| Appendix E— Abley, Integrated Transportation Assessment |  |  |  |  |
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# **Prebbleton Private Plan Change Integrated Transportation Assessment**

**Urban Estates Limited** 





# Prebbleton Private Plan Change Integrated Transportation Assessment

## **Urban Estates Limited**

#### **Quality Assurance Information**

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|                 |        |             |  |

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# 1. Introduction

Urban Estates Limited (Urban Estates) are lodging a Private Plan Change application to establish residential zoning in an area bound by Shands Road, Trents Road, the existing urban area adjacent to Springs Road and Hamptons Road, to the west of the Prebbleton Town Centre. A Private Plan Change is required as this land is currently zoned as Inner Plains. The proposed zoning is Living Z with some areas indicated as medium and low density, with several public spaces/reserves.

Urban Estates commissioned Abley Limited (Abley) to prepare an Integrated Transport Assessment (ITA) to accompany the Plan Change. The purpose of this ITA is to evaluate the potential transportation related effects of the Plan Change on the future receiving environment. The ITA has been prepared using the guidance specified in the Waka Kotahi NZ Transport Agency Research Report 422 published in 2010. The guidelines identify four levels of scope for an ITA, named "Basic assessment", "Neighbourhood transport impact assessment", "Local area transport impact assessment" and "Wide area transport assessment." Given the scale, location and anticipated trip generation of the Plan Change a "Wide area transport assessment" has been prepared to prepare a robust and comprehensive assessment of traffic and transportation effects.

## 1.1 Background

The site is located approximately 2km from Prebbleton Town Centre with a total area of 77 hectares. A total of 820 residential lots are proposed in the Plan Change area. The existing zoning is labelled is zoned as Inner Plains (IP) in the Selwyn District Plan. The existing land use is primarily farmland.

There are four nearby intersections that border the site and provide access to the wider transport network, those being as follows:

- Intersection of Hamptons and Springs Road
- Intersection of Trents and Springs Road
- Intersection of Shands and Trents Road
- · Intersection of Hamptons and Shands Road

The site has frontages on Hamptons, Trents and Shands Roads however no accessways are proposed along Shands Road. The Christchurch Southern Motorway Stage 2 (CSM2) has opened on September 2020. The CSM2 provides better access to and from the south of Christchurch, the city centre and Lyttleton by improving capacity, safety and alignment of the Christchurch Southern Corridor. There is an interchange directly off Shands Road onto CSM2, providing connectivity between Prebbleton and Christchurch, Rolleston and further afield.



# 2. Existing Land Use and Transport Environment

## 2.1 Locality

The site is located approximately 2km south-west from Prebbleton town centre and approximately 15km south-west from Christchurch CBD. The site is located west of an existing residential area with three surrounding roads forming the boundary of the site. The location of the site in context of the wider area is shown in Figure 2.1.

The surrounding land use is primarily residential and rural zoning surrounding the site.



Figure 2.1 The site (sourced: Canterbury Maps 2019)

## 2.2 Zoning

The site is currently zoned as a Rural – Inner Plains Zone (IP). As shown in **Figure 2.2**, the area immediately to the east is categorised as Living Z (LZ). To the north the areas are categorised as Living 3 (L3), LZ, Living X (LX) and Existing development Area (EDA – Kingcraft Drive). These areas are all different varieties of residential zoning that will vary in density and characteristics. The area south and west of the site is zoned as Rural – Inner Plans (IP).





Figure 2.2 Selwyn District Zoning Map

## 2.3 Existing Land Use

The site is currently occupied by rural activities, predominantly farmland.

# 2.4 Surrounding Roads

The site has frontage on to Hamptons Road along the southern boundary, Shands Road along the western boundary and Trents Road along the northern boundary. All surrounding intersections surrounding the site operate as stop intersections.

#### Shands Road

Shands Road runs in a north/east – south/west orientation between the suburbs of Springston and Hornby, approximately 15km in length total. Hornby is approximately 5km north of the site and Springston is approximately 8km south of the site. To the north Shands Road provides access to CSM2 that runs along the southern boundary of Christchurch CBD. The segment of Shands Road between Trents Road and Hamptons Road, to which the site abuts, is a two-lane carriageway with one traffic lane in each direction. Shands Road is consistent throughout the section between Trents Road and Hamptons Road, providing a shoulder roughly 1.5m in width on both sides of the road and a painted centreline. The overall road reserve width is 20m. There are no footpaths or cycle facilities on either side of the carriageway.

The District Plan classifies Shands Road as an Arterial road. The posted speed limit along Shands Road ranges from 100km/h to 50km/h, with an 80km/h speed limit within the vicinity of the site. It is considered that it would be appropriate to review this speed limit should the plan change be approved.

Within the One Network Road Classification system (ONRC), Shands Road is classified as an Arterial road. A general view of Shands Road along the frontage of the site is shown in **Figure 2.3**.





Figure 2.3 Shands Road looking south (site left of the image)

#### **Trents Road**

Trents Road runs north/west – south/east orientation between the towns of Templeton and Prebbleton, approximately 5km in length. Templeton is located approximately 3km from the site and Prebbleton is located approximately 1-2km from the site. To the north/west Trents Road provides access onto SH1 that runs along the northern boundary of Christchurch. The segment of Trents Road between Shands Road and Springs Road, adjacent to the site, is a two-lane carriageway with one traffic lane in each direction. Between Shands Road and Oakley Drive (which is the end of the existing residential area), Trents Road provides no shoulder, footpaths or cycle facilities with a painted centreline. From Oakley Drive to Springs Road that is an existing residential area, Trents Road provides on-street parking and footpaths on both sides of the road, no cycling facilities are provided. The overall road reserve width is 20.4m throughout.

The District Plan does not classify this road in either the urban or rural plans. Within the ONRC, Trents Road is classified as a Secondary Collector. The posted speed limit along Trents Road ranges from 80km/h to 50km/h, with 70km/h speed limit within the vicinity of the site. It is considered that it would be appropriate to review this speed limit should the plan change be approved. A general view of Trents Road along the frontage of the site is shown in **Figure 2.4**.





Figure 2.4 Trents Road looking east (site on right of image)

#### Hamptons Road

Hamptons Road runs north/west north/west – south/east orientation between Waterholes Road to end of road approximately 5km in length. To the north/west Hamptons Road provides a connection to CSM2, approximately 3km from the site. The segment of Hamptons Road between Shands and Springs Road adjacent to the site, is a two-lane carriageway with one traffic lane in each direction. Hamptons Road provides no shoulder, footpath or cycle facilities with a painted centreline. The overall road reserve width is 20m throughout.

The District Plan classifies Hamptons Road an Arterial Road. The posted speed limit on Hamptons Road is 80km/h throughout. Within the ONRC, Hamptons Road is classified as a Primary Collector. It is considered that it would be appropriate to review this speed limit should the plan change be approved. A general view of Trents Road along the frontage of the site is shown in **Figure 2.5**.





Figure 2.5 Hamptons Road looking east (site on left of image)

## 2.5 Surrounding Intersections

The site has four main intersections that connect the site to the surrounding road network as follows:

- Intersection of Hamptons and Springs Road
- Intersection of Trents and Springs Road
- Intersection of Shands and Trents Road
- Intersection of Hamptons and Shands Road

A map of these intersections in relation to the site is shown in Figure 2.6.



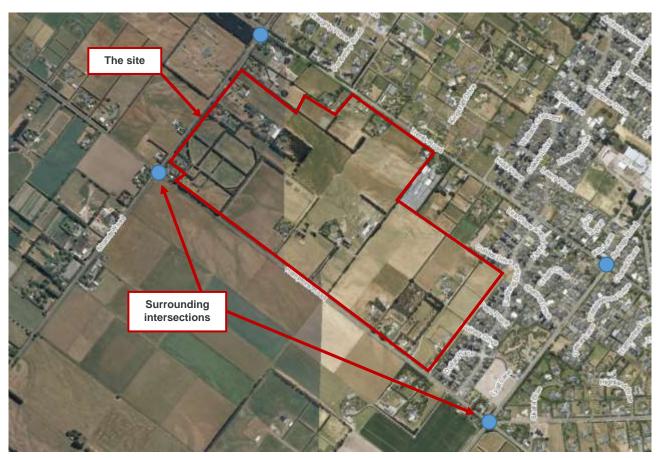


Figure 2.6 Nearby intersections

#### Intersection of Hamptons and Springs Road

The intersection of Hamptons and Springs Road located south-east of the site is a stop intersection with priority given to Springs Road. This intersection is shown in **Figure 2.7** looking north-east towards Hamptons Road. There are no pedestrian crossing facilities and no footpaths located on either side of the intersection. The lane widths are wide allowing for two vehicles to comfortably fit side by side at the head of the stop lane. There is clear visibility on both sides of the road for over 100m as the road is flat and straight on either side.

Vehicles travelling through Springs Road do not have enough space at this intersection to pass any vehicles that may be stopped to turn right onto to Hamptons Road.





Figure 2.7 Intersection of Hamptons and Springs Road (looking north-east towards Hamptons Road)

#### Intersection of Trents and Springs Road

The intersection of Trents and Springs Road located north-east of the site is a stop intersection with priority given to Springs Road. This intersection is shown in **Figure 2.8** looking south-west down Springs Road. There are no pedestrian crossing facilities provided. A footpath is provided on one side of the road. The lane widths are wide allowing for two vehicles to comfortably fit side by side at the head of the stop intersection. There is clear visibility on both sides of the road for over 100m as the road is flat and straight on either side. There is a right turn bay onto Trents Road from Springs Road allowing for vehicles travelling south on Springs Road to pass.

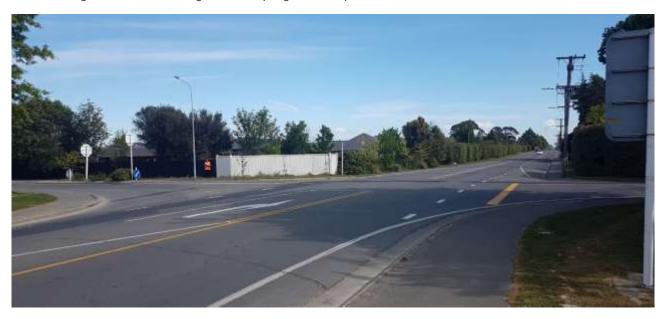


Figure 2.8 Intersection of Trents Road and Springs Road (Looking south-west down Springs Road).



#### Intersection of Shands and Trents Road

The intersection of Trents and Shands Road located north-west of the site is a stop intersection with priority given to Shands Road. This intersection is shown in **Figure 2.9** looking north-west towards Trents Road. There are no pedestrian crossing facilities or footpaths provided. The lane widths are wide allowing for two vehicles to comfortably fit side by side at the head of the stop intersection. There is clear visibility on both sides of the road for over 100m as the road is flat and straight on either side similar to the previous intersections.

Vehicles travelling through Shands Road do not have enough space at this intersection to pass any vehicles that may be stopped to turn right onto to Trents Road.



Figure 2.9 Intersection of Shands and Trents Road (looking north-west towards Trents Road).

#### Intersection of Hamptons and Shands Road

The intersection of Hamptons and Shands Road located south-west of the site is a stop intersection with priority given to Shands Road. This intersection is shown in **Figure 2.10** looking south-east towards Hamptons Road. There are no pedestrian crossing facilities or footpaths provided. The lane widths are wide allowing for two vehicles to comfortably fit side by side at the head of the stop intersection. There is clear visibility on both sides similar to the previous intersections. Vehicles travelling through Shands Road do not have enough space at this intersection to pass any vehicles that may be stopped to turn right onto to Hamptons Road.





Figure 2.10 Intersection of Shands and Hamptons Road (looking south-east)

A vehicle activated advance warning stop sign is located north -west on Hamptons Road approximately 100m from the intersection of Shands and Hamptons. This is shown on **Figure 2.11**.



Figure 2.11 Hamptons Road existing vehicle activated warning stop sign

## 2.6 Existing Traffic Volumes

Selwyn District Council undertakes traffic counts of roads on its network, typically at three yearly intervals. The most recent Annual Average Daily Traffic (AADT) follows for the streets in the immediate vicinity of the site are summarised in Table 2.1. It is noted that since these counts were recorded the Christchurch Southern Motorway Stage 2 (CSM2) project has opened and would have been under construction during this period. This is a significant project which is likely to impact on flows on some of these key corridors. For these reason full intersection counts have been captured on Shands Road and Springs Road in October 2020 and these are presented later in this report.



