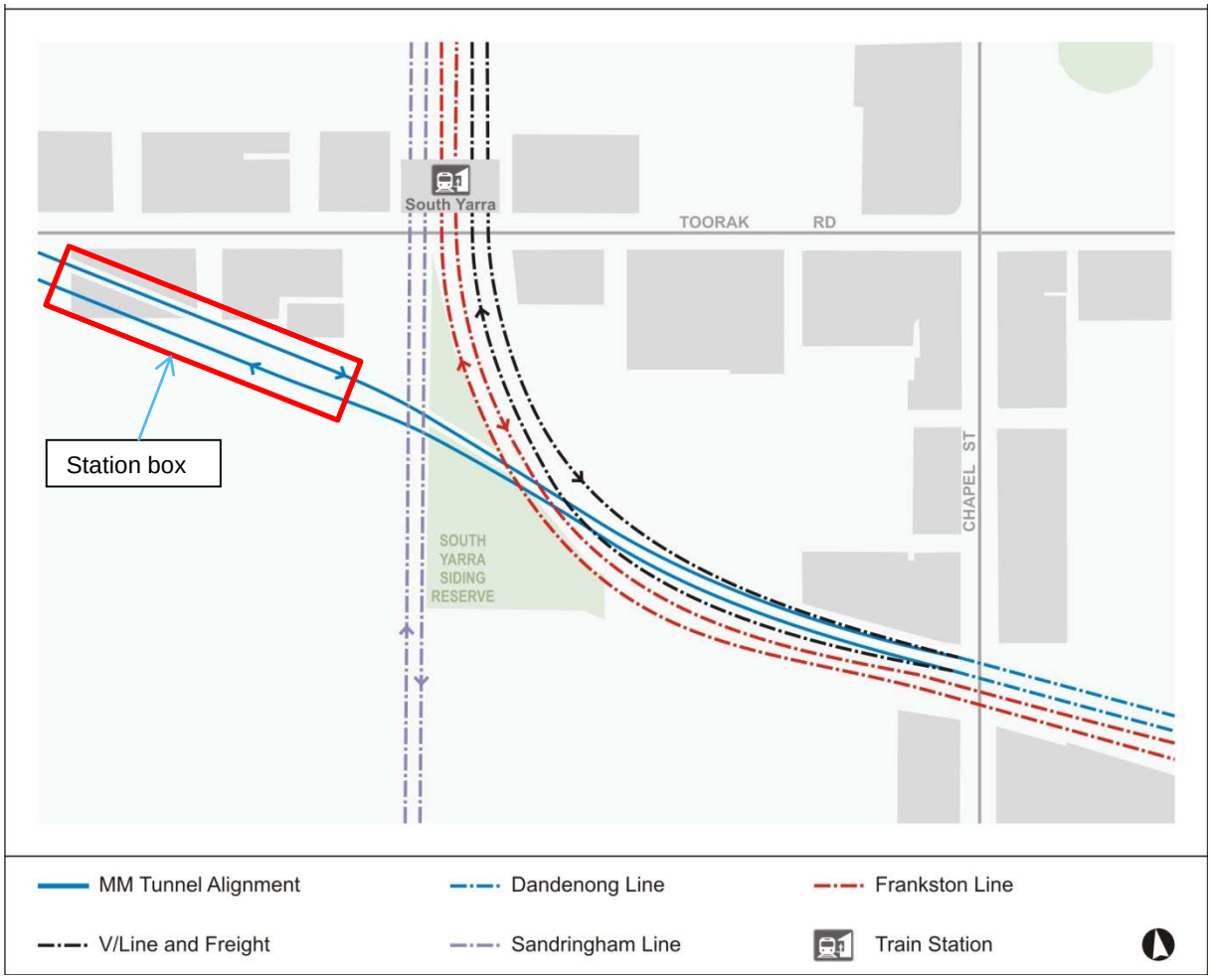


Figure 4-2 Option 1 Rail Operations

V/Line and Freight Services

Dandenong line Up and V/Line / freight Up trains continue with the MM tracks until the west side of Chapel Street where the MM trains separate to head into the tunnel. The Up V/Line/ freight alignment travels over the top of the MM tracks on the approach into Platform 5 at the existing South Yarra Station.

Down V/Line/ freight travel though Platform 6 at the existing South Yarra Station. A tangential 1 in 15 turnout connects it to the MM eastbound track before Chapel Street.

Operational Speed

The operational speed of each line is summarised below in Table 4-1. It should be noted that all lines currently operate at 50km/hr.

Table 4-1 Operational Speed – Option 1

Track	Operational Speed	Constraint
MM tracks	40 km/hr	Horizontal curvature restricting speed.
V/Line/ freight	40 km/hr	Horizontal curvature restricting speed.
Frankston tracks	40 km/hr	Horizontal curvature restricting speed.

This option limits work to between Chapel Street and Toorak Road, maintaining Chapel Street and the Jam Factory as the existing rail corridor imposes significant constraints on horizontal geometry for the resultant design.

Network Resilience

Should there be an incident requiring closure of the MM tunnel, the turnouts and double track connection into South Yarra allows MM trains to be run into the existing South Yarra Station or alternatively, all the way into Flinders Street. This may require platform extensions at surface stations to facilitate MM rolling stock. It should be noted that this scenario also applies to the project baseline.

Due to constrained rail geometry, restricting track work to the west of Chapel Street, the proposed MM station box cannot be constructed under the Sandringham line, reducing the connectivity of the new MM and existing South Yarra Station platforms.

The connections between the Up and Down V/Line / freight tracks and the eastbound and westbound MM tracks is achieved using 1 in 9 tangential turnouts at the western edge of Chapel Street bridge. These turnouts are rated for a 45km/h diverge speed, which is higher than the adjacent radius rail speed.

The MM tracks require a steep decline grade in conjunction with lifted Frankston line and V/Line/ freight Up tracks (approximately 2m at William Street road bridge) in order to achieve the level difference to facilitate a rail/ rail crossing. Raising the Frankston and V/Line / freight tracks creates vertical clearance issues with William Street road bridge. The lift in the realigned tracks makes the reinstatement of vehicular traffic on William Street road bridge unlikely. A pedestrian/ cycle bridge is to be constructed to maintain community pedestrian connectivity.

Construction staging, to maintain rail operations, will be difficult as all tracks are affected and there is limited space to create a works zone safely clear of rail traffic.

South East Rail Link

To the immediate west of Chapel Street this option creates a six track rail corridor. This is compatible with the future aspiration of the South East Rail Link. Should this option be preferred further investigation should be undertaken to ascertain the cost and land acquisition impacts along the corridor to the east of Chapel Street.

Figure 4-3 Option 1 Track Arrangement

4.1.5 Planning Considerations

Land fronting Toorak Road is within the Commercial 1 Zone, with land to the rear in Powell Street, Davis Avenue and Osborne Street in the General Residential Zone 12. Toorak Road is a Road Zone, Category 1 and is managed by VicRoads. Land fronting Toorak Road is generally commercial with varying heights. Upper stories are used for office and residential use. The streets behind Toorak Road are residential in nature with built forms ranging from 1/ 2 stories interspersed with blocks of flats of varying ages and built form. This area forms part of the Prahran/ South Yarra and Windsor Activity Centre.

A railway is an 'as of right' use with a railway station and associated buildings and works being allowable in the Commercial 1 Zone and the Road Zone, Category 1. Within the General Residential Zone 12, a railway station, which is defined as a transport terminal in the planning scheme, is currently prohibited.

The South Yarra Sidings and the Osborne Street Reserve are within the Public Park and Recreation Zone, where a railway is a Section 2 use requiring a planning permit. The Sidings are Crown land, reserved for public purposes. Council is the manager of the land. All roads, apart from Toorak Road, are managed by Council.

The rail corridor itself is in the Public Use Zone 4 – Transport, where railway uses are 'as of right'. Lovers Walk, to the western edge of the GRZ1, is also currently within this zone.

The current zoning is shown below in Figure 4-4.

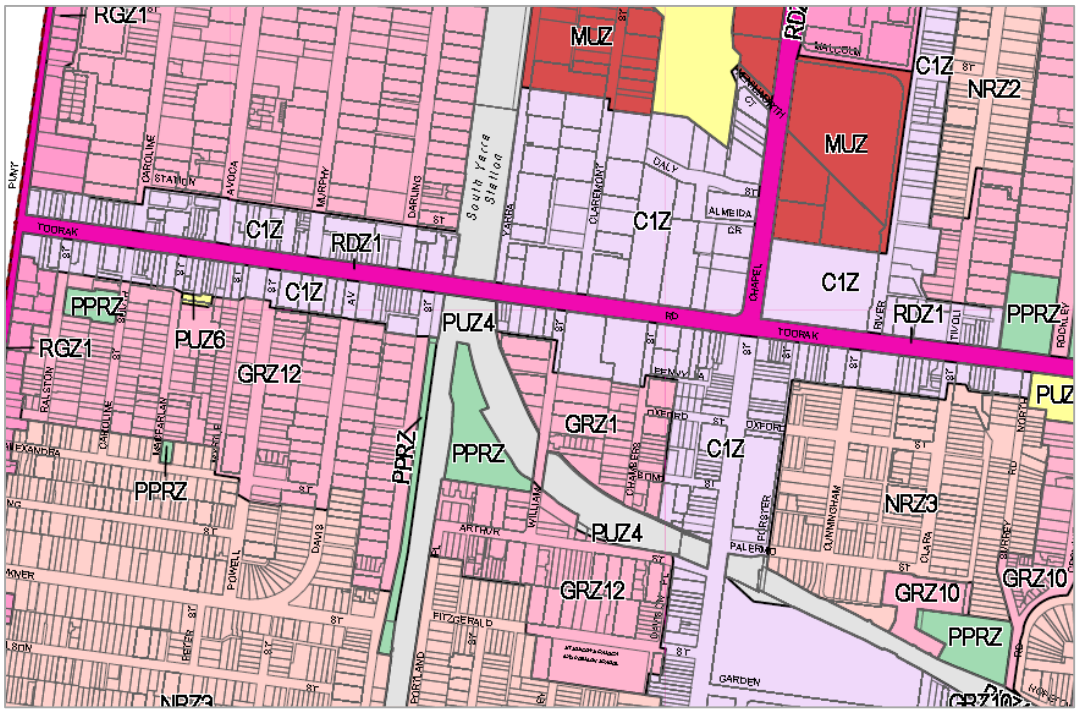


Figure 4-4 Current Zoning

4.1.6 Property/ Stakeholder Impacts

The number of properties required to be acquired with this option is 37 allotments which are comprised of 82 titles. Property impacts are presented in Figure 4-5 below.

Land acquisition drawings are provided in Appendix D.

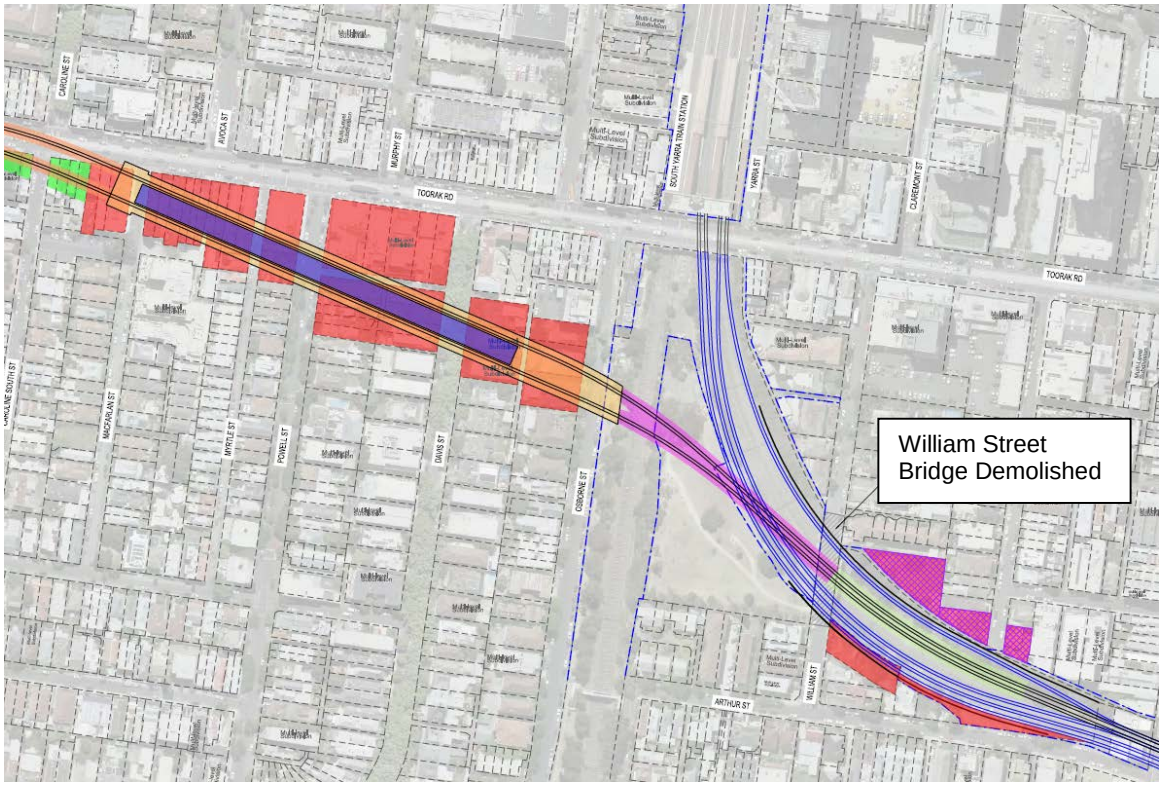


Figure 4-5 Option 1 Land Acquisition

4.1.7 Constructability

Enabling Works

Initial works will consist of piling down from the surface for the retaining walls on the south side of the proposed corridor between Chapel Street and midway between William Street and Osborne Street. Once the piling is in place, the excavation of sections of the southern side would commence, working down to the new track levels.

Occupations of the Up Frankston track will be needed to allow construction of the southern retaining wall through to Chapel Street.

With the southern wall built and track formation works complete, the Frankston tracks can be realigned onto their new alignment, and the Dandenong tracks slewed across to provide work space on the northern side for construction of the new retaining wall and track formation on that side.

MM Tunnel

Access for the northern wall is likely to be from William Street north, down a construction ramp, or works could be staged to build the MM tunnel under the realigned Frankston and Dandenong tracks to provide access from South Yarra Sidings Reserve and William Street south.

Piling on the northern wall has limited access from the top of the walls and additional properties may need to be acquired to provide piling access from the top of the wall.

With the northern retaining wall constructed, the Down Dandenong track can be temporarily relocated on to the ultimate alignment of the Down V/Line / freight track. Construction can then commence on the decline structure in between the live tracks with access via the MM tunnel into South Yarra Sidings reserve.

Construction of the tunnel is likely to be via staged cut and cover works, using piling in occupations and temporary track slews to create small work zones for cut and cover construction.

Construction access into South Yarra Sidings Reserve is likely to be via a temporary bridge over the Sandringham lines from Osborne Street. Construction access ramps will then be built to serve the construction of the declines and portal as well as for access under the realigned Dandenong Up track for construction of the eastbound MM track and the retaining walls between it and the down Dandenong track. Post construction the bridge between Osborne Street and South Yarra Siding Reserve could be utilised by the community to provide an additional connection to the reserve.

Construction traffic onto Osborne Street through to the connecting major roads will need careful consideration in terms of hours of access and disruption to local amenity. This option requires construction in the Caulfield area which will have local impacts.

Finalisation of MM Tracks

Once the tunnel is complete it would be used for construction access in between the tracks to build the decline structure. Final works near Chapel Street will require occupations to allow excavation, and track construction.

Whilst the William Street Bridge may not be able to be reinstated with vehicular access, it is assumed that a pedestrian bridge is provided. South Yarra Sidings Reserve can then be reinstated and provided with an improved landscape with improved community amenity.

4.1.8 Cost

A cost difference estimate which compares the proposed option against the project baseline, no station at South Yarra, has been developed. Separate construction and land acquisition raw costs have been estimated (e.g. excluding risk and contingency adjustments), as well as total P50 and P90 cost values for the year 2015 and a nominal P90 cost. These values are presented in Table 4-2 below.

The following items should be noted:

- No allowance for upgrade of existing South Yarra Station
- No allowance for business disruption (Toorak Road)
- No allowance for a tram stop upgrade on Toorak Road
- Assumes William Street Bridge reinstated as a pedestrian bridge

Table 4-2 Option 1 Cost Estimate

Option	Construction Cost Delta (2015$)	Land Acquisition Cost Delta (2015$)	Total Delta (2015$)	Total Cost Delta P50 (2015$)	Total Cost Delta P90 (2015$)	Total Cost Delta P90 (nominal)
Option 1 – 2010 Base Station Case	$335M	$131M	$465M	$553M	$615M	$700M

4.2 Option 2 – Flipped Arrangement

4.2.1 Overview

This option is broadly similar to Option 1, but rail works include the provision of a grade separated rail/ rail cross-over structure located between South Yarra and Caulfield stations to allow the Dandenong line to swap onto the existing Frankston line alignment and the Frankston line to swap onto the existing Dandenong line alignment.

In this option, the track alignment is constrained to the west of Chapel Street. Once again, the track geometry constrains the location of the station.

4.2.2 Station Arrangement

This option investigates the potential location for a new station entry to service dedicated Melbourne Metro underground platforms, located on the south side of Toorak Road 140m to the west of the existing South Yarra Station. A new north facing 'village square' is also proposed immediately adjacent to this new entry.

The station entrance has been relocated to the north-west corner of Davis Avenue to avoid any impact to Her Majesty's Apartments development, which is currently under construction.

The station box is arranged in an island platform configuration with a straight platform suitable for a 234m long train.

The City of Stonnington's *Chapel reVision* document is addressed including maintaining the existing sight lines to the former Post Office building from Toorak Road and Yarra Street and provision of a village square along Toorak Rd albeit not in Council's desired location.

