



WARRNAMBOOL  
CITY COUNCIL

# People and vehicle movement in Warrnambool's city centre



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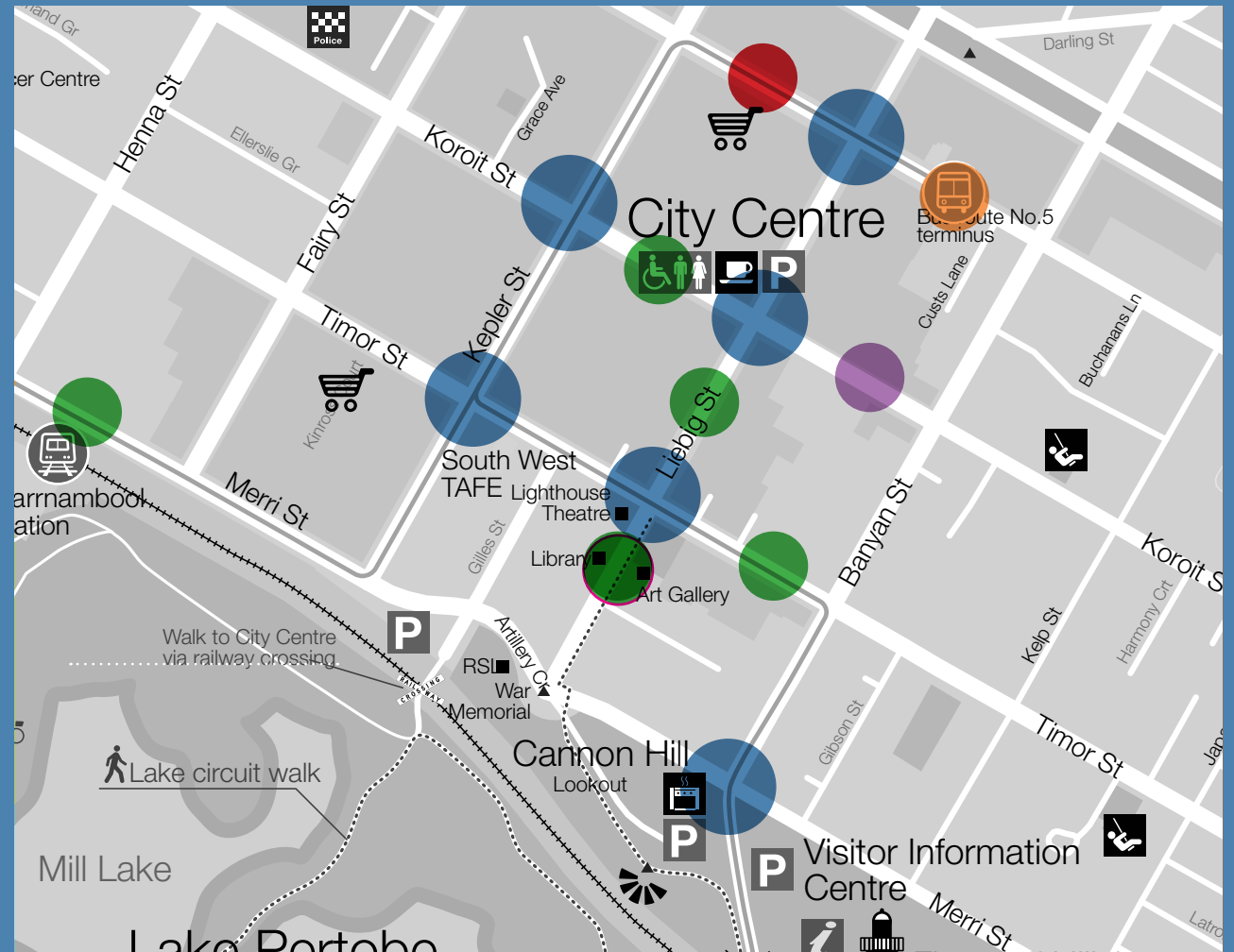
# City centre transformation

In 2017-2018 Warrnambool's city centre was transformed by a renewal project that included the elimination of high gutters, a resurfacing of the road and footpaths and the introduction of crossings at roundabouts that gave people walking priority over people driving cars.