Table 2.1 Traffic counts

| Street        | Location                                    | Data Source                | AADT   | HGV (%) | Year |
|---------------|---|----------------------------|--------|---------|------|
| Shands Road   | Between Trents<br>and Hamptons<br>Road      | Selwyn District<br>Council | 12,886 | 8.6%    | 2017 |
| Trents Road   | Between Shands<br>Road and<br>Springs Road  | Selwyn District<br>Council | 1,652  | 8%      | 2017 |
| Hamptons Road | Between Shands<br>and Springs<br>Road       | Selwyn District<br>Council | 2,240  | 9%      | 2018 |
| Springs Road  | Between Trents<br>Road and<br>Hamptons Road | Selwyn District<br>Council | 2,660  | 6%      | 2019 |

#### Christchurch Southern Motorway Stage 2 (CSM2)

The final section of CSM2 has opened on September 2020. The CSM2 provides better access to and from the south of Christchurch, the city centre and Lyttleton by improving capacity, safety and alignment of the Christchurch Southern Corridor. CSM2 provides a four-lane divided carriageway between from Halswell Junction Road to SH1 near Robinsons Road an alternative to SH1. Shands Road has direct access to the city through the Shands Road interchange that connects to CSM2. Similarly, vehicles travelling north on Springs Road will be able to connect onto CSM2 through the Halswell Junction interchange. The project overview map is shown on Figure 2.12.

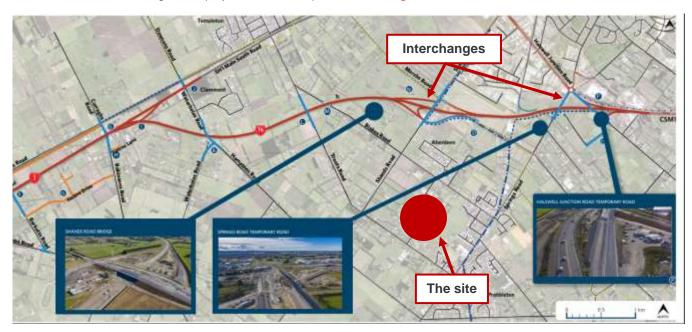


Figure 2.12 CSM2 project over view (Sourced from NZTA)



## 2.7 Safety

#### **Crash History**

A search of the NZ Transport Agency Crash Analysis System (CAS) database for the period of 2015 to 2019 (inclusive), identified 26 crashes in the vicinity of the site. The crashes are shown in the CAS crash diagram in Appendix D with totals summarised in **Table 2.2**. The search area included:

- Intersection of Hamptons Road and Springs Road (crashes within 50m)
- Intersection of Trents Road and Springs Road (crashes within 50m)
- Intersection of Shands Road and Trents Road (crashes within 50m)
- Intersection of Hamptons Road and Shands Road (crashes within 50m)
- Hamptons Road between Springs Road and Shands Road (excluding the intersections mentioned)
- Springs Road between Hamptons Road and Trents Road (excluding the intersections mentioned)
- Trents Road between Springs Road and Shands Road (excluding the intersections mentioned)
- Shands Road between Trents Road and Hamptons Road (excluding the intersections mentioned)

Table 2.2 Crash data (2015-2019)

| Location   | Fatal | Serious | Minor | Injury<br>Total | Non-Injury | Total |
|--|-------|---------|-------|-----------------|------------|-------|
| Intersection of Hamptons Road and Springs Road.          | 0     | 0       | 2     | 2               | 2          | 4     |
| Intersection of Trents Road and Springs Road             | 0     | 0       | 0     | 0               | 0          | 0     |
| Intersection of Shands<br>Road and Trents Road           | 0     | 0       | 4     | 4               | 4          | 8     |
| Intersection of Hamptons<br>Road and Shands Road         | 0     | 2       | 1     | 3               | 6          | 9     |
| Hamptons Road between<br>Springs Road and Shands<br>Road | 0     | 0       | 0     | 0               | 0          | 0     |
| Springs Road between<br>Hamptons Road and<br>Trents Road | 0     | 0       | 0     | 0               | 2          | 2     |
| Trents Road between<br>Springs Road and Shands<br>Road   | 0     | 0       | 0     | 0               | 1          | 1     |
| Shands Road between<br>Trents Road and<br>Hamptons Road  | 0     | 0       | 0     | 0               | 2          | 2     |

The crash history shows that crashes are concentrated at the intersection of Shands and Hamptons Road and the intersection of Shands and Trents Road. This is due to the higher volumes of traffic travelling along Shands Road. The two reported serious crashes were due to vehicles failing to stop on Hamptons Road towards Rolleston. The existing Hamptons Road vehicle activated warning stop sign is for vehicles travelling towards Prebbleton on Hamptons Road. A similar sign for vehicles travelling towards Rolleston would further mitigate any safety issues at this intersection, however



it is noted that Council have plans to install a large rural roundabout at this location in the next four years. The corridors between the four intersections had only five non-injury crashes. Overall, the number of crashes on the surrounding road network are low and do not indicate a strong underlying safety issue.

#### Risk Maps

The Waka Kotahi Safer Journeys Risk Assessment Tool as part of the Speed Management Framework 2020 is used to analyse the road safety of road corridors. The two types of risk metrics are summarised as follows:

- Collective Risk is a measure of the total estimated death and serious injury (DSi) casualty equivalents for a site. It is
  effectively a measure of the number of deaths and serious injuries that can be expected at a site over the next
  analysis period (typically five years). At a corridor level, Collective Risk is the total estimated DSi casualty
  equivalents derived from the intersection and midblock components divided by the length of the corridor. It is
  expressed as estimated DSi / km. This is shown in Figure 2.13.
- Personal Risk is a measure of the risk of an individual dying or being seriously injured at a site. It is calculated by dividing Collective Risk by a measure of traffic volume exposure. This is shown in **Figure 2.14**.

The risk rating will identify if there are any underlying safety issues along any of the corridors. These risk assessments are based upon crash data from 2015-2019.



Figure 2.13 Collective Risk for the surrounding road network around the site.



The collective risk maps shows that Hamptons Road and Trents Road have a low collective risk with Shands Road having a low – medium collective risk along the frontage of the site.

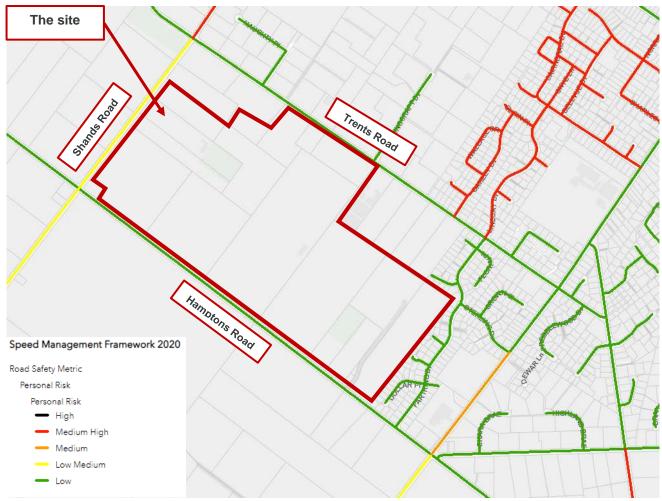


Figure 2.14 Personal Risk for the surrounding road network around the site.

The personal risk is low for Hamptons Road and Trents Road, while Shands Road has a low-medium personal risk rating along the frontage of the site.

Overall, there is no indication of any underlying safety issues with the surrounding roads along the frontage of the site.

#### High Risk Intersections

Waka Kotahi's Mega Maps is a risk assessment tool which displays the location of the top 200 high-risk intersections based on Collective Risk using the estimated DSi casualty equivalents risk assessment process as used in the High-Risk Intersections Guide. There are no high-risk intersections near the site, with the nearest being 1.5km north of the site at the intersection of Shands and Blakes Road. The Shands and Blakes Road (and nearby Springs and Marshes) intersection is at the time of writing out to tender for the design and construction of a large rural roundabout which will address these safety concerns.

## 2.8 Walking Facilities

The site is not well connected to the local pedestrian network as it is predominantly rural. Along the frontage of the site there are no footpaths on either side of the road available. There are no pedestrian crossing facilities available.



Photos of Springs Road indicate that it is a typical rural road that has been converted into an urban arterial overtime. Footpaths have been provided on one side of the road as shown in **Figure 2.15** providing walking facilities for the residential area.

Photos of the new residential development near the site were taken during our site visit on the  $22^{nd}$  of October. This can be used as an indication of what the future proposed urban development may look like at the plan change site as a minimum. Footpaths have been provided on one side of the road, with courtesy crossings located at intersections. This is shown in **Figure 2.16**. However, it is recommended that footpaths on both sides of the road corridors within the site should include footpaths on both sides of the road to provide a walkable and pleasant environment .



Figure 2.15 Springs Road facing south.





Figure 2.16 Nearby new development area

# 2.9 Cycling Facilities

There is an existing shared path that runs along Springs Road that connects Prebbleton to the Christchurch cycle network as shown on **Figure 2.17**. There are no cycling facilities at the frontage of the site, with the nearest being the existing cycling facilities on Springs Road approximately 1km east of the site.



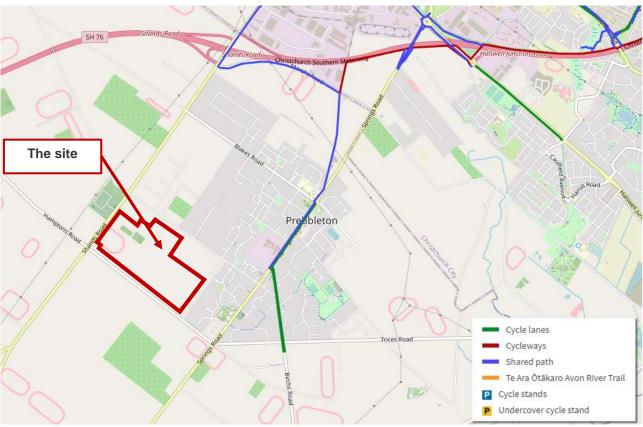


Figure 2.17 Prebbleton cycle network

## 2.10 Public Transport

The site does not have any bus stops located along its frontage. Currently there are several bus stops along Springs Road, that travel through Prebbleton township which are serviced by Bus Route 80 operating between Lincoln and Parklands. This bus route operates at high frequency intervals every 10-15mins during peak times and then every 30mins during non-peak hours on weekdays and on weekends. This bus route is shown in **Figure 2.18**. There is also an express bus route 80 that operates twice a day during peak times between Lincoln and Christchurch via Prebbleton. This route utilises the newly constructed CSM2 as shown on **Figure 2.20**. The express route between Prebbleton to Christchurch bus interchange reduces the time of travel from 35mins to 30mins.

The nearest bus stop to the site is approximately 1km from the nearest edge of the site as shown in Figure 2.19.



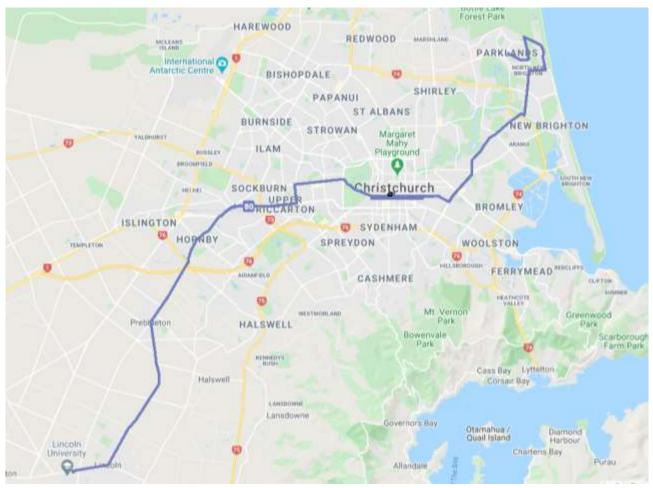


Figure 2.18 Bus route 80 between Lincoln and Parklands.