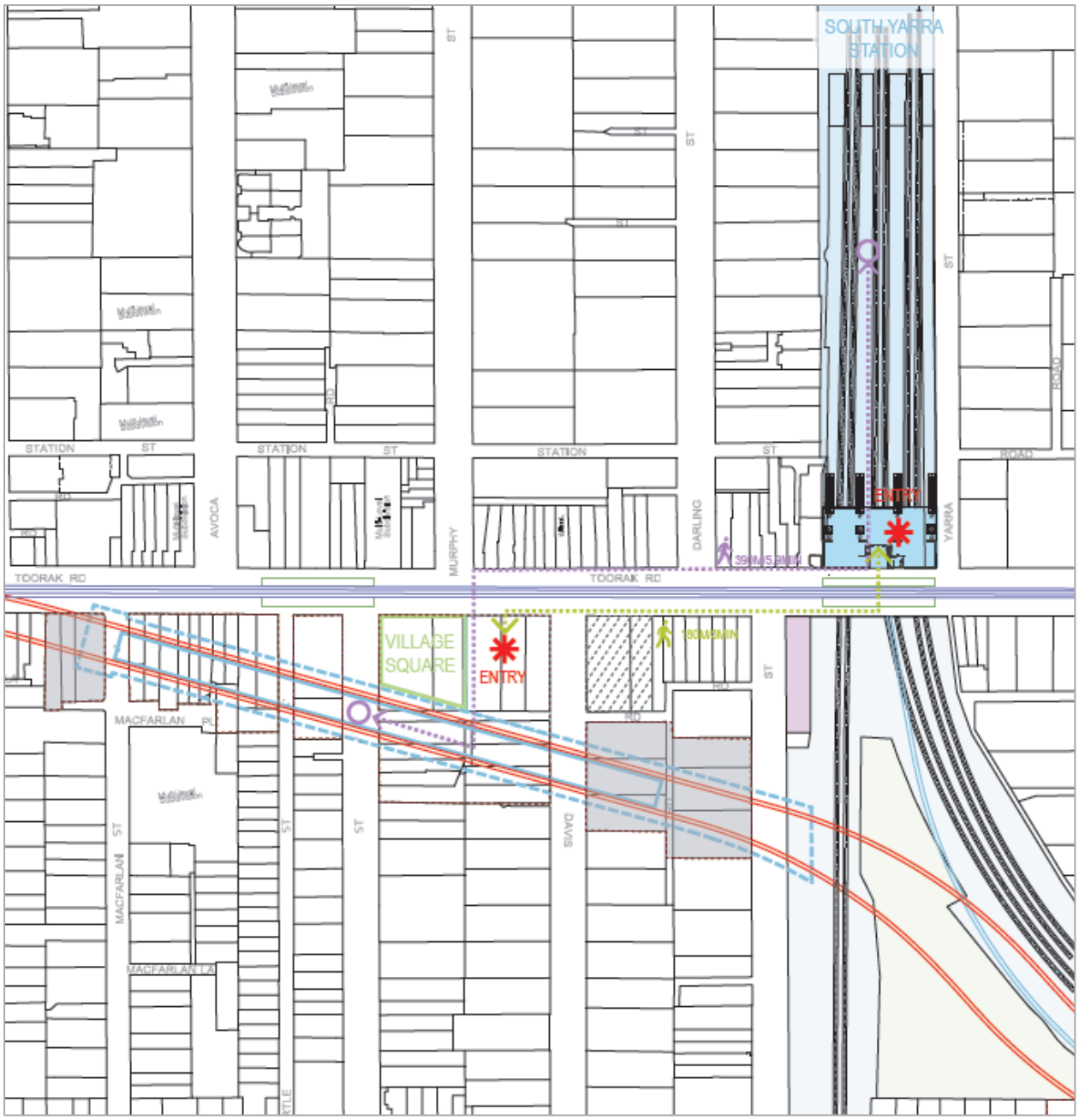


Figure 4-6 Option 2 Station Arrangement

4.2.3 Customer Experience

This option creates a 140 metre separation distance between the existing South Yarra Station entrance and the new MM station entrance along Toorak Road. This would result in increased transfer/interchange times and may be difficult to locate visually. It may be possible to integrate the connection of the two station entries with a relocated and enhanced tram stop on Toorak Road promoting more efficient interchange between modes. It should be noted that the provision of a new tram stop is not included in the cost estimate for this option.

Quality way finding and station legibility will be critical to create a favourable customer experience particularly with regard to the separated nature of the station entries. Transfer times between various modes of transport may increase overall travel times if passengers are waiting and could lead to low

customer satisfaction. The introduction of interchange passengers to street level may result in congestion with other pedestrians utilising the street.

The travel distance and time for the following travel paths are provided below.

- Centre of Frankston platform to centre of MM platform: 400m/ 6.6 mins
- Centre of Sandringham platform to centre of MM platform: 390m/ 5.9 mins
- Gate line to gate line: 180m/ 3 mins

4.2.4 Network Operations

Figure 4-7 is a graphical representation of rail operations in this option.

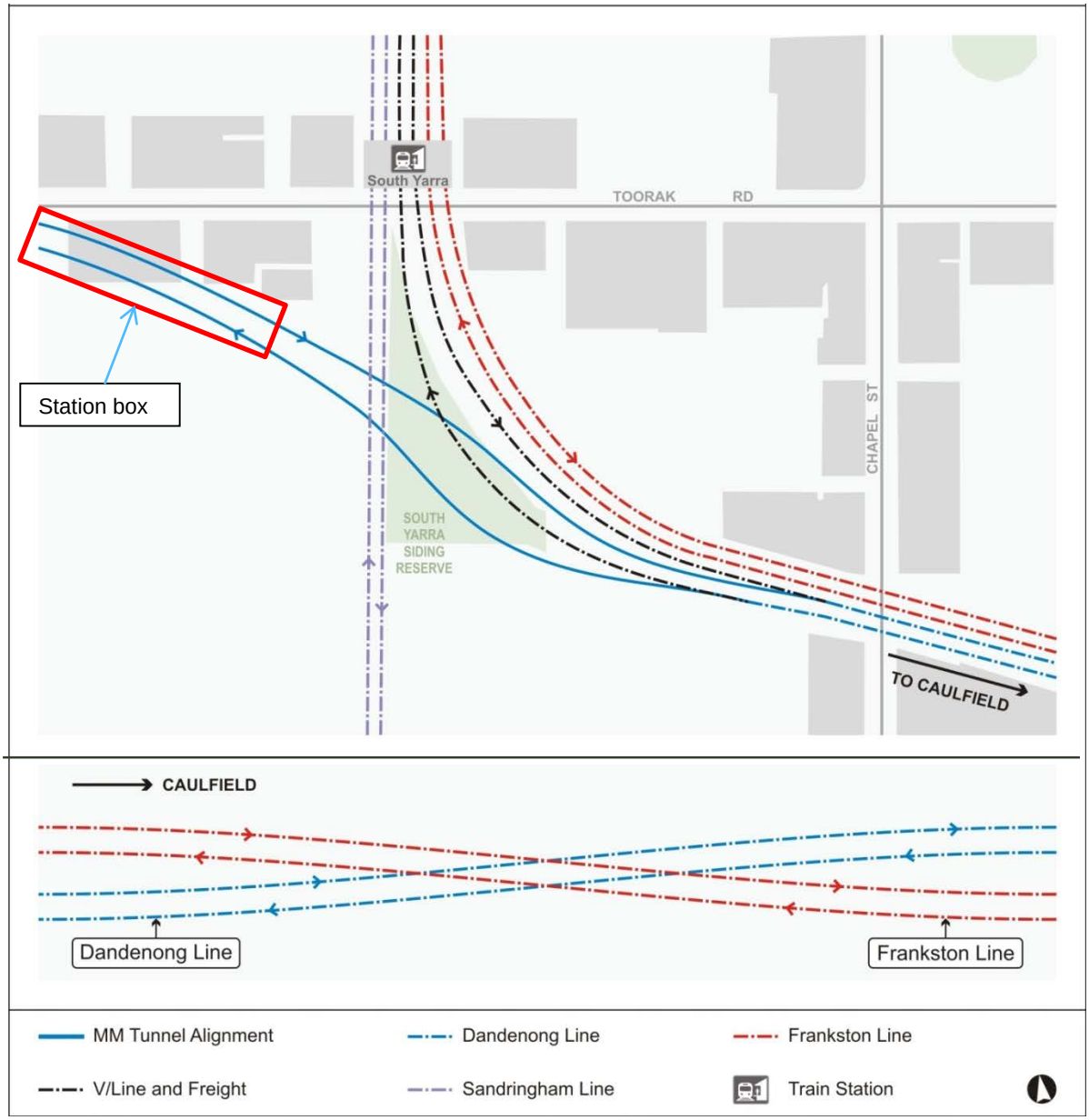


Figure 4-7 Option 2 – Schematic Representation

This option requires a new rail/ rail flyover between Caulfield and South Yarra to swap Dandenong line trains onto the Frankston line tracks and Frankston line trains on the Dandenong line tracks.

V/Line and Freight Services

Dandenong line Up and V/Line/ freight Up trains continue with the MM tracks until the upside of Chapel Street where the MM trains separate to head into the tunnel. The Up V/Line / freight horizontal alignment includes a R220 horizontal curve, over the top of the eastbound MM track in the approach into Platform 3 at the existing South Yarra Station.

Down V/Line / freight travel through Platform 4 at the existing South Yarra Station and head along the existing Down Caulfield Through track. A tangential 1 in 15 turnout connects it to the MM eastbound track before Chapel Street.

Operational Speed

The operational speed of each line is summarised in Table 4-3.

Table 4-3 Operational Speed – Option 2

Track	Operational Speed	Constraint
MM tracks	45 km/hr	Tight horizontal curvature restricting speed.
Up V/Line/ freight	45 km/hr	Tight horizontal curvature and 1 in 9 turnout restricting speed.
Down V/Line/ freight	50 km/hr	Existing operational speed due to existing track geometry
Frankston tracks	50 km/hr	Existing operational speed due to existing track geometry

With the rail/ rail flyover at Caulfield, the Frankston line travels on the existing Dandenong tracks, through South Yarra Platforms 5 and 6. The tracks remain unaffected in this option with their current alignment and operational speeds as existing. This includes the existing clearance to retaining walls and bridge structures along the northern side and below the existing Toorak Road Bridge and Chapel Street Bridge.

Network Resilience

Should there be an incident requiring closure of the MM tunnel, the turnouts and double track connection into South Yarra allows MM trains to be run into the existing South Yarra Station or alternatively, all the way into Flinders Street. This may require platform extensions at surface stations to facilitate MM rolling stock. It should be noted that this scenario also applies to the project baseline.

South East Rail Link

To the immediate west of Chapel Street this option creates a six track rail corridor. This is compatible with the future aspiration of the South East Rail Link. Should this option be preferred further investigation should be undertaken to ascertain the cost and land acquisition impacts along the corridor to the east of Chapel Street.

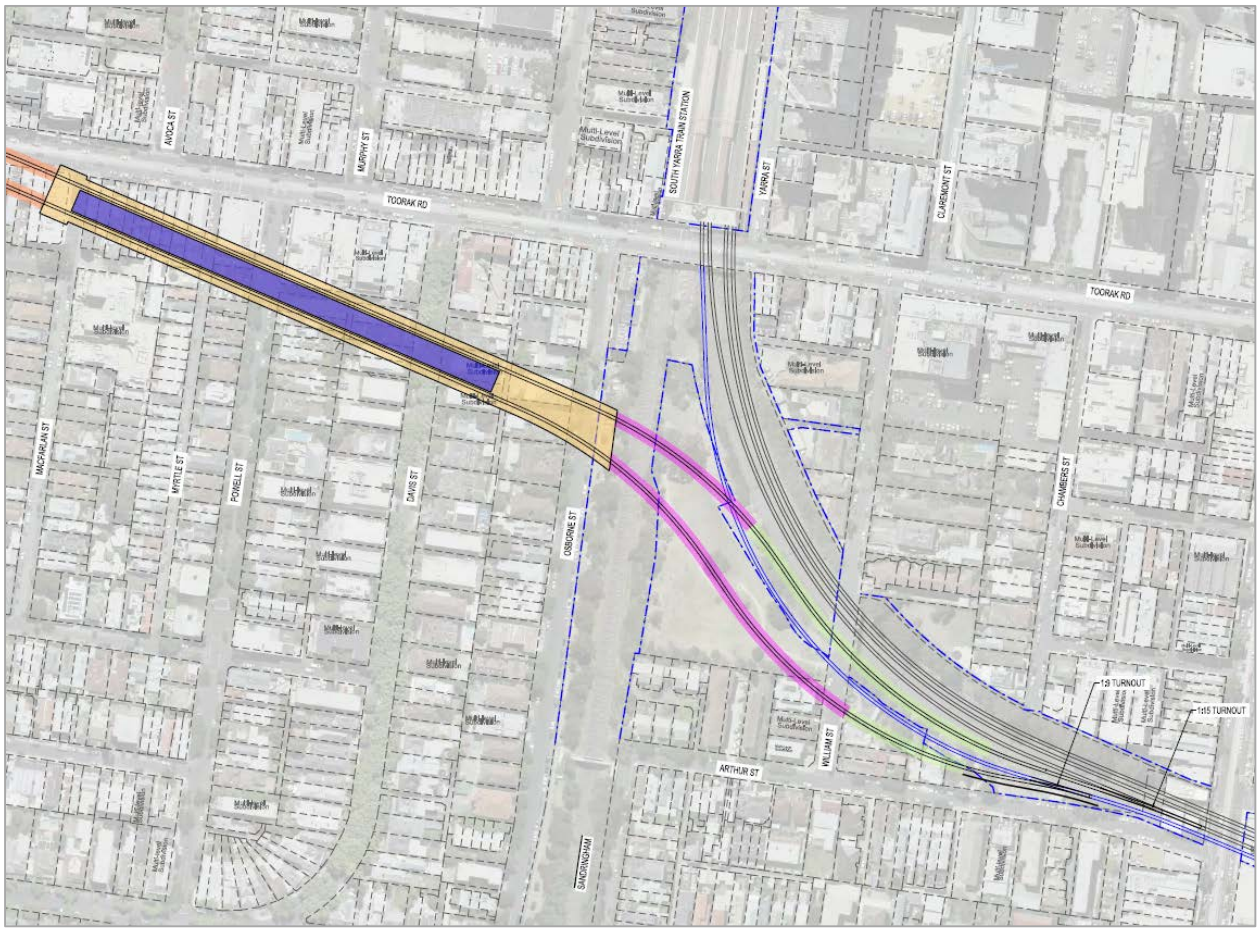


Figure 4-8 Option 2 Track Arrangement

Dandenong – Frankston Rail Flyover

As noted above, this option requires a rail/ rail flyover to be located between South Yarra and Caulfield. A location on the Up side of Caulfield was selected as the optimal location due to the availability of corridor space and minimisation of impacts on the existing corridor and adjacent assets.

The flyover approaches will impose speed restrictions of 65km/h due to curve radii of approximately 450m. Gradients on the flyover approaches will be less than 2%, curve compensated, to allow passage of V/Line / freight rail traffic along both corridors.

Using the flyover, Dandenong line trains will move from the Dandenong tracks on the Down side of the flyover to the Frankston tracks on the Up side of the flyover and the Frankston line trains will move from the Frankston tracks to the Dandenong tracks.

The rail/ rail flyover will require the closure of the short road link, which connects Normanby Road and Dandenong Road.

This road closure will potentially necessitate a reconfiguration of the intersection between Normanby Road and Dandenong Road near Malvern Station to provide provision for the right turn manoeuvre out of Normanby Road onto Dandenong Road. Further traffic modelling and discussion with stakeholders, VicRoads and both the City of Stonnington and the City of Glen Eira, would be required to fully scope the required changes to the road network. Alternatively, an upgrade may be required to the existing underpass at Smith Street to accommodate any changes to the traffic flows.

4.2.5 Planning Considerations

Planning considerations for South Yarra are broadly similar to Option 1 which are discussed in Section 4.1.5.

This option also utilises land within the Caulfield embankment between Caulfield and Malvern Stations. To the north, this land is within the City of Stonnington, whilst to the south it is within the City of Glen Eira. The railway corridor is within the Public Use Zone 4 – Transport. This zone corridor narrows at the Normanby Road underpass and where Dandenong Road crosses under the railway line near Malvern Station – this land is within the Road Zone, Category 1. A railway is an 'as of right use' in the Road Zone, Category 1.

Land to the north is in the Road Zone, Category 1 (Dandenong Road), Neighbourhood Residential Zone 2 and the General Residential Zone 10, while to the south land is within the Neighbourhood Residential Zone 1. A plan showing the zoning of this land is located in Figure 4-9.

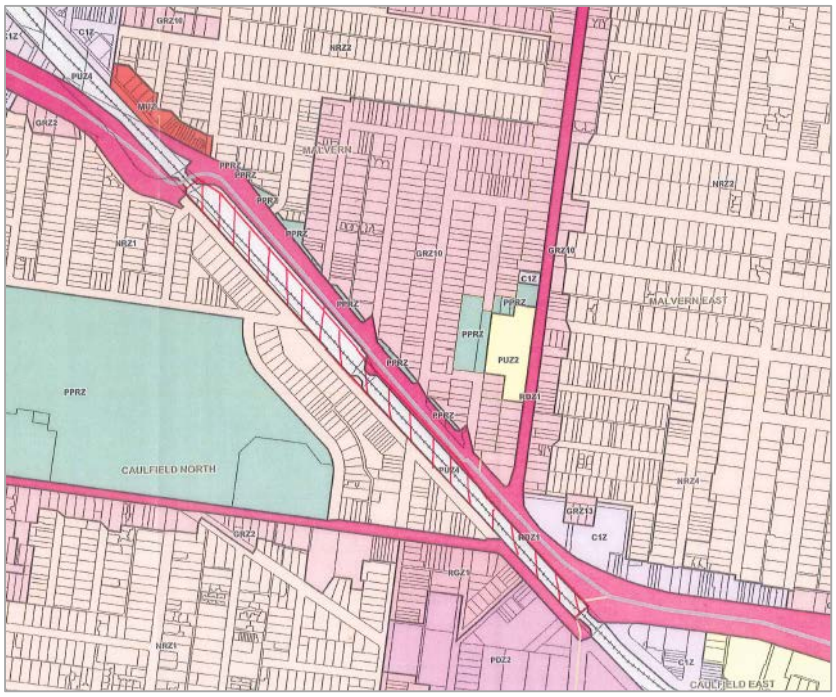


Figure 4-9 Current Zoning Caulfield

Heritage Overlay 14 (HO – Caulfield North Estate and Environment, Caulfield North) applies to a small part of the rail corridor. Planning approval will be required to undertake any works and demolition in this area. A plan of the Heritage Overlay in this area is in Figure 4-10.

Figure 4-10 Heritage Overlay

4.2.6 Property Impacts

The number of properties required to be acquired with this option is 47 allotments which are comprised of 97 titles. A graphical representation of property impacts is provided in Figure 4-11 below.

Land acquisition drawings are provided in Appendix D.

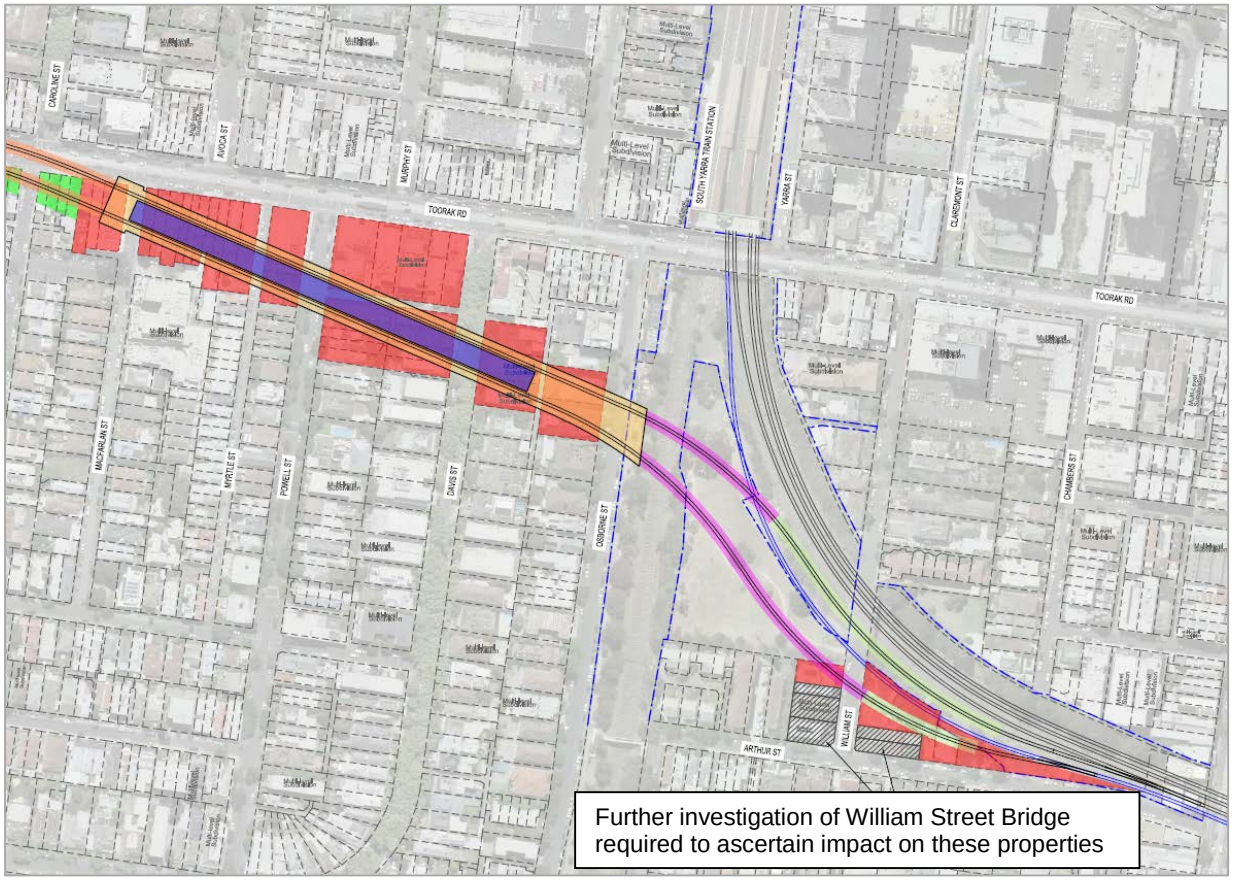


Figure 4-11 Option 2 – Land Acquisition

4.2.7 Constructability

An advantage of Option 2, compared to Option 1, is the retention of the northern tracks west of Chapel Street in their current form, which as a result of the rail/ rail grade separation at Caulfield will serve the Frankston line. This reduces the impact of construction on rail operations in the South Yarra area. Services on these tracks can be maintained during construction, with weekend occupations required for miscellaneous works such as the construction of the 1 in 15 turnout on the Dandenong Down track, signalling, and overhead structures.

