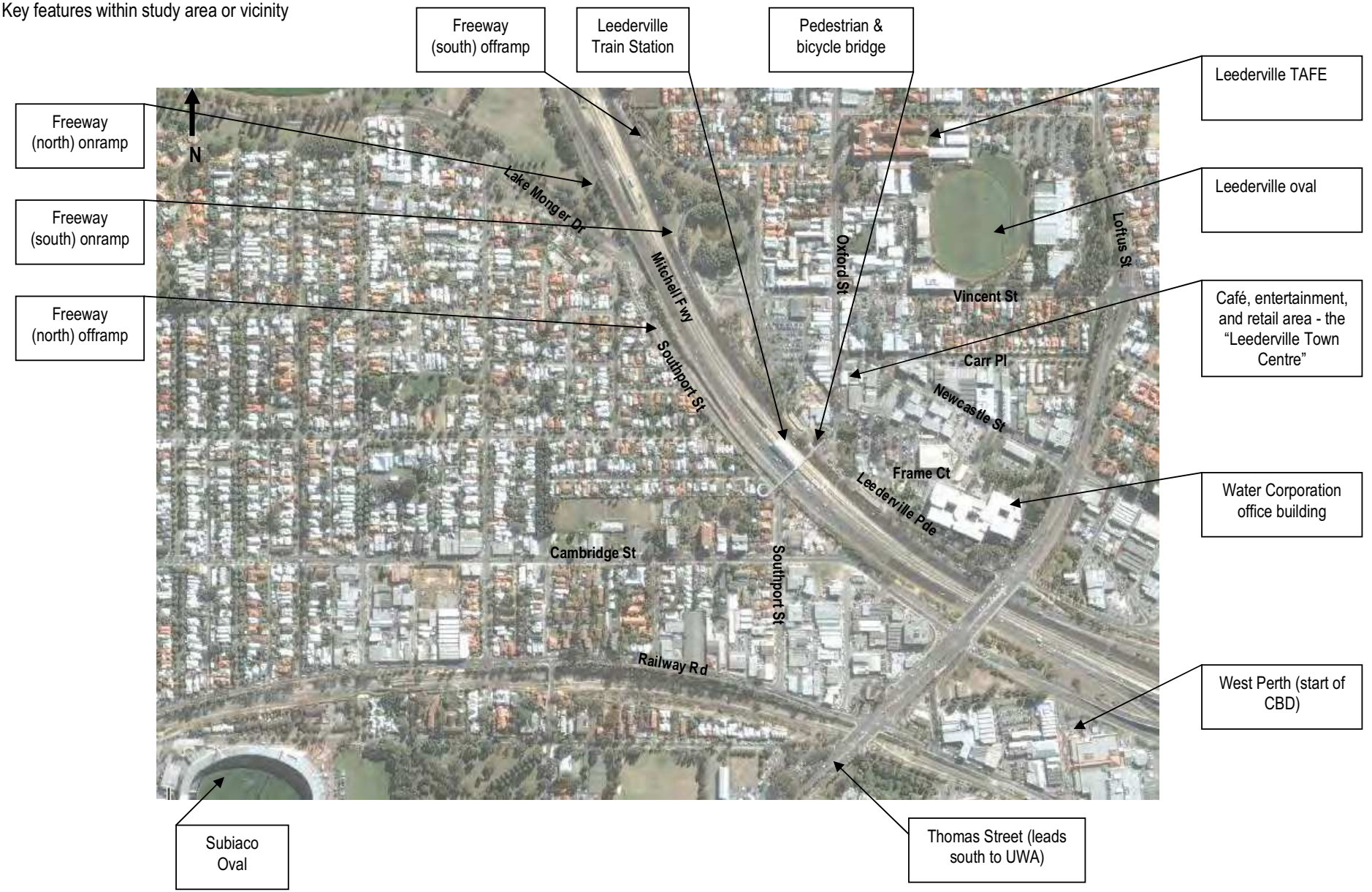
Appendix C

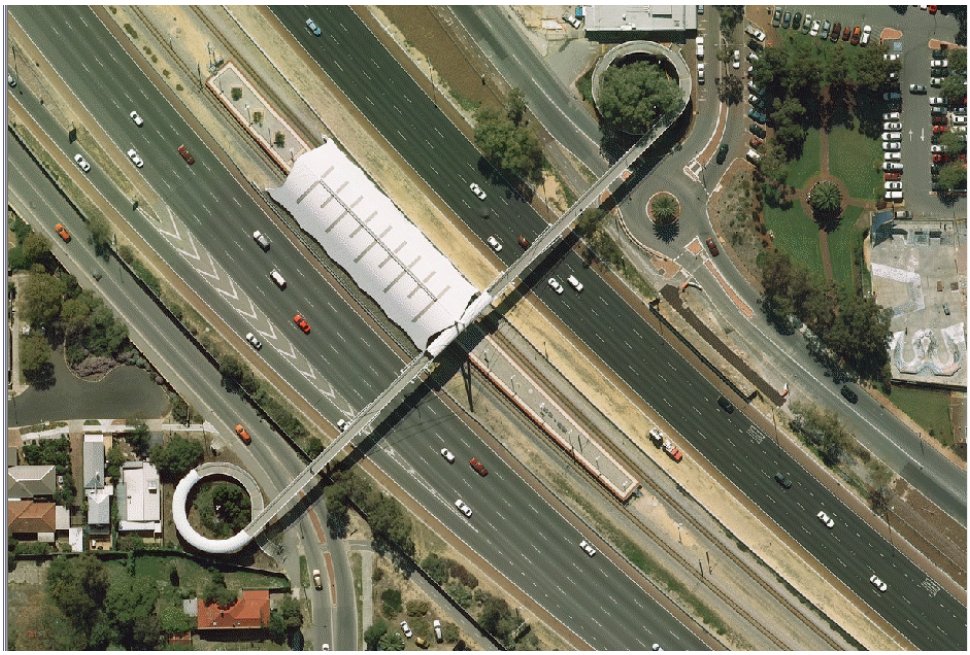
Road network (photos sourced via Intramaps and Google Maps)