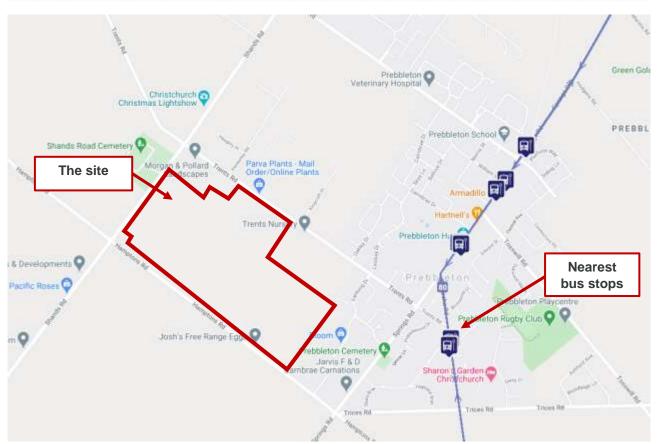


Figure 2.19 Bus route 80 in relation to the site.



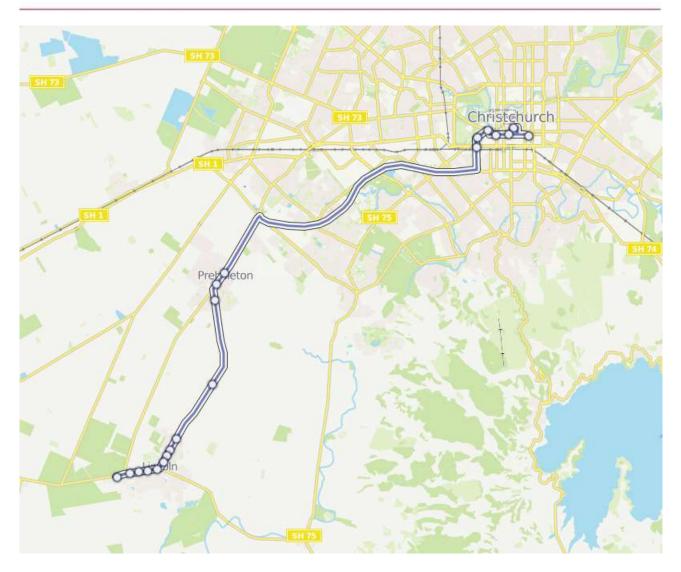


Figure 2.20 Express bus route 80 from Lincoln to Ara Institute (via Prebbleton)



# 3. Future Receiving Environment

#### 3.1 Future Infrastructure

#### Selwyn District Council -Long Term Plan 2018-28

There are several roading upgrades planned in the vicinity of the site and included in the Selwyn District Council Long Term Plan 2018-28 (LTP). The LTP sets out the key projects and activities the Council is planning over the current 10 year period and how these will be funded. The following works are planned for 2018-28:

- Springs/Hamptons Road roundabout
- Shands/Hamptons Road roundabout
- Shands/Trents Road roundabout
- Trents Road widening
- · Hamptons Road widening

The following works are planned for post-2028:

- Springs/Trents Road roundabout
- · Springs Road town centre traffic calming

With respect to funding SDC are planning to install large rural roundabouts at Shands/Trents and Shands/Hamptons in 2022-24 subject to Waka Kotahi NZ Transport Agency funding. At the time of preparing this ITA, SDC have out to tender detailed design and construction contracts for Marshs/Springs and Shands/Blakes dual lane rural roundabouts. The plans for these indicate dual lane roundabouts with inscribed (limit line to limit line) diameter in the order of 50-60 metres<sup>[1]</sup>. For the purposes of this assessment it is assumed that similar sized roundabouts would be constructed at Shands/Trents and Shands/Hamptons intersections.

The urban roundabouts noted in the LTP at Springs/Trents and Springs/Hamptons are more likely to be single lane urban roundabouts such as the Springs/Blakes roundabout which has single lane approaches and an inscribed diameter of 30 metres. Whilst there is some uncertainty as to the exact timing and funding of these projects it is reasonable to assume they are likely to occur in the next ten years. However, to provide a conservative assessment we have modelled the impacts of the development with and without these urban roundabouts.

The specific detail of the LTP widening line items is unavailable however it is assumed that this would be consistent with increasing traffic volumes on these corridors and would include the provision of additional seal width through the provision of sealed shoulders. As with the urban roundabouts there is little detail around the exact timing and funding of these projects, however, it is assumed they would most likely occur in the next ten years.

The Selwyn District Council LTP also highlights the following projects:

- Construct upgrades at key SH1 intersection in Rolleston/Rolleston industrial zone in 2023/24
- Prebbleton Arterial/CSM2 linkages construction intersections and road upgrades to provide linages to and around CSM2 in 2019/20- 2022/23
- Walking cycling will receive 11.5 million over the next 10 years to provide safe and convenient routes that will
  encourages active transportation

The Rolleston SH1 intersection upgrades are part of NZTAs package of projects in the Canterbury package. This upgrade will enable safer and better access from the residential area across SH1, the Main South Line (railway) to the industrial zone. As some residents in Prebbleton work and access Rolleston, this upgrade would better connect the two townships.





The Prebbleton Arterial/CSM2 linkage has already been constructed allowing for vehicles travelling north on from Prebbleton to access the Shands Road interchange of the Halswell Junction Interchange onto CSM2.

#### The Prebbleton Structure Plan 2010

The Prebbleton Structure Plan highlights the following projects:

- Roundabout is planned for the intersection of Springs Road and Hamptons Road.
- Cycling and pedestrian network proposed for the CSM1 and Halswell Junction Road.
- Blakes Road will become a collector road between Springs Road and Shands Road, to provide a connection to CSM2 Motorway.

As mentioned previously there is a roundabout planned for the intersection of Springs Road and Hamptons Road. This is expected to be similar to that at the current intersection of Springs and Blakes Road. This will be the southern threshold to the village and will serve to slow down traffic entering the built-up area of the township from the south. It will also encourage through traffic to follow alternative route which by-pass Prebbleton, and travel along Shands Road to access the CSM2 interchange.

A cycle and pedestrian network proposed along CSM1 could provide an additional corridor for alternative modes of transport better connecting Prebble to Christchurch.



# 4. Proposed Plan Change

The proposed Plan Change site is approximately 77 hectares of land which is presently zoned Inner Plains rezoned to Living Z. The latest site Outline Development Plan (ODP) shown in **Figure 4.1** allow for 820 dwellings.

**Figure 4.1** shows how the proposed Plan Change will connect to the road network. It is intended that properties will have direct access to the road network and via a right of way (ROW) for those lots without road frontage. The Plan Change area will gain access to the existing road network from via four access points on Trents Road, Guilder Drive extension, Guinea Drive extension and five access points on Hamptons Road. This is well integrated with the surrounding urban and rural areas.



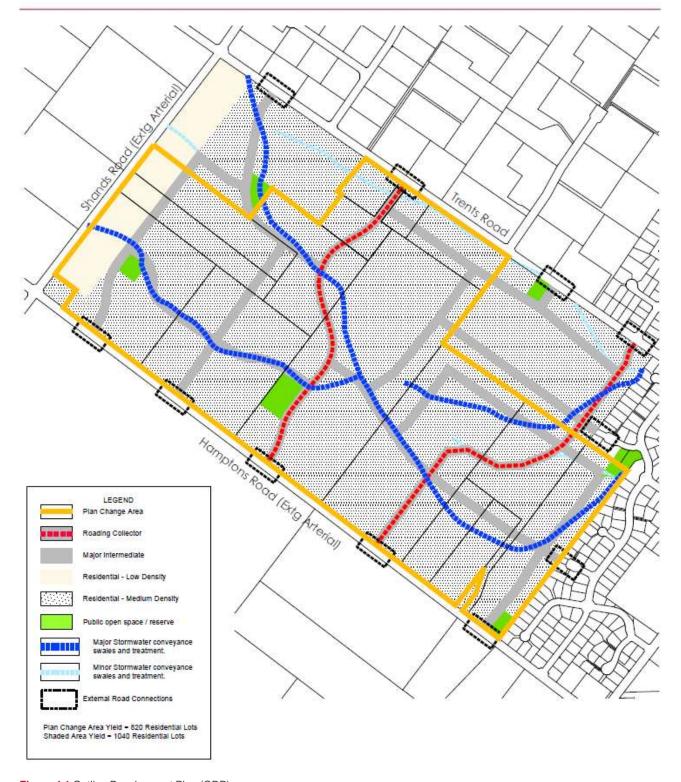


Figure 4.1 Outline Development Plan (ODP)



## 4.1 SDC Road Hierarchy

Selwyn District Council District Plan defines arterial, collector and local roads as following:

#### Arterial Road

- "They connect areas of district importance not already provided by State Highways. Arterial roads connect the districts townships and other important places and activities together, including across district boundaries. Arterial roads are subject to tighter access controls than collector and local roads to promote efficient traffic flow."

#### · Collector Road:

- "Their prime role is to distribute and collect local traffic within and between neighbourhood areas. In some situations they may link smaller rural communities to the arterial road network. Collector roads are required to balance the necessary traffic movement function against the property access function that they also need to provide."

#### Local

- "means a road that is not intended to act as a main through route for motorised vehicle traffic as their primary network function is to provide property access, and they generally have lower traffic volumes. Any road in the district that is not specifically identified in this Plan as a State Highway, Arterial or Collector road is a 'local road'. New Local roads are further classified into the following sub categories.
  - i) **Local Major Road:** means a local road that connects to collector and arterial roads (and other local roads). They are likely to form part of a wider network of connected roads of a similar standard that extends over an urban area. Council's urban design terminology refers to these roads as "local area Streets"
  - ii) Local Intermediate Road (includes cul de sacs): means a local road with low traffic volumes and speeds and primarily provides only for property access in urban areas, while maintaining some degree of connectivity best suited for walking and cycling between streets. The Councils urban design terminology refers to these as "neighbourhood streets",
  - iii) Local Minor (includes cul de sacs): means a local road that primarily provides for property access. Local minor roads are referred to as "resident's streets" Local minor roads are required to maximize street amenity in a space shared by all road users and have a low speed environment (less than 50km/hr)."

The red "Roading Collector" as mentioned in the ODC is similarly defined in the SDC district plan as a "Local Major Road" as it connects to the collector and arterial road; the collector road being Trents Road and the arterial being Hamptons Road. The proposed two local major roads will connect Trents and Hamptons Road running north- south between the two roads.

The existing cul-du-sacs will be extended with "Major Intermediate" roads as shown in the ODP. This is defined in the SDC district plan as a "Local Intermediate Road". These roads will likely reflect the existing development regarding pedestrian and carriageway streetscape to support low traffic volumes and speeds, and provide connectivity best suited for walking and cycling. These roads will also connect onto Hamptons and Trents Road. No accessways are proposed along Shands Road, which preserves its function as a through corridor between Lincoln/Rolleston and CSM2/Christchurch urban area.



# 5. Accessibility

#### **Accessibility Metrics**

The CCC Integrated Transport Assessment Guidelines (September 2015) provides a series of maps that can be used to describe the accessibility of a development site. The maps (included in Appendix A) include Prebbleton in the assessment. The maps show the site experiences high levels of accessibility by private vehicle however low to medium levels of accessibility by all other modes to employment and Key Activity Centres (KACs) in Christchurch as follows:

- Accessibility to jobs by Private Vehicle 2016 AM peak the site is located within the area that has access to 90,000 jobs.
- Accessibility to Key Activity Centres by cycle 2016 AM Peak the site is located within 25 minutes duration to the nearest KAC.
- Accessibility to Key Activity Centres by Public Transport 2016 AM Peak- the site is located within 25 minutes duration to the nearest KAC.
- Accessibility to Key Activity Centres by Private Vehicle 2016 AM Peak the site is located within 10 minutes duration to the nearest KAC.

Statistics New Zealand has recently updated their commuter maps to show the destinations people are travelling to from a selected area. This map is shown in **Figure 5.1** with Prebbleton being selected as shown in green. The main areas that residents from Prebbleton are travelling to are Lincoln (9%), Christchurch Central (5%), Christchurch Central-south (4%), Hornby Central (4%) and Islington -Hornby Industrial (4%). The accessibility to these areas via different travel options is shown for the morning (AM) and evening (PM) commuter peaks in **Table 5.1**.

