Residential Street Improvement Program

Tillyard Drive - Executive Summary

Looking North on Tillyard Drive near Sadleir Place
Introduction

Roads ACT uses a Traffic Warrant System (TWS) to objectively assess the need for, and priority of, traffic management and road safety measures on residential streets. The TWS takes into account traffic volume, speed, crash history, volume of heavy vehicles and land use to provide a ranking of over 400 collector roads. Tillyard Drive (in Fraser, Flynn and Charnwood) ranks relatively highly on this list and was identified for investigation under the 2016/2017 Residential Street Improvement Program.

Roads ACT engaged AECOM Australia Pty Ltd to develop options to improve traffic conditions along Tillyard Drive and its surrounding streets and to recommend a program of works within the available Residential Street Improvement Program funding. An important part of this project was seeking feedback from local residents and the surrounding community about what the issues are, what improvements should be implemented and what options would best suit the local community.

The objectives of this project include:

- To consult with the community on their traffic concerns within the study area
- To identify and assess the traffic safety and amenity issues in the study area, with particular emphasis on the traffic conditions on Tillyard Drive
- To consider and develop options which would mitigate / improve these issues
- To evaluate these options in terms of their expected technical effectiveness
- To identify an agreed solution for the study area
- To recommend a program of works within the available funding.

The study incorporated a technical analysis of traffic speed, volume and crash data along Tillyard Drive and its surrounding streets, as well as feedback obtained from consultation.

The technical analysis included:

- An analysis of available traffic data (volume, speed and accident statistics).
- A review of complaints received by Roads ACT.
- A review of road, pedestrian and bicycle infrastructure including networks, shared paths and movements, as well as public transport services such as frequency, times and routes of buses.

When considering the implementation of local area traffic calming measures in residential streets, a number of key considerations are addressed. Specifically for this project, the following items were considered to help ensure an effective and publicly appreciated outcome was achieved:

- Recommended treatments represent tailored solutions which take into account individual site constraints such as topography, utility services, bus routes, cycle/pedestrian facilities and surrounding land uses.
- Proposed traffic management treatment options did not simply transfer the problem to another nearby street.
- Community consultation involved residents within the study area as well as the wider community and identified stakeholders to ensure all their concerns were identified and considered.
Community Consultation

A consultation strategy was prepared for the project, in conjunction with Roads ACT, to capture community concerns on local traffic management issues in the study area. Table 1 shows the consultation stages and elements.

Stage 1 consultation outcomes, in conjunction with the technical analysis, were then used as the basis for development of the traffic management master plan for the study area.

Table 1: Consultation Stages and Elements

<table>
<thead>
<tr>
<th>Consultation element</th>
<th>Stage 1 Identifying issues and concerns</th>
<th>Reporting on final scheme and priorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media Release</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Newsletter</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Household Survey</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Online Survey</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Stakeholder Input</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Information on Your Say website</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Public Information sessions</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Information at Kippax and Belconnen libraries</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

Summary of Technical Analysis

The technical analysis for the project included a review of traffic volumes, 85th percentile speeds and crashes during the 5 year period from the beginning of 2011 to end of 2015.

Sites that were shown to have a technical issue (i.e. high speeds, volumes, crash incidence or substandard visibility/geometry) and were raised as a concern from the community were given priority in the investigation process. Figure 1 provides a summary of the traffic volumes and speeds. The incidence and severity of reported crashes for a 5 year period from 2011 to 2015 is shown in Figure 2.
Figure 1: Speed and Volume Data
Figure 2: Crash data collected over a 5 year period from the beginning of 2011 until the end of 2015.

Tillyard Drive - 5 Year Crash History 2011-2015

LEGEND

- Study Area
  - 1 - 2 Crashes
  - 3 - 5 Crashes
  - 6 - 8 Crashes
  - > 8 Crashes

- Total Crashes
- Injury Crashes
- Total (Injury) Crashes

Revision B – 14-Dec-2017
Prepared for – ROADS ACT – ABN: 37 307 569 373
Summary of Stage 1 Consultation

Stage 1 consultation was held in November/December 2016. The focus of this was to seek the community’s concerns about traffic conditions within the study area. A newsletter about the study, along with a survey inviting comments on community concerns, were letterbox dropped to all residents in Fraser, Flynn and Charnwood – approximately 3,655 households in total. An online survey was also made available on the ACT Government’s Your Say website.