The works in the South Yarra area can be undertaken before or after the construction and commissioning of the rail/ rail grade separation near Caulfield. If the changes around South Yarra are carried out before the rail/ rail grade separation is commissioned, then minimal disruption to the Dandenong line services is anticipated during construction.

Construction access into South Yarra Sidings Reserve is likely to be via a temporary bridge over the Sandringham lines from Osborne Street. Construction access ramps will then be built to serve the construction of the declines and portal as well as for access under the realigned Dandenong Up track for construction of the eastbound MM track and the retaining walls between it and the down Dandenong track. Post construction the bridge between Osborne Street and South Yarra Siding Reserve could be utilised by the community to provide an additional connection to the reserve.

Construction traffic onto Osborne Street through to the connecting major roads will need careful consideration in terms of hours of access and disruption to local amenity. This option requires construction in the Caulfield area which will have local impacts.

Table 4-4 Stage 1 Works

Stage 1 – Establishment and Up track
Activity
Establish temporary construction access bridge over Sandringham line tracks from Osborne Street into South Yarra Sidings Reserve.
Demolition of William Street Bridge over rail corridor.
Acquire and demolish properties along southern edge.
Pile along southern edge for new retaining walls.
Piling along southern edge, between westbound MM and new Up track, and between new Up track and eastbound MM.
Excavation and construction of retaining walls for full length of westbound MM track and new Up track and as much as possible of the eastbound MM track.
Construct rail/ rail bridge for Up track over eastbound MM.
Piling and construction of William Street bridge replacement pier and abutment.
Construct new Up track through to as close as possible to the existing Up track.
Connect new Up track at each end.

The majority of works are likely to be constructed clear of active tracks, allowing normal train operations to be maintained. Weekend occupations will be required to connect the new Up track to the existing Dandenong Up track at the end of this construction stage.

At the end of this stage, Dandenong Up services will use the new Up V/Line / freight track allowing the unused section of the existing Dandenong Up to be removed.

The William Street Bridge replacement can be constructed after the pier and new abutment are constructed in Stage 1 allowing the reconnection of William Street.

Table 4-5 Stage 2 Works

Stage 2 – Eastbound MM and connections
Activity
Decommission and remove the out of service section of existing Up track.
Pile and continue to construct decline structure for future east bound MM track.
Construct turnouts on new Up track and existing Dandenong Down track. Turnouts to remain locked to diverge move to / from South Yarra.
Construct new William Street Bridge.

The majority of these Stage 2 works are able to take place with trains still active. Several minor occupations for bridge span works and a weekend occupation for installation of turnouts will be required to complete works.

The configuration can remain as is after this stage until the MM tunnel is commissioned. The turnouts installed in Stage 2 allow for connection of the east and west bound MM tracks without the need for any further occupations for track work. This provides for test train access from the operating tracks into the tunnel.

Table 4-6 Stage 3 Works

Stage 3 – Final works
Activity
Construction of cut and cover tunnel under Sandringham lines and station box.
Construct MM tracks and connect to turnouts.
Rehabilitate and improve remnant land in South Yarra Sidings Reserve in conjunction with Station landscaping and urban design.
Repurpose residual acquired land parcels.
Free turnouts to allow route selection into MM tunnel.

4.2.8 Cost

A cost difference estimate which compares the proposed option against the project baseline, no station at South Yarra, has been developed. Separate construction and land acquisition raw costs have been estimated (e.g. excluding risk and contingency adjustments), as well as total P50 and P90 cost values for the year 2015 and a nominal P90 cost. These values are presented in Table 4-7 below.

The following items should be noted:

- No allowance for upgrade of existing South Yarra Station
- No allowance for business disruption (Toorak Road)
- No allowance for a tram stop upgrade on Toorak Road
- Includes cost for rail/ rail grade separation at Caulfield

Table 4-7 Option 2 Cost Estimate

Option	Construction Cost Delta (2015$)	Land Acquisition Cost Delta (2015$)	Total Delta (2015$)	Total Cost Delta P50 (2015$)	Total Cost Delta P90 (2015$)	Total Cost Delta P90 (nominal)
Option 2 – Flipped Station Option	$395M	$144M	$539M	$640M	$711M	$808M

4.3 Option 3 – Unconstrained Chapel Street North

4.3.1 Overview

This scheme includes the provision of new Melbourne Metro straight platforms (suitable for a 234m long train) with the Dandenong line and Frankston line remaining on their existing alignment (e.g. no swapping of alignments between South Yarra and Caulfield).

The new MM platform location and track arrangement are not constrained by the Chapel Street road over rail bridge and are located to provide optimal rail connectivity to the existing South Yarra Station platforms.

Land impacts, to the east of Chapel Street road over rail bridge, are predominantly limited to the north side of the rail reserve. This includes a recently completed multi-level apartment development at the former Surrey Road Council Depot. This option will impact on Palermo Street access to the Jam Factory loading dock and car park.

4.3.2 Station Arrangement

This option investigates the introduction of a new station entry to service the Melbourne Metro underground platforms to be located south of the existing station on Toorak Road between Davis Avenue and William Street. A new north facing 'village square' is possible immediately adjacent the MM station entry, addressing Toorak Road. This is consistent with Council's strategic aspiration for Toorak Road as outlined in the City of Stonnington's *Chapel reVision* document. Views of the heritage listed former Post Office building from Toorak Road and Yarra Street are maintained and enhanced with this arrangement.

There is an opportunity for an additional station entry adjacent to William Street which can be accessed via the surrounding street network. This entry is able to connect to the Chapel Street precinct either via Lovers Walk or through the development of dedicated access way to the south side of the rail reserve on land acquired for the project.

The station box is arranged in an island platform configuration suitable for a train length of 234m.

The station arrangement south of Toorak Road proposes the relocation of the existing Sandringham Up and Down platforms south of Toorak Road to create a direct platform to platform connection.

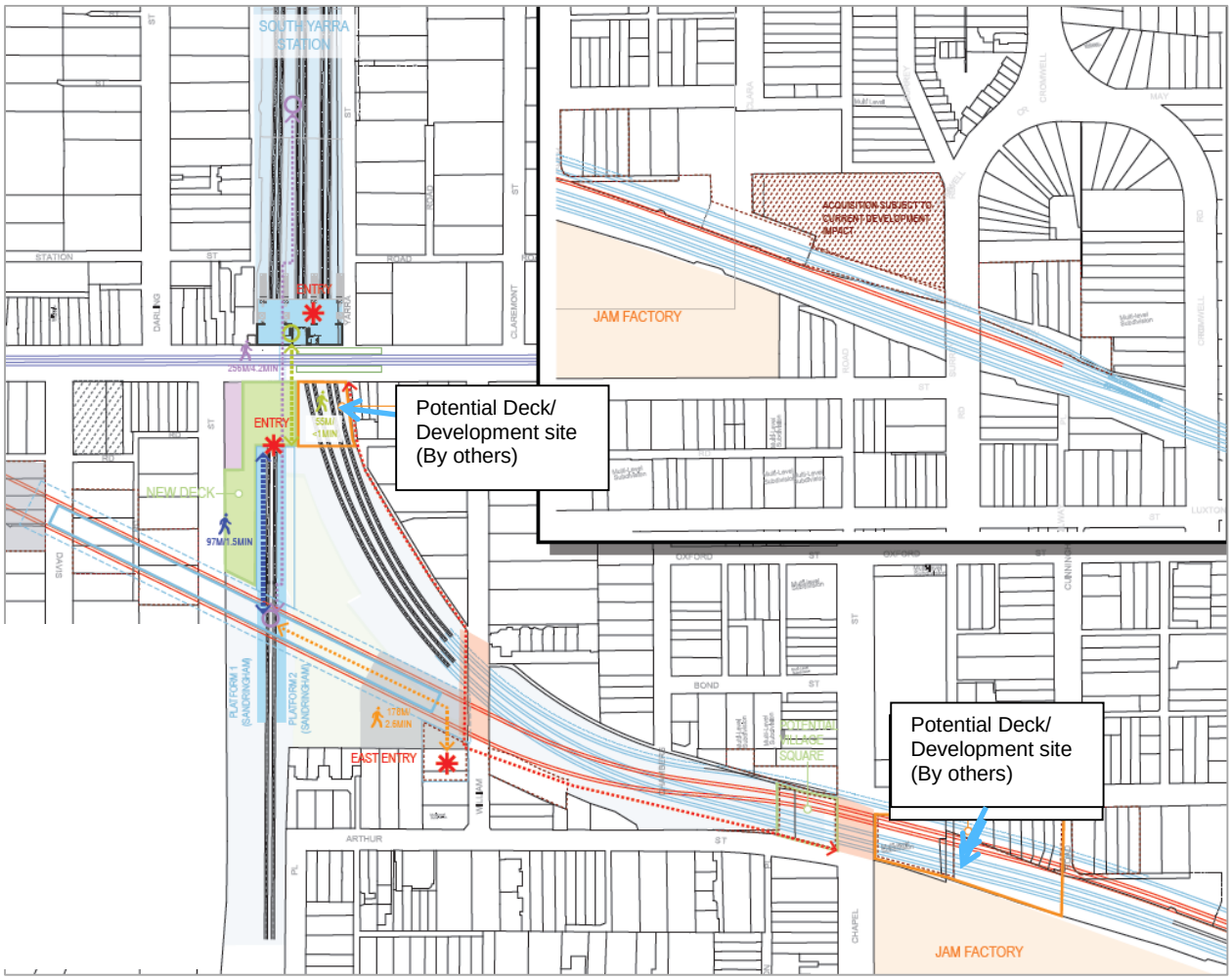


Figure 4-12 Option 3 Station Arrangement

4.3.3 Customer Experience

A 90m separation distance from the existing station entry to the new MM/ Sandringham station entry, directly opposite on Toorak Road would reinforce the creation of a central transport node. Access between station entrances would be direct with a high degree of station legibility and visual connections possible. Improvements to the pedestrian crossing would be required to enhance the customer experience and improved interchange efficiency.

The travel distance and time for the following travel paths are provided below.

- Centre of Frankston platform to centre of MM platform: 256m/ 4.2 mins
- Centre of Sandringham platform to centre of MM platform: 97m/ 1.5mins
- Gate line to gate line: 55m/ <1min

It should be noted that interchange between Frankston and Dandenong services is considered less critical as an opportunity for interchange between Frankston line and Dandenong line services exists at Caulfield Station.

4.3.4 Network Operations

Table 4-13 is a graphical representation of rail operations in this option.

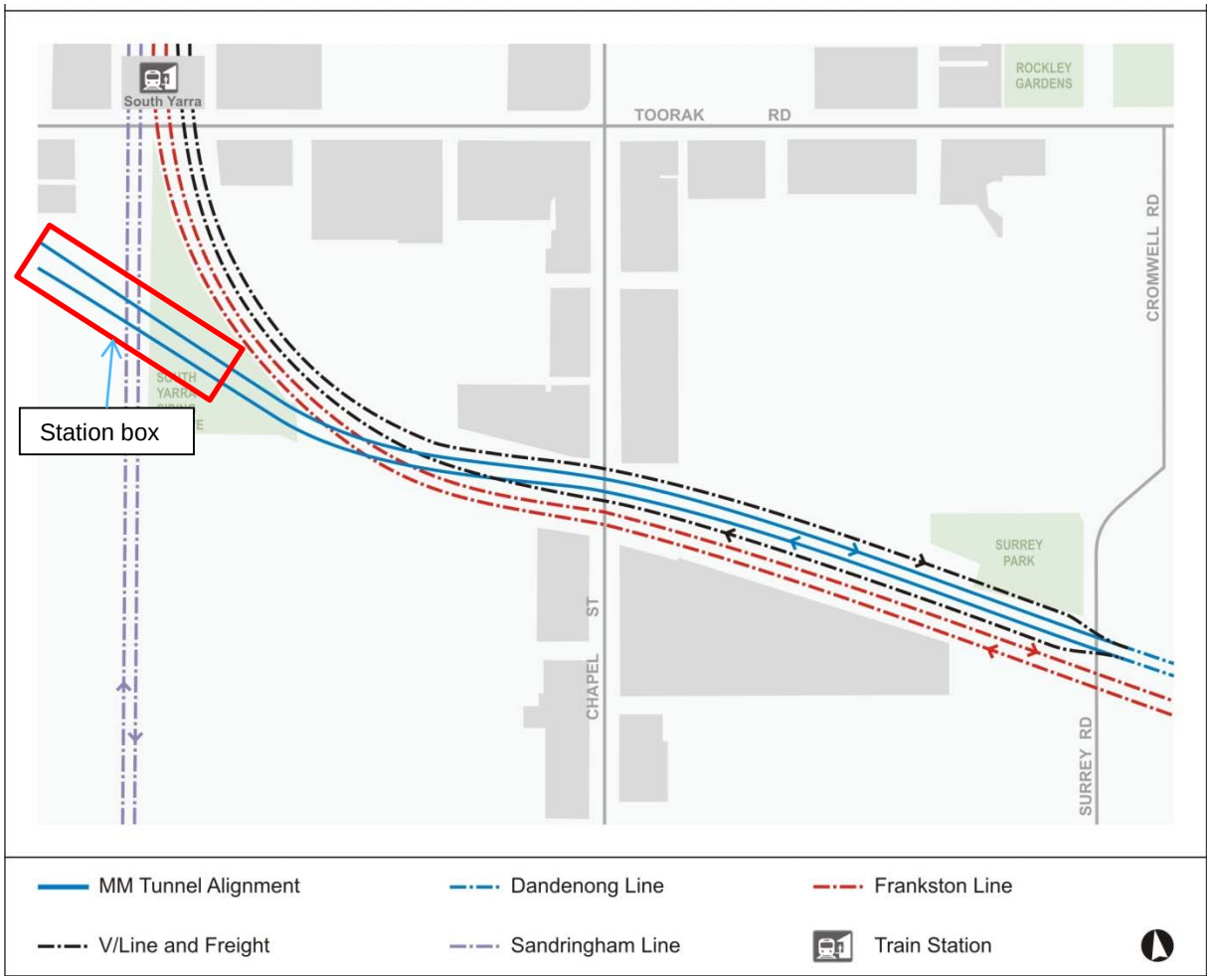


Figure 4-13 Option 3 – Schematic Representation

This option allows the construction of MM station platforms integrated with relocated Sandringham line platforms to form a new South Yarra Station located to the south of Toorak Road.

The Frankston line trains would use existing tracks without change. Up V/line / freight trains would use the existing Dandenong Up track. The retention of these existing tracks includes the existing clearance along the retaining walls on the southern edge, under Chapel Street Bridge and through Toorak Road Bridge.

Down V/Line / freight trains would use the existing Dandenong Down track through to near William Street Bridge. From William Street heading towards Caulfield, the track would then curve to the north. This amended alignment requires a radius less than the existing and will impose a reduction in speed to 45km/h.

The new alignment would travel parallel to the proposed MM tracks running along a new corridor below Chapel Street and through to a new bridge over Surrey Road. Connection to the eastbound MM track would occur on the down side of Surrey Road using a 1 in 9 tangential turnout.

The MM tracks would cross Surrey Road on a new bridge structure and then commence to decline through to Chapel Street where the MM tracks would be below the existing Frankston line tracks. This allows the optimal location of the new MM platforms.

This option requires the demolition, extension and reconstruction of the Chapel Street road over rail bridge, with consequential operational impact on the tram and road network during construction. This will require temporary tracks to maintain tram operations.

William Street road grade will remain as existing, however the bridge will need to be removed during construction and new structure and spans built to suit the final track configuration. This will impact on local road operation for the duration of William Street bridge closure.

Operational Speeds

The operational speed of each line is summarised in Table 4-8.

Table 4-8 Operational Speed – Option 3

Track	Operational Speed	Constraint
MM tracks	50 km/hr	R300m horizontal curves.
Up V/Line/ freight	45 km/hr	1 in 9 turnout restricting speed.
Down V/Line/ freight	45 km/hr	Horizontal curvature from William Street to Chapel Street and 1 in 9 turnout.
Frankston tracks	50 km/hr	Existing operational speed due to existing track geometry

The alignment allows existing line speeds to maintained for Frankston line trains, and provides higher design speeds along the MM tracks than Option 2 as the horizontal curve radii are increased to R300, giving 50km/h design speeds.

Both the Up and Down V/Line / freight tracks are connected to the MM tracks through a 1 in 9 tangential turnouts on the down side of Surrey Street Bridge. The turnout design restricts the diverge speed to 45 km/h.

Network Resilience

The use of a double V/Line / freight connection allows the MM tracks to be connected for test train purposes while still routing trains to South Yarra on normal operations. It also provides operational resilience, allowing MM trains to be routed to Flinders Street should the tunnel be closed. It should be noted that this would require provision of additional platform lengths at existing surface station platforms to accommodate MM rolling stock.

South East Rail Link

To the east of Chapel Street this options creates a six track rail corridor to Cromwell Road on the Up side of Hawksburn Station. This is compatible with the future aspiration of the South East Rail Link. It should be noted that this configuration is achieved through land acquisition. Should this option be preferred further investigation should be undertaken to ascertain the cost and land acquisition impacts along the corridor.