Table 5.1 Travel times to/from popular travel destinations from Prebbleton

|                              | Lincoln<br>/Prebbleton   | Christchurch<br>Central /<br>Prebbleton  | Christchurch<br>Central-South /<br>Prebbleton | Hornby Central<br>/ Prebbleton | Islington –<br>Hornby<br>Industrial /<br>Prebbleton |
|------------------------------|--------------------------|--|---|--------------------------------|---|
| Private Vehicle –<br>AM peak | 8mins<br>to Lincoln      | 40mins<br>to Central                     | 26mins<br>to Central –                        | 16mins<br>to Hornby            | 14mins to<br>Islington                              |
|                              |                          |  | south   | Central                        |   |
| Private Vehicle –<br>PM peak | 10min<br>to Prebbleton   | 45mins<br>to Prebbleton                  | 30mins<br>to Prebbleton                       | 16mins<br>to Prebbleton        | 14mins<br>to Prebbleton                             |
| Public Transport  – AM peak  | 16mins<br>to Prebbleton  | 40mins<br>to Central<br>(express bus)    | 42mins<br>to Central - south                  | 23mins<br>to Hornby<br>Central | 45mins to<br>Islington                              |
| Public Transport  – PM peak  | 14mins<br>to Prebbleton  | 40mins<br>to Prebbleton<br>(express bus) | 30mins to<br>Prebbleton<br>(express bus)      | 26mins<br>to Prebbleton        | 40mins<br>to Prebbleton                             |
| Cycling – AM<br>peak         | 20 mins<br>to Lincoln    | 47mins<br>to Central                     | 44mins<br>to Central - south                  | 19mins<br>to Hornby<br>Central | 20mins to<br>Islington                              |
| Cycling – PM<br>peak         | 21 mins<br>To Prebbleton | 51mins<br>to Prebbleton                  | 44mins<br>to Prebbleton                       | 19mins<br>to Prebbleton        | 17mins<br>to Prebbleton                             |

Overall, there are similar travel times between Prebbleton and the popular commuter destinations using different modes of transport. The only exception to this is Islington where public transport takes longer than the other modes due to the lack of a direct service.

In summary Prebbleton is well connected to the surrounding road, cycling and public transport network.



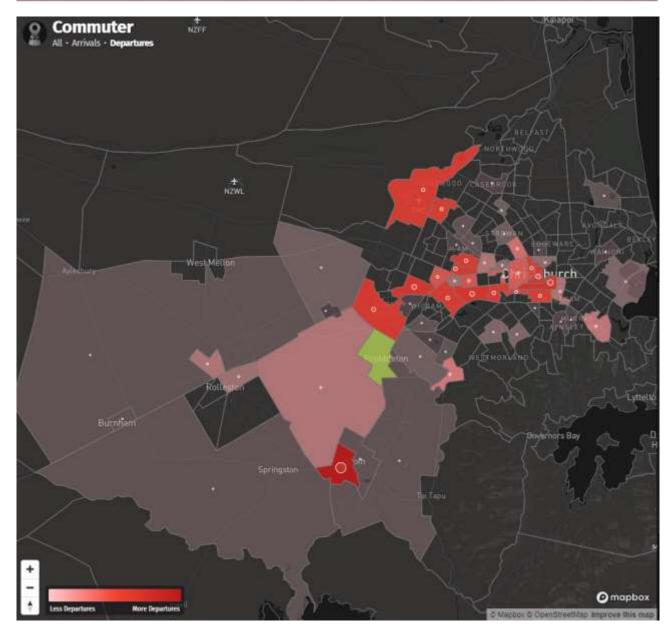


Figure 5.1 Prebbleton departure destinations (shown in red) – source Stats NZ.

#### **Public Transport**

The established bus route between Christchurch and Lincoln, along Springs Road and Birches Road is considered unlikely to change in future. Service reviews are undertaken every five years by the Regional Council (Environment Canterbury). SDC liaise with Environment Canterbury regarding the provision of public transport to ensure sustainable growth in townships. [2]

At the time of writing it is understood that there are no proposed bus route changes proposed in Prebbleton. Bus route 80 has recently added an express option that travels along the newly finished CSM2. Currently there are only two express services that run between Lincoln and Christchurch central (including pick up and drop off in Prebbleton), one in

 $<sup>^{[2]}</sup> https://www.selwyn.govt.nz/\__data/assets/pdf\_file/0008/147977/Selwyn-2031-Finalr.pdf$ 



morning peak and one in afternoon peak. It is likely given the similar travel times between private vehicles and express route that more express services will be added if this route gains popularity.

#### Walking and Cycling

The Christchurch to Little River Rail Trail has experienced strong growth in walking and cycling and is part of the national NZ Cycle Trail network <sup>[3]</sup>. The section between Prebbleton and Lincoln is used by upwards of 200 cyclists each day. Future cycle links are planned as indicated by the Walking and Cycling Strategy for Selwyn District between the cycle trail and Prebbleton in conjunction with any future retail and commercial developments in the town centre.

A key future project is a cycleway between Templeton and Prebbleton, this is shown in **Figure 5.2**. This will aim to connect Selwyn's high growth eastern townships to the wider city cycle networks via the Rail Trail <sup>[4]</sup>. This connection links the frontage of the site along Trents Road towards Prebbleton town centre that links to CCC Major Cycleway Routes and to Templeton.

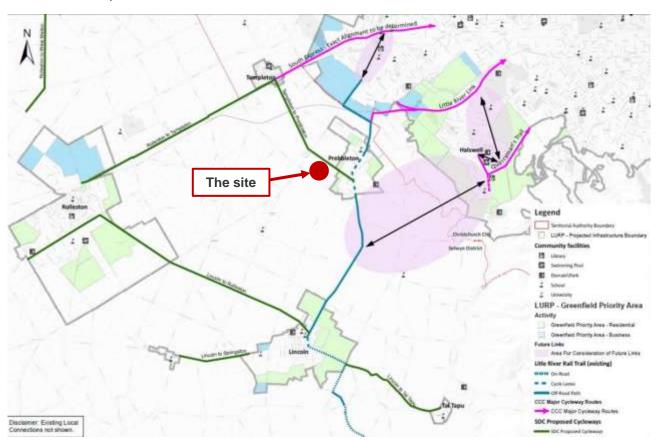


Figure 5.2 Future cycle network including existing routes. (source SDC walking and cycling strategy -2018)

New pathways and connections have been provided for in the design of CSM2 that link Rolleston to south of Templeton, while an extension of the Rail Trail to the north of Prebbleton as indicated in **Figure 5.2**. The new motorway also includes overpasses, underpasses and interchange structures that have dedicated footpath and cycleway facilities as part of their designs [5]

 $<sup>[3]</sup> https://www.selwyn.govt.nz/\_data/assets/pdf\_file/0008/282563/Final-2018-Walking-and-Cycling-Strategy\_v3-Adopted.pdf$ 

<sup>[4]</sup> https://www.selwyn.govt.nz/\_\_data/assets/pdf\_file/0008/282563/Final-2018-Walking-and-Cycling-Strategy\_v3-Adopted.pdf

https://www.selwyn.govt.nz/\_\_data/assets/pdf\_file/0008/282563/Final-2018-Walking-and-Cycling-Strategy\_v3-Adopted.pdf



The Prebbleton Structure Plan includes a future walking and cycling route around Prebbleton as shown on **Figure 5.3**. This combines existing routes and open spaces to enable a circular walking and cycling route around Prebbleton. The site is adjacent to part of this route that spans a distance of 5.4km.

The site (note the site continues west off map)

Figure 6. Future walking and cycling route around Prebbleton

Figure 5.3 Prebbleton future walking and cycling route (source: Prebbleton Structure Plan)



# 6. Travel Characteristics and Trip Generation

### 6.1 Trip Generation

The land use composition of the Site is approximately 820 low to medium density residential dwellings. Trip rates can be calculated using existing trip rate estimates and past surveys. A summary of the most recent trip rates for residential dwellings are shown in **Table 6.1**. A peak hour trip rate of 0.9 two-way trips per dwelling is chosen as a conservatively high figure, hence the proposed residential development of 820 dwellings will generate 738 additional trips in the peak hour.

Table 6.1 Trip Rate Comparison

| Source                   | Daily (vehicles per<br>day) | Peak Hour (vehicles per hour) | Daily Rate Applied to Site | Peak Hour Rate<br>Applied to Site |
|--------------------------|-----------------------------|-------------------------------|----------------------------|-----------------------------------|
| Trips Database<br>Bureau | 8.2/dwelling                | 0.9/dwelling                  | 6,724                      | 738                               |
| RTA                      | 9.0/dwelling                | 0.85/dwelling                 | 7,380                      | 697                               |
| Average                  | 8.6/dwelling                | 0.875/dwelling                | 7,052                      | 718                               |

## 6.2 Trip Distribution

The anticipated number of trips from the Site (738 trips in the peak hour) have been distributed using Statistics New Zealand 2018 census Journey to Work data (which can be accessed at <a href="https://www.stats.govt.nz/tools/commuter-waka-2018-census-data-visualisation">https://www.stats.govt.nz/tools/commuter-waka-2018-census-data-visualisation</a>). The final distribution of the trips was decided with the following steps:

- 1) A future growth rate of 2.8% per annum (calculated from Statistics New Zealand 2018-28 population medium growth projections for Selwyn District<sup>6</sup>) was applied to the 2020 traffic counts (which are detailed in section 7.2) to estimate the impacts of ten years of development growth in the District. This inclusion of ten years growth is consistent with the RR422 guidelines for plan changes. The resultant 28% growth was added to all 2020 intersection turning movements to estimate likely 2030 traffic flows as a baseline for this assessment.
- 2) Peak period destinations for Prebbleton traffic were estimated based on Journey to Work (JTW) data the JTW split for the Prebbleton Statistical Area 2 (SA2) area in 2018 was Christchurch (67%), Prebbleton (11%), Lincoln (11%) and Rolleston (11%). Given the much higher growth forecast between 2018-28 in Selwyn District (28% population growth) relative to the corresponding medium growth projection for Christchurch City (9% population growth) and likely growth in commercial activity and the emergence of new schools in Selwyn District, the trip distribution split has been modified slightly to reflect more local trips with Christchurch (55%), Prebbleton (15%), Lincoln (15%) and Rolleston (15%). This is considered to be a conservative assessment as it is predominantly based on commuter travel which tends towards longer trips compared to education, shopping and recreational trips.
- 3) The inbound/outbound split for the development traffic is based on Shands Road northbound/southbound through split at Shands/Trents intersection (30% inbound 70% outbound in morning peak and 66% inbound 34% outbound in evening peak)
- 4) The distribution assumes that 75% of Christchurch and Prebbleton town centre bound traffic travels via Trents Road and 25% via Hamptons Road. The rationale for this is that most of the development site it will be quicker to travel northbound through the site rather than increase travel distance by accessing the wider network via Hamptons Road. This is conservatively high as some traffic may access the wider network via other local roads including Sterling Drive and Lindsay Drive.
- 5) Similarly, the distribution assumes that 25% of Christchurch and Prebbleton town centre bound traffic travels via Trents Road and 75% via Hamptons Road. The rationale for this is that most of the development site it will be quicker to travel southbound through the site rather than increase travel distance by accessing the wider network via Trents Road.

6

 $http://archive.stats.govt.nz/browse\_for\_stats/population/estimates\_and\_projections/SubnationalPopulationProjections\_HOTP2013base-2043.aspx\#gsc.tab=0$ 





- 6) Splits between Shands Road and Springs Road for Christchurch-bound traffic based on the tidal flow directional through volumes on each corridor (76% Shands 24% Springs in morning peak and 72% Shands 28% Springs in evening peak)
- 7) Checksums were applied to ensure that the total increase in traffic loaded across all intersections reconciles with the traffic generation for travel to/from Christchurch, Prebbleton, Lincoln, Rolleston and total trips.

Overall, the above methodology provided a robust and conservative trip distribution estimation for the new trips generated by the Plan Change. The trip distribution diagram for each intersection movement can be seen in Appendix B.

## 6.3 Parking Supply and Demand

Car parking for the Plan Change area will be provided on site within each lot. Vehicle access and parking layouts of the proposal will be designed to comply with District Plan requirements and will be detailed at resource consenting stages.