In total 636 surveys were completed, 4 phone submissions made, 4 emails lodged, 17 stakeholder groups contacted and 120 people attended the information sessions. A combined total of 781 community members participated in this study and from this a community hotspots map was developed showing the location of issues raised, shown in Figure 3.
Figure 3: Community Feedback Hotspots
Summary of Streets Considered in Study
Tillyard Drive

Tillyard Drive carries the highest daily traffic volume of any of the streets studied. It has a generous cross section and acts as the main spine of roads in the study area.

Tillyard Drive is only one of two major north-south roads in the area. The other major north-south road is Kingsford Smith Drive, just beyond the eastern border of the study area.

Public concerns raised in relation to Tillyard Drive are:

- Lack of road safety devices
- Heavy vehicles utilising Tillyard Drive as a thoroughfare
- Dangerous intersections
- Speeding
- Dangerous overtaking issues
- Poor legibility of line marking
- Lack of pedestrian crossings
- Lack of cycling lanes
- School zone traffic congestion and safety issues
- Lack of car parking
- Visibility issues
- Traffic congestion.

There are a total of 18 bus stops located along the length of Tillyard Drive and early in the community consultation it was identified that the buses can lead to traffic becoming queued behind them. This was typically associated with the northern portion of Tillyard Drive where, due to the new median works, the carriageway is not wide enough for overtaking a stopped bus.

Tillyard Drive carries a high volume of traffic (more than 6,000 vpd), particularly at its southern end where it widens to two lanes each way. Typically, for volumes above 6,000 vpd it is difficult for drivers to access side roads or driveways or for pedestrians to cross the road. However, there is no frontage development at locations where volumes are highest and the road has adequate capacity to carry this volume.

There were a total of 149 crashes recorded along Tillyard Drive and of these 82 were located at the two southern-most intersections (Tillyard Drive / Ginninderra Drive and Tillyard Drive / Lhotsky Street). Of these 149 crashes, 27 of them were injury crashes with the largest portion of these crashes (15) occurring at the Tillyard Drive/Ginninderra Drive intersection. The Lhotsky Street and Tillyard Drive intersection had 3 injury crashes. No other intersections had more than 1 injury crash. No fatal crashes were reported on Tillyard Drive.

The Tillyard Drive/Ginninderra intersection is out of the scope of this study. Traffic concerns at this intersection and at the Tillyard Drive/ Lhotsky Street intersection have been highlighted as significant, and for consideration in future Capital Works programs.

The main objectives for improvements to Tillyard Drive are:

- Upgrade line marking to improve legibility
- Improve cyclist infrastructure
- Improve Crawford Drive intersection
- Reduce speed and traffic congestion, particularly near the school
- Improve visibility at the Tillyard Drive shops, Garrad Court intersection and opposite Bloxham Street
- Improve pedestrian safety, especially at northern end near Fraser Primary School
- Reduce crashes at the intersection with Daley Crescent
Reduce crashes at the corner of Kerrigan Street.

The following treatments are proposed to address these objectives:

- Lane narrowing between Covington Crescent (SW) and Crawford Crescent, incorporating cycle lanes and intersection improvements
- Pedestrian signage and improved delineation near the link to Charnwood shops
- Right turn pocket into Crawford Crescent intersection
- Intersection improvements at Spalding Street
- Line marking improvements between Spalding Street and Barber Crescent
- Lane narrowing between Barber Crescent and Kuringa Drive
- Right turn pocket into Kerrigan Street
- Intersection improvements at Daley Crescent
- Pedestrian refuge and a hazard sign just before the sharp bend into Kuringa Drive.

Due to servicing requirements of local shops, including Fraser and Charnwood, heavy vehicle restrictions are not feasible along Tillyard Drive. Heavy vehicle volumes are above 5% on Tillyard Drive which is greater than desirable on a residential Street. The ACT Government is engaging with trucking companies to understand their reason for being on Tillyard Drive and to encourage heavy vehicles to utilise arterial roads where possible.

**Barber Crescent**

Public concerns raised in relation to Barber Crescent are:

- Speeding
- Motorists taking shortcuts
- Safety exiting Tillyard onto Barber
- Safety and visibility at Spalding Street intersection.

The traffic volume on Barber Crescent is low (about 1,000 vpd) and in the range expected for a local access street and speeds are close to the speed limit.

There were 4 crashes recorded during the five year period of 1 January 2011 to 31 December 2015 on Barber Crescent. None of these were injury crashes.