1. Key features within study area or vicinity

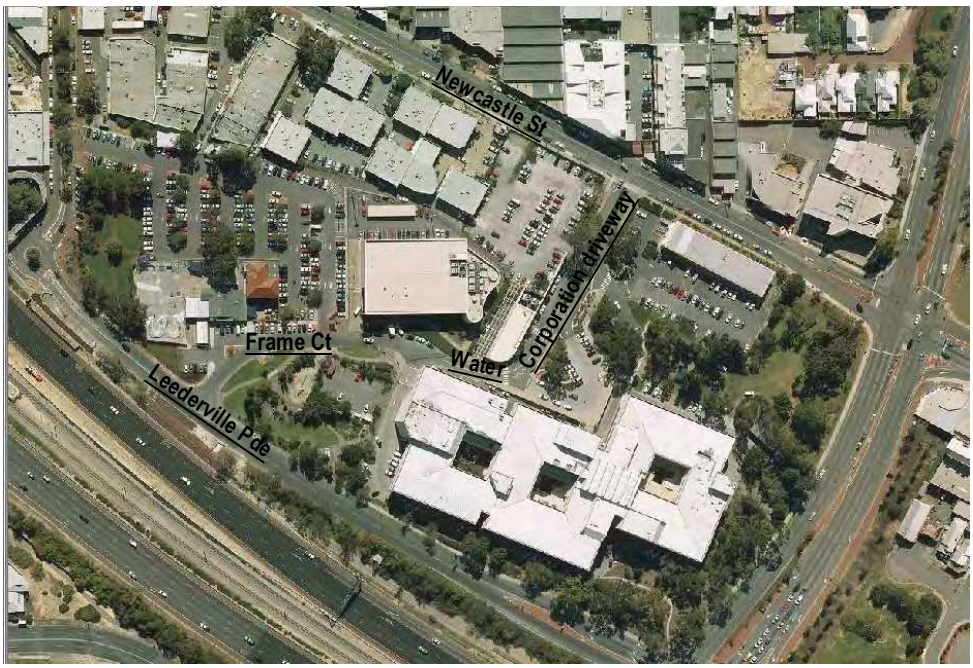


2. Freeway ramps

3. Leederville Train Station and pedestrian & bicycle bridge

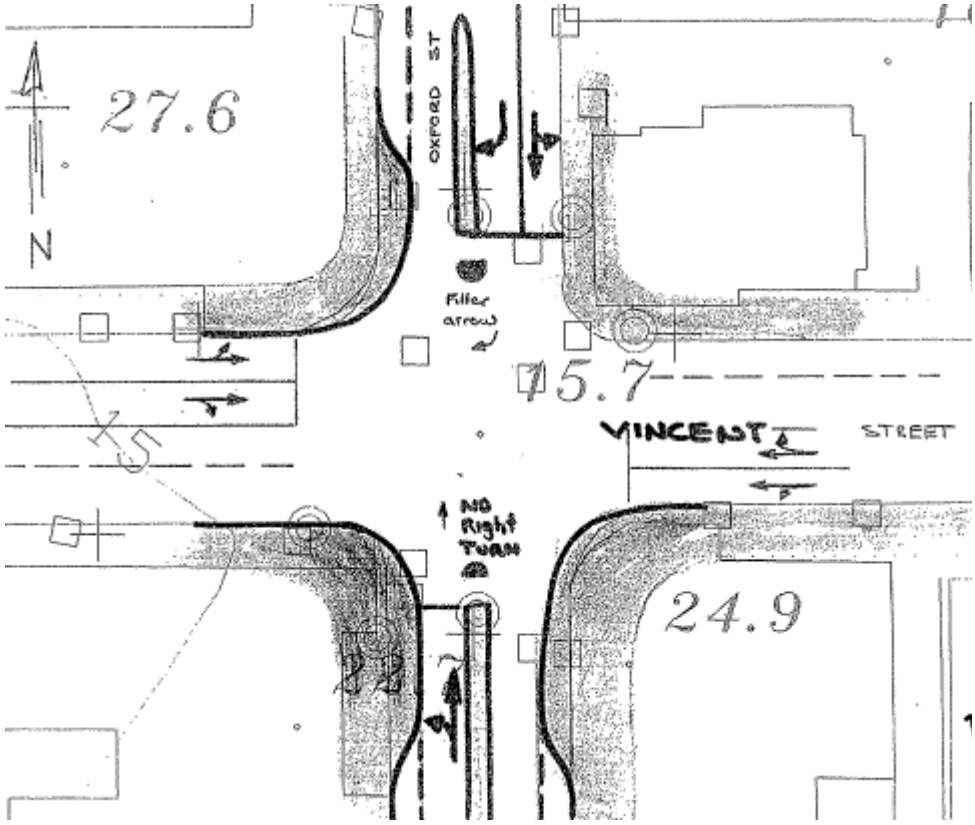


4. Street block containing Water Corporation building. Note that Frame Court is a cul-de-sac, and the Water Corporation driveway allows for connection between Frame Court and Newcastle Street. The driveway may be closed to the general public if desired by Water Corporation.



5. Vincent Street / Oxford Street intersection (existing)

6. Vincent Street / Oxford Street intersection (proposed) (Town of Vincent 2007)



Appendix D

West Leederville Traffic Management Review – recommendations (Town of Cambridge 2005)

8. Recommendations

It is recognised that the kerbside parking adjustments will be ongoing as requested and shown to be required.

The priority for the road works is Cambridge Street/Kimberley Street and Cambridge Street/ Northwood Street intersections then the District Distributor/District Distributor Road intersection treatments first. The associated further developments in the adjacent roads may be part of the intersection treatments or carried out separately depending on the location.

The upgrading of bicycle routes and shared paths can be carried out independent of the other works.

The local road network upgrading to improve the management of traffic may also be carried out independent of the District Road works.

The recommendations have been divided into separate road projects so that they may be carried out as part of an incremental road network upgrade.

8.1 Kerbside Parking

Kerbside parking is an ongoing program for Council. The development of kerbside parking will recognise:-

- extend the 'No Stopping' at intersections to ensure a minimum distance for the motorists' right hand side to be 20 metres and to the left 15 metres from the side intersection property boundary;
