Our Places

Traffic Signal Review

The purpose of this workshop is to present Council Members with information on the project and seek their views on the type of recommendations.

City of Adelaide
Traffic Signal Review

Stantec - Rebecca Strachan

CITY OF ADELAIDE

Traffic Signal Review

Key Questions

KEY QUESTION

What are Council Members' views on the findings and options to facilitate safer and quicker journeys?

Background

On 31 January 2023, Council resolved:

'*That Council:*

1. *Requests that Administration investigate and report to Council on the implementation of Pedestrian Actuated Crossing (PAC) automation and longer pedestrian crossing signal durations at key areas to facilitate safer and quicker walking journeys.*
2. *Requests that Administration investigate and report to Council on the implementation of touchless and on-demand pedestrian crossing technologies to facilitate safer and quicker pedestrian movements.'*

Further to the Council decision, a broader scope of work was proposed and in April 2024, Stantec was engaged to conduct a review of the operational and design parameters of traffic signals within the City of Adelaide. The outcome of the review is to recommend practical solutions for the organisation to consider adopting to improve efficiency, safety and consistency of design parameters.

- Reviewing opportunities at traffic signals city wide for safer and quicker pedestrian movements.
- Reviewing the operation for other movements (cyclists/general traffic/buses etc).
- To inform consultation with DIT and the CoA Integrated Transport Strategy (currently under development).
- To inform future implementation or trials.

Strategic Alignment

City Plan 2036

- ‘Lead the analysis of options for adjustments to north-south through traffic for City Squares, to enable improved pedestrian access to the City Squares.’
- ‘Lead the delivery of improved pedestrian amenity through laneways to facilitate opportunities for active transport, connectivity and activation of laneway frontages.’

City of Adelaide Integrated Climate Strategy 2030

- ‘Increasing priority at intersections for pedestrian and cyclists.’

Draft Integrated Transport Strategy

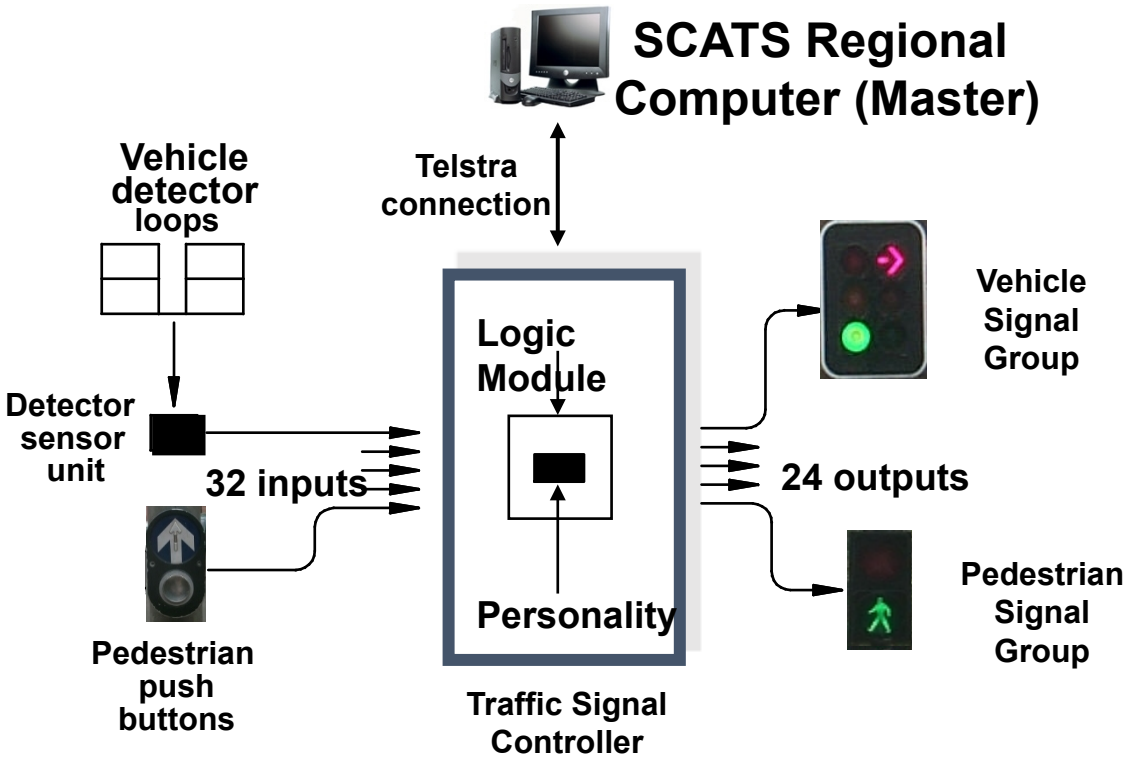
- To inform the CoA Integrated Transport Strategy (currently under development).