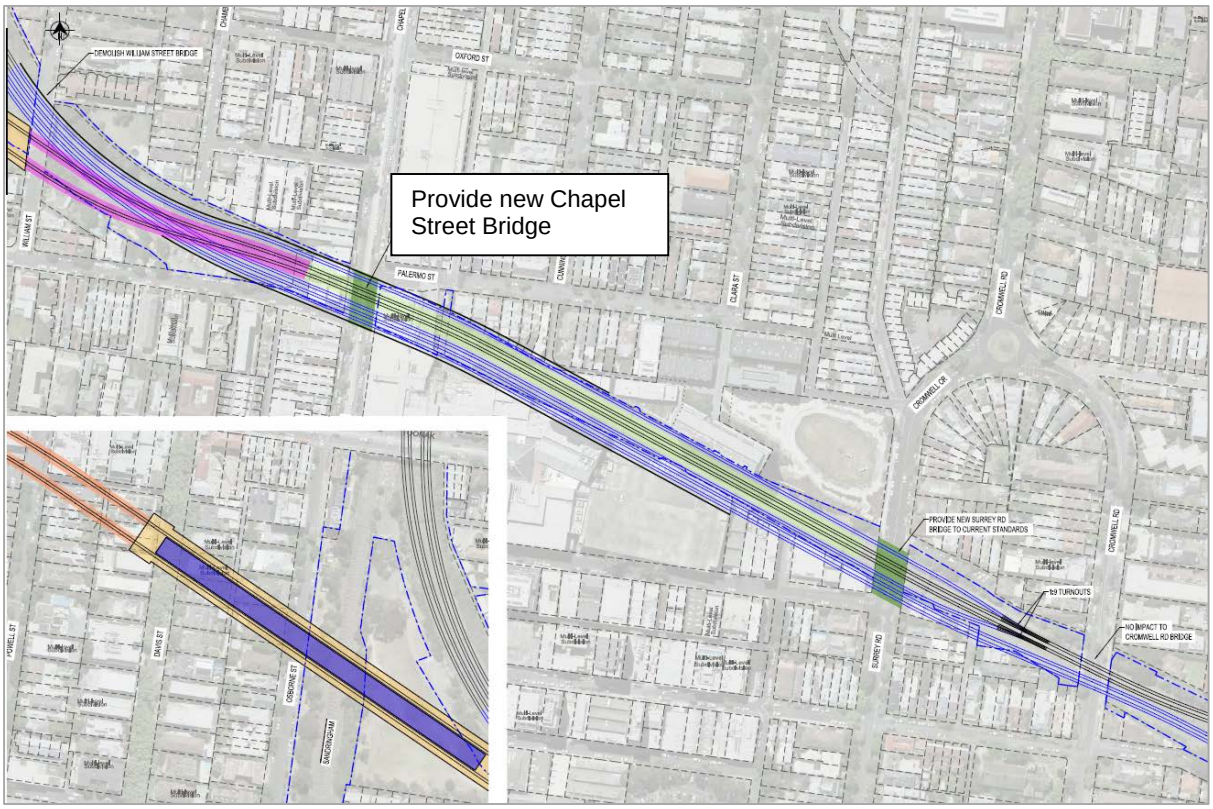


Figure 4-14 Option 3 Track Arrangement

4.3.5 Planning Considerations

To the west of the rail corridor, the streets behind Toorak Road (Osborne Street and Davis Avenue) are residential in nature with built forms ranging from 1/2 stories interspersed with blocks of flats of varying ages and built form. This area forms part of the Prahran / South Yarra and Windsor Activity Centre.

To the east of the railway corridor, land fronting Arthur Street, William Street, Bond Street and Chambers Street, is within the General Residential Zone 12. Land fronting Chapel Street, including the Jam Factory, is within the Commercial 1 Zone. Land to the north of the Jam Factory is in the Public Use Zone 4 - Transport and the Neighbourhood Residential Zone 3.

Within the General Residential Zone 12, a railway station is prohibited. Within PUZ4 a railway is an as of right use.

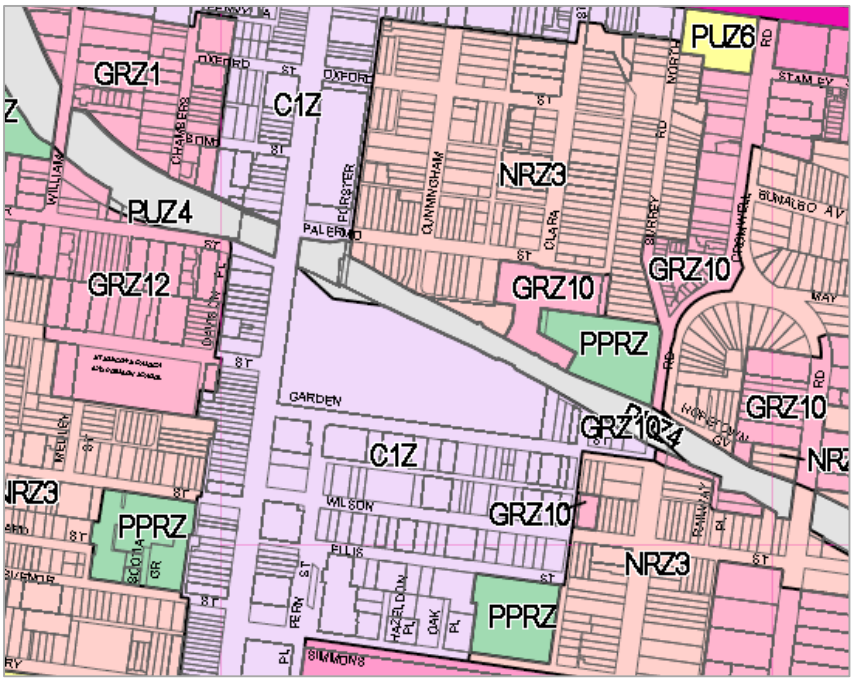


Figure 4-15 Current Zoning

As noted above, the commercially zoned areas are proposed to be rezoned to Activity Centre Zone via Amendment C172.

4.3.6 Property Impacts

The number of properties required to be acquired with this option is 47 allotments which are comprised of 239 titles. A graphical representation of property impacts is provided in Figure 4-16 over.

Land acquisition drawings are provided in Appendix D.

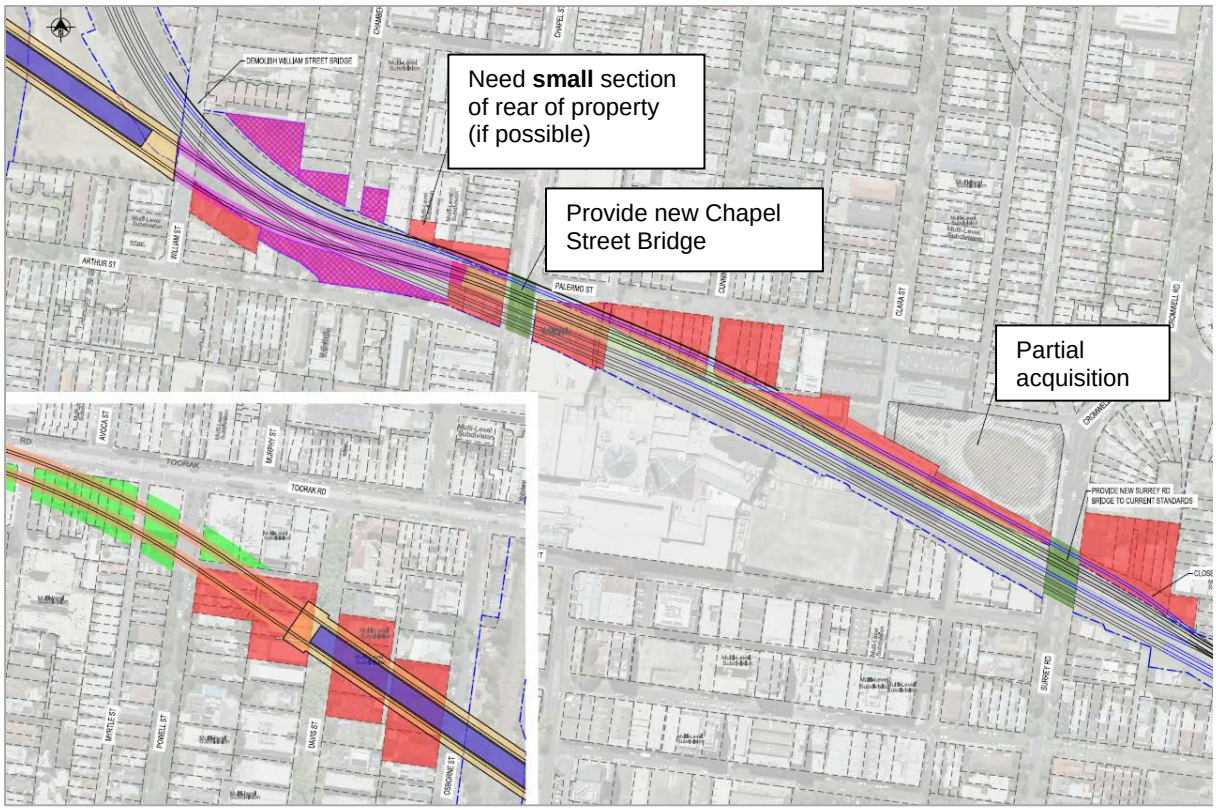


Figure 4-16 Option 3 Land Acquisition

4.3.7 Constructability

This option provides for minimal impact on Frankston line operations during construction with the existing Frankston line track remaining unaffected by the works except for occupations for demolition of Chapel Street Bridge and associated buildings. It should be noted that demolition of the Chapel Street Bridge is likely to occur in stages with limited local access maintained during this period.

Table 4-9 Stage 1 Works

Stage 1 – Enabling Works
Activity
Acquire and remove affected properties along the north side of the rail corridor.
Relocate utility services.
Pile for new Chapel Street abutment.
Pile along northern edge for new retaining walls.
Close Chapel Street and demolish bridge. Pile for new retaining walls and new bridge pier. Build new abutment and pier for bridge.
Construct a new deck over rail corridor. Construct a new bridge span clear of rail corridor.
Open new bridge spans for road and tram use.

Table 4-10 Stage 2 Works

Stage 2 – Construct new Down Track
Activity
Excavate and construct retaining walls along northern edge.
Pile for decline structure between new Down track and future east bound MM track.
Pile for new bridge over Surrey Road and construct embankment works on approaches.
Construct new bridge over Surrey Road.

All Stage 2 works occur with trains running along the existing tracks. Occupations will be required to connect the existing Dandenong Down track onto the new alignment.

At the end of this stage, Frankston services run on the existing Frankston tracks, the Up Dandenong trains use the existing Dandenong Up track and Dandenong Down trains use the new Down V/Line / freight alignment along the northern edge.

Table 4-11Stage 3 Works

Stage 3 – Tunnelling, decline and new MM tracks
Activity
Establish temporary construction access bridge over Sandringham line tracks from Osborne Street into South Yarra Sidings Reserve.
Demolition of William Street Bridge over rail corridor.
Cut and cover tunnelling under existing Frankston line tracks and Dandenong Up track.
Piling between existing Dandenong Up track and future westbound MM for decline structure.
Piling for William Street bridge replacement.
Excavation and construction of new decline structure for MM tracks with access from South Yarra Sidings Reserve.

While construction of the decline structure proceeds, the station and tunnelling works under the Sandringham line tracks can be undertaken. Construction of the station using open cut and cut and cover tunnelling under the Sandringham lines will be broadly similar to the baseline methodology.

At the end of Stage 3, the tunnels and decline structure will be complete to the west of Chapel Street, clear of the existing Dandenong Up.

Table 4-12 Stage 4 Works

Stage 4 – Finalisation of MM tracks, bridge over Surrey road
Activity
Construct embankment approaches to Surrey Road. Piling for abutments at Surrey Road.
Construct new Surrey Road bridges.
Construct new MM tracks from South Yarra Sidings Reserve through to down side of new Surrey Road bridges.

Following Stage 4, rail access is available to allow test trains into the MM tunnel; however the turnouts will be set to diverge to direct Dandenong line traffic to / from Flinders Street Station. They will remain set to diverge until the tunnel is commissioned ready for MM operations.

Table 4-13 Stage 5 Works

Stage 5 – Finalisation of Works
Activity
Construct new William Street Bridge.
Rehabilitate residual land in South Yarra Sidings Reserve in conjunction with Station landscaping.
Sell or repurpose residual acquired land parcels.
Free turnouts to allow route selection into MM tunnel.

4.3.8 Cost

A cost difference estimate which compares the proposed option against the project baseline, no station at South Yarra, has been developed. Separate construction and land acquisition raw costs have been estimated (e.g. excluding risk and contingency adjustments), as well as total P50 and P90 cost values for the year 2015 and a nominal P90 cost. These values are presented in Table 4-14 below.

The following items should be noted:

- No allowance for upgrade of existing South Yarra Station. A new connection to the station may trigger a requirement to upgrade the existing station.
- Allowance for deck adjacent to GPO building to facilitate entry to relocated Sandringham platforms
- No allowance for a tram stop upgrade on Toorak Road
- An allowance for disruption for Chapel Street businesses directly impacted by construction

Table 4-14 Option 3 Cost Estimate

Option	Construction Cost Delta (2015$)	Land Acquisition Cost Delta (2015$)	Total Delta (2015$)	Total Cost Delta P50 (2015$)	Total Cost Delta P90 (2015$)	Total Cost Delta P90 (nominal)
Option 3 – Unconstrained Chapel St Station Option (north)	$427M*	$212M	$640M	$750M*	$838M*	$958M

* P90 real cost estimate for decking (by others) on both sides of Chapel Street Bridge has been estimated at $40M and decking at Toorak Road has been estimated at $7M.

4.4 Option 4 – Unconstrained Chapel Street South

4.4.1 Overview

This option is broadly similar to Option 3 but with land impacts, to the east of Chapel Street, predominantly limited to the south side of the rail reserve. This option impacts on the existing Jam Factory commercial/ retail property. Similar to Option 3, this option will impact on Palermo Street access to the Jam Factory loading dock and car park.

4.4.2 Station Arrangement

The MM station arrangement and relocated Sandringham platforms are as per Option 3. For further information please review Section 4.3.2.

With no constraint to Chapel Street road over rail bridge the rail alignment would impact the Jam Factory during construction. This disruption may potentially be offset by the opportunity to build a deck above the rail reserve accommodating a future development (by others).

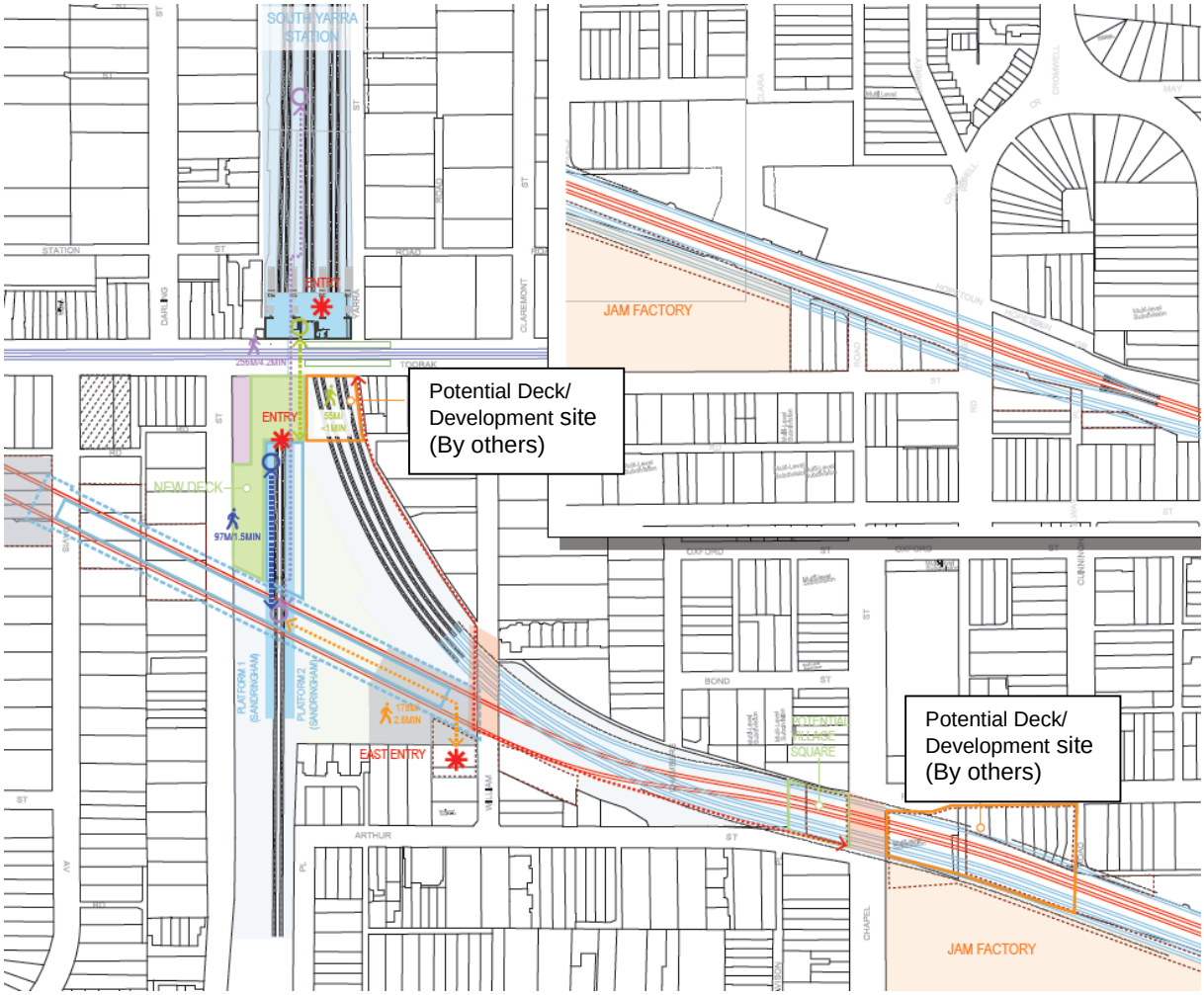


Figure 4-17 Option 4 Station Arrangement

4.4.3 Customer Experience

The customer experience is as per Option 3. For further information please review Section 4.3.3.

4.4.4 Network Operations

Figure 4-18 is a graphical representation of rail operations in this option.

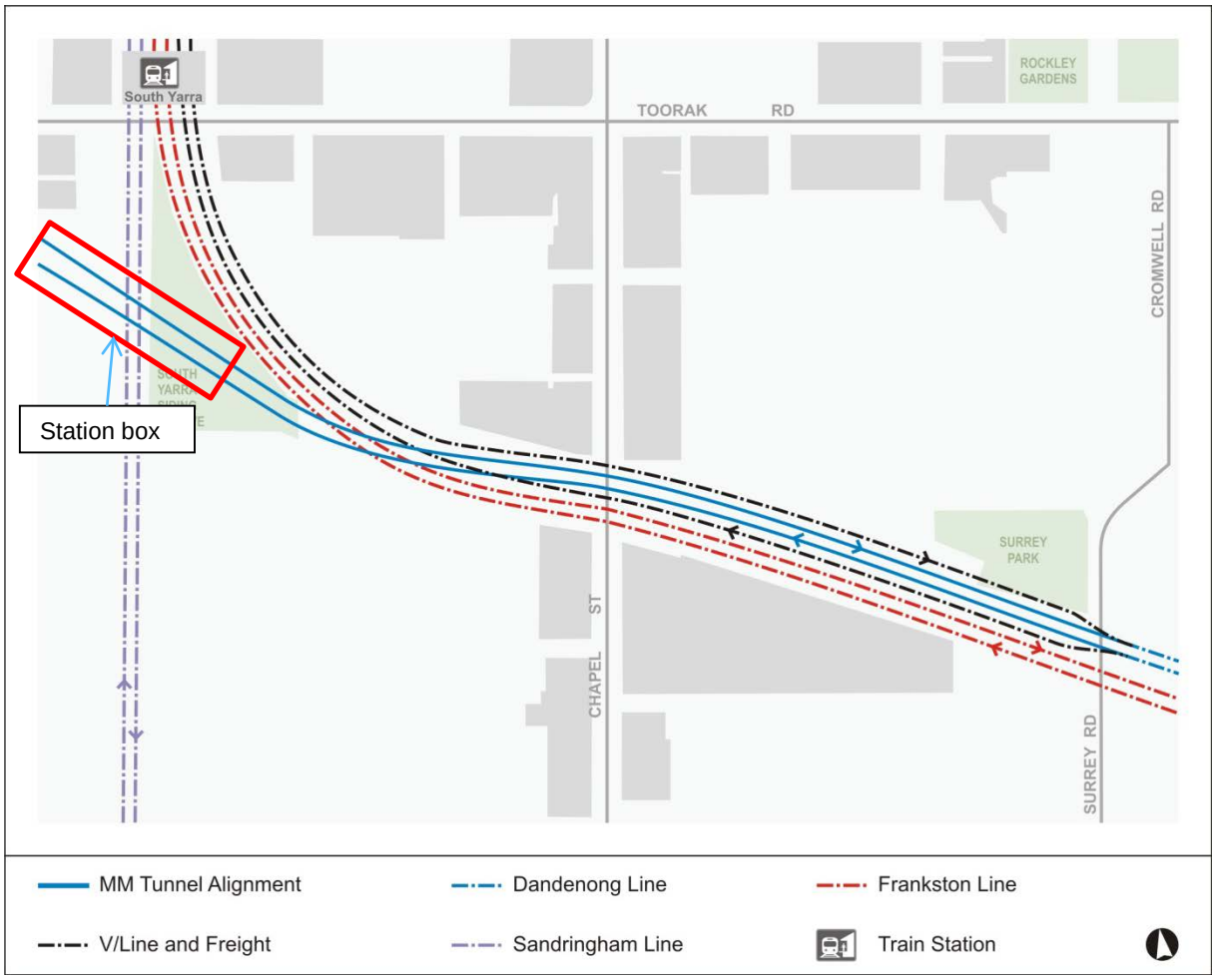


Figure 4-18 Option 4 – Schematic Representation

As per Option 3, this option allows the construction of MM station platforms integrated with relocated Sandringham line platforms to form a new South Yarra Station to the south of Toorak Road.