Proposed lane narrowing on Spalding Street is expected to reduce travel speed and also increase visibility at the Spalding Street and Barber Crescent intersection. Its effectiveness is to be reviewed post implementation. A chicane and a speed cushion are considered on Spalding Street near the Barber Crescent intersection if the initial lane narrowing treatment is not considered adequate and issues continue.

**Bettington Circuit**

The traffic volumes on Bettington Circuit are well within the range expected for a minor collector and the 85th percentile speed observed is only 5-10% higher than the speed limit except where the speed limit drops to 40 km/h near the Charnwood-Dunlop School.

There were 3 crashes recorded during the five year period from 1 January 2011 to 31 December 2015 on Bettington Circuit. No injury crashes were recorded.

No treatments are proposed for Bettington Crescent as there is no significant crash history and speeds and volumes are relatively low.
Bingle Street

Speeding on Bingle Street was identified as a community concern, especially in the vicinity of the Flynn Early Childhood Education Centre. The traffic volume experienced on Bingle Street is within the desired range for the Guidelines that applied when this road was built. The 85th percentile speed is slightly higher than the speed limit.

There were 2 crashes recorded during the five year period from 1 January 2011 to 31 December 2015 on Bingle Street and of these one was an injury crash.

The main objective for treatments on Bingle Street is to reduce speeding. Speed cushions are proposed to address this objective.

Bingley Crescent

The only public concern raised in relation to Bingley Street is low visibility (Nish Place and some driveways in particular).

The traffic volume experienced on Bingley Crescent is well within the traffic volume expected on a minor collector and the 85th percentile speed is 10% - 15% higher than the speed limit.

There were 2 crashes recorded during the five year period 1 January 2011 to 31 December 2015 on Bingley Crescent and of these 1 was an injury crash. This injury crash resulted from a vehicle hitting a parked car at night time. Vegetation around streetlights has been noted as a general issue within the study area. This is detailed in the vegetation report.

The community did not raise speeding on Bingle as a significant issue and without the ability for a second round of consultation no treatment has been proposed. There was no pattern of crashes and therefore there were no treatments proposed. Visibility issues raised related to vegetation has been passed on the ACT Government maintenance team for action.

The proposed speed cushions on Moroney Street may discourage excessive speeds or possible rat running on the adjacent residential streets including Bingley Crescent.

Cartwright Street

Pedestrian connectivity adjacent to schools (Brindabella Christian College and Charnwood–Dunlop School) was voiced as a community concern on Cartwright Street.

The traffic volumes on Cartwright Street are well within the range expected for a minor collector however the 85th percentile speed was recorded at over 15% of the speed limit.

There were 7 crashes recorded during the five year period of 1 January 2011 to 31 December 2015 on Cartwright Street and of these one was an injury crash.

The main objective for treatments on Cartwright Street is reduced speeding. The following treatments are proposed to address this objective:

- Pedestrian refuge near Rouse Place
- Speed cushions near Charnwood Dunlop School
- Speed cushions on Cartwright Street near MacIntyre Place.

Charnwood Place

Heavy vehicles causing noise in the early hours of the morning accessing the Charnwood shops was voiced as a community concern regarding residents living nearby Charnwood Place.

There were 10 crashes recorded during the five year period from 1 January 2011 to 31 December 2015 on Charnwood Place. There was no injury crashes recorded at Charnwood Place during the five year period.

In October 2013 a roundabout was added at the intersection of Lhotsky Street and Charnwood Place. During community consultation people mentioned that the roundabout was an improvement on previous operation of the intersection here. There has only been one property damage crash associated with this intersection since the implementation of the roundabout. As such, there are no treatments proposed. Another program is currently implementing local area traffic management treatments on Lhotsky Street.
Companion Crescent
Public concerns raised in relation to Companion Crescent are:

- Speeding
- A crash caused by speed (requesting police enforcement).

The traffic volume on Companion Crescent at the location surveyed was well within the range expected for a minor collector, although volumes are higher near the eastern end of Companion Crescent.

The surveyed 85th percentile speed is well in excess of the speed limit, exceeding it by 16 km/h and requiring attention. The high speeds exacerbate sight distance issues in the vicinity of Noble Place.

There were 19 crashes recorded during the five year period of 1 January 2011 to 31 December 2015 on Companion Crescent and of these 5 were injury crashes.

The main objective for treatments on Companion Crescent is reduced speeding. The following treatments are proposed to address this objective:

- Speed cushions to the adjacent oval between Nulsen Circuit and Sanderson Close
- Speed cushions near Homann Place
- A pedestrian refuge near Vickers Crescent (West).