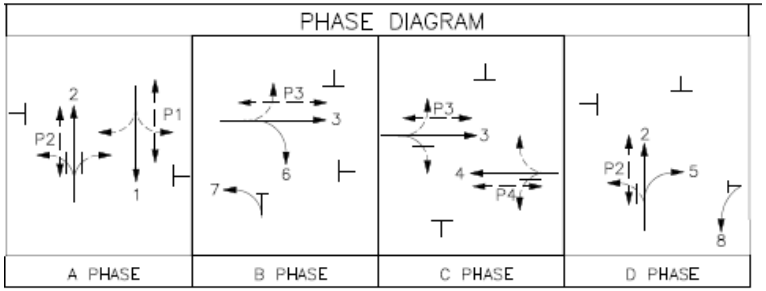
Project Stages

1. **Literature Review**
   - Understanding best practise
2. **Existing Conditions**
   - Site Inspections to understand existing conditions
   - SCATS Data Review
3. **Gap Analysis**
   - Pedestrian Treatments
   - Signal Operations
   - Council Workshop #1
4. **Policies and Recommendations**
   - Report Findings and Recommendations
   - Council Workshop #2

We are here

How a Traffic Signal Operates





Existing Pedestrian touchless and on-demand pedestrian crossing locations

Pedestrian Automatic Demand at Signalised Crossings

- Pedestrian auto demand function eliminates the need for pedestrians and cyclists to manually push the crossing button.
- Auto demand was implemented over 10 years ago and is currently active in 49 locations with current timing for activation from 7am -7pm.
- There are a number of sites where auto-demand is coded into the intersection that differs from 7am-7pm.
- For example, the Traffic signals on North Terrace at the Railway Station, and intersection of King William Street and Rundle Mall and Hindley Street have 24/7 activation.

What Causes Pedestrian Delays

Contributing Factors

- Cycle Length – number of phases, size of intersection
- Number of opportunities in the cycle for pedestrians to cross
- Type of pedestrian crossings
- Diagonal destinations require pedestrians to cross twice
- Demand not being recorded in time for action by controller

Table 5.1. Pedestrian Level Of Service

Level of Service	Average delay per pedestrian (seconds)	Likelihood of risk-taking behaviour
A	< 10 seconds	Usually, no conflicting traffic
B	10 to 20 seconds	Occasionally some delay due to conflicting traffic
C	20 to 30 seconds	Delay noticeable to pedestrians but not inconveniencing
D	30 to 40 seconds	Delay noticeable and irritating, increased likelihood of risk taking
E	40 to 60 seconds	Delay approaches tolerances level, risk taking behaviour likely
F	> 60 seconds	Delay exceeds tolerance level, high likelihood of pedestrian risk taking