- extend the 'No Stopping' distance at an intersection to facilitate safe turning movements;
- adjust kerbside parking to facilitate through traffic during peak AM and PM on District Distributor Roads;
- adjust kerbside parking as requested by adjacent businesses to assist the customer parking with time limits;
- encourage development of staff parking on site, or the use of public transport;
- protect residential precincts from intrusion of business and recreational event parking on local roads;
- encourage recreational events to include the cost of public transport in the cost of the event entrance tickets.

8.2 Cambridge Street/Kimberley Street Intersection

Introduce a 'No right turn" or "Through Traffic" restriction on the south side of Cambridge Street on Kimberley Street to restrict traffic movements of northbound traffic in Kimberley Street from turning right into Cambridge Street to travel eastwards or travel across Cambridge Street and enter Kimberley Street North.

The purpose of this work is to restrict the number of conflict points at the intersection and thereby reduce the number of accidents at the intersection. It is anticipated that this treatment will encourage the district traffic to use District Roads in lieu of Kimberley Street.

In the event that additional work is required to reduce accidents at this intersection, an additional half seagull island be introduced into the eastern side of Kimberley Street either on the north or south leg to prevent Kimberley Street traffic crossing Cambridge Street.

8.3 Cambridge Street/Northwood Street Intersection

The proposed restriction is to prevent westbound traffic in Cambridge Street from turning right into Northwood Street and travelling northwards and to prevent traffic travelling northwards in Northwood Street from crossing Cambridge Street and travelling northwards in the northern section of Northwood Street.