Other changes included lowering of the speed limit, widening of footpaths, public art and the addition of infrastructure geared towards encouraging people to stay longer in the city centre including landscaping, seating, drinking fountains and "activity nodes".

Changes to the built environment designed to have an impact on the movement of vehicle, pedestrian and cyclist traffic are depicted in the map to the right.

## Key Transport Works 2017-2022



### Legend

- Roundabout Upgrade
- New Wombat (raised) Crossing
- Zebra Crossing upgraded to Wombat Crossing
- New Zebra Crossing
- Upgraded (raised) to Existing Pedestrian Signals
- Wombat Crossing (pre 2017)



# Public perceptions and experiences

## Two surveys were undertaken to gauge public opinion about the changes for pedestrians and vehicles in the city centre and about people's experiences of using the pedestrian priority roundabouts.

The responses from the surveys showed there is a range of perceptions and experiences however key concerns for drivers were feeling uncomfortable (traffic speed/flow and queuing) and pedestrian safety, both of which have been addressed in the road safety and traffic safety reports.

Council also received correspondence in relation to people and vehicle movement and conducted focus group discussions.

## A summary of findings

### Survey 1. Online survey and call for submissions April 2021

The first survey was an online survey, responded to by more than 900 people, more than 85 per cent of whom were from Warrnambool with most of the other respondents from Koroit, Bushfield-Woodford, Allansford, Port Fairy and Woolsthorpe.

More than 91 per cent of respondents regularly visited

the city centre (either daily, more than once a week or weekly).

More than 87 per cent came to the city centre by car with the next most popular mode walking, 10.2 per cent.

The survey revealed a correlation between drivers concentrating more when driving, the streets they chose and their feelings of safety, which met the intention of encouraging drivers to be more careful was met through the redesigned streets and roundabouts.

While 30 per cent of respondents said they felt safer crossing at the pedestrian priority intersections, 69 per cent said they were worried about delaying vehicle traffic.

More than 40 per cent of motorists indicated they already gave way to pedestrians at roundabouts before the pedestrian priority intersections were introduced. A further 36 per cent of motorists said they stopped for pedestrians if it was really hot or raining, or if the pedestrian had limited mobility.

Nearly 90 per cent of motorists said they had to concentrate more when driving through pedestrian priority roundabouts. Most motorists said the pedestrian priority roundabouts had created traffic congestion.

### Survey 2: the intercept survey

The intercept survey was conducted in-person within the city centre during business hours

More than 40 per cent of respondents were aged over 60 years; more than 24 per cent were aged 41 to 59 years while those under 40 comprised 34 per cent.

The survey found wombat crossings helped make the city centre pedestrian friendly from the intercept survey, that 97 per cent of respondents used the crossings and 72 per cent found them to be safer and quicker.

More than 87 per cent of respondents said the new



crossings at the roundabouts had assisted people of all ages and abilities to cross roads.

Of those using the new crossings, 60.7 per cent were happy to do so, 21 per cent were worried about it, 2.5 per cent were cross and 16 per cent had not thought about it.

When cars stopped to give way, 43.6 per cent of pedestrians said they felt happy about it, 13.3 per cent were worried, 6.9 per cent were cross and 36.1 per cent had no feeling one way or the other about it.

Of those who drive through the roundabouts, 22 per cent said they were happy to, 29 per cent said they were worried by the experience and 23 per cent said it made them cross while 28 per cent said they had not thought about it.

## Correspondence

While the April 2021 survey was under way Council also received seven letters (attached).

Southern Stay Disability Services expressed support for the service through local media (The Standard, May 15, 2021).

Council also received a phone call from a Liebig Street property owner who said the pedestrian priority crossings had made motorists more aggressive and pedestrians more arrogant, with the latter now expecting motorists to stop at other roundabouts in the city centre that did not have pedestrian-priority infrastructure.





# Focus groups

**Council spoke to several groups to gain different perspectives about the city centre.**

## 1. Teenagers

- The interviewees were five local students, three of whom lived out of the city. This discussion focused on their experiences as L-plate drivers who felt vulnerable because of tailgating if they had to stop suddenly for pedestrians using the crossings.
- When walking across the roundabouts this group felt guilty about stopping traffic and some motorists seemed cross about having to stop.
- The group thought the crossings would help those who found it hard to cross the road and if people driving were happy to stop for people walking then they thought the crossings were a good idea.