Level of Service (LOS) Target across many states

Source: SIDRA User Guide 9.1, January 2024

What we found – Average Pedestrian Waiting Times Adelaide

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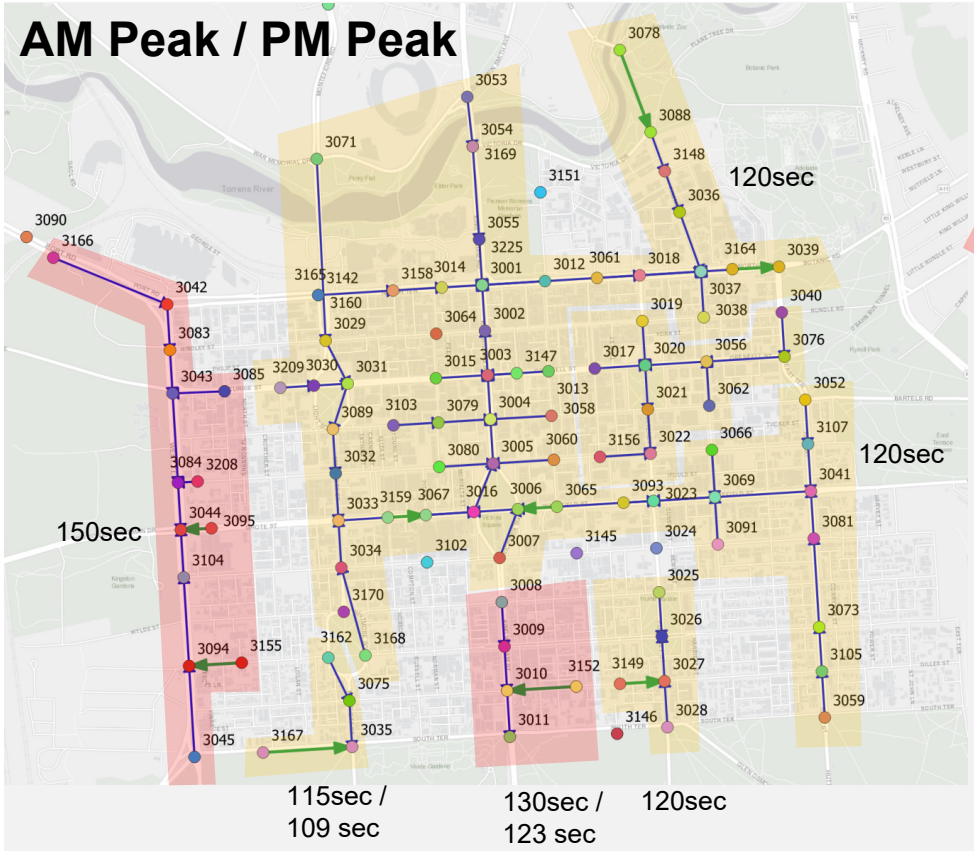