## 7. Network Effects Assessment

#### 7.1 Introduction

To provide a comprehensive assessment of effects, three tasks have been undertaken and are reported in this section of the report as follows:

- Surveys were undertaken at the four intersection bordering the site
- A capacity assessment has been undertaken of the Springs and Shands Road corridors with and without the development traffic
- Intersection modelling of the four intersections using SIDRA intersection software has been undertaken to assess the current and future performance of the intersections with and without development traffic.

## 7.2 Traffic Surveys

Manual intersection movement surveys were undertaken at each of the four intersections to inform this ITA. This was undertaken on Thursday 22 October 2020 during the typical evening peak period of 4:00-6:00pm and on Friday 23 October 2020 during the typical morning peak period of 7:00-9:00am. Both the morning and evening peaks were surveyed for the intersections. The intersections were collected during fine weather conditions.

The results of the survey show that the AM peak hour is between 7:15-8:15am and the PM peak hour is between 4:30-5:30pm. The turning movements during the survey are included in Appendix B.

The results of the traffic surveys were used to inform the capacity assessment and the SIDRA intersection modelling.

## 7.3 Capacity Assessment

The Shands Road and Springs Road arterials are expected to experience an increase in traffic demand as a result of the Plan Change as a result of traffic interactions between the site and Christchurch City and between the site and Prebbleton town centre.

The forecast 2030 traffic volumes with and without development traffic (and as are consistent with the flows forecast and applied to the SIDRA intersection modelling assessment) have been applied to assess whether there is sufficient midblock link capacity to the north of Trents Road with and without the development. The forecasts volumes have been compared to the capacity of each corridor in **Table 7.1Error! Reference source not found.**. The capacity of each corridor has been calculated using a best practice assessment based on Austroads guidance as follows:

- Springs Road capacity taken from Austroads Guide to Traffic Management Part 3 Table 6.1 Typical midblock capacities for urban undivided roads with interrupted flow - 900 vehicle per lane per hour
- Shands Road capacity taken from Austroads Guide to Traffic Management Part 3 section 5.1.1 Uninterrupted flow facilities single-lane flow - 1800 vehicles per lane per hour

Table 7.1 Capacity Assessment

| Shands Road (north of Trents) |       |       | Sprir | ngs Road ( | north of Ti | ents) |       |       |
|-------------------------------|-------|-------|-------|------------|-------------|-------|-------|-------|
| Traffic Volumes               | AM NB | AM SB | PM NB | PM SB      | AM NB       | AM SB | PM NB | PM SB |
| 2020                          | 963   | 424   | 574   | 1083       | 398         | 313   | 534   | 477   |
| 2030 (No Development)         | 1233  | 543   | 735   | 1386       | 509         | 401   | 684   | 611   |
| 2030 (With Development)       | 1396  | 636   | 834   | 1579       | 617         | 464   | 760   | 759   |
| Capacity (Austroads)          |       | 1800  |       |            | 900         |       |       |       |
| V/C Ratios                    | AM NB | AM SB | PM NB | PM SB      | AM NB       | AM SB | PM NB | PM SB |
| 2020                          | 0.54  | 0.24  | 0.32  | 0.60       | 0.44        | 0.35  | 0.59  | 0.53  |



|                         | ı    | ı    | ı    | ı    | ı    | ı    | ı    | ı    |
|-------------------------|------|------|------|------|------|------|------|------|
| 2030 (No Development)   | 0.68 | 0.30 | 0.41 | 0.77 | 0.57 | 0.45 | 0.76 | 0.68 |
| 2030 (With Development) | 0.78 | 0.35 | 0.46 | 0.88 | 0.69 | 0.52 | 0.84 | 0.84 |

The assessment demonstrates that with the addition of ten years of background traffic growth (at 2.8% per annum) the Shands Road corridor has a volume to capacity (V/C) ratio of 0.68 northbound in the morning peak and 0.77 southbound in the evening peak hour. These increase to 0.78 and 0.88 respectively with the addition of development traffic, indicating there is residual link capacity on this corridor.

The corresponding assessment for Springs Road shows that in with ten years background growth (at 2.8% per annum) the evening peak has a V/C of 0.76 which increases to 0.84 with development traffic. Both corridors have sufficient capacity to accommodate the full development of the site.

## 7.4 SIDRA Modelling Approach

To assess the potential effects at the key intersections in the vicinity of the plan change site, three scenarios have been assessed:

- 1) Base Scenario (2020) This scenario shows the existing performance of the four intersections using peak hour movements attained from the site surveys for both the morning and evening peaks. The intersection volumes from the October 2020 surveys form the basis of the assessment, and on-site observations of queue lengths have been used to calibrate the performance of the intersection in terms of queue lengths on the minor leg approaches.
- 2) Future Base Scenario (2030) This scenario adds forecast growth of 2.8% per annum to the surveyed turning movement volumes used in the Base Scenario. This scenario, therefore, predicts the future performance of the four intersections in the morning and evening peak hours without the development. This scenario also assumes the Shands / Trents and Shands / Hamptons intersection upgrade to dual roundabouts. For the Springs / Trents and Springs / Hamptons intersections, both stop-controlled and single roundabouts are tested as there is a level of uncertainty with respect to the delivery of this infrastructure.
- 3) Future Development Scenario (2030) The final scenario adds the new trips corresponding with the full development of the plan change site using the trip generation and trip distribution methodology outlined in section 6.1 and section 6.2 respectively. This scenario also assumes the Shands / Trents and Shands / Hamptons intersection upgrade to dual roundabouts; and tests for both stop controlled and single roundabouts for the Springs / Trents and Springs / Hamptons intersections.

#### SIDRA Results

SIDRA Intersection offers a range of outputs for any given model. The outputs selected for this analysis are:

- Average delay (seconds):
  - Average delay is the average delay experienced by vehicles travelling through an intersection and includes deceleration, queuing, stopping and acceleration.
- Level of Service (LOS):

The LOS is calculated as a function of the delay, and generally describes the traffic conditions in terms of travel time, volume, capacity, freedom to manoeuvre and convenience. The LOS ranges from A to F where A represents the least impediment to vehicle movement and F represents heavy congested conditions.

A general description of level of service is shown in Table 7.2.

Table 7.2 Level of Service (LOS) General Descriptions

| Level of Service Band | General Traffic Flow Description |
|-----------------------|----------------------------------|
| LOS A                 | Primarily free-flow operation    |
| LOS B                 | Reasonably unimpeded operation   |
| LOS C                 | Stable operation                 |



| LOS D | A less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed        |
|-------|--|
| LOS E | Characterised by unstable operation and significant delay  |
| LOS F | Characterised by flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay |

Typically, in assessments of intersections in peak demand periods the industry best practice is to keep the operation of an intersection at or below LOS E in peak periods. A full set of SIDRA turning movement summaries are included in Appendix C.

## 7.5 Intersection Assessment – Base Scenario (2020)

The results of the Base Scenario (2020) can be found in **Table 7.3** and **Table 7.4**. The overall intersection performance is considered that of the worst approach for stop-controlled intersections and the volume weighted average across all approaches for roundabouts. This is in alignment with SIDRA guidance and industry best practice. As a general rule LOS E or better during peak periods is considered to be acceptable. LOS E and F performance are highlighted in blue and red respectively

The two Shands road intersections are currently operating at LOS E and F, demonstrating that they are currently at or near capacity. With the addition of ten years background traffic growth they would both be operating well over capacity and the imminent roundabout upgrades planned by Council will be required irrespective of the plan change application.

Table 7.3 SIDRA Results - Base Scenario (2020) AM Peak

| Intersection                  | Approach           | Average Delay (sec) | Level of Service |
|-------------------------------|--------------------|---------------------|------------------|
| Shands Road /                 | Trents Road East   | 41.3                | Е                |
| Trents Road                   | Shands Road North  | 1.0                 | -                |
| етор                          | Trents Road West   | 29.8                | D                |
| STUP                          | Shands Road South  | 0.5                 | -                |
|                               | Intersection       | 41.3                | E                |
| Shands Road /                 | Hamptons Road East | 16.0                | С                |
| Hamptons Road                 | Shands Road North  | 1.0                 | -                |
| етов                          | Hamptons Road West | 17.6                | С                |
| STUP                          | Shands Road South  | 0.9                 | -                |
|                               | Intersection       | 17.6                | С                |
| Springs Road /                | Hamptons Road East | 11.4                | В                |
| Hamptons Road                 | Springs Road North | 0.6                 | -                |
| етов                          | Hamptons Road West | 11.2                | В                |
| STUP                          | Springs Road South | 1.3                 | -                |
|                               | Intersection       | 11.4                | В                |
| Springs Road /<br>Trents Road | Trents Road East   | 12.5                | В                |
|                               | Springs Road North | 0.8                 | -                |
| етор                          | Trents Road West   | 10.3                | В                |
| 9101                          | Springs Road South | 0.4                 | -                |
|                               | Intersection       | 12.5                | В                |



Table 7.4 SIDRA Results - Base Scenario (2020) PM Peak

| Intersection   | Approach           | Average Delay (sec) | Level of Service |
|----------------|--------------------|---------------------|------------------|
| Shands Road /  | Trents Road East   | 65.9                | F                |
| Trents Road    | Shands Road North  | 1.0                 | -                |
| CTOR           | Trents Road West   | 86.0                | F                |
| STUP           | Shands Road South  | 1.7                 | -                |
|                | Intersection       | 86.0                | F                |
| Shands Road /  | Hamptons Road East | 46.4                | Е                |
| Hamptons Road  | Shands Road North  | 0.7                 | -                |
| CTOR           | Hamptons Road West | 36.0                | Е                |
| STUP           | Shands Road South  | 2.7                 | -                |
|                | Intersection       | 36.0                | E                |
| Springs Road / | Hamptons Road East | 13.5                | В                |
| Hamptons Road  | Springs Road North | 1.4                 | -                |
| CTOR           | Hamptons Road West | 14.4                | В                |
| STUP           | Springs Road South | 1.0                 | -                |
|                | Intersection       | 14.4                | В                |
| Springs Road / | Trents Road East   | 15.1                | С                |
| Trents Road    | Springs Road North | 1.2                 | -                |
| CTOR           | Trents Road West   | 14.0                | В                |
| 9101           | Springs Road South | 0.3                 | -                |
|                | Intersection       | 15.1                | С                |

## 7.6 Intersection Assessment – Future Base Scenario (2030)

The SIDRA results of the Future Base Scenario (2030) can be found in **Table 7.5** and **Table 7.6**.

Table 7.5 SIDRA Results - Future Base Scenario (2030) AM Peak

| Intersection  | Approach           | Average Delay (sec) | Level of Service |
|---------------|--------------------|---------------------|------------------|
| Shands Road / | Trents Road East   | 10.7                | В                |
| Trents Road   | Shands Road North  | 6.4                 | A                |
|               | Trents Road West   | 11.8                | В                |
|               | Shands Road South  | 7.0                 | A                |
|               | Intersection       | 7.2                 | A                |
| Shands Road / | Hamptons Road East | 8.9                 | A                |
| Hamptons Road | Shands Road North  | 6.5                 | A                |
|               | Hamptons Road West | 9.7                 | A                |
|               | Shands Road South  | 6.7                 | Α                |
|               | Intersection       | 6.9                 | A                |
|               | Hamptons Road East | 13.1                | В                |



| Intersection   | Approach           | Average Delay (sec) | Level of Service |
|----------------|--------------------|---------------------|------------------|
| Springs Road / | Springs Road North | 0.7                 | -                |
| Hamptons Road  | Hamptons Road West | 12.7                | В                |
| етор           | Springs Road South | 1.4                 | A                |
| STUP           | Intersection       | 13.1                | В                |
| Springs Road / | Hamptons Road East | 7.1                 | A                |
| Hamptons Road  | Springs Road North | 5.6                 | A                |
|                | Hamptons Road West | 7.0                 | A                |
|                | Springs Road South | 5.7                 | A                |
|                | Intersection       | 5.9                 | A                |
| Springs Road / | Trents Road East   | 15.4                | С                |
| Trents Road    | Springs Road North | 0.9                 | -                |
| етор           | Trents Road West   | 11.7                | В                |
| STUP           | Springs Road South | 0.4                 | -                |
|                | Intersection       | 15.4                | С                |
| Springs Road / | Trents Road East   | 7.7                 | A                |
| Trents Road    | Springs Road North | 4.0                 | A                |
|                | Trents Road West   | 6.1                 | A                |
|                | Springs Road South | 4.0                 | A                |
|                | Intersection       | 4.6                 | A                |