The Frankston line tracks are realigned to run through new tracks in the basement of the Jam Factory. The Up Dandenong (also Up V/line / freight) track is also realigned to the south, running parallel to the new Frankston line tracks just on the edge of the existing rail reserve.

Operational Speed

The operational speed of each line is summarised in Table 4-15

Table 4-15 Operational Speed – Option 4

Track	Operational Speed	Constraint
MM tracks	50 km/hr	R300m horizontal curves.
V/Line/ freight tracks	45 km/hr	1 in 9 turnout restricting speed.
Frankston tracks	50 km/hr	New track geometry suitable for existing operational speed.

The new tracks have geometry capable of 50km/h operation, and will require major modifications to the Jam Factory structures as well as the reconstruction of the Chapel Street road over rail bridge.

Network Resilience

As for the other options, the use of a double V/Line / freight connection allows the MM tracks to be connected for test train purposes while still routing trains past to the existing South Yarra Station for normal operations. This option provides operational resilience, allowing MM trains to be routed to Flinders Street should the tunnel be closed. This would require additional platform length to be provided at existing surface stations.

Chapel Street Bridge

This option requires the demolition, extension and reconstruction of the Chapel Street Bridge, with consequential operational impact on the tram and road network during construction. Due to the location and scope of works there is no viable alternative alignment for the tram route, which will be divided by the construction site for the duration of the Chapel Street bridge construction work. Installation of temporary crossovers will allow tram operations along Chapel Street on either side of the works to continue during construction.

William Street road grade remains as is. However, the bridge will need to be removed during construction and new structure and spans built to suit the final track configuration.

South East Rail Link

To the east of Chapel Street this options creates a six track rail corridor to Cromwell Road on the Up side of Hawksburn Station. This is compatible with the future aspiration of the South East Rail Link. It should be noted that this configuration is achieved through land acquisition. Should this option be preferred further investigation should be undertaken to ascertain the cost and land acquisition impacts along the corridor.

Figure 4-19 Option 4 Track Arrangement

4.4.5 Planning Considerations

To the west of Chapel Street the zones and overlays affected by this option, including the heritage impacts, are the same as Option 3, See Section 4.3.5. To the east of the railway line, land fronting Arthur Street, William Street, Bond Street and Chambers Street is within the General Residential Zone 12. Land fronting Chapel Street on both sides, including the Jam Factory, is within the Commercial 1 Zone. Land to the north of the Jam Factory is in the Public Use Zone 4 - Transport and the Neighbourhood Residential Zone 3.

Within the General Residential Zone 12, a railway station is prohibited. However, a railway is an as of right use.

4.4.6 Property Impacts

The number of properties required to be acquired with this option is 41 allotments which are comprised of 94 titles. A graphical representation of property impacts is provided in Figure 4-20 below.

Land acquisition drawings are provided in Appendix D.

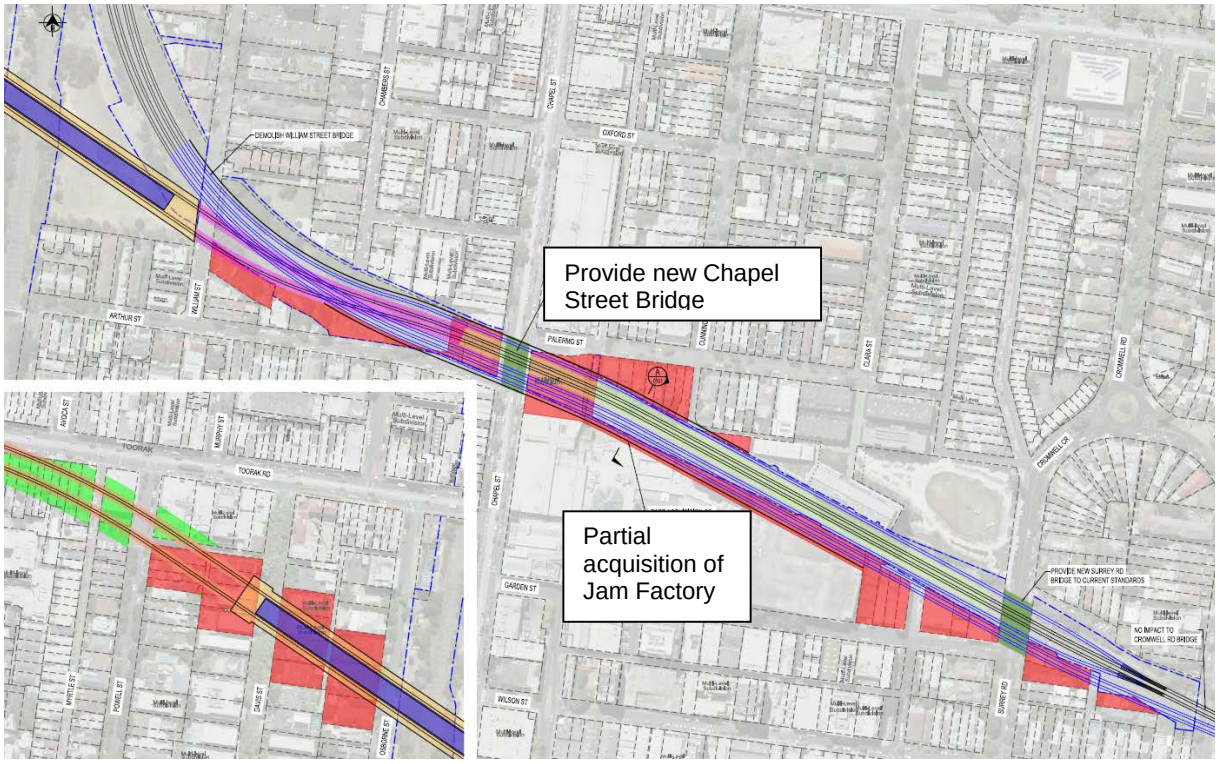


Figure 4-20 Option 4 Land Acquisition

4.4.7 Constructability

This option has significant impact on train operations during construction with all existing tracks being affected from Cromwell Road through to William Street. Unlike Option 3, this option requires rail corridor widening below the existing Chapel Street road bridge on both the north and south sides, affecting both abutments and requiring land take on each side of the existing corridor. It should be noted that demolition of the Chapel Street Bridge is likely to occur in stages with limited local access maintained during this period.

A key aspect of this option is the requirement to acquire part of the Jam Factory.

Stage 1 - Enabling Works

Early works for Chapel Street will relocate services, demolish affected buildings and carry out piling for the new abutments and bridge piers prior to the existing bridge being closed and demolished. Demolition of the buildings and different bridge structures at Chapel Street over the active rail corridor will require occupation of the rail corridor during critical activities.

Table 4-16 Stage 1 Works

Stage 1 – Enabling Works
Activity
Acquire and remove affected properties along north and south sides of rail corridor.
Relocate utility services.
Piling for new Chapel Street abutments.
Pile along northern edge for new retaining walls.
Pile along southern edge clear of Jam Factory for new retaining walls.
Close Chapel Street and demolish bridge. Pile for new retaining walls and new bridge pier. Build new abutments and pier for bridge.
Construct new deck over rail corridor. Construct new bridge span clear of rail corridor.
Open new bridge spans for road and tram use.

Jam Factory works

This option requires structural modifications and reinstatement works to the Jam Factory to provide for the Frankston line tracks running through the basement level.

To determine the quantum of work involved a detailed review of the Jam Factory structural drawings in conjunction with the track alignments would be required. From this review, construction staging could be determined for the structural works which will then lead to the staging of the track construction.

It is possible that modification of the Jam Factory structure to allow the tracks to run through the basement is not economic. In this case, this option may require partial demolition of the Jam Factory itself, maintaining sufficient buffer around the heritage elements for their protection, and Jam Factory reinstatement works next to and above the constructed tracks.

The Jam Factory works would occur within close proximity to the active Frankston lines. Occupations of the Frankston lines may be required to allow removal of retaining walls and foundations along the edge of the rail reserve.

It should be noted that construction in this area of the Jam Factory will impact on access to an existing loading dock and access to the multi-level car park. Further investigation is required to assess the impacts on access.

Table 4-17Stage 2 – Jam Factory Frankston line tracks

Stage 2 – Jam Factory Frankston line Tracks
Activity
Acquire and remove affected properties along southern side of the rail corridor.
Close affected sections of Jam Factory and carpark and commence structural modifications.
Construct new tunnel structure for the Frankston line tracks through basement level of the structurally modified Jam Factory.
Construct embankment approaches to Surrey Road. Piling for abutments at Surrey Road.
Construct new Surrey Road bridges for Frankston line and Dandenong Up tracks.
Construct new Frankston line tracks from Surrey Road to where they join back to existing alignment west of Chapel Street.

Detailed staging design will be needed to allow the Up Caulfield Local to be realigned to near the final alignment of the Up V/Line / freight track.

Once completed, Frankston line services will be routed onto their new alignments, freeing up the existing corridor for the next stage.

At the end of this stage, Frankston services run on the new tracks underneath the Jam Factory.

Table 4-18 Stage 3 Works

Stage 3 – Construct new Dandenong UP Track
Activity
Decommission and remove the out of service sections of the existing Frankston line tracks.
Construct new formation for final Up V/Line / freight track.
Piling between new Up track and future westbound MM track for decline structure.
Excavate under new Chapel Street bridge for new Up track alignment.
Construct new Up track and connect to existing at each end.

After this stage, the Dandenong up services are directed onto the new Dandenong Up track alignment, freeing space in the middle for construction of the decline structure.

Table 4-19 Stage 4 Works

Stage 4 – Construct new Down Track
Activity
Excavate and construct retaining walls along the northern edge and excavate under new Chapel Street bridge.
Pile for decline structure between new Down track and future eastbound MM track where possible.
Construct new Down track to limits near existing track.
Connect to existing Down track.

The Stage 4 works have complex access, with no direct access to the north side of the rail corridor. Access to the construction area will require a construction ramp down to track level through the acquired properties on Palermo Street, the ramp can then be removed once the Down track work is completed. Following completion of these works, Dandenong Down services are routed onto the new alignment.

Table 4-20 Stage 5 Works

Stage 5 – Tunnelling and MM decline construction
Activity
Establish temporary construction access bridge over Sandringham line tracks from Osborne Street into South Yarra Sidings Reserve.
Demolition of William Street Bridge over rail corridor.
Cut and cover tunnelling under Frankston line tracks and Dandenong Up track.
Piling between Dandenong Up track and future westbound MM for decline structure.
Piling between Dandenong Down track and future eastbound MM for decline structure.
Piling for William Street bridge replacement.
Excavation and construction of new decline structure for MM tracks with access from South Yarra Sidings Reserve.

While construction of the decline structure proceeds, the station and tunnelling works under the Sandringham line tracks can be undertaken. Construction of the station using open cut and cut and cover tunnelling under the Sandringham lines will be broadly similar to the baseline methodology.

At the end of Stage 5, the tunnels and decline structure will be complete through to the west of Surrey Road.

Table 4-21 Stage 6 Works

Stage 6 – Finalisation of MM Tracks, bridge over Surrey Road
Activity
Construct embankment approaches to Surrey Road. Piling for abutments at Surrey Road.
Construct new Surrey Road bridge.
Construct new MM tracks from South Yarra Sidings Reserve through to down side of new Surrey Road bridges.
Construct turnout connections on existing Dandenong tracks.

Following Stage 6, rail access is available to allow test trains into the tunnels; however the turnouts will be set to diverge to direct Dandenong line traffic to/ from Flinders Street Station. They will remain set to diverge until the tunnel is commissioned ready for MM operations.

4.4.8 Cost

A cost difference estimate which compares the proposed option against the project baseline, no station at South Yarra, has been developed. Separate construction and land acquisition raw costs have been estimated (e.g. excluding risk and contingency adjustments), as well as total P50 and P90 cost values for the year 2015 and a nominal P90 cost. These values are presented in Table 4-22 below.

The following items should be noted:

- No allowance for upgrade of existing South Yarra Station. A new connection to the station may trigger a requirement to upgrade the existing station.
- Allowance for deck adjacent to GPO building to facilitate entry to relocated Sandringham platforms
- No allowance for a tram stop upgrade on Toorak Road
- An allowance for disruption for Chapel Street businesses directly impacted by construction

Table 4-22 Option 4 Cost Estimate

Option	Construction Cost Delta (2015$)	Land Acquisition Cost Delta (2015$)	Total Delta (2015$)	Total Cost Delta P50 (2015$)	Total Cost Delta P90 (2015$)	Total Cost Delta P90 (nominal)
Option 3 – Unconstrained Chapel St Station Option (south)	$442M*	$200M	$642M	$751M*	$849M*	$970M

* P90 real cost estimate for decking (by others) on both sides of Chapel Street Bridge has been estimated at $40M and decking at Toorak Road has been estimated at $7M.

Appendices

Appendix A

Track Drawings

LEGEND

- EXISTING TRACKS
- MM TRACKS
- TRACKS TO BE REALIGNED
- RETAINING WALL
- VICTRACK RESERVE BOUNDARY
- PLATFORM
- UNDERGROUND STATION FOOTPRINT
- DECLINE STRUCTURE
- TUNNEL - DRIVEN
- TUNNEL - CUT & COVER

NOT TO BE USED FOR CONSTRUCTION PURPOSES

INFORMATION PURPOSES ONLY

20 10 0 20 40 60 80 100m

SCALE

STIMES

SDATES

SFILES

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.
AJM JV		P2	06/03/15	PRELIMINARY ISSUE	M.P	J.P.W		
AJM JV		P1	23/02/15	PRELIMINARY ISSUE	M.P.			

Consultant

AJM Joint Venture

Franchisee / Lessee

MMRA

RAILWAY TRACK AND CIVIL

MELBOURNE METRO

SOUTH YARRA STATION TRACK ALIGNMENT OPTION 1

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	MGA Z55 AHD

VicTrack ACCESS

File Name MM-SK-TC-131.dgn

Sheet No. 01 of 01

In Serv.

Scale 1:1000 H | Sheet Size A1

Project Drawing Number: MM-SK-TC-131

Drawn By	Designed By
D.BUCKLE	M.PRICE
Checked By	Ind. Review
J.WILLIAMS	
Approved	Approval Date
D.ANDERSON	

Drawing Number

Revision P2

LEGEND

- EXISTING TRACKS
- MM TRACKS
- TRACKS TO BE REALIGNED
- RETAINING WALL
- VICTRACK RESERVE BOUNDARY
- PLATFORM
- UNDERGROUND STATION FOOTPRINT
- DECLINE STRUCTURE
- TUNNEL - DRIVEN
- TUNNEL - CUT & COVER

NOT TO BE USED FOR CONSTRUCTION PURPOSES

INFORMATION PURPOSES ONLY

20 10 0 20 40 60 80 100m

SCALE

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.
AJM JV		P2	06/03/15	PRELIMINARY ISSUE	M.P	J.P.W		
AJM JV		P1	23/02/15	PRELIMINARY ISSUE	M.P.			

Consultant: AJM Joint Venture

Franchisee / Lessee: MMRA

RAILWAY TRACK AND CIVIL
MELBOURNE METRO
SOUTH YARRA STATION TRACK ALIGNMENT
OPTION 2

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	MGA Z55 AHD

VicTrack ACCESS

File Name: MM-SK-TC-132.dgn
Sheet No.: 01 of 01
In Serv.:
Scale: 1:1000 H
Sheet Size: A1

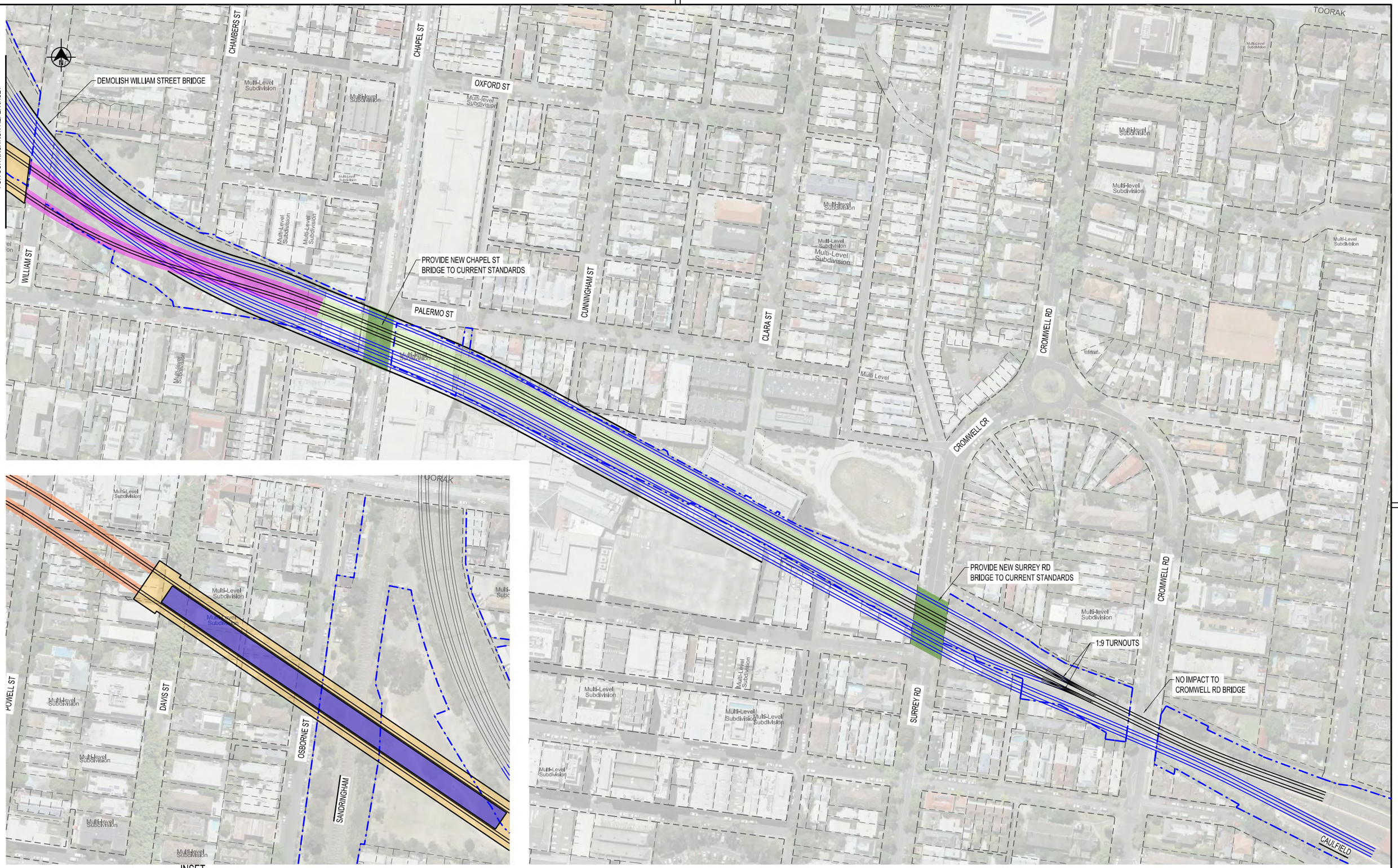
Project Drawing Number: MM-SK-TC-132

Drawn By	Designed By
D.BUCKLE	M.PRICE
Checked By	Ind. Review
J.WILLIAMS	
Approved	Approval Date
D.ANDERSON	

Drawing Number | Revision: P2

6/03/2015 12:59:30 PM

MM-SK-TC-132.dgn



INSET

LEGEND

- EXISTING TRACKS
- MM TRACKS
- TRACKS TO BE REALIGNED
- RETAINING WALL
- VICTRACK RESERVE BOUNDARY
- PLATFORM
- UNDERGROUND STATION FOOTPRINT
- DECLINE STRUCTURE
- TUNNEL - DRIVEN
- TUNNEL - CUT & COVER
- NEW BRIDGE

NOT TO BE USED FOR CONSTRUCTION PURPOSES

INFORMATION PURPOSES ONLY

20 10 0 20 40 60 80 100m
SCALE

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.
AJM JV		P2	06/03/15	PRELIMINARY ISSUE	M.P	J.P.W		
AJM JV		P1	23/02/15	PRELIMINARY ISSUE	M.P.			