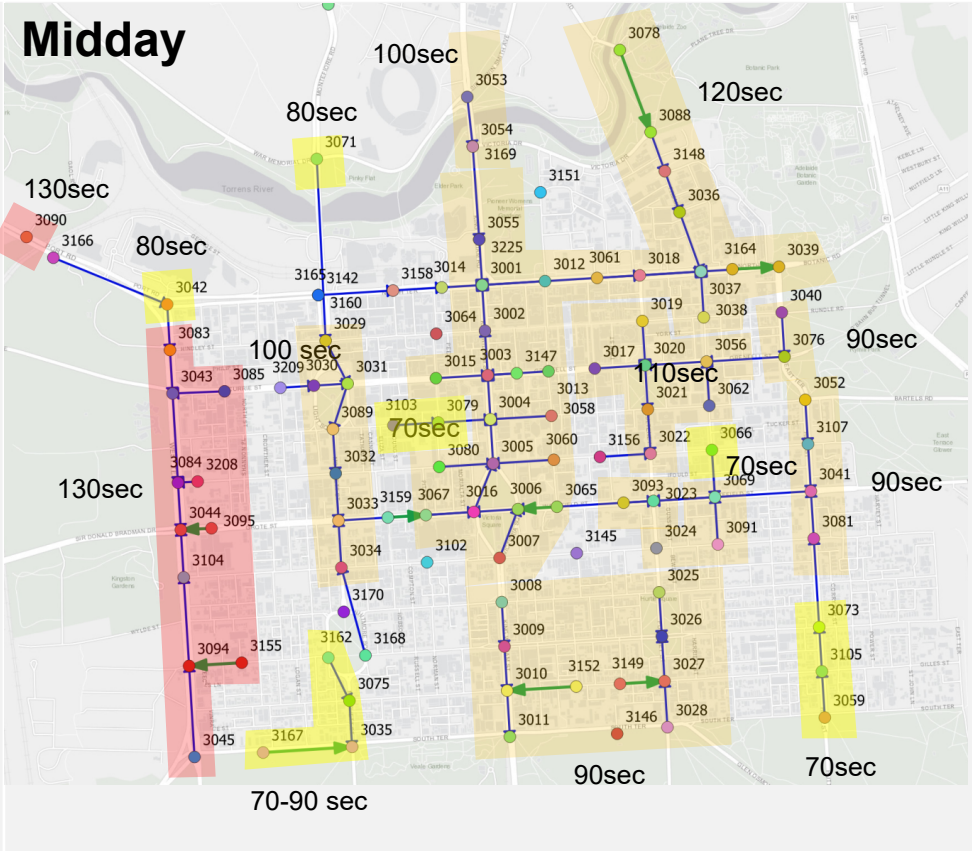

Pedestrian Delay (Average)	LOS A-C < 30 sec	LOS D 30-40 sec	LOS E 40-60 sec	LOS F > 60 sec

What we found – Average Pedestrian Waiting Times

North Adelaide

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AM Peak / PM Peak

Midday

Pedestrian Delay (Average)	LOS A-C < 30 sec	LOS D 30-40 sec	LOS E 40-60 sec	LOS F > 60 sec

What we found – Pedestrian Green Walk Time

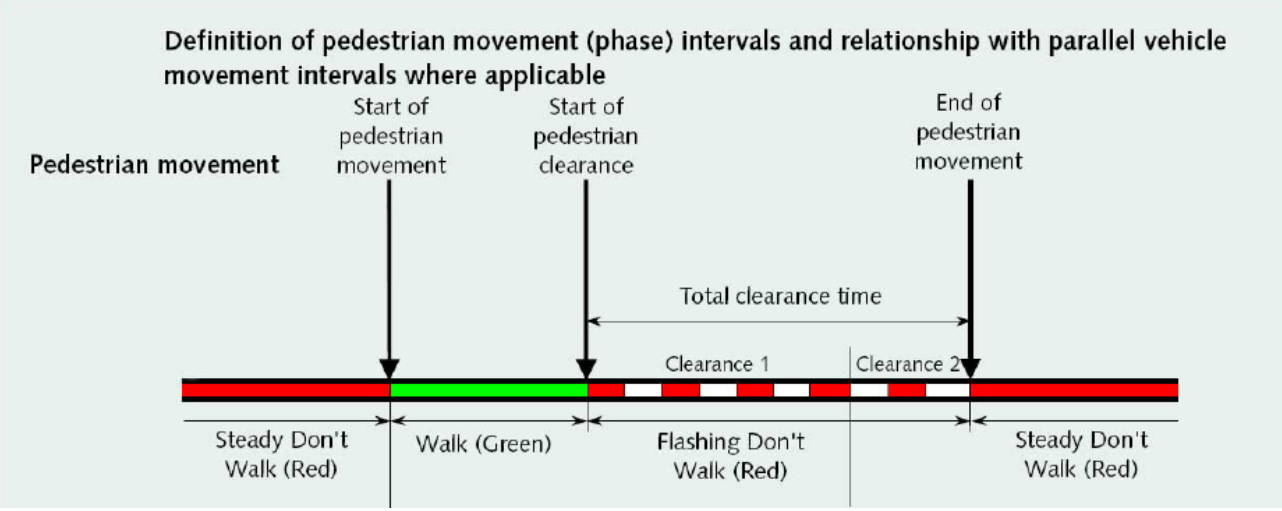
Walk Time

- The length of the Walk (Green) time depends on the amount and type of pedestrians using the crossing.
- COA typically has Walk Times in the range of 5-8 seconds.