## 2. Visually impaired group

Comments and observations from the group

- This group said it was important to listen and feel when crossing with the cane, lights mad this easier because the clicking sound provide a cue that it was safe to cross.
- After the implementation of the crossings in Warrnambool one member had to be retaught use of their cane.
- Often when crossing, people with vision impairments just have to guess that it is safe to cross, not all cars on the crossings stop as they should.
- Newer cars (especially hybrids) are becoming quieter and harder to hear.
- The timing for Pedestrian Crossing at traffic lights needs to be longer (Raglan Parade).
- Sometimes buttons for the lights can be hard to find.

- Crossings in Liebig Street made it safer for people walking.
- Need to have faith that motorists will stop.
- Not all cars stop (mention of crossing at Archie Graham).
- One member believed drivers were speeding up to get across before pedestrians.
- Suggestion to change the colour of crossings to yellow to help drivers realise they must give way to pedestrians.
- Signage in the middle of islands mean people can blend in and can be hard to spot for drivers.
- New footpath up Liebig Street is excellent because of its smooth surface.
- Gutters through Liebig Street make it easier to manoeuvre because they are even.
- One member thought Liebig Street was too narrow for cars and worried about what would happen in an emergency with cars banked up.
- Koroit Street footpath was rough.

## 3. All-abilities Advocacy Group

- When you driving along Liebig Street it can be hard to see someone crossing at the roundabouts.
- It is safer to cross the roundabouts with the new infrastructure.
- The group supports the crossings at the roundabouts.
- Crossing at lights helps because of the clicking sound.
- People in wheelchairs need to ensure they have been seen because they are lower to the ground.
- Not all drivers slow down or wait for pedestrians to cross.
- The raised footpath with no gutter at the crossing makes it easier to cross the road. It is much easier and safer for people with canes, prams, wheelchairs, scooters to cross the road.





- Laneways are access points from carparks but some have uneven surfaces and are difficult to use.
- Roundabout at Koroit and Banyan streets is difficult to cross.
- Walkers need to be confident to use the crossings
- It is cultural change required
- Recommend yellow lines at the crossing with tactile surface to remind motorists to look for pedestrians.

- Had several near misses on the motorcycle while waiting for a pedestrians to cross. Use alternative streets.
- Riders are avoiding the street.
- It has made a difference, as a motorcyclists you can park anywhere. It has improved for pedestrians but to the detriment of traffic flow.
- The focus has shifted to safety of pedestrians instead of the safety of the vehicles. Improve the safety of the vehicles then consider helping pedestrians.

#### 4. Social motorcycling group

- Roundabouts challenging because people just walk out in front of riders.
- Traffic is backed up when travelling north from Timor Street.
- Not sure what will occur if there is an emergency in the city centre.

#### 5. Warrnambool Buslines

- Drivers concerned about stopping in the roundabout to allow pedestrians to cross.



# Road safety and traffic analysis

## Council engaged an independent engineering firm, Safe System Solutions, to make a traffic safety assessment of the Liebig Street and Koroit Street intersection and the Liebig Street and

This involved a comparison of safety levels before and after the city centre renewal. Changes to the roundabout from pre-existing to current conditions included treatments such as a single level footpath and road, widened footpaths, enlargement of the roundabout central island, zebra crossings across all legs of the roundabout and sharrow pavement markings on all approaches to the roundabout. A 30kmh speed limit was also introduced for Liebig Street between Timor Street and Raglan Parade.

## Key findings of the assessment were:

- The lower 30kmh speed limit along Liebig Street together with the changes to the intersection layout (road narrowing and increased central island size) reduce both the likelihood and severity of all crash types in existing conditions
- The widened zebra crossings at the splitter islands of the roundabout provide pedestrian priority and consolidate pedestrian movements, decreasing the likelihood of collisions between vehicles and pedestrians
- This arrangement is noted however to cause a potential increase in minor vehicle-to-vehicle

collisions as motorists may stop abruptly to allow pedestrians to cross and due to congestion resulting from vehicles queueing at pedestrian crossing points

- Sharrow markings across Liebig Street enhances motorist awareness of cyclists on-road, reducing likelihood of collisions

The results of the assessment were as follows (lower scores are better, indicating greater alignment with safe system principles).