Consultant: AJM Joint Venture

Franchisee / Lessee: MMRA

RAILWAY TRACK AND CIVIL
MELBOURNE METRO
SOUTH YARRA STATION TRACK ALIGNMENT
OPTION 4

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	MGA Z55 AHD

VicTrack ACCESS

File Name	MM-SK-TC-133.dgn
Sheet No.	01 of 01
In Serv.	
Scale	1:1000 H
Sheet Size	A1

Project Drawing Number: MM-SK-TC-133

Drawn By	Designed By
D.BUCKLE	M.PRICE
Checked By	Ind. Review
J.WILLIAMS	
Approved	Approval Date
D.ANDERSON	
Drawing Number	Revision
	P2

6/03/2015 12:28:33 PM

MM-SK-TC-133.dgn

FOR CONTINUATION REFER INSET

DEMOLISH WILLIAM STREET BRIDGE

PROVIDE NEW CHAPEL ST
BRIDGE TO CURRENT STANDARDS

PROVIDE NEW SURREY RD
BRIDGE TO CURRENT STANDARDS

1:9 TURNOUTS

NO IMPACT TO
CROMWELL RD BRIDGE

CHAMBERS ST
CHAPEL ST
OXFORD ST
WILLIAM ST
CUNNINGHAM ST
PALERMO ST
CLARA ST
CROMWELL RD
CROMWELL CR
GARDEN ST
WILSON ST
SURREY RD
DAVIS ST
OSBORNE ST
SANDRINGHAM
CAULFIELD

Multi-Level Subdivision

INSET

LEGEND

- EXISTING TRACKS
- MM TRACKS
- TRACKS TO BE REALIGNED
- RETAINING WALL
- VICTRACK RESERVE BOUNDARY
- PLATFORM
- UNDERGROUND STATION FOOTPRINT
- DECLINE STRUCTURE
- TUNNEL - DRIVEN
- TUNNEL - CUT & COVER
- NEW BRIDGE

NOT TO BE USED FOR CONSTRUCTION PURPOSES

INFORMATION PURPOSES ONLY

20 10 0 20 40 60 80 100m
SCALE

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.
AJM JV		P2	06/03/15	PRELIMINARY ISSUE	M.P	J.P.W		
AJM JV		P1	23/02/15	PRELIMINARY ISSUE	M.P.			

Consultant: AJM Joint Venture

Franchisee / Lessee: MMRA

RAILWAY TRACK AND CIVIL
MELBOURNE METRO
SOUTH YARRA STATION TRACK ALIGNMENT
OPTION 3

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	MGA Z55 AHD

VicTrack ACCESS

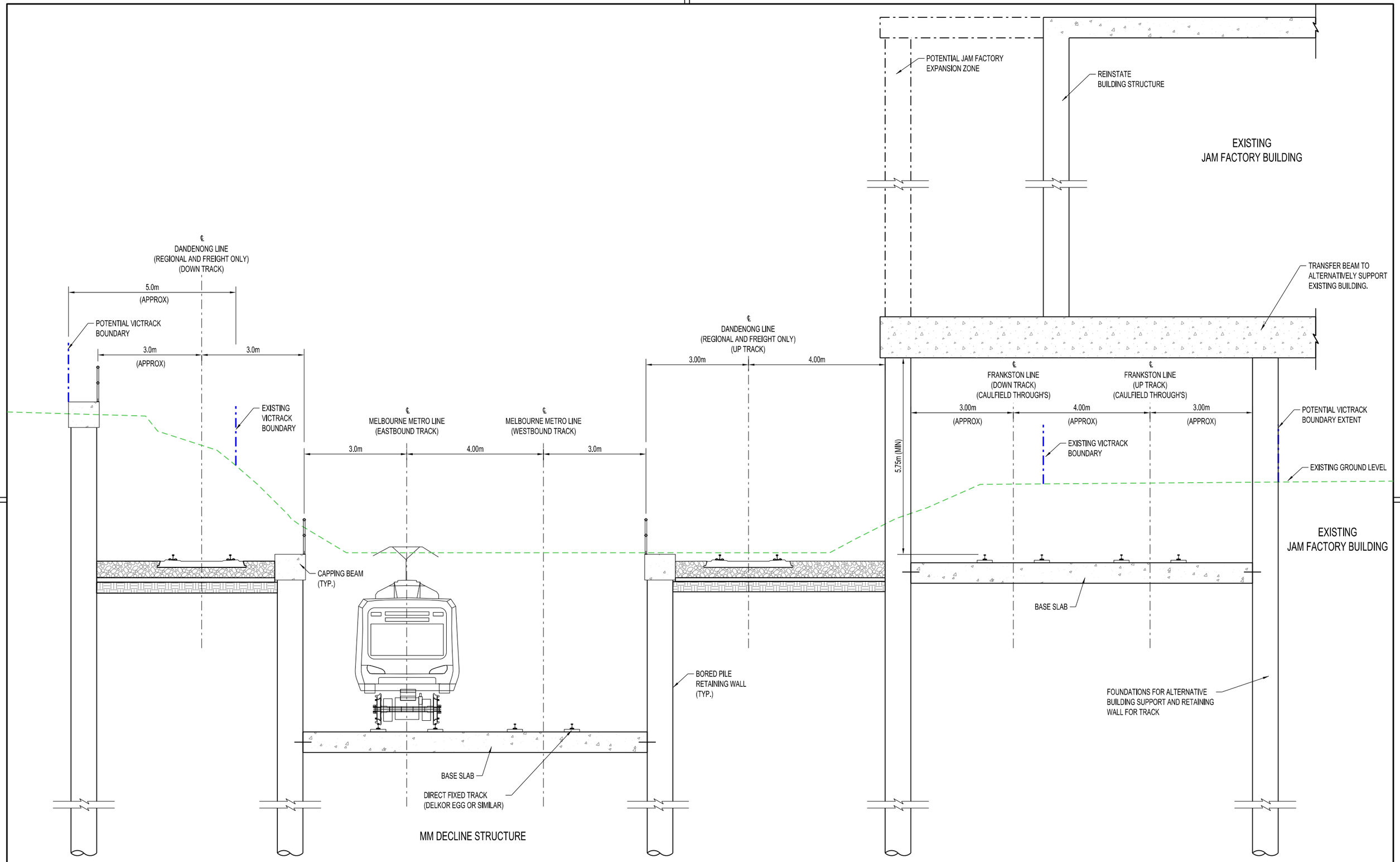
File Name: MM-SK-TC-134.dgn
Sheet No.: 01 of 01
In Serv.
Scale: 1:1000 H
Sheet Size: A1

Project Drawing Number: MM-SK-TC-134

Drawn By	Designed By
D.BUCKLE	M.PRICE
Checked By	Ind. Review
J.WILLIAMS	
Approved	Approval Date
D.ANDERSON	
Drawing Number	Revision
	P2

6/03/2015 2:52:12 PM

MM-SK-TC-134.dgn



SECTION A 0143
1:50

NOT TO BE USED FOR CONSTRUCTION PURPOSES

INFORMATION PURPOSES ONLY

1 0.5 0 1 2 3 4 5m
SCALE 1:50

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.
AJM JV		P1	06/03/15	PRELIMINARY ISSUE	M.P.	J.W		

Consultant: AJM Joint Venture

Franchisee / Lessee: MMRA

RAILWAY TRACK AND CIVIL
MELBOURNE METRO
SOUTH YARRA STATION TRACK ALIGNMENT
TYPICAL SECTION
ADJACENT JAM FACTORY

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	MGA Z55 AHD

VicTrack ACCESS

File Name MM-SK-TC-151.dgn
Sheet No. 01 of 01
In Serv.
Scale 1:50 Sheet Size A1

Project Drawing Number: MM-SK-TC-151

Drawn By	Designed By
N.WIJERATHNE	M.PRICE
Checked By	Ind. Review
J.WILLIAMS	
Approved	Approval Date
Drawing Number	Revision
	P1

6/03/2015 2:46:33 PM
MM-SK-TC-151.dgn

Appendix B

Project Evaluation Framework

Introduction to Option

The following options (refer to table over) were investigated.

Table B-1 Options Investigated

Heading	Description
Option 1 – 2010 Alignment	Provision of new Melbourne Metro lines and new platforms (for a 234m long train) arrangement 140m to the west of the existing South Yarra Station and south of Toorak Road. In this option track modifications are constrained to the west of Chapel Street.
Option 2 – “Flipped” Rail Arrangement	Broadly similar to Option 1 but with rail works to include the provision of grade separated rail/ rail cross-over structure located between South Yarra and Caulfield stations to allow the Dandenong line to swap onto the existing Frankston line alignment and the Frankston line to swap onto the existing Dandenong line alignment to achieve a modified track arrangement at South Yarra.
Option 3 – Unconstrained Chapel Street (north)	Provision of new platforms positioned under new Sandringham line platforms relocated to the south of Toorak Road, suitable for a 234m long train. In this option track modifications are not constrained to the west of Chapel Street allowing the MM platforms to be located in a position that provides optimal connectivity to the existing South Yarra Station platforms. This may involve a significant interface with Chapel Street commercial precinct. In this option land impacts, to the east of Chapel Street, are predominantly limited to the north side of the rail reserve. Access to the Jam Factory loading dock and car park from Palermo Street is impacted.
Option 4 – Unconstrained Chapel Street (south)	As per Option 3 but with land impacts predominantly limited to the south of the rail reserve.

All options investigated preserve the opportunity to accommodate a 210m long train as a 234m long train has been used for the development of the options.

Both Options 3 and 4 are considered unconstrained options; the track geometry for these options is not limited by the existing Chapel Street road over rail bridge. This results in land impacts to the east of Chapel Street, adjacent to the rail corridor, but provides for the optimal location of MM platforms to achieve a direct interchange with new Sandringham platforms located to the south of Toorak Road and Frankston line platforms retained within the existing South Yarra Station.

The four options have been developed based on the following desired operational outcomes:

- Straight platforms
- 234m trains
- Minimum platform width of 3m
- Equitable access for all users

Project Evaluation Framework

Each option has been assessed against a Project Evaluation Framework that has been developed for the Melbourne Metro Rail Project (MMRP). The Project Evaluation Framework has been developed to consider operations, safety, customer experience, land use, the environment, social impacts, economics, value for money and a range of other qualitative considerations. The evaluation of the options can be found in Table B-3.

A grading scheme has been developed to categorise the potential level of impact against the project objectives. The evaluation grading table is described in Table B-2. As this study does not asses the options against a base option it is not possible to assess the options against the grading system. Instead qualitative discussion is provided on the differentials between the various options.

Table B-2: Evaluation grading definition

Grading	Definition
(-)	Potentially disadvantaged and negative influence on MMRP project (scope, cost, risk)
(=)	Neutral influence on MMRP project or minor negative or positive influence
(+)	Potentially desirable and positive influence on MMRP project (scope, cost, risk)

Table B-3 **Project Evaluation Framework**

Goal		Objectives		Criteria	Option 1 – 2010 Base Station Case	Option 2 – "Flipped" Rail Alignment	Option 3 – Unconstrained Chapel Street Option (north)	Option 4 – Unconstrained Chapel Street (south)
Meets Project Requirements	1.1	Achievement of Project Requirements	1.1.1	All Project requirements are met or non-compliance issues have manageable impacts	Study to understand potential options to locate a station at South Yarra	Study to understand potential options to locate a station at South Yarra	Study to understand potential options to locate a station at South Yarra	Study to understand potential options to locate a station at South Yarra
Achieve an economic and financially viable project	2.1	Maximise BCR, incorporating wider economic benefits	2.1.1	Achieve greatest BCR	-	-	-	-
	2.2	Minimise net cost to the State	2.2.1	Construction Cost	Nominal P90 cost of $494million. Includes an allowance for a pedestrian bridge at William Street.	Nominal P90 cost of $582million. Includes an allowance for a rail/rail grade separation at Caulfield.	Nominal P90 cost of $634million. Includes an allowance for decking adjacent to the GPO building on the south side of Toorak Road. Does not include decking either side of Chapel Street Bridge.	Nominal P90 cost of $657million. Includes an allowance for decking adjacent to the GPO building on the south side of Toorak Road. Does not include decking either side of Chapel Street Bridge.
			2.2.2	Land and Property Cost	Nominal P90 cost of $206million.	Nominal P90 cost of $526million.	Nominal P90 cost of $324million.	Nominal P90 cost of $314million.
			2.2.3	Operational Cost (includes maintainability)	-	-	-	-
Facilitate development of an integrated,efficient transport network	3.1	Improve customer experience - efficiency and safety of the rail system	3.1.1	Station to Station and also interchange Time (all relevant transport modes)	No paid to paid interchange. Interchange movement between MM platforms and existing South Yarra Station requires passengers to cross Toorak Road at surface level.	As per Option 1.	Direct paid to paid interchange between all platforms.	As per Option 3.
			3.1.2	Accessibility of station location	-	-	Provision of a William Street entry will increase the catchment of the station.	As per Option 3.
			3.1.3	Optimise passenger movement (connectivity and legibility)	No direct connectivity between stations. The creation of two unique stations will reduce legibility for passengers.	As per Option 1.	Direct platform to platform connectivity within the paid zone.	As per Option 3.
			3.1.4	Reliability (frequency and punctuality)	-	-	-	-
			3.1.5	Provides for operational flexibility	-	-	-	-
Protect Natural and Cultural Resources and Enhance the built and natural Environment	4.1	Construction Disruption	4.1.1	Traffic Impact during construction	William Street bridge will be demolished. Road users will need to find a permanent alternate route.	As per Option 1.	The existing Chapel Street road over rail bridge will be demolished and reconstructed during construction. This will impact existing tram services and road network on Chapel Street. The existing William Street road bridge will need to be demolished and reinstated during construction. This will impact on local road operation during construction.	As per Option 3.
	4..2	Protect significant vegetation (including non-invasive exotic vegetation),	4.2.1	Minimise impacts on Commonwealth (EPBC Act) and State (FFG Act)) listed species and communities	-	-	-	-
			4.2.2	Minimise impacts on healthy mature trees, both indigenous and exotic	-	-	-	-

Goal	Objectives		Criteria	Option 1 – 2010 Base Station Case	Option 2 – “Flipped” Rail Alignment	Option 3 – Unconstrained Chapel Street Option (north)	Option 4 – Unconstrained Chapel Street (south)
	functioning of natural ecosystems and maintain biological diversity	4.2.3	Minimise removal of remnant native vegetation and habitat	-	-	-	-
4.3	Preserve indigenous and post-settlement cultural heritage values and places	4.3.1	Minimise impacts on areas of cultural heritage sensitivity defined under the Victorian Aboriginal Heritage Act 2006	-	-	-	-
		4.3.2	Minimise impacts on places listed in the Victorian Heritage Register or as Heritage Overlays in the relevant planning scheme, as identified in the Victorian Heritage Council data base	-	-	-	-
4.4	Protect surface and groundwater resources and water quality	4.4.1	Maintain the function of existing surface water flows	-	-	-	-
		4.4.2	Maintain or improve the function of existing flooding patterns	-	-	-	-
		4.4.3	Maintain or improve existing water quality	-	-	-	-
		4.4.4	Manage extraction of groundwater to avoid consequential impacts on natural (e.g. stream flows) and built environment (e.g. subsidence)	-	-	-	-
		4.4.5	Minimise impacts on significant groundwater dependent ecosystems	-	-	-	-
4.5	Contribute to the reduction of greenhouse gas emissions and build resilience to climate change	4.5.1	Provide design, construction and operational solutions which reduce greenhouse gases	-	-	-	-
		4.5.2	Design the project to accommodate extreme weather events	-	-	--	-
Support Sustainable Communities and Land Use Patterns	5.1 Minimise displacement impacts, and where possible enhance existing and land uses (construction and operation)	5.1.1	Minimise direct impact on residential areas	Properties to the south of Toorak Road abutting the station location may be subject to noise and vibration impacts. Properties around William Street bridge may be impacted by noise pollution etc. during demolition works.	As per Option 1.	Properties to the south of Toorak Road abutting the station location may be subject to noise and vibration impacts. Properties around Chapel Street road over rail bridge and William Street bridge may be impacted by noise pollution etc. during demolition works.	As per Option 3.
		5.1.2	Minimise direct impacts on public open space	South Yarra Siding Reserve impacted during construction. Lovers Walk may not be possible to reinstate.	As per Option 1.	South Yarra Siding Reserve impacted during construction. Area re-instated post construction of the station. Lovers Walk may not be possible to reinstate.	As per Option 3.
		5.1.3	Minimise direct impact on businesses	Broad impact on Toorak Road commercial precinct.	As per Option 1.	Broad impact on Chapel Street commercial precinct.	As per Option 3.
	5.2 Maintain and enhance community cohesiveness	5.2.1	Maintain community accessibility during construction and operation phases	Local access issues associated with William Street Bridge removal.	As per Option 1. Rail/ rail grade separation requires closure of road under rail connection between Normanby Road and Dandenong Road.	Chapel Street precinct access issues associated with the re-construction of Chapel Street Bridge.	As per Option 3.
		5.2.2	Minimise direct impact on community facilities, such as educational, religious and sporting facilities	-	-	-	-

Goal		Objectives		Criteria	Option 1 – 2010 Base Station Case	Option 2 – “Flipped” Rail Alignment	Option 3 – Unconstrained Chapel Street Option (north)	Option 4 – Unconstrained Chapel Street (south)
			5.2.3	Avoid long term impacts and provide opportunities to enhance public open space	-	-	-	Opportunity to create a pedestrian link along the south side of rail reserve connecting to Chapel Street.
	5.3	Maintain community safety and amenity	5.3.1	Minimise noise impacts on the number of sensitive receptors such as residences, schools, hospitals and churches within 200 metres of stations and portal locations.	-	-	-	-
			5.3.2	Minimise air quality impacts on the number of sensitive receptors within 75 metres of stations and portal locations.	-	-	-	-
			5.3.3	Minimise visual impacts on sensitive receptors and enhance landscape values, where possible	-	-	-	-
			5.3.4	Improve public safety and amenity	-	-	-	-
			5.3.5	Minimise risks from disturbance, transport and disposal of solid wastes from excavation works, including potentially contaminated materials and acid sulphate soils	-	-	-	-
	5.4	Make a positive contribution to the built form	5.4.1	Provide opportunities to improve existing urban character/aesthetics of the area	Potential to develop a civic square adjacent to proposed station entry.	-	-	Potential to develop a civic square adjacent to proposed station entry.
			5.4.2	Provide opportunities for redevelopment of higher density residential and commercial land use adjoining and over stations, consistent with Melbourne Metropolitan Strategy	Consolidated development site on Toorak Road provides an opportunity for transport orientated development.	As per Option 1.	Potential opportunity to enhance Chapel Street precinct. Decking west of Chapel Street provides an opportunity for over site development and integration between station entry at William Street and Chapel Street.	As per Option 3.
Programme	6.1	Duration	6.1.1	Length of time between CIS completion and full passenger service operation including constructability / construction constraints	-	-	-	This option is reliant on partial acquisition of the Jam Factory. Negotiations (timing and outcomes) impact overall MM programme.
Other	7.1	Future Proofing	7.1.1	Minimize spatial and infrastructure requirements to allow for future provision of South East Rail Link (SERL)	-	-	-	-
	7.2	Safety case	7.1.2	Can any residual safety aspects be eliminated and /or mitigated	-	-	-	-

Conclusion

As discussed above a qualitative assessment of the options relative to each other has been undertaken. The key differentials are considered to be cost, customer experience and disruption.

