Assessment of City of Melville Shared Path Speed Hump Configuration (Apex Park)

Best Practice Shared Path Conflict Mitigation

Prepared by: GTA Consultants (WA) Pty Ltd for City of Melville

on 16/08/2021

Reference: W210220

Issue #: A

GTAconsultants now Stantec

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Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A-Dr	09/07/21	Draft	Tim Judd / Daniel Storey	Tim Judd	Tim Judd	
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B		Final – amended				

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CONTENTS

Figures

Tables

1. RECOMMENDATION

GTA now Stantec have been engaged by the City of Melville (the City) to independently assess the City's internally designed shared path speed humps, as to whether their installation in Apex Park were/are the best option to address shared path safety concerns between pedestrians and faster bike riders. The shared path speed humps (here on in referred to as 'speed humps') were trialled in March 2021 but were cut short following two accidents involving people on bicycles in wet weather conditions.

In addition to reviewing the existing pedestrian and bicycle rider interaction at Apex Park and undertaking desktop research on the worlds' best practice shared path conflict mitigation, the project team set up the speed humps in an offsite location, in order to ride over the speed hump configuration at various speeds. Following this, GTA now Stantec recommends the City proceed with some alternative treatments as a first step to reduce bicycle rider speeds.

It is of GTA now Stantec's view that the intent for this foreshore will only be achievable if faster bike riders are provided their own facility, ideally separated cycle only infrastructure on the Canning Highway side of the current shared path. Therefore, the solutions the City is presently using to reduce bicycle rider speeds by speed humps are only to be considered a temporary outcome while a more desirable longer-term solution is sought. A review of the City's Structure Plan indicates that "dedicated cycle lanes on Canning Highway are referred to as critical transport infrastructure required in the short-term (0-10 years)"[1]. This supports the investment in separated bicycle lanes as determined in the site assessment (see Section 3.1.6).

The trial of the speed humps should only be reinstated should these alternative measures not be successful in reducing the number of complaints and evidence of reduced speed.

1.1.1. Alternative Measures

A Shared space environment can be utilised through the shared path section under assessment denoted through a green colour being used over the entire shared path and removing painted line marking. This can then be supported by block paving or similar entry statements and rumble strips.

Block paving (or similar) entry statements can be utilised at the start and end of the shared path section under assessment to denote a slower speed "shared space" environment (grey coloured preferred, and optional for the City to include additional sections of paving mid-block through the reserve).

Multiple rumble strips can be positioned on the approaches to the reserve to be configured to work in conjunction with the block paving on approach to the shared space environment and be positioned across the full length of the path.

It is suggested to install these immediately and promote throughout the community that these are interim measures that if successful in reducing speeds will negate the need to reinstall the trial of the speed hump configuration. WestCycle, bike shops and group ride organisers (if contact details are available) should be specifically informed of the City's approach to inform their contacts of the need to reduce speeds.

In addition to this, consideration of additional tree planting (or trees in pots) can be introduced as a 'gateway' feature either side of the block paving entry statements.

[1] Ibid (109 – Table 10)

1.1.2. How to Measure

The City currently has recorded evidence of speeds through Apex Park taken over a 19-day period in May 2020. Currently more than half (52%) of riders were cycling above 20km/h with 85th percentile speeds around 25km/h during the peak times. Should the alternative measures reduce speeds such that 15% were cycling above 20km/h (i.e., 85th percentile speeds would be below 20km/h) then the speed hump trial would not be considered necessary at this location.

1.1.3. Supportive Measures with a Speed Hump Re-Trial

Assuming a re-trial is necessary due to insufficient reduction in speed of the alternative measures, then the following should accompany the installation.

Multiple locations – within Apex Reserve the City should install 2-3 configurations of the speed humps, to retain lower speeds throughout the park.

Clear warning signage to be positioned on The Esplanade, Canning Bridge PSP and the Raffles path leading to the Canning Highway underpass: "*Speed Hump trial in place through Apex Park, 15km/h maximum speed through park suggested*".

Wet weather warning signage to be positioned on the path no less than 30m from each approach: "*Speed Humps may be slippery when wet*".

Additional lighting should also be considered, with bollard lighting preferred. Lighting has not been assessed, and the City has indicated the current lighting appears sufficient at Apex Park.

Planning for longer term solutions that more adequately address the issue should commence immediately. These include a separate cycle only facility and/or a separate pedestrian facility (consideration for a boardwalk structure with adequate height to not impede rowing activities). Noting their implementation is subject to funding, external funding support is suggested and for projects to align where possible with the long-term vision for the Canning Bridge precinct.

Effective communication strategy regarding the trial should occur during the lead up (starting no less than 2 weeks prior) and concurrently with the trial. Online engagement to form a substantial component. Communication to indicate the trial is intended as a temporary measure while longer term solutions are being explored and funding to be sourced.

The City should also consider the timing of any trial, preferably before the peak months, to ensure it is active during the busiest times of the year.

1.1.4. Overall Conclusions

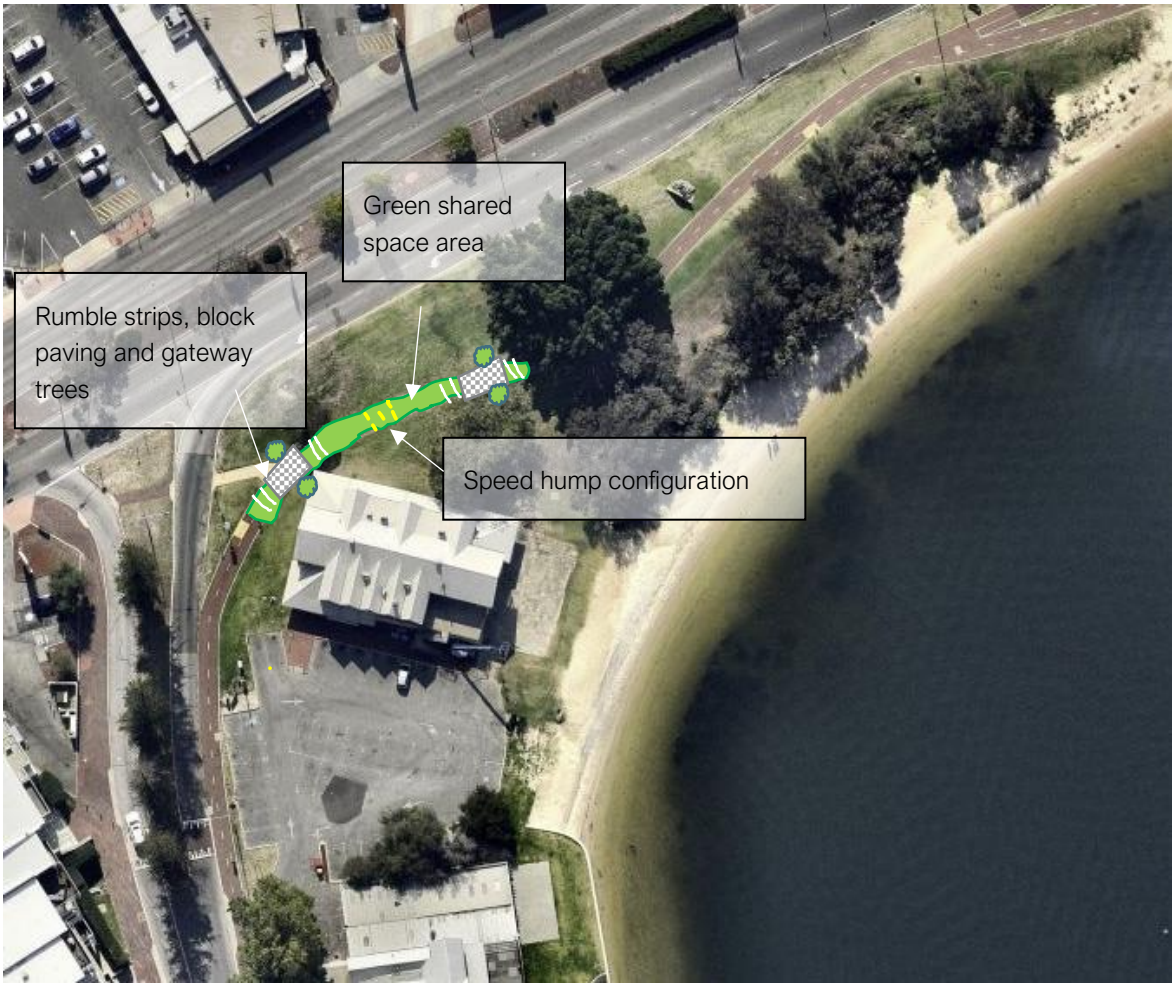
GTA, now Stantec concludes that due to the shared path in Apex Park experiencing conflict (especially during peak periods when faster bike riders are competing with pedestrians), and that walking and cycling is forecast to increase from 3% to 12% by 2050 (partly due to increasing development in Canning Bridge and potentially outcomes from Covid 19), there is validity to develop both a SHORT TERM solution and also a LONGER TERM solution to mitigating path conflicts in Apex Park.

In the SHORT TERM we recommend:

1. Installation of a shared space environment on this section of path. This could include entrance statements, gateway planting, removing the centreline, regular rumble strips and green surface treatment through the area as well as using the speed humps as needed.

2. Promotion that these treatments are interim measures to reduce speed and conflict and if 85th percentile speeds are reduced to below 20km/hr there would be no need to install shared path speed humps.
3. If 85th percentile speeds are still above 20km/hr then humps should be re-introduced at several locations

Figure 1.1: Shared Path example for Apex Reserve (Short Term - as noted this should be considered to be replicated at varying points along the shared path)



Note: Speed hump configuration is only needed if previous path treatments are NOT successful in reducing 85th percentile speeds below 20km/hr

In the LONGER TERM we recommend constructing a separate path:

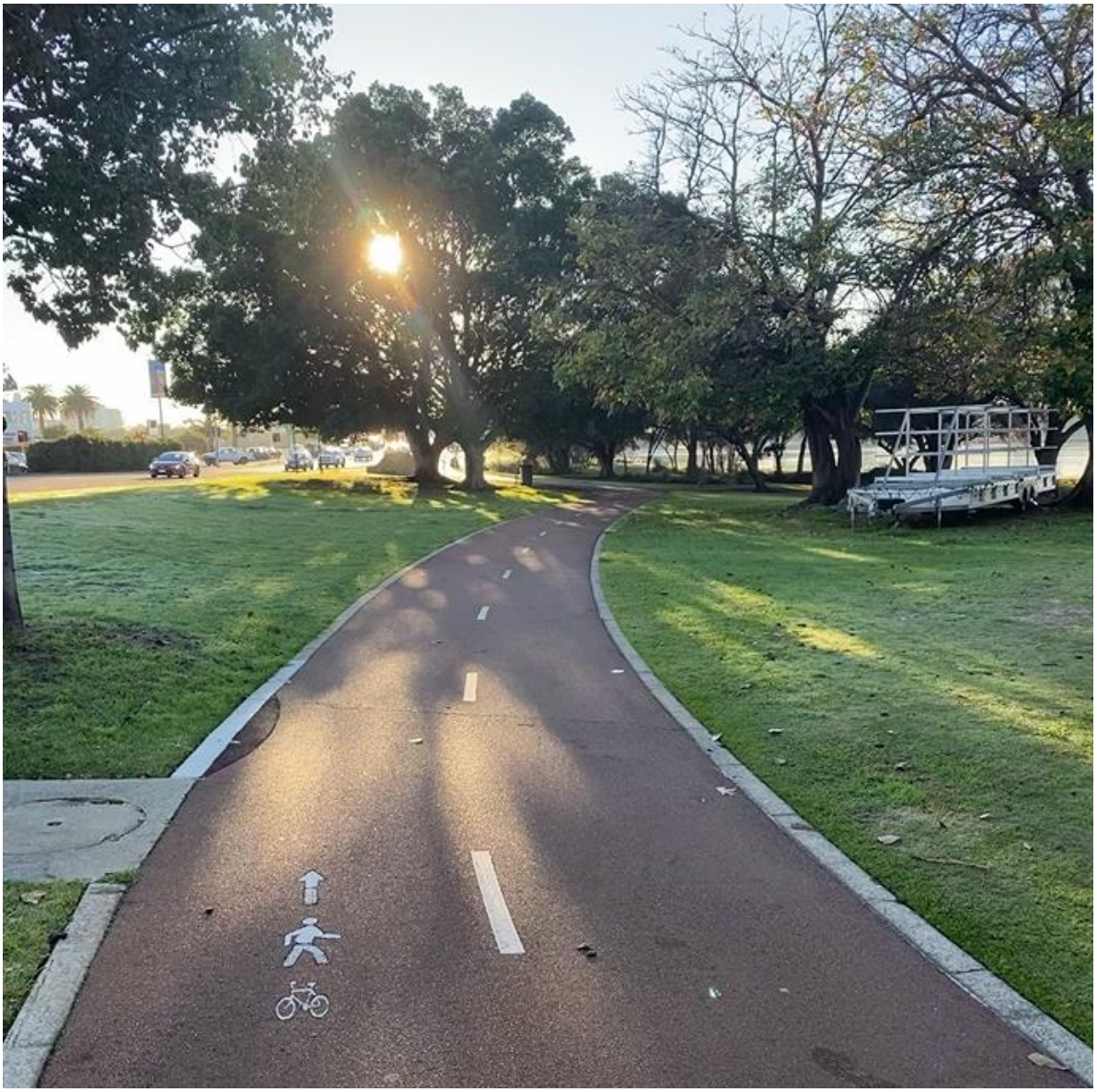
1. Creating a bi-directional cycle path using the Canning Hwy left turn pocket.
2. Creating a bi-directional cycle path adjacent to Canning Hwy but inside the Apex Park boundary.
3. Creating a pedestrian / recreational boardwalk path on the eastern side of the Rowing Club and encourage riders to continue using the existing path.

Figure 1.2: Separated Cycle Lanes Option (Long-Term)

2. INTRODUCTION

The City of Melville (City) has engaged the services of GTA now Stantec to provide an independent assessment of a speed hump configuration which the City designed to reduce the speed of people cycling on shared paths at locations where there were safety concerns. In addition, the services required GTA now Stantec to research international best practice for shared path design for conflict mitigation, and to provide options to the City to mitigate shared path conflict in Apex Reserve.

Figure 2.1: Shared Path through Apex Reserve



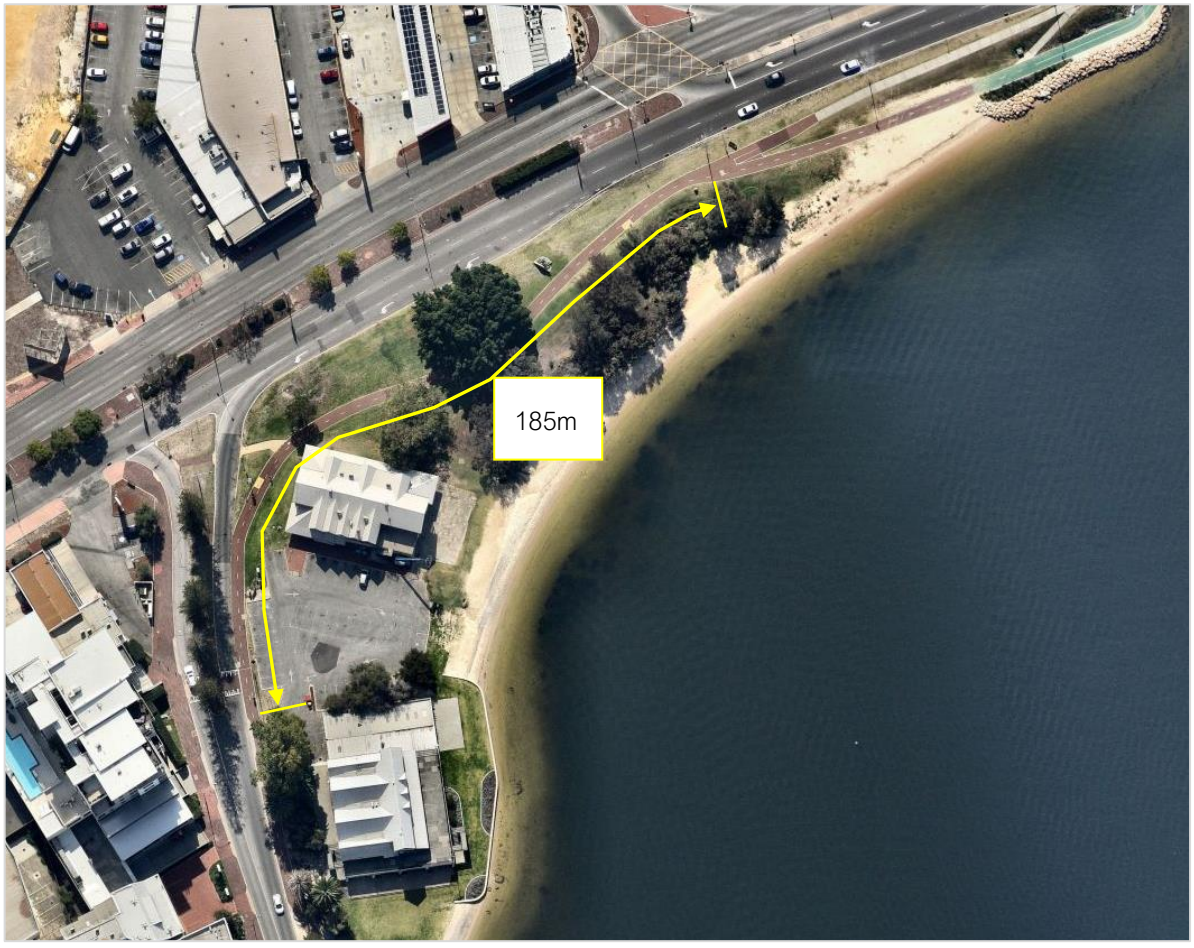
2.1. Background

The City has a good network of river foreshore shared paths that are popular for both recreation and commuting.

However, like many other jurisdictions, the increase in the amount of people using its shared path network has led to the reports of incidents and numerous complaints by pedestrians about the speed of bike riders. This is only being exacerbated as electric bicycles and scooters are becoming more popular, resulting in more movement at higher speeds (increasing the risk of an incident and the severity of the incident should it occur).

Shared path conflict largely occurs where faster bike riders, who would normally use the road, need to ride on a path with high pedestrian demand. This specific instance occurs in City of Melville at a number of locations, but most prominently within Apex Reserve in Mount Pleasant.

Figure 2.2: Apex Reserve shared path site area (source: Nearmap)



Faster bike riders who are using the carriageway of The Esplanade are currently transitioning onto a shared path through the reserve to reach destinations to the east, and vice versa.

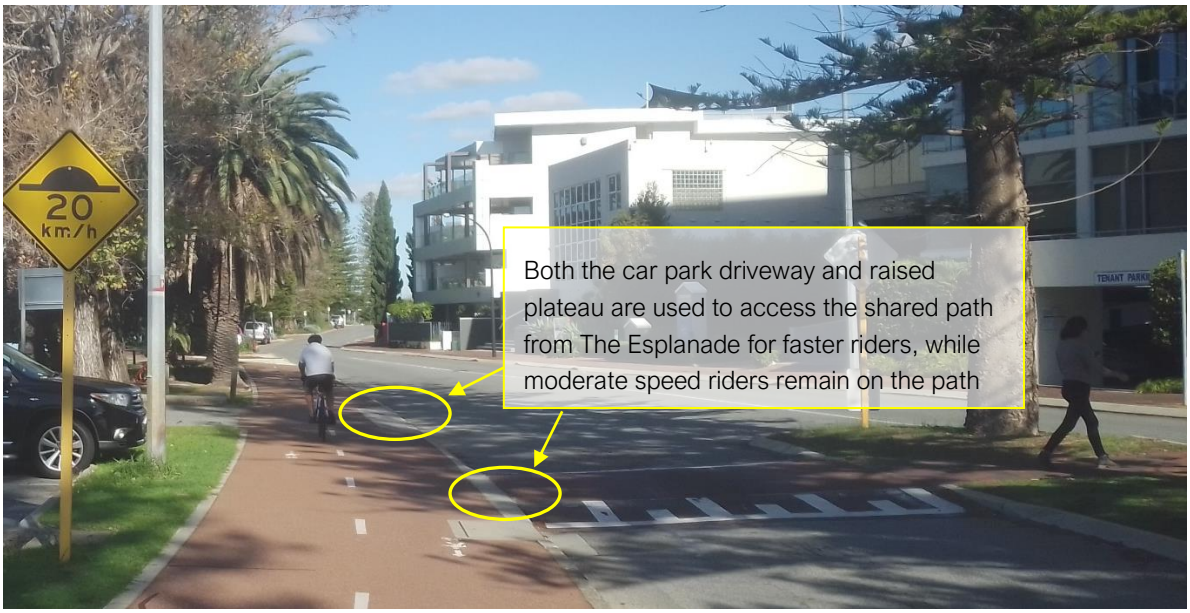
The length of the path in the reserve (where there is reported conflict) is 185m from The Esplanade to the point where the path forks in two. At this point, shared paths take riders to:

1. the underpass of Canning Highway (where they can continue along Canning Beach Road on the Applecross foreshore); and
2. Canning Bridge Station and to the Mitchell Freeway principal shared path (PSP) on the eastern side of the river at Melville Waters.

These paths east of the path diverge point have their own conflict issues. However, the subject of this study is the section to the immediate west of the divergence.

Figure 2.3: Apex Reserve shared path eastern end (diverge point)

Figure 2.4: Apex Reserve shared path western end (transition from The Esplanade)



Impact of the Swan River Rowing Club

The path traverses in front of the Swan River Rowing Club. However, most of the activity of the rowing club in the early mornings is just south of the transition point, so the faster riders are on the road at this point. The transition point includes the driveway for the car park used by rowers, which means riders in the morning peak have to negotiate cars entering and exiting the carpark as well as pedestrians.

2.1.1. High Activity and Speed

While the high activity on the shared path in the area is welcomed, speed data provided by the City indicates people are cycling in this location with an 85th percentile speed of approximately 25-27km/h depending on the time[2]. The maximum speeds of some riders are recorded as over 30km/h. These speeds are inappropriate for the level of pedestrian usage on the path, the capacity of the path (3.0m wide) and the available site distance with the curvature through the park, particularly around the Rowing Club building. Within Apex Reserve, the City has taken the view that the speed of riders is the primary area of concern to be addressed. Further information on speed is provided as part of the site assessment in Section 3.3.

2.1.2. Specific Incidences

Specific incidents have been reported to the City, including a 74-year old woman who was treated in hospital following a collision with a group of bike riders in Apex Reserve.