Conditions	SSA score
Pre-upgrade	114/448
Post renewal	87/448

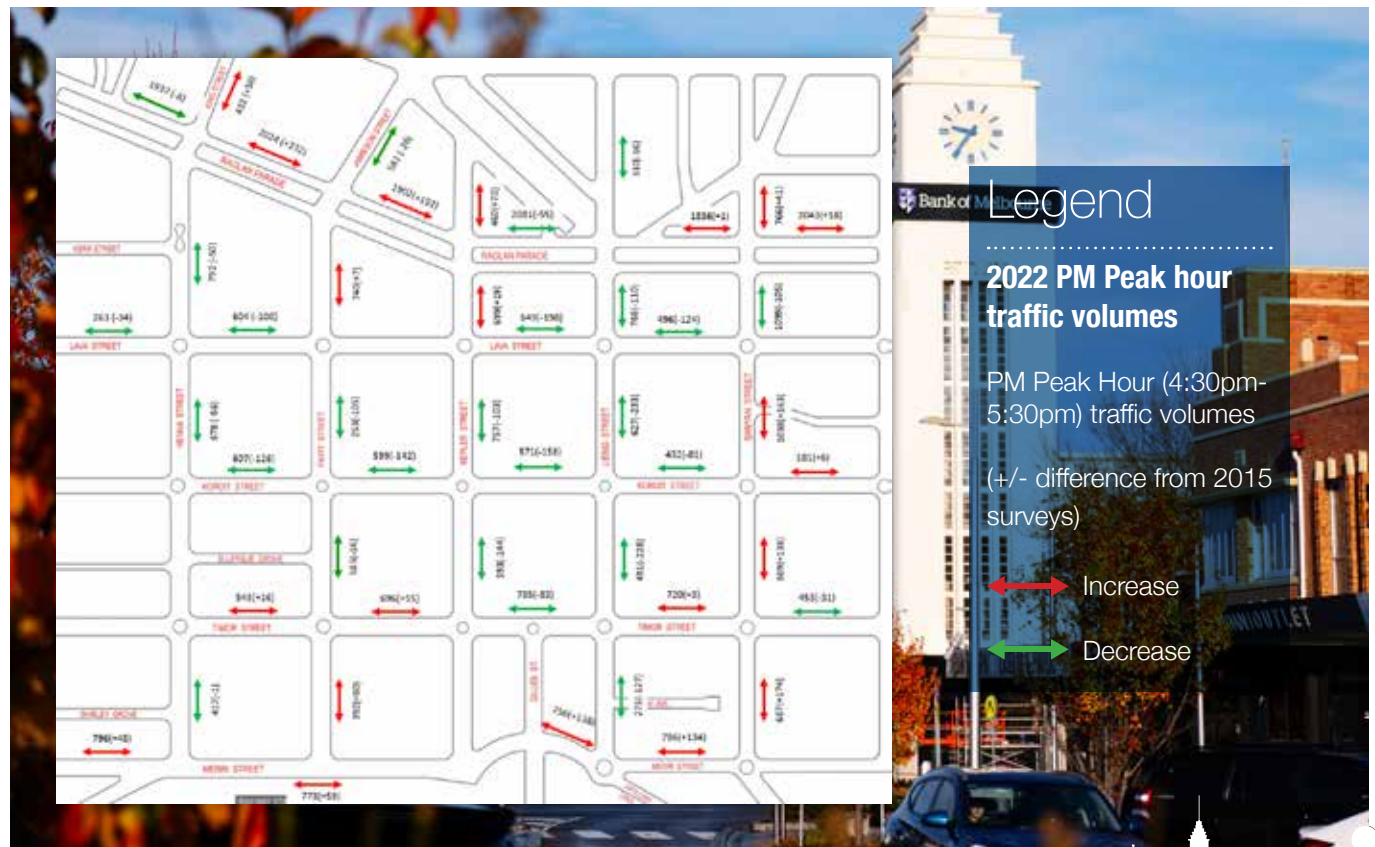
Council also engaged another firm Ratio Consultants, to

review intersection and pedestrian safety infrastructure added to the city centre since 2017.