Table 7.6 SIDRA Results - Future Base Scenario (2030) PM Peak

| Intersection   | Approach           | Average Delay (sec) | Level of Service |
|----------------|--------------------|---------------------|------------------|
| Shands Road /  | Trents Road East   | 13.7                | В                |
| Trents Road    | Shands Road North  | 7.2                 | A                |
|                | Trents Road West   | 9.3                 | A                |
|                | Shands Road South  | 6.7                 | A                |
|                | Intersection       | 7.4                 | A                |
| Shands Road /  | Hamptons Road East | 13.2                | В                |
| Hamptons Road  | Shands Road North  | 7.3                 | A                |
|                | Hamptons Road West | 9.1                 | A                |
|                | Shands Road South  | 7.0                 | A                |
|                | Intersection       | 7.7                 | A                |
| Springs Road / | Hamptons Road East | 17.8                | С                |
| STOP           | Springs Road North | 1.5                 | -                |
|                | Hamptons Road West | 20.2                | С                |
|                | Springs Road South | 1.1                 | -                |
|                | Intersection       | 20.2                | С                |



| Intersection   | Approach           | Average Delay (sec) | Level of Service |
|----------------|--------------------|---------------------|------------------|
| Springs Road / | Hamptons Road East | 7.3                 | A                |
| Hamptons Road  | Springs Road North | 6.4                 | A                |
|                | Hamptons Road West | 8.5                 | A                |
|                | Springs Road South | 6.0                 | A                |
|                | Intersection       | 6.6                 | A                |
| Springs Road / | Trents Road East   | 21.0                | С                |
| Trents Road    | Springs Road North | 1.4                 | -                |
| етов           | Trents Road West   | 20.1                | С                |
| STUP           | Springs Road South | 0.4                 | -                |
|                | Intersection       | 20.1                | С                |
| Springs Road / | Trents Road East   | 7.6                 | A                |
| Trents Road    | Springs Road North | 4.3                 | A                |
|                | Trents Road West   | 7.8                 | A                |
|                | Springs Road South | 4.2                 | A                |
|                | Intersection       | 4.8                 | A                |

## 7.7 Intersection Assessment – Future Development Scenario (2030)

The SIDRA results of the Future Development Scenario (2030) can be found in Table 7.7 and Table 7.8.

Table 7.7 SIDRA Results - Future Development Scenario (2030) AM Peak

| Intersection   | Approach           | Average Delay (sec) | Level of Service |
|----------------|--------------------|---------------------|------------------|
| Shands Road /  | Trents Road East   | 13.1                | В                |
| Trents Road    | Shands Road North  | 6.4                 | A                |
|                | Trents Road West   | 14.8                | В                |
|                | Shands Road South  | 8.6                 | A                |
|                | Intersection       | 8.7                 | A                |
| Shands Road /  | Hamptons Road East | 10.1                | В                |
| Hamptons Road  | Shands Road North  | 6.6                 | A                |
|                | Hamptons Road West | 10.3                | В                |
|                | Shands Road South  | 7.2                 | A                |
|                | Intersection       | 7.5                 | A                |
| Springs Road / | Hamptons Road East | 14.0                | В                |
| Hamptons Road  | Springs Road North | 0.9                 | -                |
| STOP           | Hamptons Road West | 14.7                | В                |
|                | Springs Road South | 1.7                 | -                |
|                | Intersection       | 14.7                | В                |
|                | Hamptons Road East | 7.8                 | A                |



| Intersection   | Approach           | Average Delay (sec) | Level of Service |
|----------------|--------------------|---------------------|------------------|
| Springs Road / | Springs Road North | 6.2                 | A                |
| Hamptons Road  | Hamptons Road West | 8.2                 | A                |
|                | Springs Road South | 5.7                 | A                |
|                | Intersection       | 6.5                 | A                |
| Springs Road / | Trents Road East   | 19.4                | С                |
| Trents Road    | Springs Road North | 1.5                 | -                |
| етоп           | Trents Road West   | 13.0                | В                |
| 2101           | Springs Road South | 0.5                 | -                |
|                | Intersection       | 19.4                | С                |
| Springs Road / | Trents Road East   | 8.3                 | A                |
| Trents Road    | Springs Road North | 4.5                 | A                |
|                | Trents Road West   | 6.9                 | A                |
|                | Springs Road South | 4.4                 | A                |
|                | Intersection       | 5.2                 | A                |

Table 7.8 SIDRA Results - Future Development Scenario (2030) PM Peak

| Intersection                   | Approach           | Average Delay (sec) | Level of Service |
|--------------------------------|--------------------|---------------------|------------------|
| Shands Road /                  | Trents Road East   | 19.7                | В                |
| Trents Road                    | Shands Road North  | 7.4                 | A                |
|                                | Trents Road West   | 9.9                 | A                |
|                                | Shands Road South  | 7.2                 | A                |
|                                | Intersection       | 8.2                 | A                |
| Shands Road /<br>Hamptons Road | Hamptons Road East | 15.9                | В                |
|                                | Shands Road North  | 7.8                 | A                |
|                                | Hamptons Road West | 9.5                 | A                |
|                                | Shands Road South  | 7.5                 | A                |
|                                | Intersection       | 8.4                 | A                |
| Springs Road /                 | Hamptons Road East | 21.1                | С                |
| Hamptons Road                  | Springs Road North | 2.2                 | -                |
| етоп                           | Hamptons Road West | 26.6                | D                |
| STUP                           | Springs Road South | 1.6                 | -                |
|                                | Intersection       | 26.6                | D                |
| Springs Road /                 | Hamptons Road East | 7.9                 | A                |
| Hamptons Road                  | Springs Road North | 7.0                 | A                |
|                                | Hamptons Road West | 9.2                 | A                |
|                                | Springs Road South | 6.4                 | A                |
|                                | Intersection       | 7.2                 | A                |



| Intersection                  | Approach           | Average Delay (sec) | Level of Service |
|-------------------------------|--------------------|---------------------|------------------|
| Springs Road /<br>Trents Road | Trents Road East   | 28.3                | D                |
|                               | Springs Road North | 2.6                 | -                |
|                               | Trents Road West   | 25.5                | D                |
|                               | Springs Road South | 0.6                 | -                |
|                               | Intersection       | 25.5                | D                |
| Springs Road /                | Trents Road East   | 9.3                 | A                |
| Trents Road                   | Springs Road North | 5.0                 | A                |
| (                             | Trents Road West   | 8.4                 | A                |
|                               | Springs Road South | 5.6                 | A                |
|                               | Intersection       | 5.8                 | A                |

## 7.8 Comparison of Scenarios

To consider the effects of the development it is helpful to see the results of intersection performance for each scenario side-by-side. The Future Base Scenario (2030) and the Future Development Scenario (2030) are shown in the following tables for each of the intersections. The Shands Road / Trents Road intersection performance comparison for both the AM and PM peak are shown in **Table 7.9**. The change in average delay to the base is small for all movements with no more than 6 seconds additional delay and average delays increasing by up 1-2 seconds only. None of the delay changes result in a worsening of LOS and this level of changes will not be noticeable to road users.

Table 7.9 Shands Road / Trents Road Intersection Performance Comparison

| Intersection  | Approach          | Average     | Delay (sec)           | Level o     | f Service             |
|---------------|-------------------|-------------|-----------------------|-------------|-----------------------|
|               |                   | Future Base | Future<br>Development | Future Base | Future<br>Development |
| Shands Road / | Trents Road East  | 10.7        | 13.1                  | В           | В                     |
| Trents Road   | Shands Road North | 6.4         | 6.4                   | А           | A                     |
|               | Trents Road West  | 11.8        | 14.8                  | В           | В                     |
|               | Shands Road South | 7.0         | 8.6                   | А           | А                     |
| AM Peak       | Intersection      | 7.2         | 8.7                   | Α           | Α                     |
| Shands Road / | Trents Road East  | 13.7        | 19.7                  | В           | В                     |
| Trents Road   | Shands Road North | 7.2         | 7.4                   | А           | А                     |
| 0             | Trents Road West  | 9.3         | 9.9                   | А           | А                     |
|               | Shands Road South | 6.7         | 7.2                   | А           | А                     |
| PM Peak       | Intersection      | 7.4         | 8.2                   | A           | Α                     |

The Shands Road / Hamptons Road intersection performance comparison for both the AM and PM peak are shown in **Table 7.10**. Delays on each approach increase by no more than three seconds with average delay increasing by less than one second which will not be noticeable to road users.

Table 7.10 Shands Road / Hamptons Road Intersection Performance Comparison

| Intersection Approach Average Delay (sec) Level of Service | ntersection A | Approach | Average Delay (sec) | Level of Service |
|--|---------------|----------|---------------------|------------------|
|--|---------------|----------|---------------------|------------------|



|               |                    | Future Base | Future<br>Development | Future Base | Future<br>Development |
|---------------|--------------------|-------------|-----------------------|-------------|-----------------------|
| Shands Road / | Hamptons Road East | 8.9         | 10.1                  | А           | В                     |
| Hamptons Road | Shands Road North  | 6.5         | 6.6                   | А           | А                     |
|               | Hamptons Road West | 9.7         | 10.3                  | А           | В                     |
|               | Shands Road South  | 6.7         | 7.2                   | А           | А                     |
| AM Peak       | Intersection       | 6.9         | 7.5                   | A           | A                     |
| Shands Road / | Hamptons Road East | 13.2        | 15.9                  | В           | В                     |
| Hamptons Road | Shands Road North  | 7.3         | 7.8                   | А           | А                     |
|               | Hamptons Road West | 9.1         | 9.5                   | А           | А                     |
|               | Shands Road South  | 7.0         | 7.5                   | А           | А                     |
| PM Peak       | Intersection       | 7.7         | 8.4                   | A           | A                     |

The Springs Road / Hamptons Road intersection performance comparison for both the AM and PM peak are shown in **Table 7.11**. Both the stop-controlled intersection and roundabout upgrade have been summarised. The Hamptons Road West approach of the stop-controlled arrangement will experience a small increase in delay of six seconds in the PM Peak and a reduction of level of service from LOS C to LOS D. This is an acceptable intersection LOS during peak periods and indicates that the intersection will perform well as a stop-controlled intersection with the addition of plan change traffic and does not require upgrading to a roundabout as a result of this plan change.

In the case that the Springs Road / Hamptons Road intersection is transformed into a single-lane roundabout by Council, the change in average delay to the base is less than one second. None of the delay changes result in a worsening of LOS and any changes will not be noticeable to road users.

Table 7.11 Springs Road / Hamptons Road Intersection Performance Comparison

| Intersection   | Approach           | Average     | Average Delay (sec)   |             | f Service             |
|----------------|--------------------|-------------|-----------------------|-------------|-----------------------|
|                |                    | Future Base | Future<br>Development | Future Base | Future<br>Development |
| Springs Road / | Hamptons Road East | 13.1        | 14.0                  | В           | В                     |
| Hamptons Road  | Springs Road North | 0.7         | 0.9                   | NA          | NA                    |
| етоп           | Hamptons Road West | 12.7        | 14.7                  | В           | В                     |
| STUP           | Springs Road South | 1.4         | 1.7                   | А           | NA                    |
| AM Peak        | Intersection       | 13.1        | 14.0                  | В           | В                     |
| Springs Road / | Hamptons Road East | 17.8        | 21.1                  | С           | С                     |
| Hamptons Road  | Springs Road North | 1.5         | 2.2                   | NA          | NA                    |
| етов           | Hamptons Road West | 20.2        | 26.6                  | С           | D                     |
| STUP           | Springs Road South | 1.1         | 1.6                   | NA          | NA                    |
| PM Peak        | Intersection       | 20.2        | 26.6                  | С           | D                     |
| Springs Road / | Hamptons Road East | 7.1         | 7.8                   | A           | А                     |
| Hamptons Road  | Springs Road North | 5.6         | 6.2                   | А           | А                     |
|                | Hamptons Road West | 7.0         | 8.2                   | A           | A                     |



| Intersection                               | Approach           | Aver | age Delay (sec) | L | evel of Service |
|--|--------------------|------|-----------------|---|-----------------|
|  | Springs Road South | 5.7  | 5.7             | А | А               |
| AM Peak                                    | Intersection       | 5.9  | 6.5             | A | A               |
| Springs Road /<br>Hamptons Road<br>PM Peak | Hamptons Road East | 7.3  | 7.9             | А | А               |
|  | Springs Road North | 6.4  | 7.0             | А | А               |
|  | Hamptons Road West | 8.5  | 9.2             | Α | А               |
|  | Springs Road South | 6.0  | 6.4             | А | Α               |
|  | Intersection       | 6.6  | 7.2             | Α | Α               |

The Springs Road / Trents Road intersection performance comparison for both the AM and PM peak are shown in **Table 7.12**. Both the stop-controlled intersection and roundabout upgrade have been summarised. The Trents Road West and Easy approaches of the stop-controlled arrangement will experience small increases in delay of seven and five seconds respectively in the PM Peak and a reduction of level of service from LOS C to LOS D. This is an acceptable intersection LOS during peak periods and indicates that the intersection will perform well as a stop-controlled intersection with the addition of plan change traffic and does not require upgrading to a roundabout as a result of this plan change.