2.1.3. Previous Attempts to Address the Issue

The City has been made aware of issues on shared paths for several years and sought to resolve it through methods such as the installation of signage and painted messages. These messages have focused on influencing behaviour of the riders, encouraging them to slow down and be considerate of other users.

Information campaigns have also been undertaken to advise the community on how to use the path network more considerately towards other users.

In some instances, mirrors have been used at conflict hotspots where the issue related to a sight distance problem (although not specifically in Apex Reserve).

[2] Speed data was obtained by MetroCount from 30 April to 19 May 2020 – note: this is soon after the first Covid lockdown and path usage was high and speeds were likely to be a little lower as a result

2.1.4. Speed Hump Trials

Similar to a local area traffic management (LATM) scenario, where devices are installed to physically slow users travelling at inappropriate speeds, the City considered lateral and horizonal devices to force speeds of cyclists to be towards a more appropriate 15km/h.

Hump and Dip Trial

The first vertical speed hump device considered by the City was the *Brommerdrempel* styled hump and dip technique used in the Netherlands. The City worked with the Department of Transport (DoT) for more than a year in 2017-2018 to consider a trial of this sort of hump, initially at Alfred Cove, and then at the Apex Reserve location.

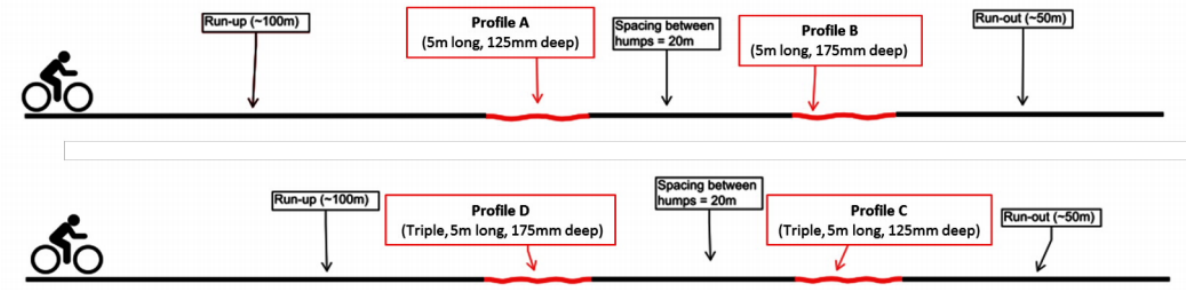
It should be noted that these devices used in the Netherlands were to moderate speeds of mopeds, while remaining convenient for bike riders.

Figure 2.5: Example of Brommerdrempel style speed hump

While these are considered to have a potential to be effective, the City's position has been that further development is required to determine the best hump / dip profile that balances effectiveness and safety. The device cost was also in the range of $10k-30k. Testing of this device was undertaken by the DoT at a quieter location on a shared path in Leeming within the City of Melville.

During the first phase of testing, the depth of the vertical displacement and the number of dips was altered across four profiles with participants provided feedback on their perceived safety and effectiveness.

Figure 2.6: Four hump profiles used in phase 1 (DoT, 2018)



Hump Profile	Length	Amplitude	No. of dips
A	5 m	125 mm	2
B	5 m	175 mm	2
C	5 m	125 mm	3
D	5 m	175 mm	3

During the evaluation of the trial, there was found to be a strong correlation between safety and effectiveness at reducing speeds, but with an inverse relationship. The safer devices were less effective, while the less safe devices were more effective at reducing speeds. 100% of participants found Profile A to be the most suitable overall and it was shortlisted for further refinement as part of phase two of the trial.

Phase two increased the length of the speed hump, while retaining 2 dips and 125mm depth of the vertical displacement (or dip). Another profile reduced the amplitude or dip again but retained the 5m length and number of dips.

Figure 2.7: Hump profiles tested in phase 2 (DoT, 2018)

Hump Profile	Length	Amplitude	No. of dips
A (control from Phase 1)	5 m	125 mm	2
E	5 m	100 mm	2
F	6 m	125 mm	2
G	7 m	125 mm	2

Profile G, the longest, was found to the most suitable.

The COM did not proceed with the Netherlands style speed hump and dip due to the cost and the inconvenience to path users over a protracted timeframe. However, the City found the trial useful in that it helped to identify all users and that a combination of horizontal and vertical deflection was most likely to be both safe and effective.

City of Melville Design Speed Hump

Instead of proceeding with the Netherlands style speed hump and dip, the City designed a special configuration of speed humps using a combination of vertical and horizontal deflection to slow path users to around 15km/h.

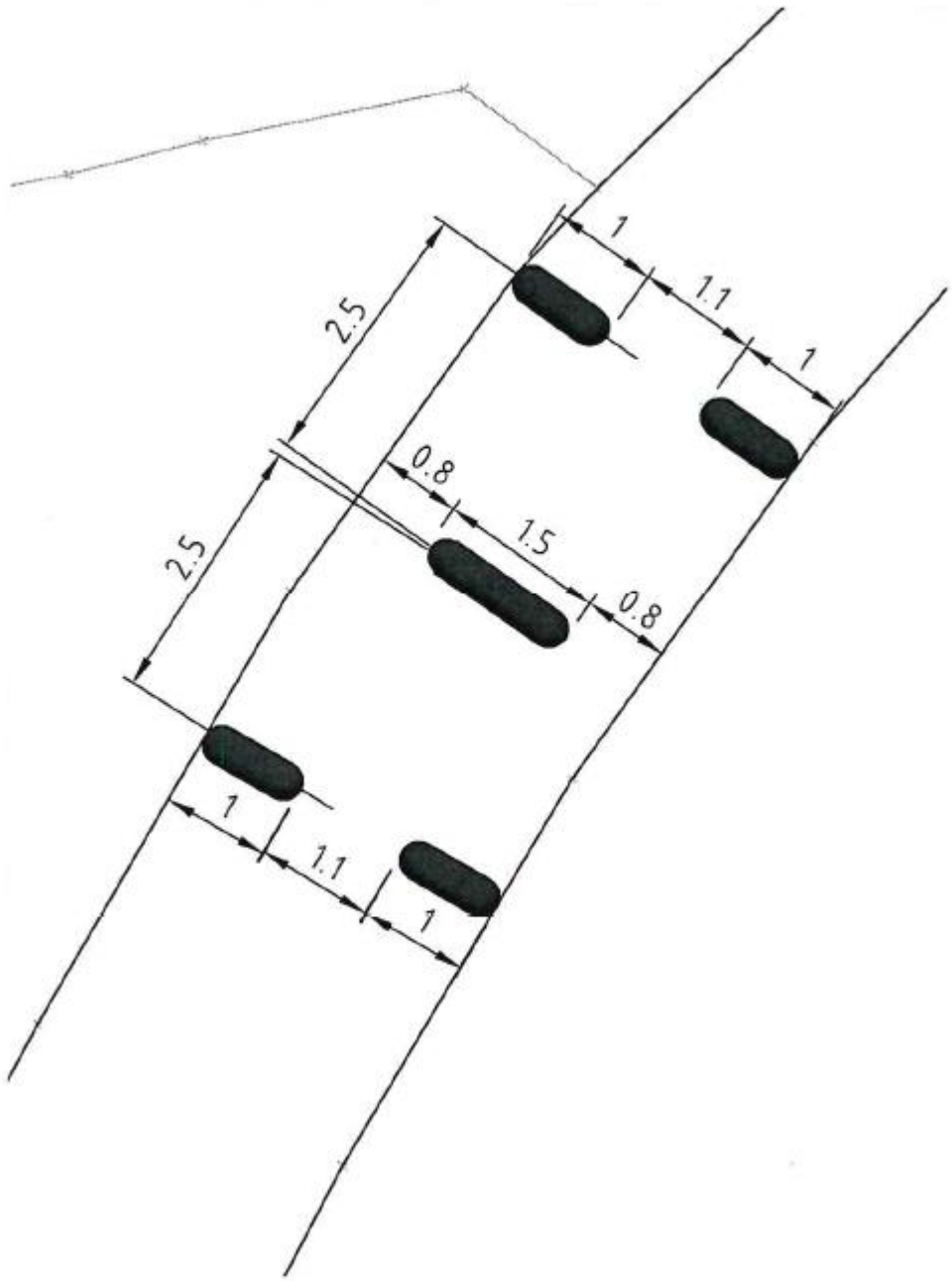
The longitudinal spacing between the humps of this configuration is 2.5m which allows path users to go 'over' or 'around' the humps depending on their needs.

With this configuration, people in wheelchairs, on foot, on scooters or skateboards for example, might choose to deviate to avoid the humps. The hump configuration was designed to accommodate small-wheeled

vehicles like skateboards, rollerblades and people with limited mobility by being yellow in colour and allowing space between them. They were also of a height that could be stepped over by those that wanted to.

At the same time, people on a bike might choose to ride over the humps. The hump configuration was designed to be more comfortable on a person cycling at lower speeds, but uncomfortable to be ridden over at higher speeds (similar to a road speed hump designed to reduce vehicle speeds).

Figure 2.8: City of Melville speed hump configuration (source: City of Melville)



The speed hump configuration was tested in a number of locations with various stakeholders before it was trialled, including:

- Point Walter
- John Connell Reserve
- Tompkins Park.

These stakeholders included walkers, people riding various bikes, people using wheelchairs and Cycling Without Age Melville[3] to ensure safety and accessibility.

Figure 2.9: City of Melville testing of speed hump configuration (source: City of Melville)

2.1.5. Trial Installation of Speed Humps at Apex Reserve

Following the testing with stakeholders, the City selected Apex Reserve as the first location to trial the speed humps. The City installed the configuration on 4 March 2021 with the intent to trial them for a couple of months through to May 2021. Upon obtaining user feedback, the City would consider expanding the trial to other locations, starting with the Alfred Cove shared path on the river foreshore.

Figure 2.10:City of Melville speed hump trial at Apex Reserve (source: City of Melville)

[3] https://www.melvillecity.com.au/our-community/grants-scholarships-and-sponsorship/project-robin-hood/project-robin-hood-iv/cycling-without-age

Apex Reserve was selected for the trial because of the limited sight lines, high speed path users interacting with slower path users, high volumes of pedestrians and bike riders and a history of previous incidents.

Trial Aborted

However, the hump configuration was removed the next day in response to two reported bike rider crashes on the humps. One of the bike riders who crashed cycling over the speed humps on the day of the trial attempted to obtain compensation from the City, although the insurance provider ruled in favour of the City.

On the day of the trial there was wet weather, which was likely to have contributed to the crashes, and increased the perceived concerns with the speed humps in the cycling community. In addition, the City believes the crashes most likely occurred due to unfamiliarity with the hump configuration. Bike riders tended to weave between the humps without slowing down, rather than reducing their speed to cycle over or through the humps, as they were intended to do.