In terms of cost Option 1 has the lowest a construction and land cost estimate at $494 million and $206 million respectively. Costs increase through Option 2, Option 3 and Option 4.

Options 1 and 2 do not provide a direct paid to paid interchange between MM platforms and existing South Yarra Station platforms. Options 3 and 4 provide a direct paid to paid interchange which is considered preferable from a user perspective. Options 3 and 4 have the ability to increase the catchment of the station through the provision of a William Street entry. Again, from a user perspective this is considered preferable to Options 1 and 2.

Both Options 1 and 2 and Options 3 and 4 have varying impacts on residential properties, open space and commercial businesses.

Appendix C

Strategic and Land Use Planning

State Planning Policy Framework

The State Planning Policy Framework is a key part of the Victorian planning system and the Victoria Planning Provisions. It sets the key policy direction for state planning issues and is consistent across all planning schemes in Victoria.

The following clauses of the State Planning Policy Framework are relevant to this options assessment:

- Clause 12.01-1 Protection of biodiversity
- Clause 13.02-1 Floodplain management
- Clause 13.04-1 Noise abatement
- Clause 13.04-2 Air quality
- Clause 14.02-1 Catchment planning and management
- Clause 14.02-2 Water quality
- Clause 16.01-3 Strategic redevelopment sites
- Clause 15.01-1 Urban design
- Clause 15.01-2 Urban design principles
- Clause 15.01-4 Design for safety
- Clause 15.01-5 Cultural identity and neighbourhood character
- Clause 15.02-1 Energy and resource efficiency
- Clause 15.03-1 Heritage conservation
- Clause 15.03-2 Aboriginal cultural heritage
- Clause 17.01-1 Business
- Clause 18.01-1 Land use and transport planning
- Clause 18.01-2 Transport system
- Clause 18.02-3 Principal Public Transport Network

Local Planning Policy Framework

The Local Planning Policy Framework is municipality specific and is available for Council to customise to address local planning issues and priorities. The Municipal Strategic Statement and Local Planning Policies are found in this section of the planning scheme. The Municipal Strategic Statement sets out Councils vision for the future, establishing the objectives they want to achieve and draws together all the various strategies from a range of planning initiatives into a consolidated statement of how they want to proceed. Together with Local Planning Policies, it provides the strategic basis and guiding principles for land use and development planning that is appropriate for Stonnington.

Municipal Strategic Statement

The following clauses of the Municipal Strategic Statement are relevant to this options assessment:

- Clause 21.02-3 identifies key influences and challenges facing Stonnington (as relevant):
  - The access to public transport and services within 400 metres in almost all the City, and how to achieve a more refined approach to the distribution of future housing densities in the City
  - Upholding and restoring the City's key values (its distinctive built form and landscape character) while encouraging high quality new development and accepting change
  - The impact of increasing higher density development, and how to maximise opportunities for canopy tree landscaping in new developments
  - Protecting the City's assets, its heritage buildings, key landmarks, important vistas and riverside environs
  - The City's low ratio of open space provision, the cost and availability of land for new open space in an already densely developed City, and how to capitalise on opportunities to improve the public realm, maximise the use of existing open space and add new open space.
  - The impact of intensive new development on the City's ageing infrastructure, and how to maintain an appropriate mix and level of social and physical infrastructure and an integrated approach to infrastructure provision.
  - The City's comprehensive public transport system and how to optimise its use and access to it and to encourage sustainable transport options
- Clause 21.03-2 provides for Councils Strategic vision (as relevant)
  - Higher density development is directed to locations with the highest accessibility to roads with trams and Smart buses and beside railway stations
  - The City has high quality built form that reflects an appreciation of its context and the underlying character and topography of the City
  - Key landmarks, view and vistas (Royal Botanic Gardens, Shrine of Remembrance and the Yarra River frontage, escarpment and skyline) are protected from intrusive development
  - All places of at least local heritage significance to the City are identified and protected
  - The landscaped character of the City is retained, repaired and enhanced and canopy trees are a prevailing part of the City's environment
  - New built form is well-designed and respects the valued, traditional built form character elements of its host precinct
  - New development in activity centres contributes to the vibrancy, activity and passive surveillance of streets and public spaces, while respecting the heritage values, human scale and the unique character of different centres.
  - The public realm is expanded and enhanced and adjoining development and landscaping contributes positively to its character and function
  - The City is a walkable environment with enhanced connectivity within activity centres and between centres and adjacent residential neighbourhoods
  - Environmentally sustainable development principles are embraced in all new developments
  - Universal access, safety and social inclusion are incorporated as lead principles in the design of all developments
  - The City's valued open space is protected and enhanced through no net loss in public open space and increases in areas of identified shortage; it is safe and accessible for public use and meets the diverse and changing needs of the community.
  - The City has an enhanced biodiversity and a system of linked riparian environment areas that support native flora and fauna

- Environmental risks (including flooding, contamination, air pollution and noise) are identified and managed to ameliorate their impact
- An adequate level and standard of infrastructure (utility, transport and community) is provided to support the community's needs and new development
- The City's prosperity is fostered by well integrated transport and land use, including improved pathway connectivity to local activity centres and public transport nodes, so as to reduce car trips to local shops and services.
- The City's main roads with trams are progressively converted to 'main streets' where pedestrians, bicycles and public transport have priority and private motor vehicles are limited to local (Stonnington) traffic.
- The need for sustainable personal transport modes (for pedestrians, cyclists and public transport users) is given priority over the needs of motorists
- The City's suburbs and precincts are world class walking areas, where it is safe and convenient to walk to destinations, and where people are actively encouraged and enabled to walk
- Other clauses of relevance include:

- Clause 21.04 Economic Development
- Clause 21.05 Housing
- Clause 21.06 Built Environments and Heritage
- Clause 21.07 Open Space and Environment
- Clause 21.08 Infrastructure

Local Planning Policies

A number of Local Planning Policies are also relevant as follows:

- Clause 22.04 Heritage Policy
- Clause 22.18 Stormwater Management (Water Sensitive Urban Design)
- Clause 22.19 Prahran, South Yarra and Windsor Activity Centre Policy

Clause 22.19 gives effect to the Prahran, South Yarra and Windsor Activity Centre Policy. The policy needs to be read and applied in conjunction with Design and Development Overlay Schedule 7 (DDO7). The policy implements the land use components of the Chapel Vision Structure Plan, December 2007. The Structure Plan seeks to:

- *Implement Melbourne 2030 – Planning for Sustainable Growth and Melbourne 2030: A Planning Update Melbourne @5 million.1*
- *Provide a sustainable framework in which change can be strategically managed*
- *Protect and enhance important local attributes of the Activity Centre and its environs*
- *Guide the location of more intensive development of housing, office and other compatible uses*

The vision statement for South Yarra states:

> *A transformed employment, living and tourism hub founded on high quality, integrated public transport and pedestrian links, convenient neighbourhood and distinctive shopping and attractive networks of streets and spaces. Acknowledgement that the redevelopment of the Forrest Hill precinct and nearby Cremorne and Church Street precincts will change the dynamics of South Yarra.*

This Policy expires on 31 October 2015.

[1] Now superseded by Plan Melbourne

Zones and Overlays

Zones and overlays are the primary planning controls that apply to all land in Victoria. They reflect the primary character of land, such as residential, commercial or industrial, and indicate the type of use and development, subdivision and signage that may be appropriate. Often parcels of land may have an overlay as well as a zone. An overlay depicts a special characteristic of the land, for example a heritage overlay may cover a parcel of land that has a building or feature of special cultural or historical significance. A planning permit for a particular development may be required under an overlay, even if a permit is not required under the zone provisions.

A separate discussion about zoning is contained in each of the option assessments as a range of zones apply across the options. The same overlays apply to all of the options and as such have been discussed below.

Heritage Overlay

Heritage Overlays apply to land as follows:

- HO106 - Former South Yarra Railway Station, 165 – 167 Toorak Road, South Yarra (H1068)
- HO107 - Former South Yarra Post Office, 162 Toorak Road, South Yarra (H210)
- HO126 - Chapel Street Precinct (South Yarra, Prahran and Windsor)
- HO 447 - Franklyn House Flats, 137 Osborne Street, South Yarra
- HO150 - Toorak Road (west of William and Claremont Street Precinct) South Yarra - both sides of Toorak Road as well as the South Yarra Sidings / Osborne Street Reserve and the railway corridor.

The plan below shows the locations of the Heritage Overlays. HO106 and HO107 are also listed on the Victorian Heritage Register[2].

Planning approval is generally required for all buildings and works and demolition in a Heritage Overlay.

[2] Where a site is listed on the Victorian Heritage Register, the requirements of the *Heritage Act 1995* supersede the requirements of the Heritage Overlay in the relevant planning scheme.

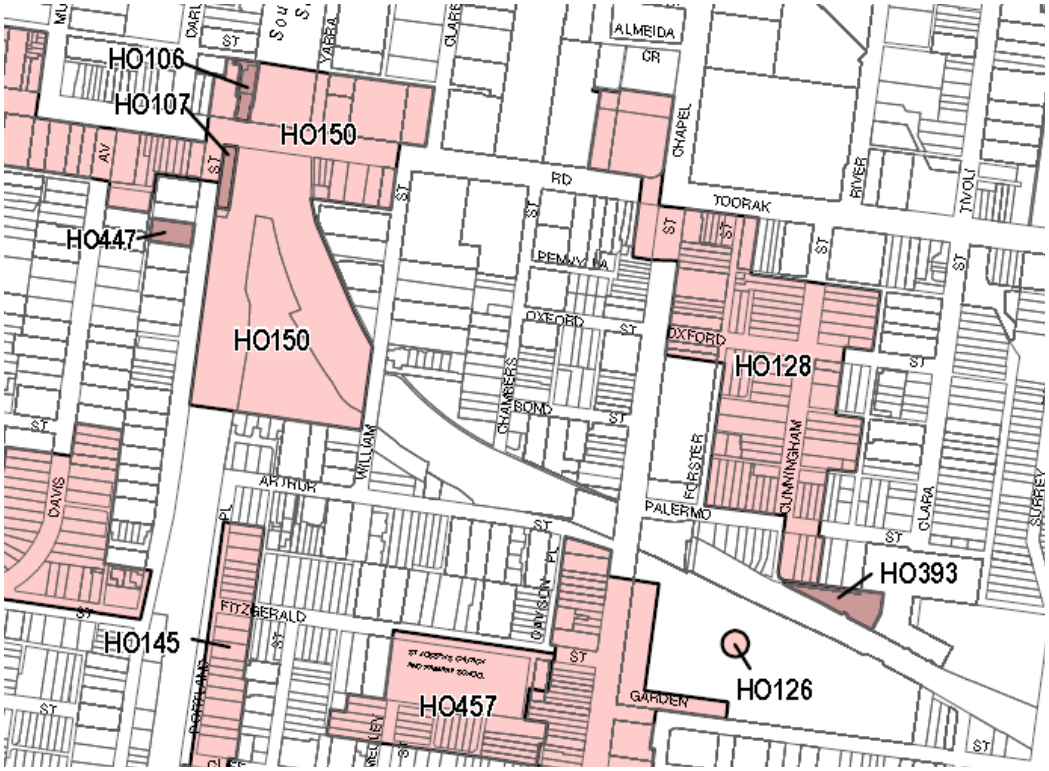


Figure C-1 Heritage Overlay – Study Area

The citation for HO 150 states the following in relation to the railway:

> *" In 1860 direct communication by rail with Melbourne was effected when a bridge was constructed across the Yarra and the railway station Gardiner's Creek Road (now South Yarra) was opened. When the South Yarra to Oakleigh section of the main Gippsland Line was constructed in 1879 it joined the single track Brighton Line at South Yarra. Because both lines were set in deep cuttings a potentially dangerous junction was created and this was not alleviated until some years later when the embankment of the cutting lowered to provide a clearer vision for locomotive drivers."*

While part of the Jam Factory is shown as being within HO126 (Chapel Street Precinct (South Yarra, Prahran and Windsor), the area of the proposed work appears to be outside of the Heritage Overlay, although this depends on the extent of works and acquisition.

Special Building Overlay

A Special Building Overlay runs along Toorak Road form the north and then generally runs along the alignment of Powell Street to the south. It also runs along Chapel Street to the south of Palermo Street affecting properties on both sides of the road, although not the railway. Melbourne Water must be consulted about any works in this overlay.

This overlay highlights the issue of flooding within the study area that will need to be addressed.

FigureC-2 Special Building Overlay

Design and Development Overlay

A Design and Development Overlay (Schedule 7 - Prahran / South Yarra and Windsor Activity Centre) currently applies to all the options and requires that planning approval be sought for all buildings and works. It contains design objectives related to character and heritage, landmarks, views and vistas, interfaces and energy and resource efficiency. It also provides for building design, heritage and character, street frontages, solar access, views, gateways and landmarks and public realm and movement.

Figure C-3 Design and Development Overlay

Particular Provisions

Particular provisions are specific prerequisites or planning provisions for a range of particular uses and developments, such as advertising signs and car parking. They apply consistently across the state and there is no ability to include in planning schemes particular provisions which are not in the Victoria Planning Provisions. Unless specified otherwise, the particular provisions apply in addition to the requirements of a zone or overlay.

Approval may be required to remove native vegetation pursuant to Clause 52.17 (Native Vegetation). However there may be exemptions, as described in the Memorandum of Understanding between Department of Transport and Department of Sustainability and Environment[3] (dated 27/08/2008), which may apply.

Planning Scheme Amendments

Planning Scheme Amendment C172

A planning scheme amendment (Amendment *C172 – Chapel Street Activity Centre Permanent Planning Controls)* is required to give effect to the objectives and strategies contained in the Chapel Street Structure Plan (*Chapel reVision 2013 – 2031)*. The structure plan guides future land use and development in the Chapel Street Activity Centre towards 2031 and was formally adopted by Council in 2014. The Chapel reVision Structure Plan 2013-2031 replaces Chapel Vision 2007 – the interim controls associated with this are due to expire on 31 October 2015.

[3] These departments are now known as the Department of Economic Development, Jobs, Transport and Resources and Department of Environment, Land, Water and Planning respectively.

The amendment seeks to consolidate the planning controls that apply to the Chapel Street Activity Centre by replacing the existing zone provisions with Schedule 1 to the Activity Centre Zone (ACZ), with the exception of some existing land in the Public Use Zone, Public Park and Recreation Zone and Road Zone. The proposed zoning is shown in Figure C-4 below.

Figure C-4 Amendment C172 – Proposed Zone

The Structure Plan also provides comprehensive built form and urban design analysis, which identifies significant opportunities for change within the Activity Centre. This analysis has identified building height and setback requirements for each sub-precinct within the Activity Centre.

The Structure Plan splits the area into neighbourhoods. These neighbourhoods are discussed in the following section and Council's aspirations for these areas should be noted and considered.

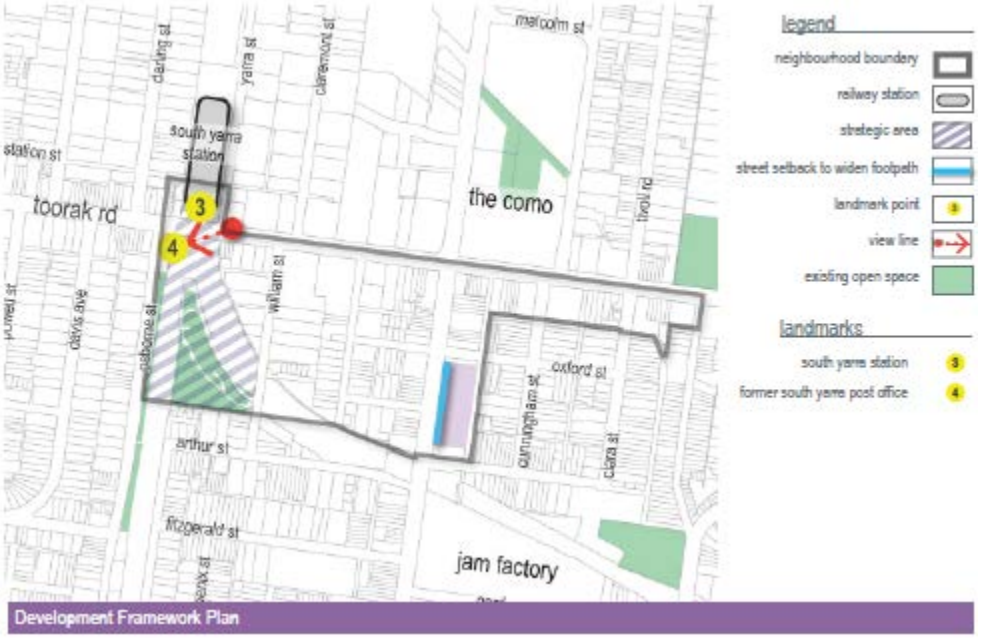
Neighbourhood 2: Toorak Road Central

The following opportunities have been identified in the Structure Plan and are reproduced below in Table C-1.