Clearance Time

- Clearance time is calculated based on a walking speed of 1.2m/s for the crossing distance

Figure 6.7: Pedestrian phase intervals

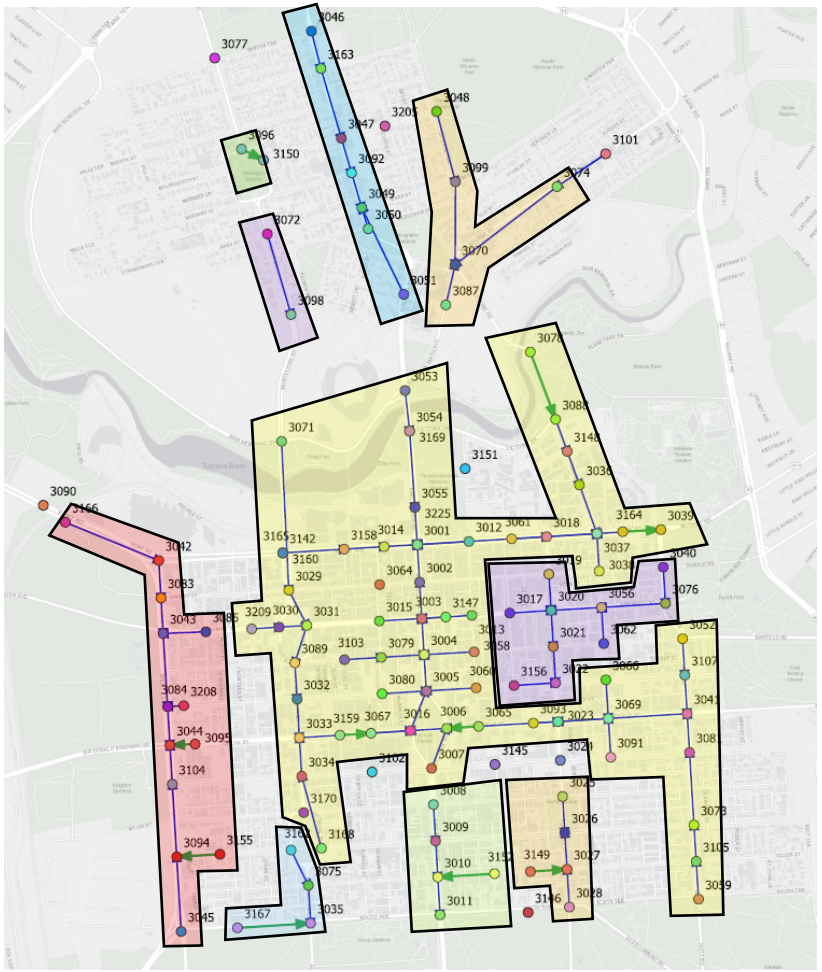


Source: Austroads Guide to Traffic Management Part 9: Transport Control Systems

What we found – Linking of Intersections

- Sydney Coordinated Adaptive Traffic System (SCATS) allows traffic signal operators to create plans to link the operation of signals along a corridor.
- Linking:
  - Adopts the same cycle length along a corridor
  - Reduces stops for dominant flow of traffic
  - Manages queues between closely spaced intersections.
- CoA has a complex network of large roads which are all linked.
- DIT has worked with CoA a number of times to improve the operation includingin 2010 and 2016/2017.