The report by Ratio Consultants found that in 2022 peak hour vehicle traffic volumes had increased on streets without pedestrian priority compared to traffic volumes in 2015. Vehicle traffic decreased in the streets where pedestrians were prioritised. This was the desired outcome of the pedestrian priority infrastructure.

The changes are illustrated in the diagram below.

The Ratio report noted that “overall, the traffic volumes during the 2022 survey period within the core activity centre internal roads have reduced, while volumes of traffic have increased on higher order arterial or road such as Raglan Parade and Banyan Street”.





# Traffic at intersections

## The Ratio report also looked at intersection performance at peak hour (4.30pm to 5.30pm) pre- and post-city centre renewal.

The analysis of the intersections was done using software called SIDRA Intersection (SIDRA stands for Signalised and unsignalised Intersection Design and Research Aid).

The key parameters used to measure the performance of an intersection are: queue length, average delay and degree of saturation – Degree of Saturation (DOS) considers the volume of traffic and the capacity of a road to carry that volume.

A rating scale applies to DOS, which is:

Degree of saturation	Rating
Up to 0.6	Excellent
0.61 to 0.70	Very good
0.71 to 0.80	Good
0.81 to 0.90	Fair
0.91 to 1.00	Poor
Greater than 1	Very poor

Traffic flows at key intersections before and after the city centre renewal

Intersection	December 2016				March 2022			
	DOS	95th percentile queue (m)	Ave delay (sec)	DOS rating	DOS	95th percentile queue (m)	Ave delay (s)	DOS rating
Timor/Banyan	0.41	20	7	Exc	0.48	26	8	Exc
Timor/Liebig	0.51	27	8	Exc	0.72	17	6	Good
Koroit/Kepler	0.52	30	9	Exc	0.77	17	11	Good
Koroit/Liebig	0.46	23	9	Exc	0.55	15	5	Exc
Koroit/Banyan	0.37	17	7	Exc	0.40	23	9	Exc
Lava/Liebig	0.54	31	9	Exc	0.73	17	8	Good

The results of the analysis by Ratio highlight that “while in all instances the overall intersection DOS has increased, the overall performance of each intersection in terms of queuing and delays has improved, with the exception of the intersection of Banyan Street with Timor Street and Koroit Street respectively.

“The analysis shows that during the PM peak hour all intersections are operating under acceptable conditions having regard to level of service, including queuing and delays.”

## Road safety

Records from 2015 to 2020 indicate that along Liebig Street and the intersections where pedestrian priority treatments have been installed (Liebig-Koroit, Liebig-Lava, Liebig-Timor, Kepler-Timor, Kepler-Koroit) there have been just two accidents since the city centre renewal was completed in 2018.