In the case that the Springs Road / Trents Road intersection is transformed into a single-lane roundabout, the change in average delay to the base is less than two seconds on each approach. None of the delay changes result in a worsening of LOS and any changes will not be noticeable to road users.

Table 7.12 Springs Road / Trents Road Intersection Performance Comparison

| Intersection   | Approach           | Average     | Delay (sec)           | Level o     | f Service             |
|----------------|--------------------|-------------|-----------------------|-------------|-----------------------|
|                |                    | Future Base | Future<br>Development | Future Base | Future<br>Development |
| Springs Road / | Trents Road East   | 15.4        | 19.4                  | С           | С                     |
| Trents Road    | Springs Road North | 0.9         | 1.5                   | NA          | NA                    |
| етов           | Trents Road West   | 11.7        | 13.0                  | В           | В                     |
| SIUP           | Springs Road South | 0.4         | 0.5                   | NA          | NA                    |
| AM Peak        | Intersection       | 15.4        | 19.4                  | С           | С                     |
| Springs Road / | Trents Road East   | 21.0        | 28.3                  | С           | D                     |
| Trents Road    | Springs Road North | 1.4         | 2.6                   | NA          | NA                    |
| етов           | Trents Road West   | 20.1        | 25.5                  | С           | D                     |
| STUP           | Springs Road South | 0.4         | 0.6                   | NA          | NA                    |
| PM Peak        | Intersection       | 21.0        | 28.3                  | С           | D                     |
| Springs Road / | Trents Road East   | 7.7         | 8.3                   | А           | А                     |
| Trents Road    | Springs Road North | 4.0         | 4.5                   | А           | А                     |
|                | Trents Road West   | 6.1         | 6.9                   | А           | А                     |
|                | Springs Road South | 4.0         | 4.4                   | А           | А                     |
| AM Peak        | Intersection       | 4.6         | 5.2                   | A           | Α                     |



| Intersection   | Approach           | Average | e Delay (sec) | Le | vel of Service |
|----------------|--------------------|---------|---------------|----|----------------|
| Springs Road / | Trents Road East   | 7.6     | 9.3           | A  | A              |
| Trents Road    | Springs Road North | 4.3     | 5.0           | А  | A              |
| ()             | Trents Road West   | 7.8     | 8.4           | A  | A              |
|                | Springs Road South | 4.2     | 5.6           | Α  | A              |
|                | Intersection       | 4.8     | 5.8           | Α  | A              |
| PM Peak        |                    |         |               |    |                |

## 7.9 Summary of Development Effects

This section has described the performance changes on the road network due to increased traffic generation from the plan change site during the weekday morning and evening peak periods.

The assessment demonstrates that with ten years of background traffic growth, both the Shands Road corridor and the Springs Road corridor have sufficient capacity to accommodate the full development of the site. The volume to capacity (V/C) ratio for Shands Road is expected to increase from 0.68 northbound in the morning peak and 0.77 southbound in the evening peak hour, to 0.78 and 0.88 respectively with the addition of development traffic. The corresponding assessment for Springs Road shows that with ten years background growth the evening peak has a V/C of 0.76 which increases to 0.84 with development traffic.

The results of the SIDRA intersection modelling for the four adjacent intersections show that the additional traffic from the development of the Plan Change area will perform well within capacity for all intersections, assuming that the Shands Road roundabouts that are planned to be installed by Council in the next four years are installed. These roundabouts are required irrespective of this plan change application.

Notably the existing stop-controlled intersections on Springs Road have sufficient capacity to accommodate the plan change traffic as well as ten years of future background traffic growth. If small urban roundabouts were installed at these locations the plan change traffic can also be accommodated with minimal increase in delays.

Overall, the changes in road and intersection performance in relation to the Plan Change are minimal and the effects are considered acceptable in terms of transport, subject to the construction of the two Shands Road roundabouts as intended by Council in the 2021-24 funding cycle.



## 8. Strategic Planning Framework

#### Canterbury Regional Land Transport Plan 2015 – 2025

The Canterbury Regional Land Transport Plan 2015 – 2025 describes a list of primary objectives to achieve the vision of "Canterbury has an accessible, affordable, integrated, safe, resilient and sustainable transport system"<sup>[7]</sup>.

These primary objectives are:

- · Progressively reduce transport-related fatalities and serious injuries
- Improve levels of access in an environmentally sustainable way by increasing the attractiveness of public transport, walking and cycling, so there is greater use of these modes:
  - For public transport the focus is on timeliness, convenience, affordability, efficiency, connectedness, and sustainability; and
  - For walking and cycling the focus is on safety, amenity, convenience, connectivity and being able to take a direct route
- Increased capability for appropriate roads and bridges to carry heavy vehicles
- All roads comply with One Network Road Classification performance measures
- Improve journey time reliability on key corridors, with a focus on freight, public transport and tourism
- Improve access to freight hubs
- Resilience routes are in place for strategic routes that are most at risk of disruption
- · Reduce the number and duration of road closures
- Identify routes that are at risk of being impacted by climate change, and how to manage these risks to improve resilience
- Increased uptake of energy efficient and environmentally sustainable vehicles
- Increased transport and land use integration
- Reduced air and water pollution
- Improved storm water management

The Plan Change will facilitate a development that will not give rise to adverse effects on the strategic transport network and does not require any new roading links. The Site is located within proximity to public transport services and will therefore provide for a choice of travel modes. Environment Canterbury is proposing future changes to the Christchurch bus network which are expected to increase bus services near the site to further improve public transport accessibility.

#### Canterbury Regional Public Transport Plan 2018 – 2028

The Canterbury Regional Public Transport Plan 2018-2028 sets out Environment Canterbury's objectives and policies for delivering public transport in Canterbury.

One of the key objectives of the plan is to achieve "A network of public transport services in the Greater Christchurch and Timaru urban areas that provides people with access to key destinations." This includes services to and from the satellite centres, including Prebbleton. In order to achieve this objective, four new high frequency routes are proposed. One of these being the already implemented Lincoln to Christchurch CBD express service. With these four routes and increased frequency, this will overall improve public transport accessibility in Christchurch where 47% more people will be able to travel from home to the city within 30 minutes.

The proposed route network is shown in Figure 8.1, which shows a high frequency route between Prebbleton and the Christchurch CBD that was recently implement with the opening of CSM2 in September 2020. This route travels along Springs Road corridor and stops at the existing bus stops. As a result, there will be improved public transport accessibility between the Site and the Christchurch CBD.

Page 4 of Environment Canterbury's 'Canterbury Regional Land Transport Plan 2015 – 2025' (June 2018)



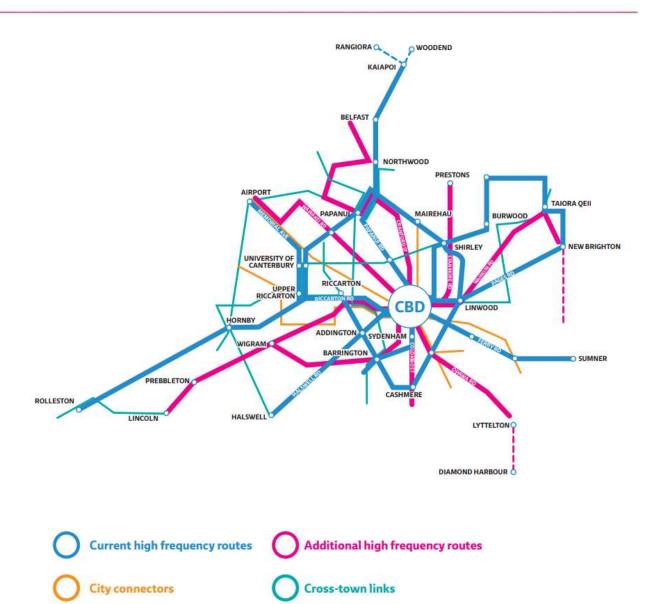


Figure 8.1 Proposed Changes to the Christchurch Bus Network

## 8.1 Local Policy Environment

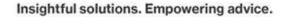
#### Selwyn District Plan

#### Objectives and policies

An assessment of the Plan Change against the transport related objectives and policies in the District Plan is included in **Table 8.1**.

Table 8.1 SDC District Plan Objectives and Policies

| Selwyn District Plan Objectives and Policies | Assessment | Comments |
|--|------------|----------|
| Township Volume / B2 Physical Resources      |            |          |





| Selwyn District Plan Objectives and Policies  | Assessment      | Comments  |
|---|-----------------|---|
| Objective B2.1.1  An integrated approach to land use and transport planning to ensure the safe and efficient operation of the District's roads, pathways, railway lines and airfields is not compromised by adverse effects from activities on surrounding land or by residential growth. | Consistent      | The Plan Change will form new Local Major Roads and Local Intermediate Roads within the site to connect to the wider road network via Trents Road and Hamptons Road. The residential development is proposed to be of a similar nature to the existing residential area directly east of the site. The development is proposed in a location that can accommodate the growth whilst both ensuring safety and efficiency of transport operation. |
| Objective B2.1.2  An integrated approach to land use and transport planning to manage and minimise adverse effects of transport networks on adjoining land uses, and to avoid "reverse sensitivity" effects on the operation of transport networks.                                       | Consistent      | Traffic modelling has demonstrated that the receiving transport network has enough capacity to accommodate the increased trip generation of the Plan Change.  |
| Objective B2.1.3  Future road networks and transport corridors are designed, located and protected, to promote transport choice and provide for: a range of sustainable transport modes; and alternatives to road movement of freight such as rail.                                       | Consistent      | The Plan Change takes into account the future road network and transport corridor changes, and considers future public transport network plans and walking and cycling provisions, within and to/from Prebbleton.   |
| Objective B2.1.4  Adverse effects of land transport networks on natural or physical resources or amenity values, are avoided, remedied or mitigated, including adverse effects on the environment from construction, operation and maintenance.   | Consistent      | The Plan Change can be accommodated by the land transport network and any adverse effects from construction of the residential dwellings and internal roads can be avoided, remedied or mitigated with Temporary Traffic Management Plan(s).  |
| Objective B2.1.5  The future, unrestricted operation of Christchurch International Airport is not jeopardised by "reverse sensitivity" effects from residential development in the Selwyn District.   | Not<br>contrary | The future, unrestricted operation of Christchurch International Airport is not expected to be jeopardised by the Plan Change.  |
| Policy B2.1.1  Apply a road hierarchy classification in Selwyn District to recognise the different functions and roles of the District's roads.   | Consistent      | The Plan Change will apply the road hierarchy classification of Selwyn District and form new Local Major Roads and Local Intermediate Roads within the site to connect to the wider road network via Trents Road and Hamptons Road.   |
| Policy B2.1.2  Manage effects of activities on the safe and efficient operation of the District's existing and planned road network, considering the classification and function of each road in the hierarchy.   | Consistent      | As mentioned under Objective B2.1.2, traffic modelling has demonstrated that the receiving transport network has enough capacity to accommodate the increased trip generation of the Plan Change.  Furthermore, no accesses and/or future road connections are proposed off Shands Road to reflect the road purpose as an Arterial road with a higher speed environment (80kph) and important movement function.                                |
| Policy B2.1.3 Recognise and protect the primary function of roads classified as State Highways and Arterial Roads in  | Consistent      | The proposed Outline Development Plan of the Plan Change ensures the safe and efficient flow of through traffic on the high speed Arterial, Shands Road, by proposing no new accesses or roads off Shands Road.   |