Intersections that are linked



What we found - Pedestrian Crossing Types

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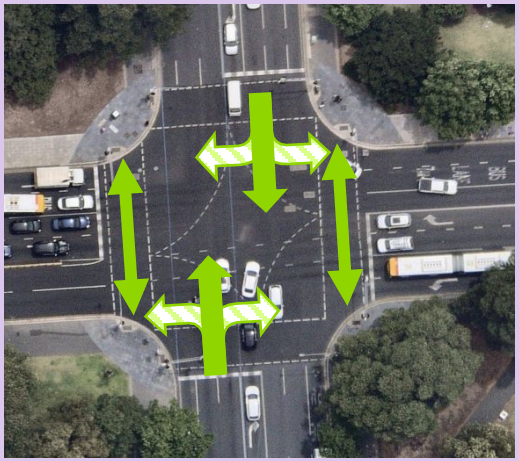
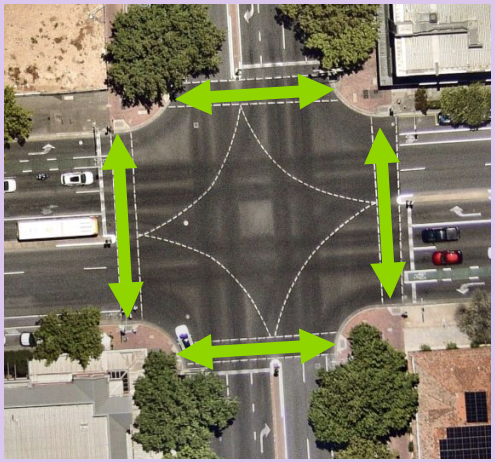
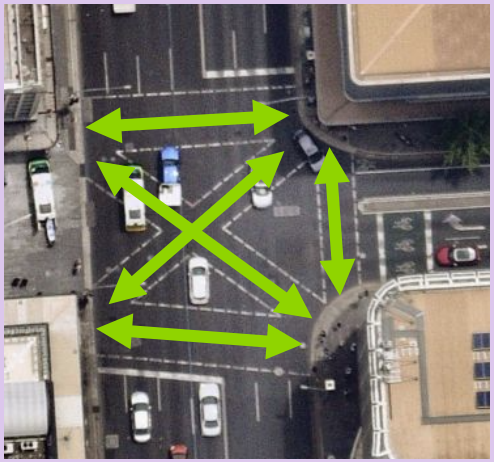
Parallel to Vehicles	All Pedestrian Phase	Scramble Crossing
Most intersections	Pirie Street / Gawler Place Hutt Street / Wakefield Street (During Clipsal Only)	Rundle Mall / Pulteney Street Waymouth Street / Bentham Street King William Street / Pirie Street
		

What can we do?

Issue	Impact	Solution	Benefits
Inconsistent cycle lengths	Can cause variation in delays experienced by road users. Eg. Obahn / Grenfell St / East Terrace (3076)	Review vehicle flows and linking conditions	Reduce delays for all road users. Improve predictability.
Long delay due to cycle lengths in midday peak	Delays for all road users	Identify a location to break large linking arrangement. E.g. Separate King William / Currie / Grenfell in midday peak from King William / North Terrace	Allow a shorter cycle length to operate. More cycles and opportunities for all road users.
Push button activation	Long delays can occur if pedestrians arrive at the wrong time in the cycle for the push button to activate.	Provide Auto Demand at key intersections. Locations can be aligned with existing high demands and frequent operation and the Integrated Transport Strategy,	Time of day based implementation Sensor technology could be used to cancel calls if pedestrians walk away from site.
Access to Tram Stops	Long delays can occur if pedestrians arrive at the wrong time in the cycle for the push button to activate.	Use advanced detection of trams to place demand for pedestrian crossings that lead to stops.	Quicker access for pedestrians to tram stops when critical Specific to tram arrivals so would not impact vehicle throughput when unnecessary.