The purpose of this work is to reduce the number of traffic conflict points at the intersection and thereby reduce the number of accidents. Further, to negate the need to stop in Cambridge Street while waiting to turn right into Northwood Street and travel northwards. This will remove the queuing traffic in Cambridge Street across the school pedestrian crossing over Cambridge Street east of Northwood Street. By removing this waiting traffic in Cambridge Street, the sight distance for motorists' in Cambridge Street will be improved and this will also improve the safety of the intersection.

It is anticipated that this work will be carried out at the same time as the intersection treatment at Cambridge Street/Kimberley Street, as indicated in 8.2 above.

8.4 Southport Street/Cambridge Street Intersection

It is recommended that a right turn arrow be introduced for the southbound traffic in Southport Street to turn right into Cambridge Street and travel westward. This is being negotiated with Main Roads WA at present and there may be an interim phase where the right turn arrow for westbound traffic in Cambridge Street will remain to assess the impact.

It is anticipated that this work will enhance the safety of southbound traffic in Southport Street turning right into Cambridge Street and reduce the accidents at this intersection. Further, it is anticipated that there will be a small increase in the traffic turning right from Southport Street into Cambridge Street in lieu of turning right from Southport Street into Railway Parade and therefore reduce the accidents at the intersection of Southport Street and Railway Parade.

8.5 Railway Parade/Southport Street Intersection

This recommendation is to implement a right turn and through traffic lane for westbound traffic in Railway Parade from Loftus Street to Southport Street and improve the turning movements at the intersection. It is anticipated that this will improve the road safety and reduce the accidents at this intersection.

It is considered that this work should be done in association with the work as identified in 8.4 above.

Further, consideration is to be given to introducing a single lane roundabout and is subject to traffic analysis design and land acquisition.

8.6 Southport Street – from Cambridge Street to Railway Parade

It is proposed that this section of Southport Street be widened to accommodate kerbside parking, through traffic, underground power, upgraded street lighting and improved footpath pavements.

This work should be carried out in association with the work at the Railway Parade/Southport Street intersection (8.5).

8.7 Railway Parade – from Southport Street to Kerr Street

It is proposed that kerbside parking embayment be introduced on the southern side of Railway Parade from Southport Street to the Hamilton Street Bridge and a median island be introduced to accommodate one lane of through traffic in each direction, kerbside parking and pedestrians.

This work may be carried out after the completion of 8.5 and 8.6 above.

8.8 Railway Parade/Kimberley Street Intersection

It is proposed that a roundabout be introduced at this intersection.

The proposed works will encourage district traffic crossing the Hamilton Street Bridge to turn left into Railway Parade and carry out a 'U' turn movement at the Kimberley Street roundabout, then travel eastwards to Southport Street and north along Southport Street to the Mitchell Freeway.

This work should be carried out in association with or after Item 8.2, and 8.3 above.

8.9 Harborne Street/Cambridge Street Intersection

Consideration be given to introducing a pedestrian phase into the traffic signals at the intersection.

Recommend that the traffic lanes in Harborne Street north of Cambridge Street be widened to permit two lanes of traffic to approach the traffic signals for a distance of approximately 150 metres.

It is considered that this will improve the efficiency of the network traffic.

8.10 Harborne Street/Grantham Street Intersection

Consideration be given to introducing a pedestrian phase into the traffic signals at the intersection.

Recommend to extend the two lane approach to the traffic signals in each direction along Harborne Street to approximately 150 metres.

It is considered that this will improve the efficiency of the network traffic turning movements.

8.11 Cambridge Street/Station Street Intersection

To introduce a half seagull island into Station Street on the northern side of Cambridge Street to prevent southbound traffic from turning right into Cambridge Street or crossing Cambridge Street.

It is recognised that this will reduce the number of conflict points at the intersection and improve the traffic safety.

8.12 Cambridge Street/McCourt Street

It is recommended that a half seagull island be introduced into McCourt Street at the Cambridge Street intersection to prevent traffic from crossing and turning right into Cambridge Street.

This work will reduce the number of conflict points at the intersection and improve road safety.

8.13 Loftus Street/Cambridge Street

It is recommended that a left turn lane be provided for northbound traffic in Loftus Street to turn left into Cambridge Street and travel westwards. This lane will extend southwards to the Bermondsey Street shared path underpass without extending the underpass.

This work is proposed to improve the left turn traffic flow and reduce the delay time for northbound traffic in Loftus Street.

8.14 Station Street – from Cambridge Street to Salvado Road

It is recommended that this section of road be widened and that provision be made for kerbside parking on both sides of the road and through traffic, as well as turning movements.