Covington Crescent
The traffic volumes on Covington Crescent are well within the range expected for a minor collector. However the 85th percentile speed is well in excess of the speed limit between Leycester Place and Warby Place, along a long straight section of Covington Crescent. In contrast, more than 85% of the traffic travels below the speed limit between Gannon Place and Boot Place, because this location has a short straight section of road prior to a bend where traffic slows.

There were 8 crashes recorded during the five year period of 1 January 2011 to 31 December 2015 on Covington Crescent and of these 4 were injury crashes.

The main objective for treatments on Covington Crescent is to reduce speeding. The following treatments are proposed to address this objective:

- Speed cushions near Noakes Circuit
- Hazard sign on Covington Crescent near Boot Place
- Two speed cushions located between Boot Place and Warby Place.

Daley Crescent
Concerns were expressed with the south-west (SW) intersection of Tillyard Drive and Daley Crescent. This is busy near school closing time and there can be trouble turning into Daley Crescent causing cars to bank up on Tillyard Drive.

The traffic volume on Daley Crescent is well within the range expected for a minor collector; however, the 85th percentile speed is 10-15% higher than the speed limit.

There were 13 crashes recorded during the five year period of 1 January 2011 to 31 December 2015 on Daley Crescent and of these one was an injury crash. None of these crashes were associated with mid-block locations or in the vicinity of where speeding was recorded.

The main objective for treatments on Daley Crescent is to improve the safety of the Tillyard Drive (SW) intersection.

An intersection upgrade is proposed as a priority treatment at the corner of Tillyard Drive, with a more defined right turn created by extending the kerb. The speeding was occurring on the downhill direction section which is on a wide sweeping bend. Lane narrowing was considered but dismissed as it is a bus route and there were noted to be parked cars on both sides. The community's appetite for lane narrowing was not able to be assessed. As such, no midblock treatments are proposed.

Florey Drive
Public concerns raised in relation to Florey Drive are:

- Large numbers of cars for sale parked next to the Ginninderra and Florey Drive roundabout causing damage to verge and unleased land
- Safety of students crossing the road to St Thomas Aquinas Primary School, with suggestions of road crossings.

The traffic volumes on Florey Drive are high but it is an arterial road and only runs for a short length near the edge of the study area. The 85\textsuperscript{th} percentile speed is lower than the speed limit in this section. This is likely due to the short length of the road.

There were 65 crashes recorded during the five year period of 1 January 2011 to 31 December 2015 on Florey Drive and of these 5 were injury crashes. The majority of these crashes (40) occurred at the Ginninderra Drive intersection, which is out of the scope of this study.

21 crashes were at the Lhotsky intersection – 13 of these were caused by vehicles moving in opposing directions, 5 were right angle crashes and 3 were rear ends.

The main objectives for treatments on Florey Drive are:

- Ensure safety of students and other pedestrians that need to cross Florey Drive
- Reduce the number of crashes occurring at the Lhotsky Street intersection.

Through this study design options were assessed and it was seen that a channelised right turn lane with pedestrian refuges would meet the objectives while still enabling articulated vehicle movements to service the Charnwood shops and petrol station. Due to the high costs associated with this treatment it will be considered for implementation under future Capital Works programs rather than the Residential Streets program.

**Kerrigan Street**

Public concerns raised in relation to Kerrigan Street are:

- Vehicle speeding
- Drivers driving on the wrong side of the road to avoid traffic calming devices
- Reckless driving
- Requests for pedestrian crossing at top of the hill
- Traffic noise.

There is no evidence of excessive speeds with the 85\textsuperscript{th} percentile speeds only slightly exceeding the speed limit. The volumes are quite high but are less than 6,000 vpd which is acceptable for a major collector road.

There were a total of 27 crashes including 1 injury crash on Kerrigan Street in the five year period studied.

The main objectives for treatments on Kerrigan Street are:

- Provide places for pedestrians to cross safely
- Improve safety at intersection with Tillyard Drive.

Improvements at the intersection with Tillyard Drive are proposed to address this objective. This includes a right turn pocket for traffic turning into Kerrigan Street and also the separation of the turning movements when exiting Kerrigan Street.
Kuringa Drive

Public concerns raised in relation to Kuringa Drive are:

- Width of road is not suitable for heavy vehicles
- Better lighting
- Tailgaters and lack of overtaking opportunities
- Visibility due to the bend in the road.