Sample Recommendations – Quick Wins

Pedestrian Automatic Demand

- Prepare AM / PM and Midday map of Intersections where pedestrian actuation is already high, and automatic introduction could occur with minimal impact to vehicle though put.
- Overlap pedestrian priority areas and align with Integrated Transport Strategy.

Use advanced detection of trams on King William Street to automatically introduce pedestrian crossing which services Tram Stops
e.g. Victoria Square, Halifax, Waymouth

Sample Recommendations – Quick Wins

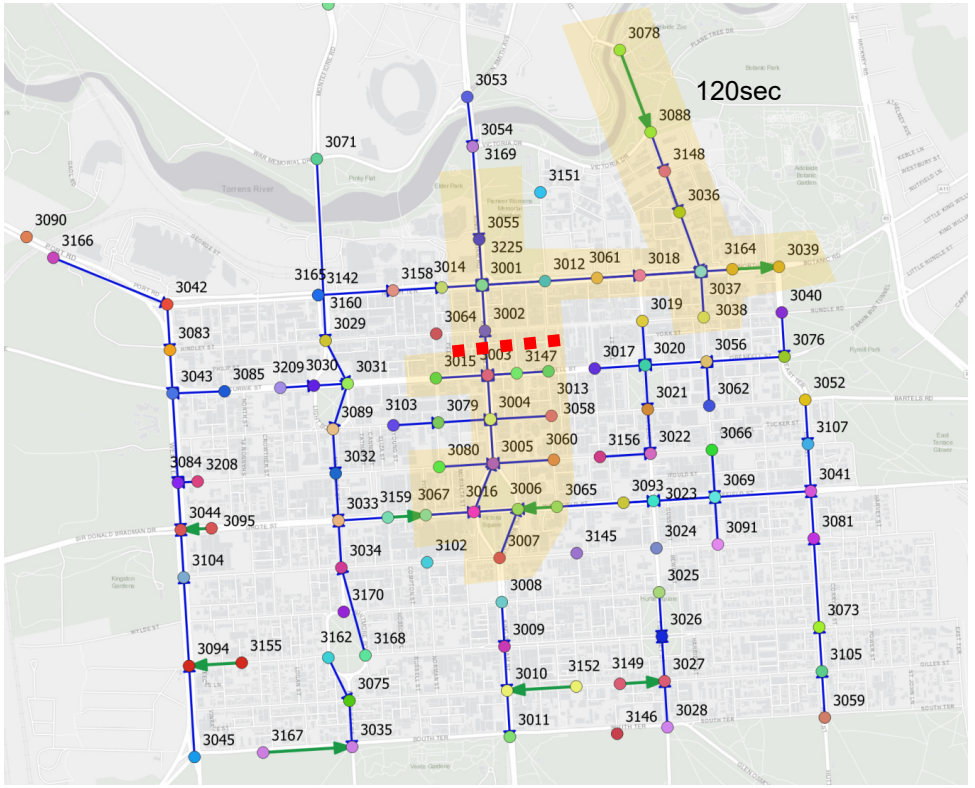
Example - Melbourne Street

- Review volume profile along Melbourne Street for middle of day.
- Could link from Melbourne / Jerningham Street intersection to Brougham Place intersection be broken in middle of day to reduce cycle length and reduce pedestrian waiting times.
- Future consideration given to the introduction of wombat crossing.

Sample Recommendations – Further Investigation

Long delay due to cycle lengths in midday peak

- Investigate impacts of breaking links.
- Consider between King William / North Terrace and King William / Currie / Grenfell in midday peak
- Example - Grenfell and Frome Street intersection – long delay (greater than 60 seconds) for Frome Street pedestrian, cyclists and vehicles.



Case Study - Traffic Signal Review

O’Connell Street North Adelaide - Review of Pedestrian Delays

As part of the broader Traffic Signal Review project a specific review of the O’Connell Street corridor was undertaken.