Figure 2.11: Apex Reserve speed hump trial location

Figure 2.12:Traffic management for Apex Reserve speed hump trial (source: City of Melville)

2.1.6. Cost of Speed Hump Trial

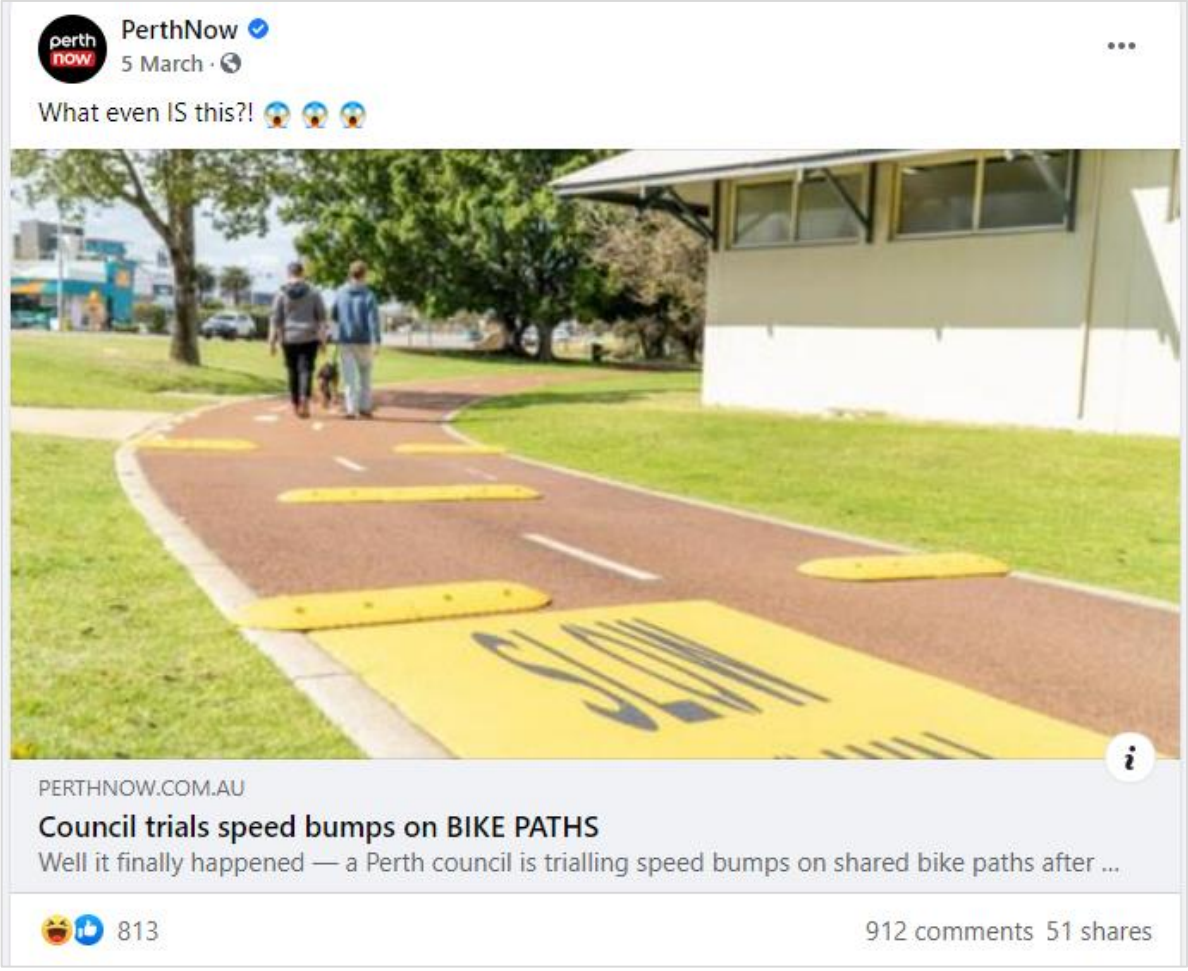
The cost of the trial to the City, including traffic management, installation and removal, was $1.5k. The hump configuration purchase costs alone are $850, normal installation costs are $440, and removal costs $250.

2.1.7. Community Complaints

There was large community push back regarding the speed hump configuration. The angle that some media, particularly online, took towards the trial likely contributed to the negative responses.

For example, a PerthNow article posted on Facebook generated 900+ comments (as of 23 June), largely people concerned about it being a trip hazard.

Figure 2.13:Facebook article relating to the trial



People who disliked the speed humps tended to be faster path users, who were also concerned they will start to appear in other locations across the network. However, almost all agreed that there was conflict on some of the City's shared paths and recognised something needed to be done.

Richard Stallard disliked the treatment indicating it was problematic due to the geometry of bicycle steering wheel. Richard indicated the point of contact between a bicycle wheel and the road or path surface is slightly behind the steering axis of the bicycle. The tril distance is what gives a bicycle its self-steering ability. He

believed a child on a bicycle (smaller bicycle size) will be more vulnerable. Although many Technical Officers have ridden through these humps and found that by riding at 15km/hr they were simple to navigate.

2.1.8. The Current Situation Following Removal of the Speed Humps

Following the removal of the speed humps after the accidents, the City has installed two Your Everyday Speed (YES) signs with the message to 'SLOW DOWN'.

Figure 2.14:Replacement installation of YES signs

2.1.9. Further Assessment of City Designed Speed Humps Required

The City is still in the position of needing to address the conflict situation at Apex Reserve and has engaged GTA now Stantec to independently assess the speed hump configuration as designed and trialled for the one day above.

2.1.10.Types of Users

It is important to distinguish between the 'type' of user on the shared path, and specifically, to distinguish the types of users the concerns are coming from, and the types who are the most vulnerable.

Although all active transport users are often considered as one together, and all are vulnerable in comparison to vehicles, their distinctions from each other in a shared path environment attributes need to be understood so the City can design changes which improve safety appropriately.

Fast riders use this section of shared path through Apex Reserve as they have no other feasible option to avoid Canning Highway (either crossing it or cycling along it). An underpass to the highway exists but is only accessible via this shared path. There are no protected cycling facilities along Canning Highway itself and no other path in this area.

Pedestrians also use this path, including people who walk their dogs, the vision impaired, those in a wheelchair and the elderly. This section of path is a continuation of the foreshore path immediately south (adjacent to The Esplanade). People are also walking to Canning Bridge Station which is only a 600m walk from Apex Reserve.

Moderate speed riders are also known to use this section of path through Apex Reserve. These people are most likely using the path network on the foreshore and are not seeking to cycle on road. These types of riders are less of a concern to pedestrians and may also feel uncomfortable being overtaken by a faster rider. These riders may also include children and those learning to cycle, who would be more closely associated with a pedestrian than a fast rider.

People on skateboards and scooters, some of which are electric and travel at higher speeds, represent other types of users expected on the shared paths. People in wheelchairs are also considered with unique requirements to able-bodied pedestrians.

3. APEX PARK PATH ASSESSMENT

3.1. Primary Inspection

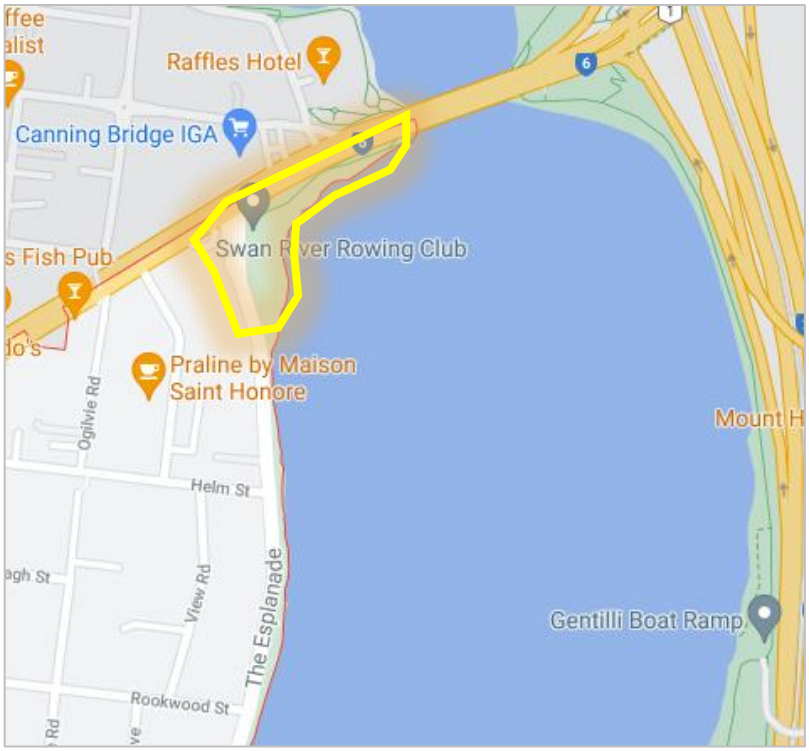
As a first phase of the assessment, GTA now Stantec inspected the site location where the trial speed humps were installed for one day in March 2021. Present at the site meeting were:

- Tim Judd and Daniel Storey – GTA now Stantec.
- Leon Ebbelaar and Ruth Behn – City of Melville.

Originally, the morning of Thursday 10 June 2021 was selected for the inspection but due to rain being forecast, the inspection was postponed to 17 June 2021 when fine weather conditions were forecast to ensure maximum numbers of users on the path would be observed.

The time of the assessment was between 7:30am-9:00am to capture the morning peak movements. It was important to assess the site during the times and conditions most resembling where conflict could occur. While the humps were no longer there, the behaviour of path users could be assessed.

Figure 3.1: Apex Reserve Site Location



The site assessment also provided an opportunity for the City to provide additional information to GTA now Stantec on the background of the project. Some of the observations of the site assessment, and discussion points made at the meeting are described below.

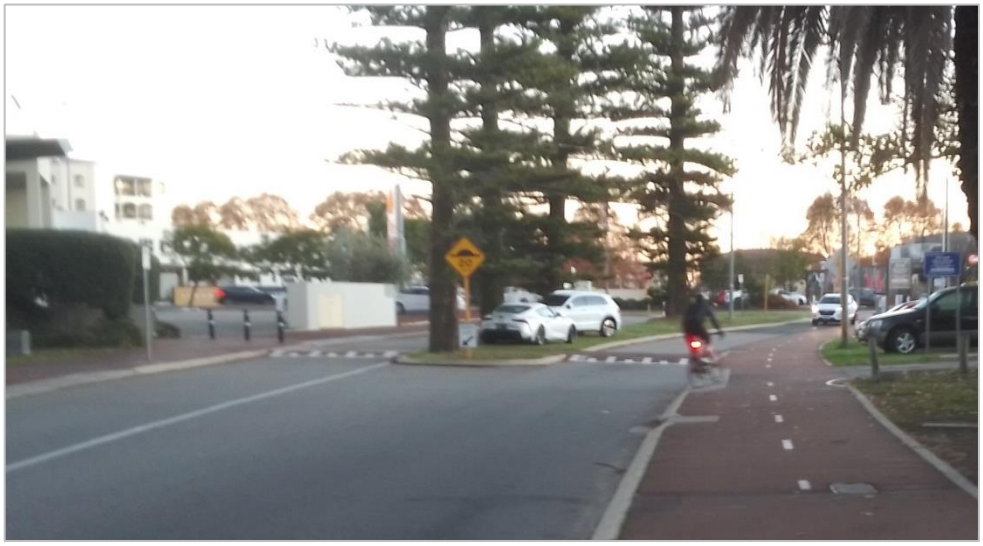
As the project was undertaken in the month of June, it is likely the problems could be further exacerbated in warmer months than were observed at the site visits.

3.1.1. Fast Riders on the Esplanade

It was noted that the faster bike riders were most prevalent from 6:30-8:00am, and more pedestrians and casual riders were using the path from 8:00am to 9:00am.

It was clearly observed that faster riders were cycling on The Esplanade itself and transitioning onto the shared path at the kerb ramp or just beyond at the location of the road speed hump (Figure 3.2). Slower riders and pedestrians were continuing on the shared path on the river foreshore side of The Esplanade.

Figure 3.2: Transition Point from The Esplanade to Shared Path



3.1.2. Swan River Rowing Club

Also of note was the activity at the Swan River Rowing Club, that continued until around 8:00am. It is understood that the rowing sessions commenced between 5:30am to 6:00am each morning of the week.