Kuringa Drive carries a relatively high volume of traffic for the width of carriageway that it has. The volume reflects its classification as an arterial road. It is long and has no developments adjacent to it. However, the road is relatively narrow, has soft edges and contains two sharp bends in the study area (on intersection with Tillyard Drive and the S bend in its midsection). This traffic is consistently travelling well over the speed limit with the 85th percentile speeds exceeding the speed limit by over 15%.

Heavy vehicle volumes were around 8% which is considered high for a road which turns into a residential street. A crash analysis revealed that of the 41 crashes associated with the road 38 were midblock crashes. The analysis also discovered that the S bend was a hot spot for crashes with 22 crashes occurring over the last five years. 21 of these 22 crashes involved a loss of control and 17 crashes occurred in the wet. The problem at that location is unlikely to be caused by poor lighting as 20 of the 22 crashes occurred during the day time. Along the whole length of the road, 23 occurred in wet conditions and 12 occurred at night. An analysis of the time of day that crashes were recorded appeared to have no significant trends with higher rates occurring in the early afternoon and thus not associated with sun glare which can be a contributing factor on east-west road links.

The main objectives for treatments on Kuringa Drive are:

- Reduce speed on Kuringa Drive, particularly on entry to Tillyard Drive
- Warn commuters of the S bend in the road – where large proposition of accidents occur
- Increase mid-block safety.

The following treatments are proposed to address these objectives:

- A hazard sign and rumble bars before the sharp turn into Tillyard Drive
- A hazard sign and rumble bars on each approach to the S bend on Kuringa Drive.

An interim measure of slippery when wet and associated hazard signage is not expected to result in a notable reduction in crashes recorded given the existing advisory speed signage. Hence a more conspicuous treatment is proposed.

More substantial treatments for Kuringa Drive were considered, however their high costs would not allow implementation within the available budget of the Residential Street Improvement Program. The proposed treatments are expected to address the crash hotspots in a cost effective manner.

The future development of the CSIRO site may cause further impacts on Kuringa Drive, and ongoing reviews of the safety and functionality on Kuringa Drive are recommended.

Lhotsky Street

The section of Lhotsky Street between Florey Drive and Tillyard Drive is sign-posted as a 40 km/h zone, as it is adjacent to shops and schools. The remaining (northern) section of Lhotsky Street is sign-posted at 60 km/h and has playing fields and residential uses adjacent to the road, but not with direct frontages to Lhotsky Street.

Public concerns raised in relation to the section of Lhotsky Street zoned as 40 km/h are:

- Speeding
- The Lhotsky and Tillyard intersection (several people requested a roundabout here)
- Pedestrian safety for the St Thomas Aquinas school students and the need for an additional crossing
• Traffic congestion caused by school peak periods, heavy vehicles, cars banking behind buses.

Public concerns raised in relation to the northern section of Lhotsky Street are:

• Sightlines on the bend of the road and at some intersections
• Intersection visibility issues with Kerrigan Street.

The analysis of traffic speeds and volumes does not indicate excessive speeds on either section of the road. It does however indicate that the southern section of the road is carrying a high volume of traffic which exceeds the desired volume for a major collector. However, it has limited driveway accesses, all of which are forwards in and out access.

There were a total of 89 crashes recorded on Lhotsky Street in the five year time period studied. Of particular interest is the Lhotsky Street and Tillyard Drive intersection where there were a total of 34 crashes, which accounts for 38% of the crashes associated with Lhotsky Street. An analysis of crashes here indicates that 19 of the 34 were right angle crashes which could be caused by high traffic volumes and having to complete a right turn across two lanes of traffic.

The main objectives for treatments on Lhotsky Street are:

• Address the cause of congestion experienced during peak times
• Reduce speeding.

Since the time of commencing this study additional traffic calming devices have been installed along Lhotsky Street in the 40km/h section near the shops and school. As such, no treatments have been proposed for this section of Lhotsky Street.

The intersection at Tillyard Drive and Lhotsky intersection was identified as a major source of congestion in the area. This intersection will be considered under Capital Works funding.

Visibility issues at Kerrigan Street are largely related to vegetation and have been raised as a priority for vegetation maintenance.

As outlined in the Florey Drive section above, a channelised right turn lane with pedestrian refuges has been proposed at the intersection with Florey Drive. However, due to the high costs associated with this treatment it will be considered for implementation under future Capital Works programs.

**Magrath Crescent**

The traffic volume experienced on Magrath Crescent is well within the range expected for a minor collector but the 85th percentile speed is well in excess of the speed limit.

There were 8 crashes recorded during the five year period of 1 January 2011 to 31 December 2015 on Magrath Crescent and of these one was an injury crash.