On 23 April 2024, Council resolved:

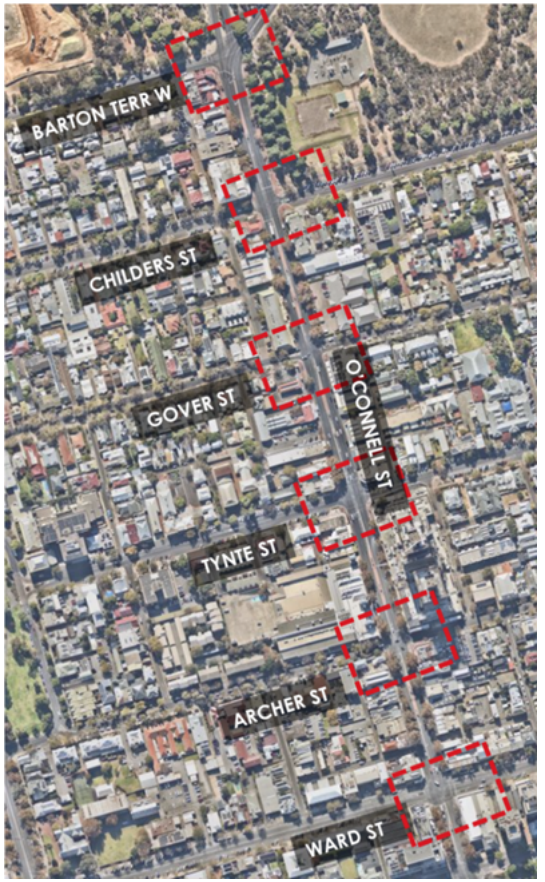
That Council, noting temporary arrangements are in place for the Tynte Street crossing, asks the Administration to examine and to report to Council within quarter one of 2024/25, on the possibility of extending the pedestrian crossing time for all East West crossings of O’Connell Street, North Adelaide

The O’Connell Street Review considered three scenarios:

Scenario 1 – Operating with a reduced cycle length so that pedestrians are provided with more opportunities to cross per hour.

Scenario 2 – Operating with reduced cycle length and an increase to the pedestrian walk time (green man) so that more pedestrians could commence crossing during activation.
- 8 seconds walk across O’Connell Street and 12 seconds walk parallel to O’Connell Street.

Scenario 3 – Operating with a reduced cycle length and pedestrians operating every cycle (auto-introduction).



Case Study - Traffic Signal Review

O’Connell Street North Adelaide - Review of Pedestrian Delays

Pedestrian Findings:

- A reduced cycle length could allow between 6-21 extra cycles or opportunities for pedestrians to cross each hour in the midday peak, and up to 4 extra opportunities in the PM peak.
- A reduced cycle length could reduce the Average Delay at intersections for pedestrians by 14 seconds in the midday peak.
- A consistent and increased pedestrian walk time could reduce the average delays for pedestrians by a further 2-4.5 seconds.

Vehicle Findings:

- The majority of queue lengths reduced by an average of 3-5m.
- There were some outliers with reductions of 23m (3-4 cars) and some increasing by up to 15m (2 cars).
- Average Delays for vehicles were reduced on between 38-46% of approaches in the PM peak and 50-54% in the midday peak.

As per the E-News dated 11 October 2024, the preferred scenario combines scenario 1 and scenario 2, which requires changes to the traffic signal time settings. This has been discussed with the Department for Infrastructure and Transport (DIT) and they have provided in principle support to:

- Reduce the cycle length where possible, most notably in the midday and off-peak times.
- Increasing the pedestrian walk time setting (green man) to 8 seconds for east-west movements across O’Connell Street and 12 seconds for north-south movements parallel to O’Connell Street.

Council is working with DIT to implement the changes.

Next Steps

Based on the Council Member feedback:

- Continue to progress the Traffic Signal Review project.
- Present the findings and recommendations of the remaining project scope including the outcomes from modelling some sample intersections using transport modelling software to demonstrate quantifiable change.

Traffic Signal Review

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