## Pedestrian traffic

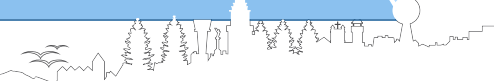
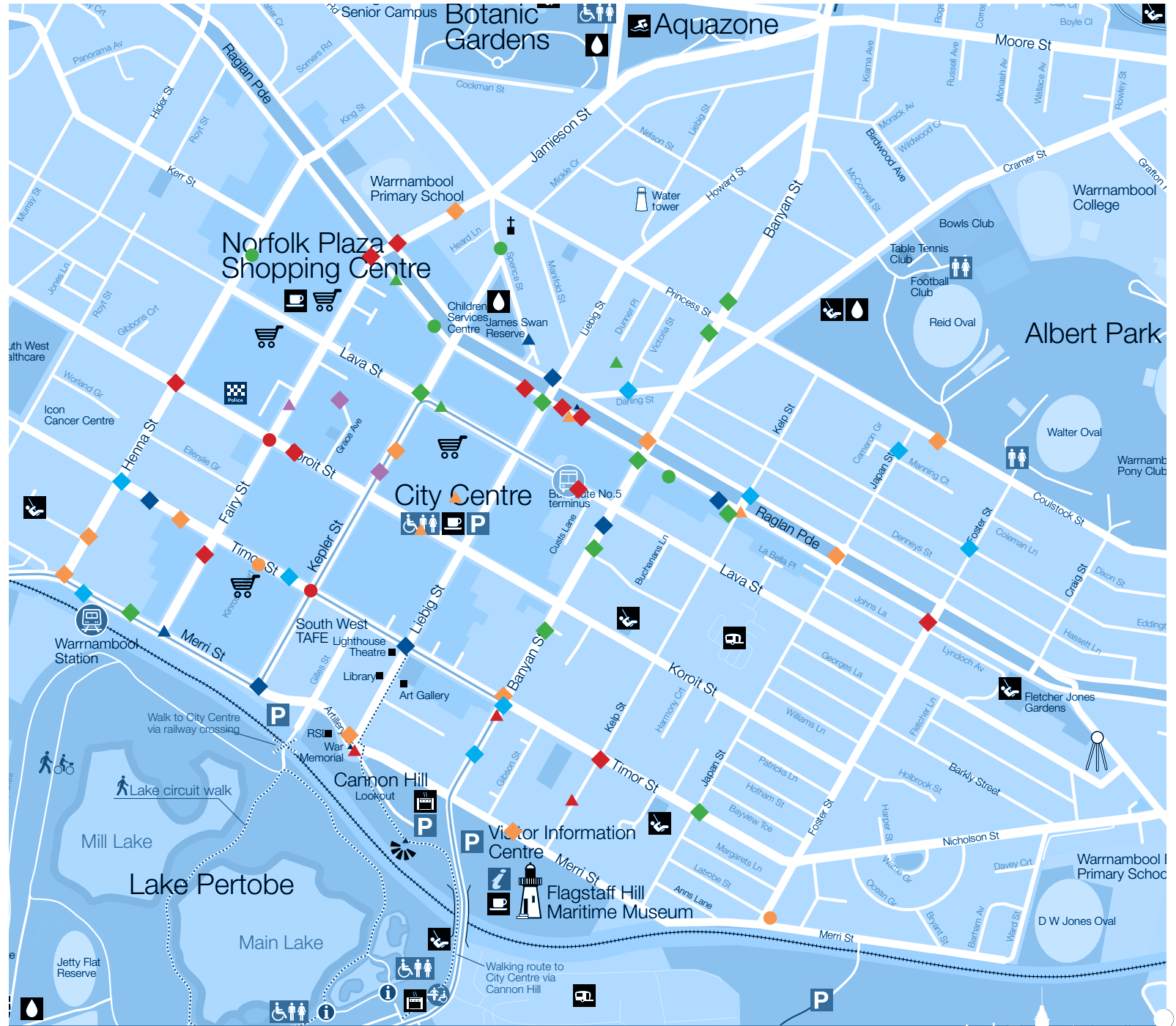
Pedestrian numbers have remained relatively constant across the city centre since 2015 with highest pedestrian activity recorded on Liebig Street between Lava and Koroit streets.

## Cyclists

The numbers of cyclists in the city centre during commuter hours are consistent with numbers from 2015 which suggests that at this point the city centre renewal has not resulted in a significant change in the number of people riding bikes during commuter times

### Legend

Year	User
2015	Cyclist
2016	Pedestrian
2017	Non-Vulnerable user
2018	
2019	
2020	



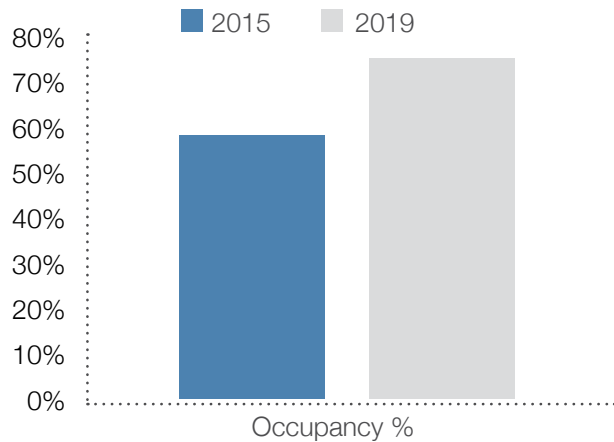


# Access to parking

While some of the feedback from the community suggested some motorists were discouraged from coming to the city centre the occupancy levels at Council-managed car parks have increased since the city centre renewal.

**Note:** free one-hour parking was introduced at selected Council-owned and managed car parks in 2021.

## Week day off-street parking occupancy



## Parking transactions