The activity and large number of people at the rowing club largely disappeared around 8:00am, vehicles exited the car park where the point of the transition from road to path was occurring for people on bikes. This added to the conflict, and people riding continued to cycle on the Esplanade and transition at the speed plateau.

Cars Parked on Median

While the people in the rowing club were away from the path, there were some cars parked on the central median of The Esplanade. There was clear evidence the median was not required to be so large, and space could be taken from there if additional path separation were provided (described further below).

3.1.3. The Esplanade –Safe Active Street Potential with Road Closures

The City indicated it has an intent to pursue a Safe Active Street for the Esplanade. There was clear evidence of one-way movement of vehicles. GTA now Stantec raised the prospect for making the entire section of The Esplanade as one-way route – there is around twice the number of southbound vehicles as northbound ones. The City is happy to consider all options.

There is no timing for proceeding with a Safe Active Street and would likely be subject to its bike plan scheduled for an update in 2021/2022.

3.1.4. Path Characteristics

- Path Width: 3.0m wide (including flush kerbs).
- Surface treatment: red asphalt with centreline. Upgraded in 2008 (from 2.0m concrete). Path surface is the standard treatment for a recreational shared path, which is conducive to increased speeds[4].
- Grade: The site is fairly level except for the approach from Canning Bridge which is a decline and will likely add to increased speeds from the eastern approach.

3.1.5. Blind Corner

For fast moving riders, the corner around the Rowing Club building would be blind towards pedestrians, noting that the assessment was undertaken by foot rather than a bicycle to completely verify this. The position of the speed humps appeared to have been placed where visibility from both sides was at its best.

3.1.6. Longer Term Separation is Required

From the assessment on site, it became very self-evident that reducing speeds on the shared path was a temporary solution, and a longer-term solution to provide separate facilities for pedestrians and faster bike riders was necessary. This was especially prevalent with the higher density development occurring along Canning Highway and forecast to continue, with higher demand for active travel access to Canning Bridge Rail Station.

Modifications to the Esplanade & Separated Cycle Lanes on Canning Highway

There is width to provide a separate path through most of the park itself. However, it is not feasible without modifications to either the carpark or The Esplanade at the point of transition at the south end of this section of path where the conflict occurs. It is also preferable for the fast bike-only section to be as close to Canning Highway as possible, away from the park.

As indicated above, there is space to take from the central median to The Esplanade and potential to reconfigure the southbound carriageway of The Esplanade to allow for a separate cycle only facility. The transition points will need to be thought out carefully, including how vehicles enter and exit the car park.

An alternative option would be to modify the Esplanade such that the existing north-bound carriageway becomes a one-way south bound lane, and north-bound movement is prohibited at this point (or north of Helm Street). This would mean the existing south bound carriageway could become a bicycle only facility through to Canning Highway.

[4] Speed Management on Shared Paths (TN130, Department of Transport and Main Roads, QLD)

A separate cycle only facility on the southern carriageway of Canning Highway would then need to be constructed. Potentially, the left turning pocket could be used for separated cycle lanes and is to be discussed further with Main Roads WA.

These modifications should align with the Canning Bridge Activity Centre Structure Plan and could be expected to be supported by DoT as a priority for grant funding. Refer to sketch in Figure 3.3. Note: transition points at each end and their treatments are indicative only.

Figure 3.3: Separated Cycle Lanes Option (Long-Term)

Riverside Pedestrian Boardwalk

Another option is to provide a boardwalk for pedestrians and slower moving bike riders. Any boardwalk structure will need to be high enough to allow rowers easy access underneath and be aligned to the objectives of the Canning Bridge Structure Plan.

Construction of the boardwalk and the separated bicycle lanes is the ideal outcome, with the present shared path still being in use for east-west movement on Canning Highway. This is expected to allow for the increase in capacity of movement in the area in the longer term.

Path Widening Through Reconfiguring Car Park

Should the separated cycle lanes options or a boardwalk not be feasible, there is opportunity to widen path through the blind corner and through to Canning Bridge. An additional path could be provided adjacent to the existing shared path on the southern and eastern side, with the existing path being for use by faster bike riders, and the new path being for use by pedestrians and slower moving bike riders.

This option will require configuration of the car park to allow for space and will mean loss of bays. This is not the preferred option from a user behaviour point of view, as there is often confusion over which path to use, as is the case with the City of Subiaco and the City of South Perth in their separated paths. However, the site assessment appeared to indicate that modifications to the car park were feasible.

Figure 3.4: Shared Path through Apex Reserve with indicative location of additional path option

3.1.7. Time of Day

As indicated previously, the faster bike riders tended to be using the path earlier in the mornings, before 8:00am with pedestrians coming out using the path more from 8:30am-9:00am. It can be assumed that local residents are more aware of the times of the faster riders and are prepared for the potential hazards. Communication with the public through City's media channels, could be made to indicate the best times to use the path for each type of user, whether the trial for speed humps is reinstated or not.

3.1.8. Impact of Covid-19

Since the original lockdowns were introduced in Western Australia in March 2020, there has been an increased demand in pedestrian and cycling movements as a global phenomenon. This is likely to have an impact on the demand for use of the shared path and conflict.

3.1.9. Other Solutions Considered

Utilising in-ground technology could be a further solution to shared path conflict mitigation. In-ground or projected onto the ground signs to tell cyclists to slow down could be explored, these could be triggered by a speed of the cyclists, such that, when a cyclist speed is detected above the desires limit (15km/h for

example) an illuminated sign is projected onto the ground in the travel path of the approach cyclist to say 'slow down, pedestrians ahead' or similar. However, the ability to do this and technology would need to be explored further but could be world leading in utilising technology to modify path user behaviour.

3.2. Additional Inspection

GTA also observed the site on Sunday afternoon 13 June 2021 around 4pm.

A middle-aged couple were observed walking on the left side of the path, and after a fast-moving bike rider went past them, the gentleman beckoned to his wife to move to the right of the path so they could see the bicycle riders coming towards them. They were clearly visibly uncomfortable with the experience.

3.3. Bike Rider Speed Assessment

Speed data provided by the City for people cycling in this location indicates 85th percentile speeds are approximately 27-28km/h[5]. There are a small number of high maximum speeds greater than 30km/hr (about 30 per day). However, 838 riders per day were cycling more than 20km/h which was more than half of the riders counted. These speeds are too high for the situation when there are pedestrians using the path, and the ideal speed is 15km/h (and below).

Table 3.1: Measured Speed of Bike Riders in Apex Reserve, May 2020

Measured Speed	Total	Eastbound	Westbound
0-10 km/h	55 per day	34 per day	21 per day
10-20 km/h	717 per day	438 per day	279 per day
20-30 km/h	809 per day	484 per day	325 per day
30-40 km/h	29 per day	11.6 per day	17.4 per day
40-50 km/h	3 (over 19 days)	-	3 (over 19 days)
50+km/h	5 (over 19 days)	3 (over 19 days)	2 (over 19 days)
Total	1610 per day	968 per day	642 per day

The above speeds shown as a percentage is indicated in Table 3.2.

[5] Speed data was obtained using MetroCount over a period of 19 days (30 April – 19 May 2020)

Table 3.2: Measured Speed of Bike Riders in Apex Reserve as a Percentage, May 2020

Measured Speed	Total	Eastbound	Westbound
0-10 km/h	3.4%	3.5%	3.3%
10-20 km/h	44.5%	45.2%	43.5%
20-30 km/h	50.2%	50%	50.6%
30-40 km/h	1.8%	1.2%	2.7%
40+ km/h	0.026%	0.016%	0.04%

Using 20 km/h as a threshold, Table 3.3 indicates the percentages of riders above and below this speed as recorded over the 19-day period in May 2020. The City should continue to monitor these speeds with the reintroduction of the trial and any associated measures undertaken for this path.

Table 3.3: Measured Speed of Bike Riders in Apex Reserve as Cumulative Percentages

Measured Speed	Total	Eastbound	Westbound
<20 km/h	47.8%	48.8%	46.7%
>20 km/h	52.2%	51.2%	53.3%

3.3.1. Time of Day Speed

Eastbound speed on a weekday and weekend are indicated in the following tables. The speeds recorded are the 85th percentile. One of the oldest criteria for setting speed limits is the 85th percentile speed - the speed at or below which 85% of motorists travel under free flow conditions, when their speed choice is not constrained by vehicles in front of them. There are questions about whether 85th percentile speed analysis is as applicable for bike riders as it is for motorists, without motor assistance. However, no other data was provided.

85th percentile speeds indicate there is a significant likelihood of encountering these speeds and above for those walking eastbound towards Canning Bridge (15% of riders overtaking you will be doing these speeds and above). Tables have been separated for morning, middle of the day, and evening.

Eastbound Direction

Eastbound has a higher volume of bicycle use, particularly on weekends and has therefore been tabled before westbound.

Table 3.4: 85th Speed of Bike Riders in Apex Reserve – Morning Within Each Hour (Eastbound)

Time of Day	Week Day Speed	Weekend Speed
5:00 – 6:00am	27.2 km/h (20 riders)	27.8 km/h (19 riders)
6:00 – 7:00am	26.2 km/h (60 riders)	26.5 km/h (78 riders)
7:00 – 8:00am	26.1 km/h (75 riders)	26.4 km/h (142 riders)
8:00 – 9:00am	24.9 km/h (67 riders)	24.2 km/h (117 riders)
9:00 – 10:00am	24.3 km/h (51 riders)	23.9 km/h (97 riders)

The highest 85th bicycle speeds recorded in the morning are before 8:00am on both weekdays and weekends. This is expected to be because pedestrian numbers increase after 8:00am and training riders tend to ride earlier in the morning to minimise encounters with traffic and other path users. No pedestrian volume data was available to confirm this, but the site observation revealed this to be so for that particular day.

Table 3.5: 85th Speed of Bike Riders in Apex Reserve – Middle of the Day Within Each Hour (Eastbound)

Time of Day	Weekday Speed	Weekend Speed
10:00 – 11:00am	23.6 km/h (60 riders)	23.8 km/h (91 riders)
11:00 – 12:00pm	24.4 km/h (53 riders)	22.7 km/h (80 riders)
12:00 – 1:00pm	25.0 km/h (37 riders)	23.5 km/h (53 riders)
1:00 – 2:00pm	25.0 km/h (27 riders)	22.8 km/h (42 riders)
2:00 – 3:00pm	25.1 km/h (26 riders)	23.4 km/h (39 riders)

The weekend speeds during the middle of the day can be seen to be reducing to the lower 20's km/h compared to weekday speed which is still mid 20's km/h. The number of riders per hour continues to be higher in the weekend compared to weekday over the same time period in the middle of the day (about 50% more). The number of pedestrians can be expected to be higher during the middle of the day on the weekends compared to weekday, as well as the type of bike rider is expected to be more moderate speed type of rider rather than faster commuter or group riders of the mornings.

Table 3.6: 85th Speed of Bike Riders in Apex Reserve – Evening Within Each Hour (Eastbound)

Time of Day	Weekday Speed	Weekend Speed
3:00 – 4:00pm	25.5 km/h (36 riders)	22.4 km/h (50 riders)
4:00 – 5:00pm	25.5 km/h (53 riders)	21.2 km/h (63 riders)
5:00 – 6:00pm	24.5 km/h (69 riders)	22.3 km/h (65 riders)
6:00 – 7:00pm	25.1 km/h (23 riders)	24.8 km/h (19 riders)

Evening speeds are clearly lower for weekends over weekday riders, and the volumes change after 5:00pm whereby there are more riders on weekdays than weekends during this time (5:00-7:00pm). The speed for the weekday bike rider in the evenings continues to be mid 20's km/h for the 85th percentile.