Table C-1 Toorak Road Central Opportunities

Recommendation/ Opportunity	Rationale	
Movement		
Investigate opportunities for a regional north/ south shared path and bicycle link, particularly through the South Yarra Sidings Reserve.	To ensure future strategic planning in this area considers the implementation of a new north /south regional bike network along the Sandringham railway corridor.	
Encourage improvements to South Yarra Station including improved access from Toorak Road and Yarra Street.	This South Yarra Station is one of the most highly utilised stations in Stonnington. It is a premier interchange station and improved access is required to cater for patron numbers.	
Advocate for a modal interchange at South Yarra Station and real time information to provide a more efficient and effective public transport network.	Provide a tram/ train interchange at South Yarra Station with the latest technology in real time information.	
Provide a new pedestrian link into the South Yarra Sidings Reserve directly from Toorak Road.	To improve access to the South Yarra Sidings Reserve, including more direct access from the Forrest Hill Precinct.	
Investigate opportunities to provide an improved pedestrian crossing on Toorak Road at South Yarra Station which is extended to include Osborne Street and Yarra Street.	To improve pedestrian access and connections.	
Investigate opportunities to provide a pedestrian link into the South Yarra Sidings Reserve from Osborne Street and Portland Place.	To improve access to the South Yarra Sidings Reserve.	

Public Realm		
Improve the quality and amount of public open space in the South Yarra Sidings Reserve as a central parkland which caters for the surrounding population and increasing density.	The South Yarra Sidings Reserve is an under utilised public open space within South Yarra. The quality of this space should be enhanced, including new and improved access.	
Undertake a laneway program in Lovers Walk South Yarra. A project for this space could be to allow padlocks along fencing for people to declare love along this link, similar to those used along bridges in Paris, and Lovers Walk in the Cinque Terre Italy.	To improve the safety, activation and utilisation of this space.	
Investigate the opportunity for a Village Square on the south side of Toorak Road above the railway line as a new meeting point.	To provide a north facing village square above the railway line to provide a new civic focus along Toorak Road and to maintain view lines to the former historic Post Office.	

Development and Land Use		
Open view lines to the former South Yarra Post Office and require uninterrupted views to this building from the corner of Yarra Street and Toorak Road.	To preserve and enhance view lines to the former historic Post Office along Toorak Road.	
Improve passive surveillance and sightlines along Lovers Walk by ensuring new development overlooks this space and fencing used along the way considers safety and aims to be graffiti proof.	Improve safety along this laneway.	

The plan below also shows the location of open space in the area, highlighting the importance of retaining existing open spaces.

Response Sites		
South Yarra Station: Advocate for new entries into South Yarra Station.	Provide new entries into the South Yarra Station.	 Community Framework Plan

Of interest to this study, the area over the railway line to the south of Toorak Road is proposed to be zoned ACZ from its current zoning Public Use Zone 4 – Transport.

The amendment also seeks to rezone Lovers Walk adjacent to the railway track, between Toorak Road to the north and Chapel Street to the south-east, to a Public Park and Recreation Zone.

Council has requested the Minister for Planning to appoint an independent Panel to assess the amendment and the submissions.

Once the hearing has been held, the Panel will then present a report to Council outlining their recommendations. The Panel Report is not a binding determination. Council will then consider the Panel Report, as well as any alterations to the proposed amendment provisions, and can determine to adopt the amendment unchanged, adopt the amendment with changes, or abandon the amendment. This is predicted to occur during mid-2015.

Neighbourhood 5: Jam Factory District

It should be noted that within an Activity Centre Zone, a railway is an 'as of right' use however a railway station is prohibited. This is in conflict with a key aspiration for the Jam Factory as covered under Neighbourhood 5: Jam Factory District and reproduced below.

"Jam Factory site: Advocate for a new train station at the Jam Factory (e.g. Melbourne Metro project)." and

"Improve access to the railway network due to increase population."

A train station at the Jam Factory has not been considered as part of this study as it does not provide an interchange opportunity with the Sandringham line.

Planning Scheme Amendment C204

A recent proposal to demolish a residential building (21 William Street) has led to the preparation of Amendment C204. The amendment proposes to apply the Heritage Overlay to 21 William Street. Should this amendment progress the existing building will need to be preserved. This property abuts the rail reserve.

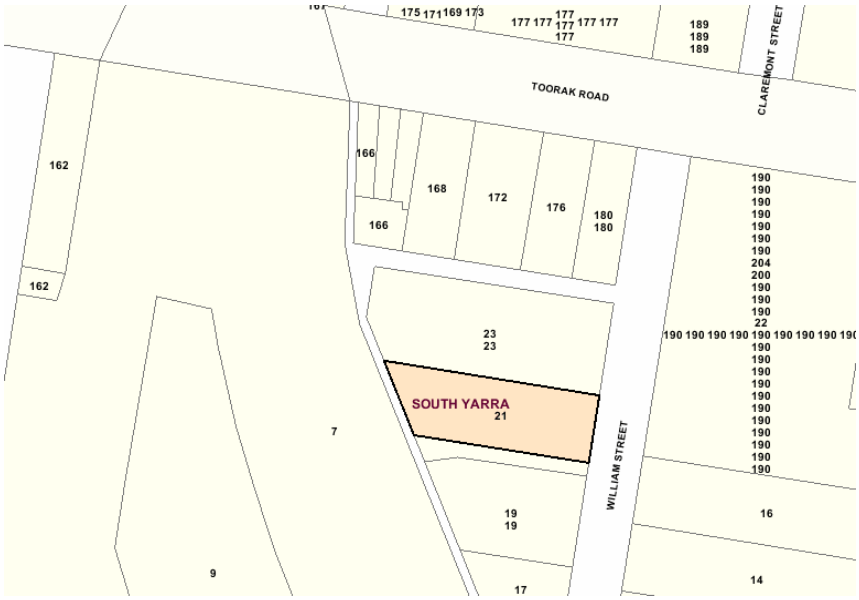


Figure C-5 William Street, South Yarra

The amendment has been exhibited and considered by Council. It was resolved, by Council, to request the Minister for Planning to appoint a Panel to hear the submission and consider the Amendment.

Planning Scheme Amendment C175

The City of Stonnington has prepared Amendment C175 to introduce a new Neighbourhood Character Policy. This policy will clarify the preferred neighbourhood character for an area and assist in ensuring that a development proposal respects and reinforces the preferred character. The Neighbourhood Character Local Planning Policy includes the preferred character statements, design objectives and design responses to be taken from the precinct profiles. The area around South Yarra is identified as being in the Inner Urban Area.

A Panel Report recommended that the Amendment be adopted as exhibited subject to changes. Council considered the recommendations of the Panel and has resolved to adopt the amendment with changes.

This amendment may inform the scale of future redevelopment sites.

Other Approvals

The following other approvals are considered noteworthy and would apply across all the options, abet subject to the exact detail and location of specific works:

- Aboriginal Heritage Act 2006 – A Cultural Heritage Management Plan may need to be prepared depending on whether the works impact on sites of Cultural Heritage Significance or other matters.
- Heritage Act 1995 – Approvals will be required under this Act to undertake works, including demolition, to places listed on the Victorian Heritage Register. The following sites are locally listed and listed on the Victorian Heritage Register:
  - H210 - Former South Yarra Post office, 162 Toorak Road, South Yarra (H0107)
  - H1068 - Former South Yarra Railway Station, 165 – 167 Toorak Road, South Yarra (HO106)

  The extent of the registration and the nature of the works will determine what approval is required from Heritage Victoria.
- Local Government Act 1988 – Approval will be required under this Act to impact on Council street trees and other assets
- Road Management Act 2004 – Approval will be required under this Act to occupy or undertake works in roads. Chapel Street and Toorak Road are managed by VicRoads with the rest of the roads managed by Council.

Work required as part of further assessment

Additional work would be required to help refine each of the options and provide inputs into any design process.

Appendix D

Land Acquisition Drawings

LEGEND

- EXISTING TRACKS
- MM TRACKS
- TRACKS TO BE REALIGNED
- RETAINING WALL
- VICTRACK RESERVE BOUNDARY
- PERMANENT ACQUISITION
- PLATFORM
- WILLIAM STREET BRIDGE DEMOLISH
- STRATA ACQUISITION
- PROPOSED ACQUISITION FOR WORK SITE
- DECLINE STRUCTURE
- TUNNEL - DRIVEN
- TUNNEL - CUT & COVER
- UNDERGROUND STATION FOOTPRINT

NOT TO BE USED FOR CONSTRUCTION PURPOSES

INFORMATION PURPOSES ONLY

20 10 0 20 40 60 80 100m

SCALE

$TIMES

$DATES

$FILES

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.
AJM JV		P2	06/03/15	PRELIMINARY ISSUE	M.P	J.P.W		
AJM JV		P1	27/02/15	PRELIMINARY ISSUE	M.P.			

Consultant

AJM Joint Venture

Franchisee / Lessee

MMRA

RAILWAY TRACK AND CIVIL
MELBOURNE METRO
SOUTH YARRA STATION TRACK ALIGNMENT
OPTION 1
LAND ACQUISITION

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	MGA Z55 AHD

VicTrack ACCESS

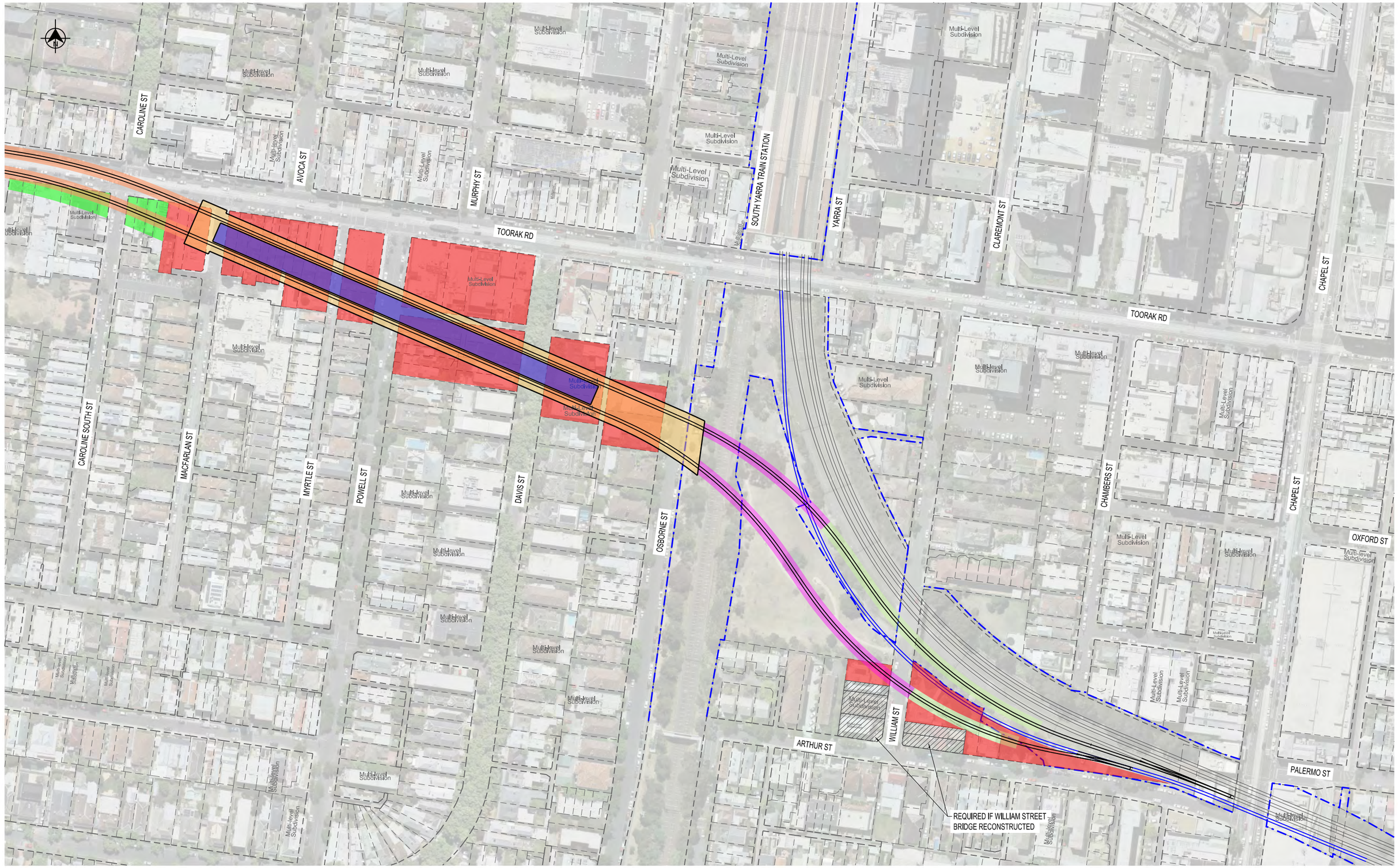
File Name MM-SK-TC-141.dgn
Sheet No. 01 of 01
In Serv.
Scale 1:1000 H
Sheet Size A1

Project Drawing Number: MM-SK-TC-141

Drawn By	Designed By
N.WIJERATHNE	M.PRICE
Checked By	Ind. Review
J.WILLIAMS	
Approved	Approval Date
D.ANDERSON	

Drawing Number

Revision P2



LEGEND

- EXISTING TRACKS
- MM TRACKS
- TRACKS TO BE REALIGNED
- RETAINING WALL
- VICTRACK RESERVE BOUNDARY
- PERMANENT ACQUISITION
- PLATFORM
- REQUIRED IF WILLIAM STREET BRIDGE RECONSTRUCTED
- STRATA ACQUISITION
- DECLINE STRUCTURE
- TUNNEL - DRIVEN
- TUNNEL - CUT & COVER
- UNDERGROUND STATION FOOTPRINT

SCALE 20 10 0 20 40 60 80 100m

NOT TO BE USED FOR CONSTRUCTION PURPOSES

INFORMATION PURPOSES ONLY

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.
AJM JV		P2	06/03/15	PRELIMINARY ISSUE	M.P	J.P.W		
AJM JV		P1	27/02/15	PRELIMINARY ISSUE	M.P.			

Consultant: AJM Joint Venture

Franchisee / Lessee: MMRA

RAILWAY TRACK AND CIVIL
MELBOURNE METRO
SOUTH YARRA STATION TRACK ALIGNMENT
OPTION 2
LAND ACQUISITION

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	MGA Z55 AHD

VicTrack ACCESS

File Name: MM-SK-TC-142.dgn
Sheet No.: 01 of 01
In Serv.:
Scale: 1:1000 H
Sheet Size: A1

Project Drawing Number: MM-SK-TC-142

Drawn By	Designed By
N.WIJERATHNE	M.PRICE
Checked By	Ind. Review
J.WILLIAMS	
Approved	Approval Date
D.ANDERSON	

Drawing Number | Revision: P2

6/03/2015 1:28:49 PM

MM-SK-TC-142.dgn

FOR CONTINUATION REFER INSET

DEMOLISH WILLIAM STREET BRIDGE

PROVIDE NEW CHAPEL ST BRIDGE TO CURRENT STANDARDS

PART ACQUISITION OF JAM FACTORY (IF POSSIBLE)

PROVIDE NEW SURREY RD BRIDGE TO CURRENT STANDARDS

NO IMPACT TO CROMWELL RD BRIDGE

CHAMBERS ST
CHAPEL ST
OXFORD ST
WILLIAM ST
ARTHUR ST
CUNNINGHAM ST
PALERMO ST
CLARA ST
CROMWELL RD
CROMWELL CR
SURREY RD
GARDEN ST
WILSON ST
AVOCA ST
MURPHY ST
TOORAK
TOORAK RD
MYRTLE ST
POWELL ST
DAVIS ST
OSBORNE ST

A 0151

Multi-Level Subdivision

LEGEND

- EXISTING TRACKS
- MM TRACKS
- TRACKS TO BE REALIGNED
- RETAINING WALL
- VICTRACK RESERVE BOUNDARY
- PERMANENT ACQUISITION
- PLATFORM

INSET

- STRATA ACQUISITION
- DECLINE STRUCTURE
- TUNNEL - DRIVEN
- TUNNEL - CUT & COVER
- NEW BRIDGE
- UNDERGROUND STATION FOOTPRINT

NOT TO BE USED FOR CONSTRUCTION PURPOSES

INFORMATION PURPOSES ONLY

20 10 0 20 40 60 80 100m
SCALE

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.
AJM JV		P2	06/03/15	PRELIMINARY ISSUE	M.P	J.P.W		
AJM JV		P1	27/02/15	PRELIMINARY ISSUE	M.P.			

Consultant: AJM Joint Venture
Franchisee / Lessee: MMRA

RAILWAY TRACK AND CIVIL
MELBOURNE METRO
SOUTH YARRA STATION TRACK ALIGNMENT
OPTION 4
LAND ACQUISITION

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	MGA Z55 AHD

VicTrack ACCESS

File Name: MM-SK-TC-143.dgn
Sheet No.: 01 of 01
In Serv.:
Scale: 1:1000 H
Sheet Size: A1

Project Drawing Number: MM-SK-TC-143

Drawn By	Designed By
N.WIJERATHNE	M.PRICE
Checked By	Ind. Review
J.WILLIAMS	
Approved	Approval Date
D.ANDERSON	

Drawing Number | Revision: P2

128552 PM
6/03/2015
MM-SK-TC-143.dgn

FOR CONTINUATION REFER INSET

DEMOLISH WILLIAM STREET BRIDGE

NEED SMALL SECTION ON REAR OF PROPERTY (IF POSSIBLE)

PROVIDE NEW CHAPEL ST BRIDGE TO CURRENT STANDARDS

ACQUISITION SUBJECT TO CURRENT DEVELOPMENT IMPACT

PROVIDE NEW SURREY RD BRIDGE TO CURRENT STANDARDS

CLOSE ROADWAY

CHAMBERS ST
CHAPEL ST
OXFORD ST
WILLIAM ST
ARTHUR ST
PALERMO ST
CUNNINGHAM ST
CLARA ST
CROMWELL RD
CROMWELL CR
SURREY RD
AVOCA ST
MURPHY ST
TOORAK RD
MYRTLE ST
POWELL ST
DAVIS ST
OSBORNE ST

Multi-Level Subdivision

INSET

LEGEND

- EXISTING TRACKS
- MM TRACKS
- TRACKS TO BE REALIGNED
- RETAINING WALL
- VICTRACK RESERVE BOUNDARY
- PERMANENT ACQUISITION
- PLATFORM
- PROPOSED ACQUISITION FOR WORK SITE
- STRATA ACQUISITION
- DECLINE STRUCTURE
- ACQUISITION SUBJECT TO CURRENT DEVELOPMENT IMPACT
- TUNNEL - DRIVEN
- TUNNEL - CUT & COVER
- UNDERGROUND STATION FOOTPRINT
- NEW BRIDGE

NOT TO BE USED FOR CONSTRUCTION PURPOSES

INFORMATION PURPOSES ONLY

20 10 0 20 40 60 80 100m
SCALE

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.
AJM JV		P2	06/03/15	PRELIMINARY ISSUE	M.P	J.P.W		
AJM JV		P1	27/02/15	PRELIMINARY ISSUE	M.P.			

Consultant: AJM Joint Venture

Franchisee / Lessee: MMRA

RAILWAY TRACK AND CIVIL
MELBOURNE METRO
SOUTH YARRA STATION TRACK ALIGNMENT
OPTION 3
LAND ACQUISITION

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	MGA Z55 AHD

VicTrack ACCESS

File Name MM-SK-TC-144.dgn
Sheet No. 01 of 01
In Serv.
Scale 1:1000 H | Sheet Size A1

Project Drawing Number: MM-SK-TC-144

Drawn By	Designed By
N.WIJERATHNE	M.PRICE
Checked By	Ind. Review
J.WILLIAMS	
Approved	Approval Date
D.ANDERSON	
Drawing Number	Revision
	P2

6/03/2015 12:45:57 PM

MM-SK-TC-144.dgn

121 Exhibition Street

Melbourne VIC 3000

PO Box 23061 Docklands VIC 8012 Australia