The main objective for treatments on Magrath Crescent is to reduce speeding. A speed cushion is proposed to be installed on Magrath Crescent to address this objective.

**Moroney Street**

Public concerns raised in relation to Moroney Street are:

• Speeding
• Reckless Driving.

The traffic volume is within the desired range for the Guidelines that applied when this road was built. The 85th percentile speeds exceed the speed limit by over 15%. There were 4 crashes recorded during the five year period of 1 January 2011 to 31 December 2015 on Moroney Street and of these there were no injury crashes.

The main objective for treatments on Moroney Street is to reduce speeding. Speed cushions and associated signage located at the crest of Moroney Street is proposed for this purpose.
Shakespeare Crescent

Public concerns raised in relation to Shakespeare Crescent are low visibility at intersections with Rogers Street (N) and with Carrodus Street(S).

Volumes are well within the volumes expected for a minor collector but the speeds are well above the speed limit. There were 5 crashes recorded during the five year period of 1 January 2011 to 31 December 2015 on Shakespeare Crescent and one of these was an injury crash.

The main objectives for treatments on Shakespeare Crescent are:

- Reduce speeding, especially in the school zone
- Increase visibility at Rogers and Carrodus intersections.

The following treatments are proposed to address these objectives:

- Two speed cushions in the school zone on each approach to the school crossing.
- Improved pedestrian signage at the intersection with Kerrigan Street (East)
- Speed cushions at the western end near Carrodus Street and Rogers Street (South)
- Improvements at the intersection with Rogers Street (North).

Spalding Street

Public concerns raised in relation to Spalding Street are:

- Speeding
- Safety of pedestrians crossing the road near Tillyard Drive, requesting a pedestrian crossing
- Traffic noise
- Difficulty exiting driveways onto road due to large traffic volumes and high speeds.

The observed volumes are well below the upper limit for a major collector and the speeds at the survey location are close to the speed limit.

There were 26 crashes recorded during the five year period of 1 January 2011 to 31 December 2015 on Spalding Street and of these 7 were injury crashes. The majority of these crashes (14) occurred at the Kingsford Smith Drive intersection which is out of the scope of this study.

The main objectives for treatments on Spalding Street are:

- Improve Mid-block safety
- Improve Intersection Safety
- Reduce speeding
- Improve pedestrian safety while crossing
- Enable easier Driveway access.

The following treatments are proposed to address these objectives:

- Lane narrowing the length of Spalding Street
- A chicane and a speed cushion near the Barber Crescent intersection.

The lane narrowing will assist with driveway access, intersection visibility, midblock safety and speeding. The treatments at the intersection with Tillyard Drive will assist with pedestrian safety.

Townson Crescent

Speeding was voiced as a concern on Townson Crescent.

The traffic volume on Townson Crescent is well within the range expected for a minor collector; however 85th percentile speeds were recorded as over 15% higher than the speed limit.

There were 11 crashes recorded during the five year period of 1 January 2011 to 31 December 2015 on Townson Crescent and of these 2 were injury crashes.

The main objective for treatments on Townson Crescent is to reduce speeding. Two speed cushions are proposed to be installed on Townson Crescent to address this objective.
Vickers Crescent

Speeding was expressed as a concern on Vickers Crescent during community consultation.

The traffic volume is low, which is expected for a local access street and speeds are close to the speed limit.

There was only one property damage only crash recorded during the five year period of 1 January 2011 to 31 December 2015 on Vickers Crescent.

No treatments are proposed due to the low volumes, low speeds and low number of crashes.

Final Traffic Management Scheme – The Master Plan

Using the analysis of the technical data and the community feedback received, a traffic management ‘Master Plan’ was developed to improve traffic conditions on Tillyard Drive and surrounding streets. The technical merits of community suggestions were also considered in developing this scheme. The proposed treatments are detailed in Table 2.

The objectives of this scheme are to:

- Reduce travel speeds
- Improve safety at intersections and mid-blocks
- Improve pedestrian safety.