Westbound Direction

The westbound speeds provide a similar outcome. The number of riders is slightly lower than eastbound particularly across the weekends. 85th percentile speeds recorded for westbound bike riders in the morning time are the highest across all movement and time period, and edges towards 30km/h before 7:00am.

Table 3.7: 85th Speed of Bike Riders in Apex Reserve – Morning Within Each Hour (Westbound)

Time of Day	Weekday Speed	Weekend Speed
5:00 – 6:00am	28.3 km/h (25 riders)	28.9 km/h (22 riders)
6:00 – 7:00am	27.4 km/h (53 riders)	27.9 km/h (60 riders)
7:00 – 8:00am	27.0 km/h (68 riders)	26.4 km/h (85 riders)
8:00 – 9:00am	26.0 km/h (47 riders)	24.8 km/h (73 riders)
9:00 – 10:00am	24.9 km/h (46 riders)	24.3 km/h (71 riders)

Table 3.8: 85th Speed of Bike Riders in Apex Reserve – Middle of the Day Within Each Hour (Westbound)

Time of Day	Weekday Speed	Weekend Speed
10:00 – 11:00am	24.5 km/h (41 riders)	23.6 km/h (64 riders)
11:00 – 12:00pm	25.6 km/h (33 riders)	24.2 km/h (52 riders)
12:00 – 1:00pm	26.8 km/h (24 riders)	23.6 km/h (31 riders)
1:00 – 2:00pm	25.7 km/h (18 riders)	23.0 km/h (28 riders)
2:00 – 3:00pm	27.5 km/h (15 riders)	24.0 km/h (30 riders)

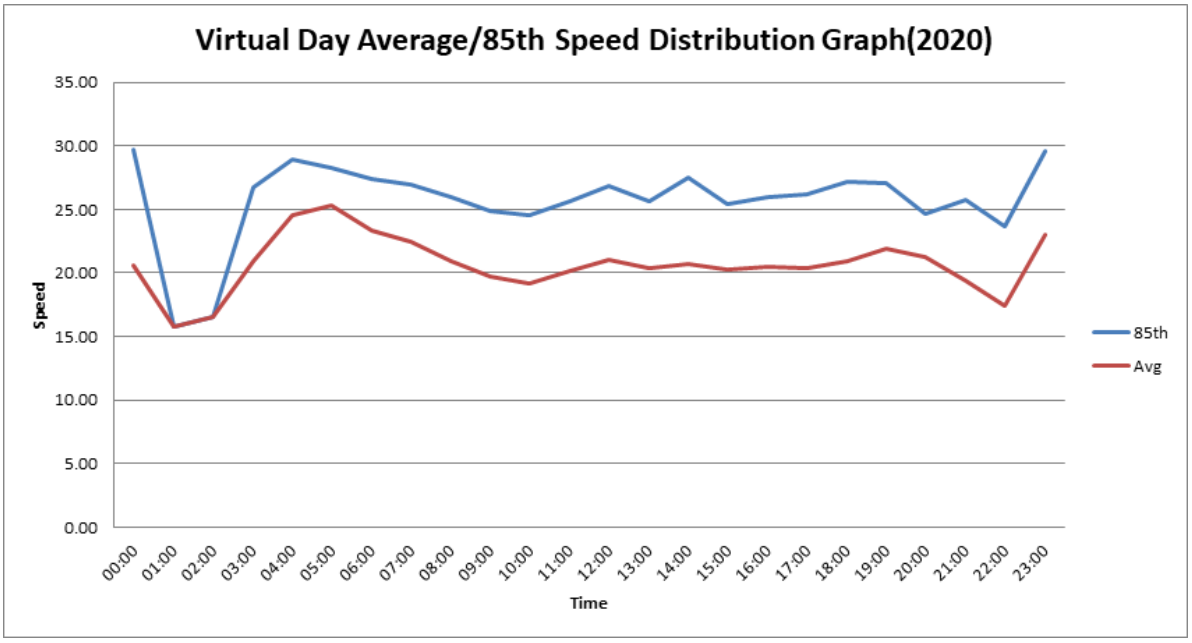
Table 3.9: 85th Speed of Bike Riders in Apex Reserve – Evening Within Each Hour (Westbound)

Time of Day	Weekday Speed	Weekend Speed
3:00 – 4:00pm	25.4 km/h (22 riders)	23.9 km/h (32 riders)
4:00 – 5:00pm	27.5 km/h (31 riders)	24.8 km/h (39 riders)
5:00 – 6:00pm	26.1 km/h (36 riders)	24.7 km/h (37 riders)
6:00 – 7:00pm	27.2 km/h (10 riders)	27.8 km/h (8 riders)

3.3.2. Comparing Average Speed to 85th Percentile Speed

As to be expected, average speeds are lower than the 85th percentile speed, and an indication of the varying speed across the time of day at this location is shown below in Figure 3.5. Note that this is for combined movement east and west.

Figure 3.5: Average Speed vs 85th Percentile Speed



The average speeds are the highest before 6:00am. However, the number of riders at this time was significantly lower. The intent should be to reduce the 85th percentile closer towards the average speed with the reintroduction of the speed humps (or other path treatments), and for the speeds to be closer towards 15 km/h.

3.3.3. Comparison to Pedestrian Speed

People who walk on the path are moving at a much slower speed and are vulnerable to potentially life-threatening injury if hit by a person travelling at these speeds on a bicycle indicated above (25-30km/h).

Actual pedestrian speeds have not been measured for this site, but the average person's walking speed is considered to be about 5km/h[6]. Therefore, the speed differential between faster bike riders and people walking is 20+km/h at this location; or in other words, some people are cycling about 5 times the speed of the person walking. Elderly pedestrians or those with mobility impairments speed can be as low as 3.5km/h[7] which is almost 1/7th the speed of a rider at 25 km/h or 1/10th the speed of a rider at 35 km/h.

Comparing the average walking speed to the higher speeds of bicycle riders is acceptable, as these are the situations where there is the most risk for an accident, and where a pedestrian is most likely to be concerned.

[6] Planning and Designing for Pedestrians: Guidelines (2016, page 74)
[7] Ibid

4. PLANNING CONTEXT

4.1. Long Term Cycle Network (LTCN)

The subject path falls within the Department of Transport's classification of a primary route on the Long-Term Cycle Network for Perth and Peel.

Figure 4.1: LTCN of the shared path and surrounding network

4.2. Canning Bridge Structure Plan

Endorsed by the WAPC in September 2020, the Canning Bridge Structure Plan guides the development of the area where Apex Reserve shared path is situated.

Figure 4.2: Canning Bridge Activity Centre Plan

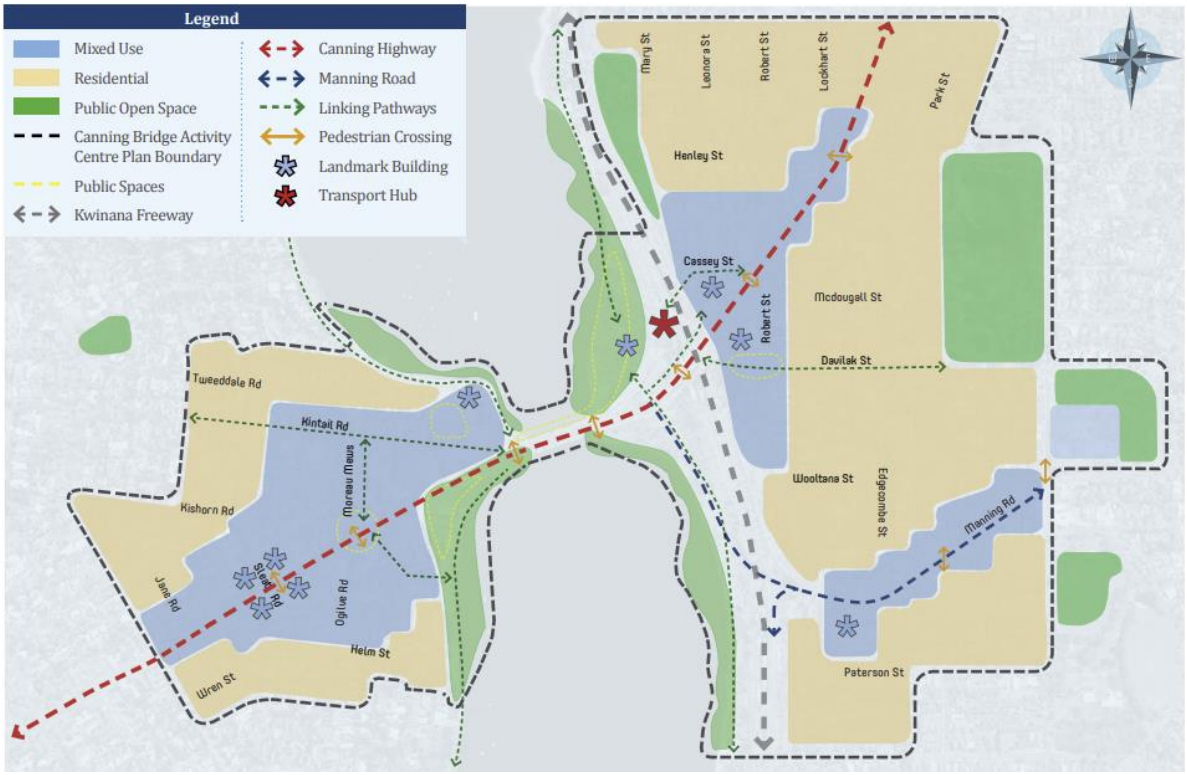
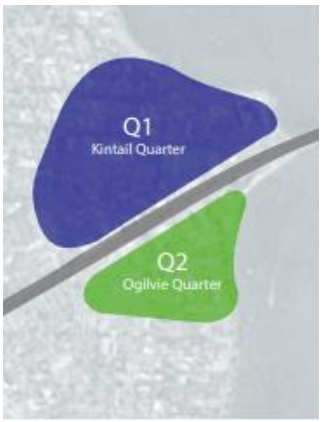


Figure 4.3: Canning Bridge Activity Centre Plan Quarters (City of Melville excerpt)



Apex Reserve falls within the Ogilvie Quarter where "Innovative, sensitive and well-designed riverfront areas will characterise this as the playground of the Western Quarters, and more active uses will be encouraged at the Rowing Club and along the foreshore."[8]

It is of GTA now Stantec's view that the intent for this foreshore will only be achievable if faster bike riders are provided their own facility, ideally separated cycle only lanes on the Canning Highway side of the current shared path. Therefore, the solutions the City is presently using to reduce bicycle rider speeds by speed humps are only to be considered a temporary outcome while a more desirable longer-term solution is sought.