The recommended work will improve the free-flow of traffic in this section of Station Street.

8.15 Cambridge Street – Pedestrian Signals

To introduce a traffic signal pedestrian crossing over Cambridge Street between Northwood Street and Kimberley Street if shown to be necessary after Item 8.1 (AM, PM Clearways on Cambridge Street) 8.2, 8.3 and 8.8 are complete.

This will assist pedestrians to cross Cambridge Street without a school guard.

8.16 Bicycle Routes and Shared Paths

a. That the bicycle routes and shared paths leading to the West Leederville Railway Station, Lake Monger, the shopping precinct along Cambridge Street and the West Leederville Primary School be upgraded to encourage parents and children to walk or ride to the school and shops in lieu of driving short trips.

b. It is recommended that a shared path be installed in Northwood Street and extend from Lake Monger Drive to Railway Parade. Further, that a shared path be installed into Woolwich Street and extend from St Leonard's Avenue to Kimberley Street.

   This work will assist school children and pedestrians travelling to the West Leederville Primary School and cross Cambridge Street at the school pedestrian crossing, linking Lake Monger path with the Northwood Street West Leederville Railway Station pedestrian underpass.

c. It is recommended that a shared path be developed along Cambridge Street from Oxford Close to Loftus Street. Further that the median island in Cambridge Street be extended westwards to provide a safe refuge for cyclists and pedestrian crossing over Cambridge Street.

8.17 Cambridge Street – Blencowe Street to Holyrood Street - Clearway

It is recommended that an AM and PM 'Clearway' be introduced on the northern and southern side of Cambridge Street from Blencowe Street to Holyrood Street.

This will improve traffic flow, side road and driveway access, and pedestrian crossing.

8.18 Cambridge Street – Bus Embayments

Recommend that the road reserve along Cambridge Street from Harborne Street to Loftus Street be widened by 3 metres for a length of 30 metres at bus stops at the time of future property development adjacent to the bus stops.

This will provide for bus embayments, bus passenger shelters, footpaths, improved traffic flow and motorist sight distance.

8.19 Harborne Street – Bus Embayments

Recommend that the road pavement in Harborne Street be widened at bus stops to provide bus embayments.

This will improve the traffic flow in Harborne Street and reduce the need for traffic to "rat run" through local access roads.

8.20 Local Area Traffic Management

Consideration be given to introducing Local Area Traffic Management in streets in accordance with their traffic volume and the existing road pavement using the "Liveable Neighbourhood" guidelines and utilising the following management devices:-

- Highlight the entrance to local residential precincts and the change of traffic speed – entry statement with traffic island;
- to slow traffic speeds – plateaux or raised pavements at intersections;
- to reduce the width of 10 metre wide pavements for through traffic – introduce kerbside nibs and parking embayments;
- to break vistas for motorists' to a maximum of 200 metres – introduce blister islands with landscaping;
- to assist pedestrians crossing roads – traffic islands;
- manage intersection traffic and reduce right angle accidents – roundabouts;
- street enhancement – plant verge trees one per property.

The above recommendations are based on a traffic analysis of the local and district road network and some detailed designs. The development of the projects will be subject to detailed design, public comment, Main Roads WA signs and lines approval and allocated funds.

Appendix E

CAT and FTZ (DPI 2008)

Background

For a number of years, the City of Subiaco and the Town of Vincent have indicated an interest in 'free-to-user' public transport links to Central Perth (CBD, West Perth, East Perth and Northbridge) and local link services.

Town of Vincent interest has been further increased by the recent boundary change between it and the City of Perth that transferred a small area of land affected by the Perth Parking Management Act (PPMA) to Vincent. From various sources, the DPI has identified interest in the establishment of a new CAT service to Leederville from central Perth.

The CAT was originally designed to function as a central area circulator. The characteristics of such a service are:

- High-quality buses
- Frequent service (ideally 5 minutes or less but 10 to 15 minutes acceptable)
- Links origins & destinations
- Readily comprehendible routes to allow “non-expert” users ready access
- Accessible to all potential users e.g. disabled, mothers with prams, shoppers with bags etc
- Successfully compete with the private car for the same journey.

The current Red, Yellow, and Blue CAT routes fit the above criteria well. To extend what is essentially a central city service like the CAT into the suburbs risks compromising the success of the existing CAT system with little prospect of gain in users, likely a high risk of a decline in use, and certainly increased costs.

Implementation in Town of Vincent

Current priority for the DPI/PTA is coping with increased demand from recent opening of the Southern Suburbs train line, especially due to the new stations of the Esplanade and Perth Underground at William Street. Since more public transport users are able to access the city via this service, the CAT is becoming more congested.

