FISHERMANS BEND METRO RAIL

1. Summary

This note summarises the findings of a rapid assessment of options to extend metro rail services to Fishermans Bend. The study is based on preliminary land use plans for the area and incorporates the views of range of organisational stakeholders in the project.

This assessment identifies a preferred alignment for the extension of the proposed Mernda to Southern Cross line to two new stations within the Fishermans Bend area. The new stations are proposed in the vicinity of Ingles / Fennell Streets and Plummer / Salmon Streets as these locations appear to offer the best land use outcomes, integrate with the proposed surface public transport nodes at these sites and maximise population / employment catchments. It should be noted that this recommendation is highly dependent on the activity centres proposed in these locations.

The proposed scheme locates the stations within the road reserve to minimise the land requirements. Nevertheless, some private land will be required for the purposes of station entrances and other operational requirements.

The information provided in this report is intended to inform a high level assessment of the rail alignment for further discussion with Places Victoria and relevant stakeholders. In order to determine the feasibility of metro rail and associated land requirements a thorough investigation of this preferred option is recommended.

2. PTV Network Development Plan

The Fishermans Bend Urban Renewal Area will undergo significant redevelopment in the coming decades and become an important new hub in the expanding Central City. The area will need significant additional public transport capacity and connections as it develops and it is anticipated that the initial enhanced surface public transport network will not be sufficient to support the longer term needs for passengers wishing to access the area.

In April 2013, Public Transport Victoria (PTV) released its ‘Network Development Plan – Metropolitan Rail’ report. This plan is a demand-led strategy for planning Melbourne’s rail system over the next two to three decades.

Stage 4 of the Network Development Plan (‘Preparing for further growth: within 20 years’) identifies network improvements which will capitalise on benefits already delivered and prepare for further growth. This stage includes the extension of the Mernda - Southern Cross Line to Fishermans Bend.

The tunnel extension from Southern Cross to Fishermans Bend would provide improved network connectivity to assist the future development of the Fishermans Bend area. This project would enable a fast and frequent train service to be provided into Fishermans Bend connecting to the Mernda - Southern Cross Line. This would provide rapid connections to the inner city and hospital...
Key benefits of the Southern Cross to Fishermans Bend Extension are:

- Improved network reach by extending the new tunnel into Fishermans Bend urban redevelopment area
- Improved travel time and access to and from growing residential and employment precinct, taking pressure off the road network
- Provides a staging opportunity for an ultimate extension from Fishermans Bend to Newport to facilitate connection to Werribee and Sunbury lines and relieving capacity constraints.

3. Fishermans Bend station location investigations

The Department of Transport, Planning & Local Infrastructure (DTPLI) coordinated preliminary investigations relating to potential station locations within the Fishermans Bend in conjunction with PTV. Raylink Consulting and Eric Keys & Associates were contracted to provide technical advice to DTPLI and PTV.

The following process was applied:

3.1 Background information review

Primary sources of information were reviewed as part of the assessment:

- A 2008 study into metro rail through the area. This report is confidential to PTV.
- Technical information provided by the PTV Melbourne Metro project. This information is confidential to PTV.
- A desktop geotechnical study prepared for Places Victoria. This report is confidential to Places Victoria.
- Indicative/preliminary land use plans for Fisherman’s Bend prepared by Places Victoria.
- Established land uses in the surrounding area.
3.2 Station location options workshop

A stakeholder workshop was held in April 2013 to:

1. Identify constraints and opportunities
2. Identify objectives for station(s) within Fishermans Bend
3. Identify candidate locations

The following constraints and opportunities were documented:

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>High cost of infrastructure due to ground conditions limiting choices for track alignment and station location</td>
<td>Minimising pedestrian and cyclist access to the station</td>
</tr>
<tr>
<td>Duplication role of light rail services</td>
<td>Ensuring integration of other modes of public transport (light rail and buses) as well as to the rest of the heavy rail network</td>
</tr>
<tr>
<td>Interface with access requirements for freight movements in port area</td>
<td>Integrating station precincts with activity centres (e.g., ferry, ports, etc.)</td>
</tr>
<tr>
<td>Climate changes issues including flooding</td>
<td>Minimising community benefits by integrating with the public realm</td>
</tr>
<tr>
<td>Ability to protect private land for station footprints</td>
<td>Being able to serve to neighbouring areas to FB</td>
</tr>
<tr>
<td>Ability to reserve land for stations without compromising open space</td>
<td></td>
</tr>
</tbody>
</table>

The following objectives and measures were documented:

<table>
<thead>
<tr>
<th>STATION OBJECTIVES</th>
<th>POSSIBLE MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Enabling maximum user catchment area</td>
<td>Number of people within 300m of station (residential and employment)</td>
</tr>
<tr>
<td>2. Catalyst for development/ Supports mixed use</td>
<td>Potential for associated development due to available land within a longer timeframe</td>
</tr>
<tr>
<td>3. Integration with other modes of public transport</td>
<td>Linked to train and bus routes</td>
</tr>
<tr>
<td>4. Supports sustainable travel choices</td>
<td>Base of connecting (within minutes) to existing and new walking and cycling paths</td>
</tr>
<tr>
<td>5. Ability to serve the neighbouring areas</td>
<td>Meeting PT guidelines requirements</td>
</tr>
<tr>
<td>6. Value for money, based on constructability</td>
<td>Stations to be underground (or at surface)</td>
</tr>
</tbody>
</table>

The table below maps the objectives as nominated by the stakeholders against the broader development objectives established for Fishermans Bend.