The Structure Plan outlines an objective to: "Maximise access to and through the Canning Bridge Activity Centre Planning area by walking, cycling and public transport while reducing private car trips."[9]

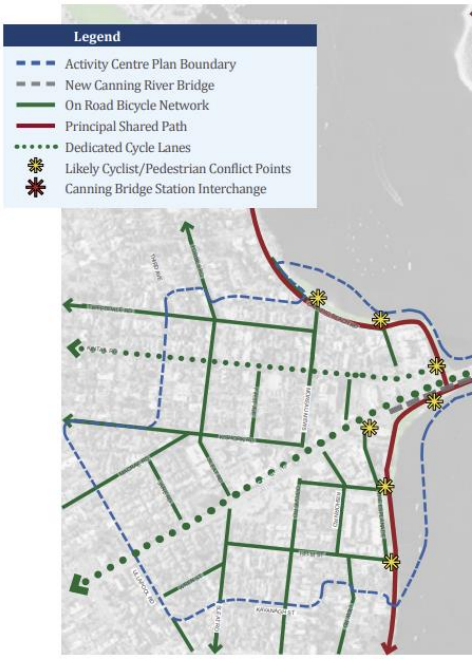
[8] Canning Bridge Activity Structure Plan (page 57)
[9] Ibid (page 55)

The target mode splits for walking and cycling are forecast to increase to 12% by 2050 (up from 3% in 2020)[10]. The current shared path is already at capacity and will not be able to hold additional volumes of pedestrians and bike riders as forecast in the structure plan. Separate facilities are therefore essential to be developed.

Indicative cross sections for Canning Highway[11] show a cycle lane on each side of Canning Highway. A preferred option would be to construct a separated cycle lane on the south side between the Esplanade and across the Canning Bridge to reach the Freeway Principal Shared Path (PSP) on the eastern side. Facilities on the north side of Canning Highway are outside the scope of this study and should also be considered, at the very least by a shared path.

Details of the cycling and walking requirements that could be applied for Apex Reserve are not provided in the structure plan's Section on the topic (4.3.2)[12]. However, cyclist / pedestrian conflict is indicated to be a concern at Apex Reserve on the Cycling Network Plan as shown in the structure plan[13].

Figure 4.4: Cycling Network Plan (City of Melville excerpt)



The structure plan indicates that "dedicated cycle lanes on Canning Highway are referred to as critical transport infrastructure required in the short-term (0-10 years)"[14]. This supports the investment in separated bicycle lanes as determined in the site assessment (see Section 3.1.6).

**it is noted that the Canning Bridge Activity Centre Plan is currently under review, acknowledging the above may change."*

[10] Ibid (page 70)
[11] Ibid (page 73)
[12] Ibid (page 79)
[13] Ibid (page 81)
[14] Ibid (109 – Table 10)

5. SPEED HUMP TRIAL ASSESSMENT

GTA now Stantec met with City of Melville staff to ride over the speed humps at a quiet location in Leeming on Wednesday 7 July 2021 at 11:00am. The configuration was installed as per the positioning at Apex Reserve with 2.5m spacing.

Figure 5.1: Speed Hump Assessment Trial Location

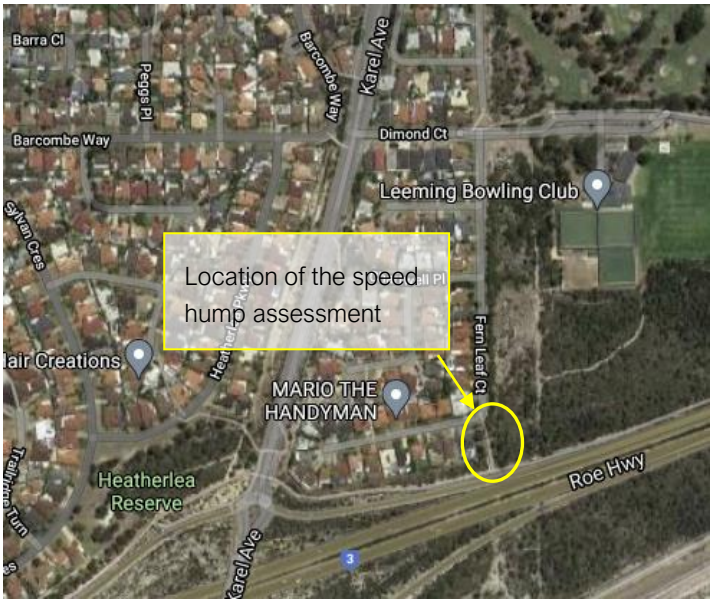
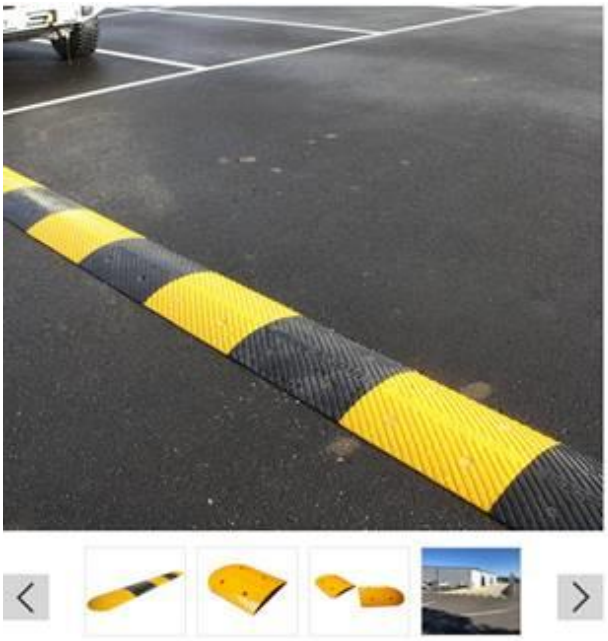


Figure 5.2: Speed Hump Assessment Trial Configuration

The material and specifications are shown in Figure 5.3 and Figure 5.4.

Figure 5.3: Speed Hump Material Used in Trial



- Engages the driver to reduce speed
- Quick and easy to install
- Minimal driver discomfort
- Durable
- Built to last
- Cost effective alternative to asphalt or concrete
- Reduce: Speed, Accidents, Noise
- Cable/hose protector for temporary applications
- Extra fasteners to prevent dislodging or cracking
- Manufactured from high quality recycled rubber
- Highly visible
- Installed in minutes - no OH&S Issues
- Ready for immediate use
- Suitable for delineating tram lines
- Ready for immediate use

Figure 5.4: Speed Hump Specifications

Specifications

	Low Profile Intermediate	Low Profile End Caps
Code	K1401950	K1401952 (pair)
Height	50mm	50mm
Width	350mm	350mm
Length	500mm	500mm
Weight	7kg	7.5kg
Colour	Black or Yellow	Yellow

The trial occurred on a wet weather morning which was fortunate in order for the team to experience the slipperiness of the surface. It was clearly evident that the material is slippery, especially for people walking.

A phone app was used to measure speed of the approach when riding a bike. It was evident that approaching at 15km/h speed made the rider feel comfortable to cycle around the configuration. At 20km/h it wasn't as comfortable but, the devices could be negotiated without cycling over them. Anything over 20km/h and the humps had to be cycled over, and this was uncomfortable at a high speed. This was exactly as the City had intended the devices to operate.

The trial also considered increasing the spacing, increasing to 2.8m spacing first of all which enabled the test rides to negotiate the devices without riding over them at faster speeds 20km/h and above. The spacing was reduced to 2.7m and then 2.6m, which meant 25km/h was "the grey area" where a rider would be uncertain to ride over the devices or around them.

Based on the assessment, GTA now Stantec believes 2.5m to be the dimension to use in any future trial to encourage cycling at 15km/h. In addition, consideration should be given to use of other hump materials such as asphalt or rubber impregnated with colour or cat-eyes to reduce the likelihood of slipping.

5.1.1. Further Considerations

The importance of having more than one configuration of speed humps set up in the Apex Reserve path can't be overstated. Similar to a local area traffic management design of 70m spacing along a street to ensure a vehicle does not increase its speed, the same should be applied in this scenario. This should add to the safety but preventing increased speed through the park, as well as approaching the device.

GTA now Stantec noted that the trial conditions were somewhat different to Apex Reserve in terms of there not being a significant approach length to build up speed. The path intersection with the Roe Highway PSP was about 30m from the device. However, the location was deemed fit for purpose to establish optimal speeds the humps could be safely encountered. Additional trials if required should be applied to a more open section of path such as on John Connell Reserve, noting this is likely to have more people wanting to walk or cycle over the path during the time of the trial.

GTA now Stantec also believes lighting should be further assessed at the Apex Reserve path, and to also consider additional treatments such as rumble strips and paving installed into the path. At the assessment trial it was noted that the City preferred green coloured rumble strips rather than the white ones used in Baijup Wetlands in City of Bayswater. Further consideration of rumble strips should include those used in Bayswater Station.

Figure 5.5: Rumble strip and pavement marking at Bayswater Station (Google Streetview)

6. BEST PRACTICE RESEARCH

As part of the best practice research on addressing shared path safety concerns, GTA now Stantec incorporated input from the wider Stantec network, existing knowledge of existing best practice and input from WestCycle given directly to the City of Melville.

Bollard treatments were considered as they have been used before but were not advised and have been problematic. Rebuilding the path with sharp horizontal bends were also considered and not advised, as these have been problematic in the City of South Perth.

6.1. Literature

6.1.1. Shared Paths Research Findings and Key Safety Issues – Transport for NSW[15]

Path width is a critical element to minimise conflict between pedestrians and bike riders

The recommended minimum path width according to Austroads guidelines is between 2.5 and 3.0 metres, increasing as path volume increases. The path volume at Apex Reserve is demonstrated to exceed acceptable volumes for a 2.5m to 3.0m path. These were noted in the site assessment in Chapter 3 with over 60 cyclists within one hour.

Commuter vs recreational use

In instances of high path volumes, separation of different user groups is proposed as the most effective way to increase their capacity to use the shared path (Transport and Main Roads, 2012).

Riders were more likely to keep to the left on paths with high pedestrian volumes (volume not specified). However, when cycling on wider paths, riders were less likely to keep to the left (assumed with high pedestrian volumes)[15].

Centreline delineation

Centreline delineation was associated with higher cycling speeds in the observational study.

Advisory Speed Signage

A trial of speed signage found neither a 10km/h advisory speed marking or slow markings resulted in significant reductions in cyclist speed.

[15] Shared paths: Discussion of research findings and key safety issue (Transport for NSW, Centre for Road Safety, August 2015)

6.2. Rumble Strips

WestCycle provided a recommendation to the City to consider use of rumble strips in lieu of the speed hump trials. In providing the recommendation, WestCycle noted:

- Rumble strips using the thermoplastic are a relatively new approach in WA.
- Have been applied differently in different scenarios and any evaluation that has been done would be very site-specific.
- Shared zones are the most common use of the rumble strips on shared paths in Perth (but are still used inconsistently).

6.2.1. Perth Examples - Rumble Strips

- City of Perth - Wellington, Market and Roe Streets
- Several Train Station 'shared zones"
- City of Fremantle - Leighton Beach Shared Path
- City of Subiaco / Fremantle PSP - using pavers (trip hazard) instead of thermoplastic
- Mitchell Freeway PSP - West Perth - on the approach to a poorly designed underpass

WestCycle suggested for the City to consider the treatment used in the Baigup Wetlands (City of Bayswater) which is a series of 7 strips. These provided more of a short & sharp tactile alert especially on thinner/high pressure tyres.

Figure 6.1: Rumble Strips in Baigup Wetlands, City of Bayswater

It is suggested for the City to contact Bayswater about effectiveness, any evaluation, any anecdotal evidence of improvement. Although it is understood that the City unsuccessfully attempted to find evidence regarding shared path treatments, it is suggested that the City continue to seek information regarding relevant evaluations regarding use of these type of treatments.