Table 2: Detailed Treatments that form the Traffic Management Master Plan

<table>
<thead>
<tr>
<th>Street</th>
<th>Main Issues of Concern</th>
<th>Proposed Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tillyard Drive</td>
<td>• Speeding issues</td>
<td>• Pedestrian signage and improved delineation near the link to Charnwood shops</td>
</tr>
<tr>
<td></td>
<td>• Mid-block safety</td>
<td>• Lane narrowing between Covington Crescent (SW) and Crawford Crescent</td>
</tr>
<tr>
<td></td>
<td>• Intersection safety</td>
<td>• Right turn pocket into Crawford Crescent</td>
</tr>
<tr>
<td></td>
<td>• Cyclist safety</td>
<td>• Intersection improvements at Spalding Street</td>
</tr>
<tr>
<td></td>
<td>• Pedestrian safety</td>
<td>• Line marking improvements between Spalding Street and Barber Crescent</td>
</tr>
<tr>
<td></td>
<td>• Driveway access</td>
<td>• Lane narrowing between Barber Crescent and the Kuringa Drive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Right turn pocket into Kerrigan Street</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Intersection improvements at Daley Crescent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pedestrian refuge and hazard signage prior to the Kuringa Drive bend approaching</td>
</tr>
<tr>
<td></td>
<td></td>
<td>from the East.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pedestrian refuge and hazard signage when entering Kuringa Drive from Tillyard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drive.</td>
</tr>
<tr>
<td></td>
<td>• Visibility issues</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>NOTE:</strong> Improvements to the Lhotsky Street/Tillyard Drive intersection have been</td>
</tr>
<tr>
<td></td>
<td></td>
<td>highlighted as significant, and will be considered under future Capital Works</td>
</tr>
<tr>
<td></td>
<td></td>
<td>programs.</td>
</tr>
<tr>
<td>Bingle Street</td>
<td>• Speeding</td>
<td>• Speed cushion near Hedland Circuit</td>
</tr>
<tr>
<td>Cartwright Street</td>
<td>• Speeding</td>
<td>• Pedestrian refuge near Rouse Place</td>
</tr>
<tr>
<td></td>
<td>• Mid-block safety</td>
<td>• Speed cushions near Charnwood Dunlop School</td>
</tr>
<tr>
<td></td>
<td>• Visibility issues</td>
<td>• Speed cushions near MacIntyre Place</td>
</tr>
<tr>
<td>Companion Crescent</td>
<td>• Speeding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Intersection safety/visibility</td>
<td>• Speed cushions adjacent oval between Nulsen Circuit and Sanderson Close</td>
</tr>
<tr>
<td></td>
<td>• Driveway access</td>
<td>• Speed cushions near Homann Place</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A pedestrian refuge near Vickers Crescent (West)</td>
</tr>
<tr>
<td>Covington Crescent</td>
<td>• Speeding</td>
<td>• Speed cushions near Noakes Circuit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hazard sign near Boot Place</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Two speed cushions between Boot Place and Warby Place</td>
</tr>
</tbody>
</table>
### Street Improvement Program

<table>
<thead>
<tr>
<th>Street</th>
<th>Main Issues of Concern</th>
<th>Proposed Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daley Crescent</td>
<td>- Intersection safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Pedestrian safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Intersection upgrade at the corner of Tillyard Drive with a more defined right turn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>created by extending the kerb</td>
</tr>
<tr>
<td>Kerrigan Street</td>
<td>- Intersection safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Pedestrian safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Mid-block safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lane narrowing between Shakespeare Circuit and Tillyard Drive.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Intersection improvements at Tillyard Drive</td>
</tr>
<tr>
<td>Kuringa Drive</td>
<td>- Speeding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Mid-block safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A hazard sign and rumble bars before the sharp turn into</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tillyard Drive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A hazard sign and rumble bars on each approach to the S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bend on Kuringa Drive</td>
</tr>
<tr>
<td>Lhotsky Street</td>
<td>- Intersection safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Pedestrian safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Right turn pocket and pedestrian refuge islands to be considered under future</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capital Works program.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>NOTE:</strong> since undertaking this study, additional traffic calming</td>
</tr>
<tr>
<td></td>
<td></td>
<td>treatments have already been implemented on this road under other Roads ACT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>programs.</td>
</tr>
<tr>
<td>Magrath Crescent</td>
<td>- Speeding</td>
<td></td>
</tr>
<tr>
<td>Moroney Street</td>
<td>- Speeding</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Speed cushions located at the crest of Moroney Street</td>
</tr>
<tr>
<td>Shakespeare Crescent</td>
<td>- Intersection safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Speeding through</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Driveway access</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- visibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Two speed cushions in the school zone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Improved pedestrian signage at the intersection with Kerrigan Street (East)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Two speed cushions near Carrodus Street &amp; Rogers Street</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intersection improvements at Rogers Street (North)</td>
</tr>
<tr>
<td>Spalding Street</td>
<td>- Mid-block safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Intersection safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Driveway access</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- visibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Speeding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Pedestrian safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lane narrowing between Tillyard Drive and Kingsford Smith Drive.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- A chicane and speed cushions near the Barber Crescent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>intersection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Speed cushions near Jacob Place</td>
</tr>
<tr>
<td>Townson Crescent</td>
<td>- Speeding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Intersection safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Two sets of speed cushions on either end of the street</td>
</tr>
</tbody>
</table>

The traffic management ‘Master Plan’ is presented in Figure 4.