<table>
<thead>
<tr>
<th>Proposed Station Objectives</th>
<th>Strategic Direction 1</th>
<th>Strategic Direction 2</th>
<th>Strategic Direction 3</th>
<th>Strategic Direction 4</th>
<th>Strategic Direction 4</th>
<th>Strategic Direction 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum user catchment area</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>catalyst for development/ Supports mixed use</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Integration with other modes of public transport</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Ability to serve the neighbouring areas</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Value for money, based on constructability</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Stakeholders were invited to nominate potential locations on a map. The area considered was wider than the Fishermans Bend Urban Renewal Area and is shown in blue below. The locations with the highest number of nominations are shown in red.

3.3 Station location evaluation workshop

DTPLI undertook a preliminary evaluation of the proposed locations against the identified objectives. Stakeholders reviewed and modified the evaluation at a second workshop in April 2013. A scoring system of 1 (Low) to 5 (High) was used. (It should be noted that the workshop assumed that at least two stations would be provided due to the size of the study area and assumed density of development.)

Locations L1, L5 and L8 scored highest, as shown below:
3.4 Potential metro rail alignments

A high level alignment assessment was undertaken based on heavy rail allowable curvature, vertical gradients and the indicative geotechnical information from the earlier study. This assessment indicates that a number of alignments would appear to be technically feasible between:

- Southern Cross and any of the three top-scoring stations individually, marked in red below (SX-L1, SX-L5, SX-L8)
- Southern Cross and any logical combinations of two of the top three station locations (SX-L8-L1, SX-L8-L5, SX-L1-L5). Of these combinations, it is considered highly unlikely that the SX-L8-L1 alignment would merit further investigation.

Of the top three station locations, the two in the vicinity of Ingles / Fennell Streets and Plummer / Salmon Streets appear to offer the best land use outcomes, integrate with the proposed surface public transport nodes at these sites and maximise population / employment catchments. It should be noted that this outcome is highly dependent on the activity centres proposed in these locations.

Therefore, based on this high level assessment, alignment SX-L1-L5 (red) is seen to be a preferred alignment, subject to more detailed investigations. Note that although this alignment appears to duplicate the planned short term light rail line along Plummer / Fennell Street, it is anticipated that the light and light rails would perform different and complementary roles in the network and that the heavy rail line provides the additional capacity required at full build-out of the Fishermans Bend area.

Any tunnel alignment will be constrained by a number of significant issues including:

a) the unfavourable ground conditions which are known to exist in the area (e.g. Moray Street Gravel, Fishermans Bend silt);
b) building foundations in the Yarra Edge area between the M1 freeway and the Yarra River; and
c) the foundations for the evaluated sections of the M1 freeway.

In light of these constraints, it is anticipated that any future metro tunnel is likely to be deep (50-60m) in the vicinity of the station at Ingles / Fennell Street as shown in the diagram below. As the alignment moves further west it may be feasible to have either shallow (30m) or deep (50-60m) alignment in the vicinity of the Plummer / Salmon Street station.

Connell Wagner, 2008 – Ground conditions of an alignment in the vicinity of Fishermans Bend.
3.5 Land implications for metro rail within Fishermans Bend

Subject to further detailed studies, it is reasonable to assume that the extension would be constructed as a twin bore tunnel from a new underground station beneath Southern Cross passing under the Yarra and M1 into Fishermans Bend, then broadly following the Fennell / Plummer Street alignment within Fishermans Bend (see diagram below). This bored tunnel could continue for the length of the line extension. Alternatively, a “cut-and-cover” tunnelling method could be utilised using existing road reserve for construction (apart from the site near the corner of Plummer / Bridge Street). “Cut and cover” or other “near surface” construction methods are unlikely to be feasible for crossing the M1 / Yarra corridor. However, in order to minimise surface disruptions during construction is likely that tunnel boring would be the preferred method of construction for the entire length of the alignment. This would then result in the Plummer/Salmon St being deeper.

In order to protect this alignment for future construction the following measures should be considered:

a) Ensure sufficient road reserve is provided to accommodate a station cavern / box (at a depth of 50-60m) near Ingles / Fennell Streets and near Plummer / Salmon Streets, with approximate dimensions of 30m wide x 260m long x 60m deep.

b) Two 800sqm sites (to accommodate station entrances, ventilation and services) at each station at both ends. The required size of these portals is likely to be the same for both shallow or deep stations, but the relevant station access arrangements would differ. Protecting these sites would require land reservation as shown.

c) One 100sqm site for a tunnel vent and emergency egress at the end of the train turn-around facility beyond the terminus station. Protecting this vent would require land reservation as shown.

d) Acquisition of the site on the corner of Plummer and Bridge St (actual requirements to be confirmed through a more detailed alignment study).

e) Development controls on land over and along the proposed corridor to avoid infringement of the alignment and to mitigate any construction impacts such as ground movement.

---

4. Next steps

The above information is based on a desktop review of available information as at May 2013 and is indicative only. This information is provided for high level assessment purposes and for further discussion with Places Victoria and relevant stakeholders. In order to determine the feasibility of metro rail and associated land requirements with greater certainty, thorough investigations would be needed to examine:

a) confirm the proposed land including location of the proposed activity centres
b) feasible alignment options
c) ground conditions, building footings and utilities along preferred alignments
d) station constructability at Southern Cross Station and within Fishermans Bend
e) concept design and preliminary cost estimates
f) patronage and cost-benefit assessment.

---

1 It is assumed that this corner location would also need to be acquired for the purposes of constructing a proposed light rail route along Fennell / Plummer Street.