6.2.2. International Examples of Rumble Strips

Multnomah County in Portland installed a series of speed bumps (a.k.a. rumble strips) aimed at reducing bicycling speeds as riders' transition from the on-street bike lane up a ramp to the shared sidewalk which also happens to be the location of a TriMet bus stop. This bike lane is slightly downhill and bike speeds are relatively high.

There are five bumps placed about two feet apart and they're made up of thermoplastic strips about an eighth-of-an-inch think.

Figure 6.2: Rumble Strips in Portland, Oregan (USA)

Source: https://bikeportland.org/2013/11/08/county-installs-speed-bumps-to-slow-down-riders-on-hawthorne-bridge-viaduct-96860

It should be noted that these in the end became unpopular and removed with a plan subsequently made to widen the existing path at the bus stop. It is important to learn from case studies that were both successful and not.

6.3. Paving to Create Shared Zone Environments

Creating an active transport "shared zone" through paving as a commonly used feature of shared path design. One of the most prominent examples is the Perth Arena forecourt area, that is on the alignment of the Perth to Fremantle PSP. Asphalt with a centreline gives indication of a fast commuter type path, which is not the intent of this location. The City is suggested to include pavement marking treatments at each end of Apex Reserve, and between locations of where the speed humps are installed, if at more than one location.

Previously, the PTA had provided paving treatment at Claremont Train Station to slow speeds down. The site has been modified due to development in the area. The City is suggested to contact the PTA to discuss the impact of this treatment further.

Shared zones have also been used for the Joondalup separated cycle and pedestrian facility linking the freeway PSP through to Lake Goolelal for areas were the cycle only facility and the pedestrian only facility have to interact. No evaluation of these is available.

6.4. Bollard Treatment (Lateral Obstacles)

Some examples of where these treatments have been used are indicated here, but these are not suggested for the Apex Reserve.

- Cannington Train Station
- City of Stirling shared path

Figure 6.3: Cannington Train Station

Figure 6.4: City of Stirling Shared Path

6.5. Other Considerations

Collaboration with the wider international Stantec team from USA, UK and New Zealand, as well as the Melbourne office gleaned the following suggestions:

- Construct a separate (paved or un-paved) trail parallel to this one
- Widen the trail or install path shoulders
- Install a parallel bi-directional bike lane
- Install bike infrastructure on-street to re-direct faster riders
- Install rumble strips or some kind of pavement texture
- Switch out some sections of asphalt with cobblestones or brick
- Emphasise respect/messaging on the path surface on actions expected
- In-ground flashing LEDs
- Thermo-plastic markings to provide a raised profile
- Use of coloured surface / banding at access interfaces / junctions
- Addition of soft landscaping
- Bypasses
- Reinforcement mesh on the verge to allow overtaking while not physically widening the path.

Examples of some of these treatments are shown in the following figures.

Figure 6.5: Low strips and red surfacing (Bay Trail, Melbourne)

Figure 6.6: Bi-directional shared path at a high conflict point (Wellington, New Zealand)

Figure 6.7: Verge reinforcement mesh (Cambridge, UK)

Figure 6.8: Path etiquette (The Beltline, Atlanta, USA)

Source: Trail Etiquette // Atlanta Beltline

Figure 6.9: Path etiquette (The Katy Trail - Texas, USA)

Source: https://www.traillink.com/trail/katy-trail-(dallas)/

Furthermore, the Cycle Infrastructure Guide[16] by the Department for Transport (UK) makes the following point regarding centreline delineation:

"*this form of separation is not well observed, and pedestrians walking on or crossing the cycle side can encounter greater conflict than with unsegregated facilities due to the increased cycling speeds that can result from the designation.*"

As a result of this, white line segregation is not recommended within this guide.

It also provides the following advice regarding managing user conflicts:

- Although there are few recorded collisions between pedestrians and cyclists on shared use paths, the fact that the two user groups travel at different speeds and sometimes in different directions, can affect the level of comfort of both groups.
- Providing sufficient width for the anticipated levels of use will help minimise the risk of conflict
- Where space and budget allow, the most effective way to minimise conflict and increase comfort is to provide separate routes for walking and cycling.
- Where the surface is fully level, a raised strip (trapezoidal in cross section), or some other textured material should be used.
- A fully shared surface is preferable to creating sub-standard widths for both pedestrians and cyclists where the available width is 3.0m or less.
- Prescribed traffic signs to indicate a shared route, or alternative signs with legends such as 'Share with Care' or 'Give Way to Pedestrians' signs may be used
- It may be necessary to encourage cyclists to slow at certain points, such as in areas of high localised pedestrian activity,

Regarding horizontal deflections, sinusoidal speed humps, and thermoplastic rumble strips, the guide advises that *these should be used sparingly and only in response to site-specific problems that cannot be addressed in another way* to avoid the potential hazards and discomfort that these tend to introduce to disabled users (both cyclists and pedestrians). GTA, now Stantec understand this to mean, only in certain locations where conflict has been recorded and as a short term measure, not as a replacement for a preferred longer term separation solution.

[16] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/951074/cycle-infrastructure-design-ltn-1-20.pdf

7. OPTIONS

GTA now Stantec determine potential three options to proceed with addressing the conflict on the shared path issue at Apex Reserve.

1. Signage Only
2. Physical intervention
3. Full Separation

(or a combination of the above).

7.1.1. Signage Only

There are currently signs in place, including pavement marking, and posted speed signage. This option is essentially a do-nothing approach, and to monitor the user behaviour but is unlikely to achieve the preferred outcome.

7.1.2. Physical intervention

Re-introduction of the City of Melville designed speed humps, as a trial. It is suggested to undertake this before the peak time, as the winter months close and lead into spring. GTA now Stantec believe the treatment should not be used on its own, without additional associated measures. These include a shared path area, pavement changes (block paving) at either approach to the path, and rumble strips approaching the speed humps. GTA now Stantec, also recommend more than one location be used for the speed humps, two or three locations are preferred.

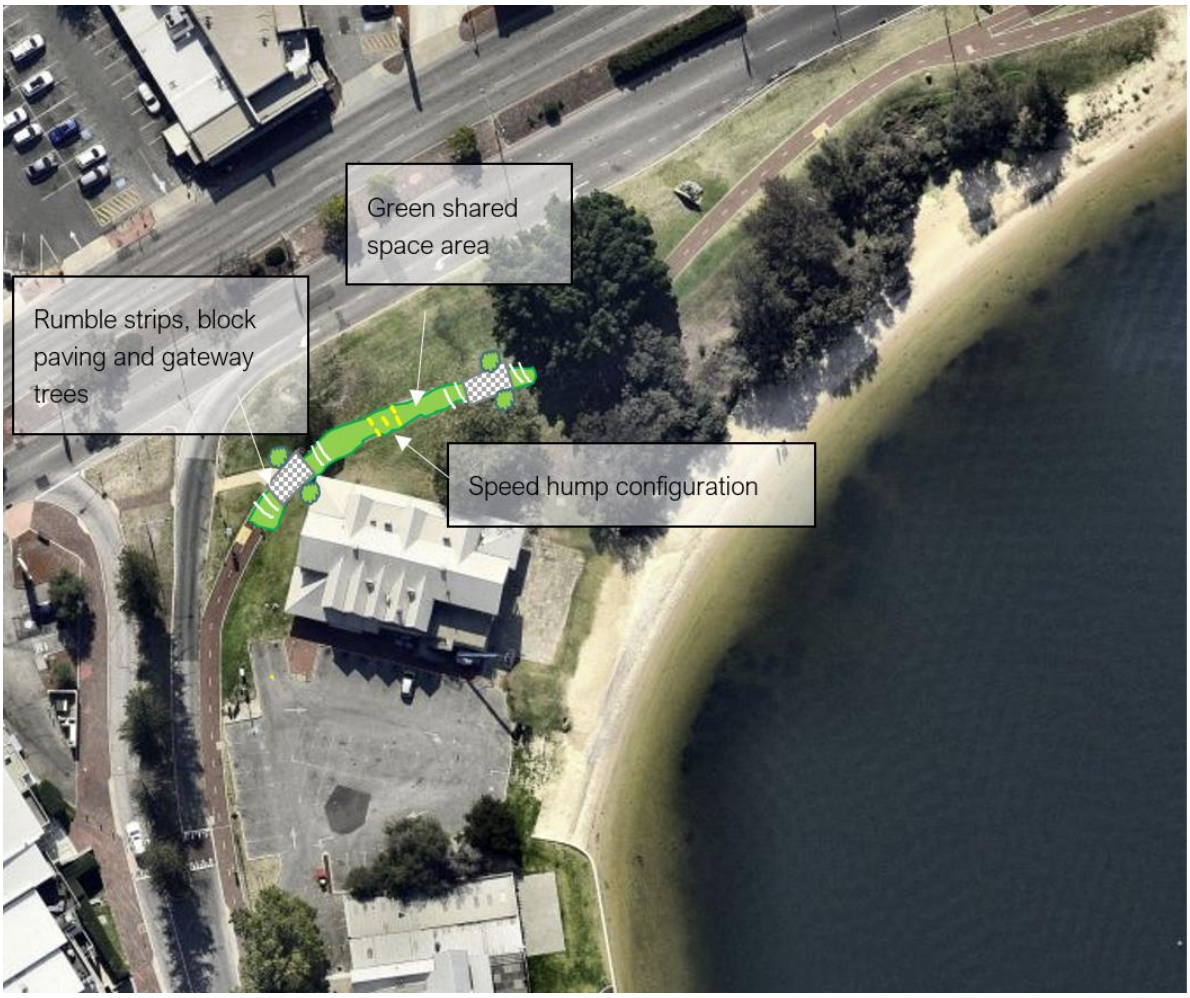
A Shared space environment can be utilised through the shared path section under assessment denoted through a green colour being used over the entire shared path and removing painted line marking. This can then be supported by block paving or similar entry statements and rumble strips.

Block paving (or similar) entry statements can be utilised at the start and end of the shared path section under assessment to denote a slower speed “shared space” environment (grey coloured preferred, and optional for the City to include additional sections of paving mid-block through the reserve).

Multiple rumble strips can be positioned on the approaches to the reserve to be configured to work in conjunction with the block paving on approach to the shared space environment and be positioned across the full length of the path.

In addition to this, consideration of additional tree planting (or trees in pots) can be introduced as a ‘gateway’ feature either side of the block paving entry statements.

Following the assessment of the speed hump assessment on 7 July 2021, GTA now Stantec recommends the associated measures be installed first, and only if necessary, that the speed humps be installed at Apex Reserve for another trial. Should the associated measures reduce speeds towards 20km/h over a sustained period of time, the speed humps should not be necessary.



7.1.3. Full Separation

This option involves the modification of the Esplanade to be one-way for vehicle traffic (using the existing northbound carriageway for this purpose for the most part), and for the existing south bound carriageway to become a two-way separated cycle only lane. The turning pocket on Canning Highway could be considered for use as a continuation of the two-way separated cycle only lane, with approval required by Main Roads WA. If the turning pocket is not able to be used, then a designated separated cycle only lane will need to be constructed to the south of the westbound traffic lanes to Canning Highway.

A second option for full separation is construction of an additional path for pedestrians and slower bike riders, to the immediate east and south of the existing shared path. This option will require reconfiguration of the car park and expected loss of several bays.

A third option is to design and construct a boardwalk to effectively bypass Apex Reserve, noting that it will need to be of sufficient height to allow rowing club personnel effective access to the river from the club areas.

Constructing a path through the river front (in front of the rowing club) is likely to present drainage issues, as well as problematic conflict with the rowing club users each morning before 8:00am.