The CAT service is under pressure at present from very high demand. It would be difficult to expand the service to new areas unless there was an increase in revenue or grants to fund both operating and capital needs.

As the CAT is a 'central area circulator', it needs to be tight, frequent, and high quality service. It requires high density residential and commercial areas surrounding closely situated stops to create the necessary demand from residents, shoppers, business visitors, and workers to create the demand.

Central Perth’s “density” is approximately 150 jobs and 12 residents per hectare.

Town of Vincent's "density" is significantly less than this with approximately 10 jobs and 24 residents (of which more than 24% work in central Perth) per hectare.

Parking levels also need to be high enough to facilitate funding requirements and to permit adequate numbers of patron's convenient access to the service.

Commercial and retail densities as well as parking levels in Subiaco and Leederville are significantly lower than central Perth (1 retail store and 65 car parking bays per hectare in Central Perth). This raises doubts of adequate revenue base through parking fees and sufficient projected patronage levels.

With approximately $1.00 per passenger running costs and a capital cost of about $580,000 per bus, possible funding arrangements of any future CAT would need to be detailed. This may be a duplication/alteration of current funding arrangements for other CAT-equivalent services (outlined below).

Fremantle CAT	
Funding:	60% City of Fremantle 40% PTA
Cost:	approximately $900,000 p.a.

Joondalup CAT	
Funding:	33.4% Transperth 33.3% ECU 33.3% City of Joondalup
Cost:	approximately $425,000 p.a.

Perth Parking Management Act (PPMA)
The PPMA creates the power to impose a parking tax or levy. The amount is determined by relevant stakeholders and can be as substantial or negligible as warranted. The Act refers to consultation with the City of Perth only regarding how the tax revenue is spent, excluding other Local Government Authorities from formal input. The Perth Parking Policy controls the quantum, type, and location of tenant and public parking.

Free Transit Zone (FTZ)
The area covered by the FTZ is presently the same as the PPMA, which covers the CBD, Northbridge, East Perth, and West Perth.

Funding for the FTZ is currently derived solely from parking revenue raised from the Perth Parking Licence fee.

Appendix F

Light rail (DPI 2008)

In 2007, the DPI commissioned a study that required investigation into route feasibility for a light rail alignment between the City of Subiaco and East Perth. Maunsell Australia Pty Ltd completed the *Perth Light Rail Study* and its major findings are outlined below with specific reference given to the feasibility of a light rail route through West Leederville; the western portion of the study area for this report.

Characteristics of light rail

'Cities all over the world are investigating light rail opportunities, technological options and system types to suit their individual requirements. Given its planned growth, Perth has good reason to explore the benefits that light rail could bring to both the mobility and accessibility of the City, the QEIIMC and other medical facilities, UWA and other educational institutions, and major sports and entertainment stadia. Even more critically, light rail can provide the economic regeneration support that permanent public transport infrastructure can bring to local and regional growth areas.'

'Light rail systems provide a middle tier to a three-tier public transport hierarchy including rail and bus, which can be provided as on-road or off-road infrastructure and can serve “middle distance” and/or “short distance” trips, depending on the design of the system. Light Rail Transit can accommodate 5,000 to 10,000 passengers per hour per direction with an upper crush capacity limit of 20,000 passengers per hour per direction.'

Busy locations or those with multiple demands on the road space and street environment are exciting locations for a light rail route, however positioning a new system within a well-utilised road reserve can be quite problematic and often requires the removal of existing amenity in order to accommodate the light rail system. In most circumstances this is a trade-off between vehicle lanes (carriageways and parking lanes) and light rail.

Proposed route for Perth's first light rail service

Five potential light rail route alignment options were identified and were reviewed by the Working Group and Steering Committee. A single base route was selected from these five, linking QEIIMC and UWA to East Perth via Subiaco and the Perth CBD. The route incorporated an extension along Hay Street to a potential secondary depot site at Jolimont and included two sub-route options through Subiaco:

i) Rokeby Road (primary place making)
ii) Thomas Street (superior operating speed mass transit)