It is important to note that the final scheme is an overall ‘Master Plan’ for the area and that not all proposed devices will be installed at once. The ‘Master Plan’ will guide the implementation of the scheme over a number of years due to annual budgetary constraints. In that context, priorities have been assigned to the proposed treatments based on the results of the technical analysis and the feedback from the community.

The locations of proposed treatments shown on the map are also indicative only, and the exact locations, as well as the detailed design of treatments, will be determined before the implementation stage.
Figure 4: Traffic Management Master Plan

LEGEND

Intersection Improvements
Right Turn Pocket
Line Marking
Line Marking Improvements
Chicane including vertical deflection
Speed Cushion
Pedestrian Signage
Priority Treatments
Additional Treatment, subject to evaluation and funding
To be considered under future Capital Works programs
Study Area

Note:
- Locations of treatments are indicative
- Treatments to be implemented subject to budget constraints

Revision B – 14-Dec-2017
Prepared for – ROADS ACT – ABN: 37 307 569 373
### Priority Treatments

Priorities have been assigned to the proposed treatments based on the results of the technical analysis and the feedback from the community. The priority treatments are shown in Table 3.

**Table 3: Priority Treatments**

<table>
<thead>
<tr>
<th>Street</th>
<th>Proposed Treatments</th>
<th>Reduce Travelling Speeds</th>
<th>Improve Safety at Intersections</th>
<th>Improve Pedestrian Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tillyard Drive</td>
<td>Lane narrowing between Covington Crescent (south) and Crawford Crescent.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pedestrian signage near the Charnwood Shops.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Right turn pocket into Crawford Crescent.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intersection improvements at the corner of the Spalding Street Intersection.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Line marking improvements between Spalding Street and Garrad Court.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lane Narrowing between Barber Crescent and Kuringa Drive.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Right turn pocket into Kerrigan Street.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intersection improvements at the Daley Crescent (south) intersection.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pedestrian refuge at the bicentennial trail just before the bend into Kuringa Drive.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A hazard sign just before the sharp bend into Kuringa Drive.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cartwright Street</td>
<td>Pedestrian Refuge near Rouse Place.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Companion Crescent</td>
<td>Speed cushions adjacent oval between Nulsen Circuit and Sanderson Close.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Covington Crescent</td>
<td>Speed cushions near Noakes Circuit.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kerrigan Street</td>
<td>Lane narrowing between Shakespeare Circuit and Tillyard Drive.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McGrath Crescent</td>
<td>Speed cushions near Schey Place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kuringa Drive</td>
<td>A hazard sign and rumble bars before the sharp turn into Tillyard Drive.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>It is proposed to implement a hazard sign and rumble bars on each approach to the S bend present on Kuringa Drive.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moroney Street</td>
<td>Speed cushions at crest of Moroney Street.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shakespeare Crescent</td>
<td>Two speed cushions in the school zone.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improved pedestrian signage at the intersection with Kerrigan Street (East).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spalding Street</td>
<td>Lane narrowing between Tillyard Drive and Kingsford Smith Drive.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 5: Priority Treatments

LEGEND

- Intersection Improvements
- Right Turn Pocket
- Line Marking
- Pedestrian Refuge
- Speed Cushion
- Hazard Signage
- Pedestrian Signage
- Rumble Strips
- Priority Treatments
- Study Area

Note:
- Locations of treatments are indicative
- Treatments to be implemented subject to budget constraints
Cost Benefit Analysis

The estimated probable cost of all priority treatments is $397,000 inclusive of GST and a 40% contingency. The cost benefit analysis for the priority options indicates that the proposed priority treatments with a Benefit Cost Ratio of just over 2. This indicates that the treatments would return crash reductions valued at more than twice the installation and maintenance costs over a 20-year project life.

It should also be noted that the LATM treatments will have additional benefits beyond crash reductions. By reducing speeds in the neighbourhood, the treatments are expected to improve residential amenity and better support active modes of transport such as walking and cycling.