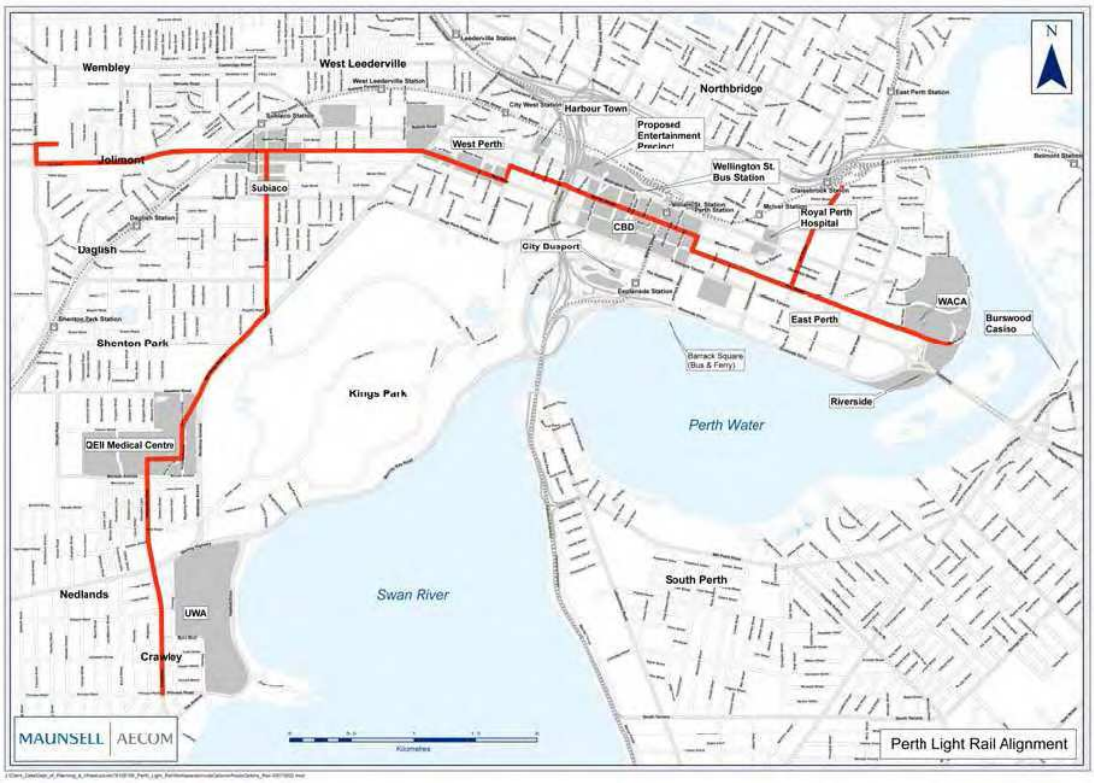
The Steering Committee workshopped the two sub-routes and judged each against three overarching project objectives:

- Creating an economic catalyst for development
- Ensuring nett positive impact on local area
- Facilitating an integrated public transport system

The Rokeby Road option was selected as the preferred route due to its larger patronage catchment area and place-making potential (see Figure 1).

The expected patronage of a light rail system serving UWA, QEIIMC, Subiaco Activity Centre, West Perth Neighbourhood Centre, Perth CBD and the East Perth Riverside commercial and residential redevelopment area, is estimated at around 45,000 trips per average week day. To put this in perspective, the total daily patronage of the northern heavy rail line to Joondalup is about 50,000 trips per day.

Figure 1: Rokeby Road option



Feasibilty of a light rail route through West Leederville
One of the five rail route alignment options explored was the Suburban Orbital Loop (see Figure 2).

'The rationale for Option 4 was to deliver an orbital public transport route for inner Perth serving key rail stations outside the CBD and providing an express route between QEIIMC, UWA and Perth CBD if a link is established along Mounts Bay Road.'

'The summary points for Option 4 are:

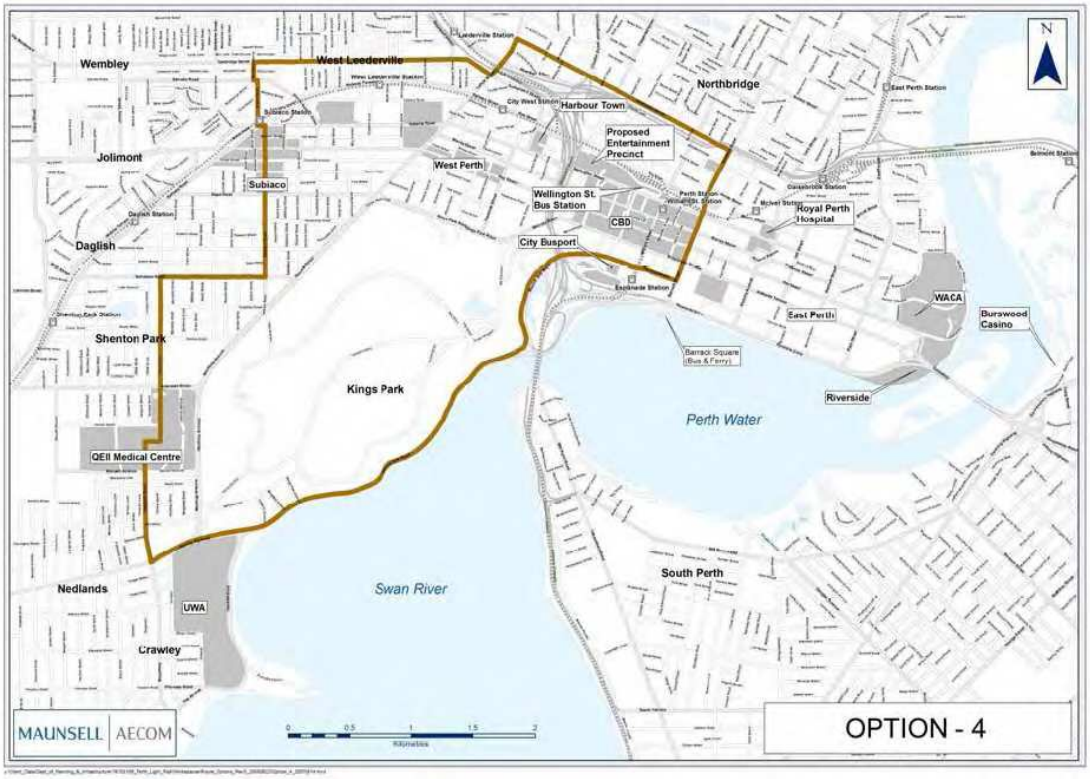
- Multiple interchange opportunities with heavy rail
- Permanent orbital link between UWA, Subiaco, West Leederville, Northbridge and Perth CBD
- Place-making opportunities in West Leederville and Northbridge
- Express Service for QEIIMC employees and UWA students to CBD
- Does not connect to East Perth and therefore does not conform to study brief
- Feasibility of a first stage without a Mounts Bay Road link would be unlikely
- Traffic congestion issues crossing Mitchell Freeway and Loftus Street
- Requirement of complex scheduling.'

A main reason for this route option not being progressed any further was the road network issues, particularly crossing the Mitchell Freeway.

'The road network generally experiences heavy traffic congestion during peak traffic periods, with the section of Loftus / Thomas Street between the Mitchell Freeway and Hay Street commonly acknowledged as one of the busiest roads in Perth.'

Considering this, 'the possibility of a dedicated bridge structure for light rail over this section might be required.'

Figure 2: Suburban Orbital Loop



Future light rail network

Maunsell Australia has recommended against the implementation of the *Suburban Orbital Loop* in their study due to a number of major challenges in the route design and layout. However, the opportunity for a future orbital route was identified and supported.

'Future demand has been recognised, however, for an orbital route connecting the inner suburbs, from Claremont to South Perth via Mount Claremont, Floreat, Wembley, Leederville, North Perth, Inglewood, Maylands, Belmont, Riverdale, Lathlain, Victoria Park and Kensington. This orbital route would provide interchange opportunities with the radial routes, and could also share the alignment linking the Perth Airport with Perth CBD, which would increase service frequencies on that line.'

This route could be considered once the preliminary east-west route between East Perth and UWA is designed.

Subiaco Shuttle (Route #97) and its interaction with the proposed light rail route

'The Subiaco Shuttle Route 97, which is jointly funded by Transperth, the City of Subiaco, QEIIMC and UWA, was introduced in 2001 to provide a frequent bus service between the UWA campus at Crawley, the QEII Medical Centre and the Subiaco railway station via Shenton Park and Rokeby Road in Subiaco. It currently operates every 15 minutes during the daytime on weekdays, every 30 minutes on Saturdays and hourly on Sundays.'

'The introduction of the light rail route along Rokeby Road would replace Route 97, which could then be discontinued.'

The expected increased demand on this route, due to the switch from a bus service to a dedicated light rail service, further supports the call for an extension of the route from Subiaco train station to Leederville train station. This would enable passengers to transfer between the Joondalup train line ('northern suburbs' train) and the light rail service.

Appendix G

Route options for extension of Subiaco Shuttle (route 97) to Leederville Train Station (DPI 2008)

Department for Planning and Infrastructure

Route Options for the Extension of the Subiaco Shuttle (Route #97) to Leederville Train Station

- Route Option A
- Route Option B
- Route Option C
- Route Option D
- Route Option E
- Route Option F

2007 Metro Peel Aerial Photography

Scale 1:7,500

0 500 m

Prepared by: bekent

Prepared for: Alix Rhodes

Date: Wednesday, June 18, 2008 17:33

Plot identifier: P20080618_1733

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