| Selwyn District Plan Objectives and Policies   | Assessment | Comments  |
|--|------------|---|
| Part E, Appendix 7, to ensure the safe and efficient flow of 'through' traffic en route to its destination.  |            | All new internal roads are formed on Trents Road and Hamptons Road which do not act as through movement routes.   |
| Policy B2.1.4(a)  Ensure all sites, allotments or properties have legal access to a legal road which is formed to the standard necessary to meet the needs of the activity considering:  • the number and type of vehicle movements generated by the activity;  • the road classification and function; and  • any pedestrian, cycle, public transport or other access required by the activity. | Consistent | The Plan Change will ensure all dwellings have legal access to a legal road that is formed to the appropriate standard required.  The new legal roads with the Plan Change will reflect the existing neighbouring residential roads and integrate seamlessly.   |
| Policy B2.1.4(b) Avoid adverse effects on the safe flow of traffic along State Highways and Arterial Roads from new property access, where the speed limit is more than 70 km/hr.  | Consistent | No new property accesses are proposed on an Arterial Road where the speed limit is more than 70km/hr.  Shands Road and Hamptons Road are both Arterial Roads with a speed limit of 80km/hr. No new property accesses are proposed on these roads.   |
| Policy B2.1.5  Ensure the development of new roads is:  integrated with existing and future transport networks and landuses; and  is designed and located to maximise permeability and accessibility; through achieving a high level of connectivity within and through new developments to encourage use of public and active transport; whilst having regard to the road hierarchy.            | Consistent | The development of the new internal roads within the Plan Change will integrate with the existing and future transport networks and landuses and is designed and located to maximise vehicle, cycle and pedestrian permeability and accessibility.  Public and active transport will be encouraged with the level of pedestrian and cyclist permeability within the site. |

#### **District Plan Rules**

It is anticipated that at resource consent stage of any development, the transport related District Plan Rules set out in Section C5 LZ Roading (Living Zone Rules – Roads and Transport) of the Township Volume in the Selwyn District Plan will form an appropriate basis for the design and layout of the internal site. However, it is also envisaged that there may be occasional departures from these since, to achieve the optimum urban design outcome, non-compliances may arise and any effects of these non-compliances would be assessed accordingly.



## 9. Conclusion

The Integrated Transport Assessment (ITA) has been developed in accordance with Waka Kotahi ITA guidelines and support the Assessment of Effects for the Urban Estates Limited (UEL) Private Plan Change application in Prebbleton. The site is 77 hectares on the south-west fringe of Prebbleton. UEL seek to rezone land which is presently zoned as Inner Plains to Living Z and would accommodate up to 820 dwellings. Overall, the development that would be facilitated by the plan change will result in an increased level of traffic activity compared to the current zoning.

The location has good accessibility by all modes to key destinations in the Greater Christchurch area and future planned infrastructure upgrades in the Selwyn District Council Long Term Plan (2018-28) will deliver important safety and efficiency improvements in the vicinity of the site including the installation of large rural roundabouts at Shands/Hamptons and Shands/Trents intersections. Modelling has demonstrated that these roundabouts are required in the near future irrespective of the proposed plan change.

A comprehensive capacity assessment and SIDRA intersection modelling assessment has been undertaken to understand the effects of increased traffic volumes associated with the plan change on Springs Road and Shands Road, and to robustly model the impact on the performance of nearby intersections for both the morning and evening peak hours. Three scenarios were compared:

- the base scenario (2020) which is calibrated directly from recent traffic counts collected in October 2020,
- the future base scenario without development (2030) assuming continued and sustained growth across the Selwyn District over the next ten years, and
- the future development scenario with the Plan Change (2030) to understand the cumulative effects of the development and background growth.

The results of the analysis demonstrate that the future receiving transport network (including planned upgrades to the two adjacent Shands Road intersections) has sufficient capacity to accommodate the increased traffic that would result from the Plan Change. Notably, the Springs and Shands Road corridors have residual capacity and the two stop-controlled intersections on Springs Road adjacent to the site operate with good level of service during peak periods. It is recommended that the speed environments on the adjoining corridors be re-evaluated should the plan change be approved in keeping with a more urban environment.

The Plan Change has been assessed against the relevant transport planning framework contained in regional and local strategies and policies, and overall, it is considered that the proposal is consistent with the transport-related objectives and policies of those documents. It is also able to comply with the District Plan Rules which would be fully assessed at resource consenting stages.

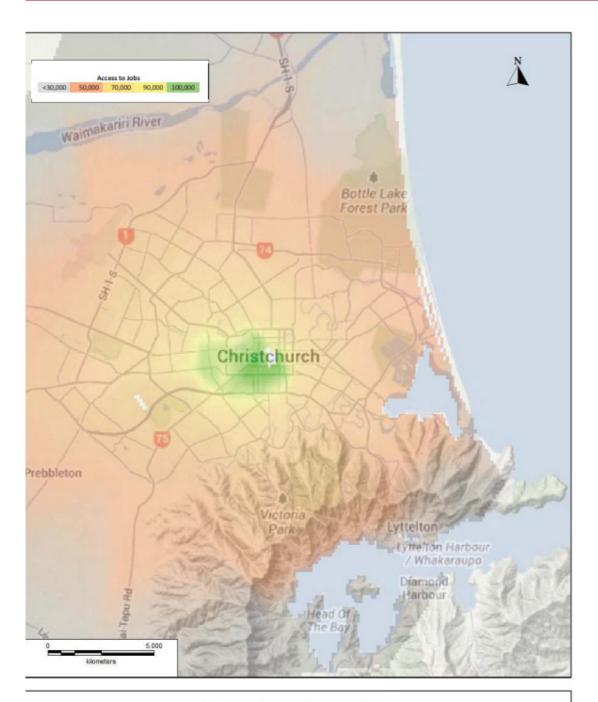
Overall, the proposed Plan Change can be supported from a traffic and transportation perspective and it is considered that there are no traffic and transportation reasons why the Plan Change could not be approved.



Appendix A CCC Integrated Transport Assessment Guidelines - Maps

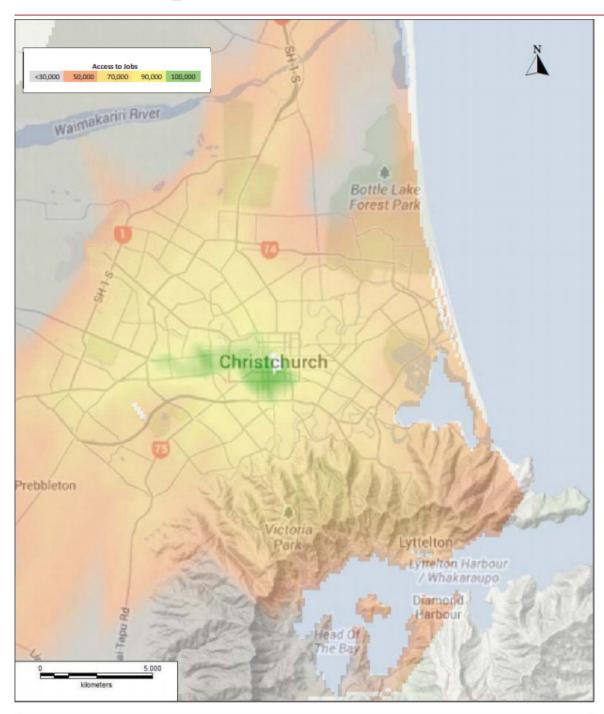






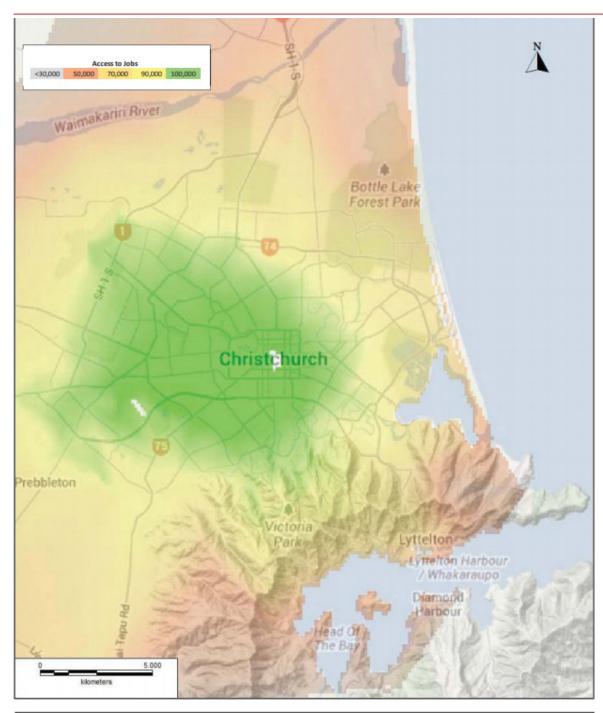
Accessibility to Jobs by Cycle
2016 AM Peak





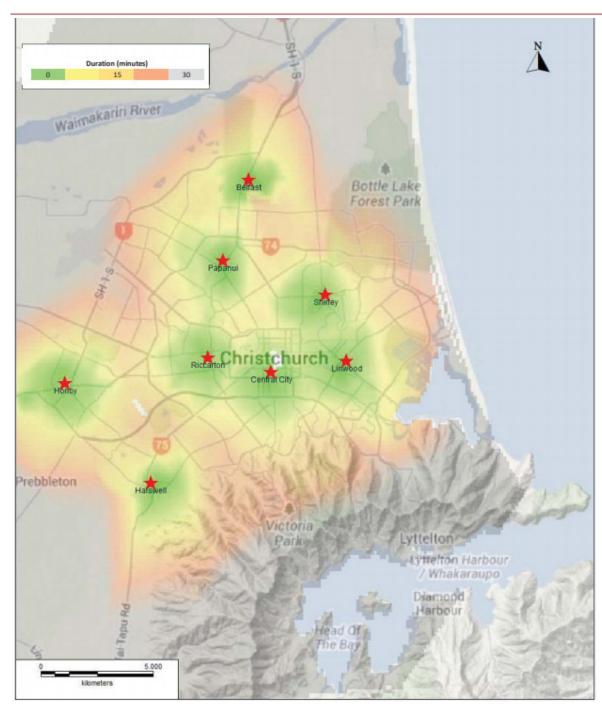
Accessibility to Jobs by Public Transport
2016 AM Peak





Accessibility to Jobs by Private Vehicle
2016 AM Peak

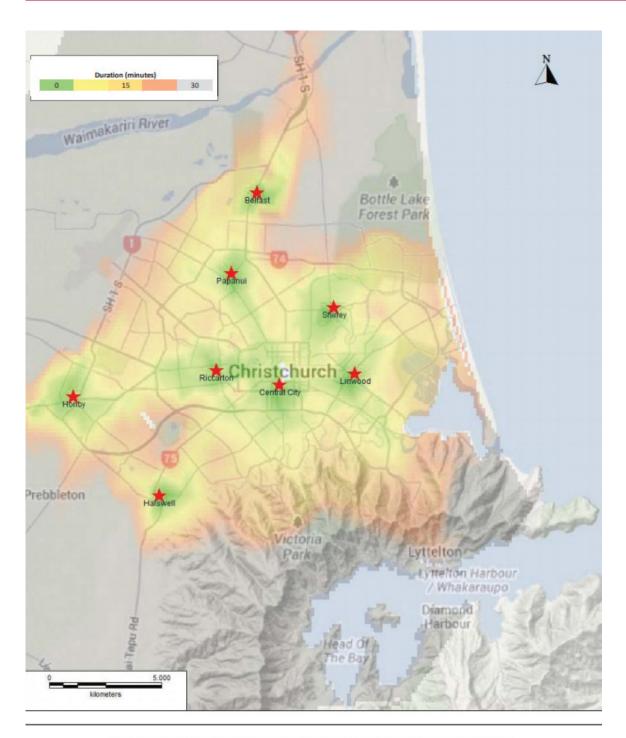




Accessibility to Key Activity Centres by Cycle
2016 AM Peak

**A**5

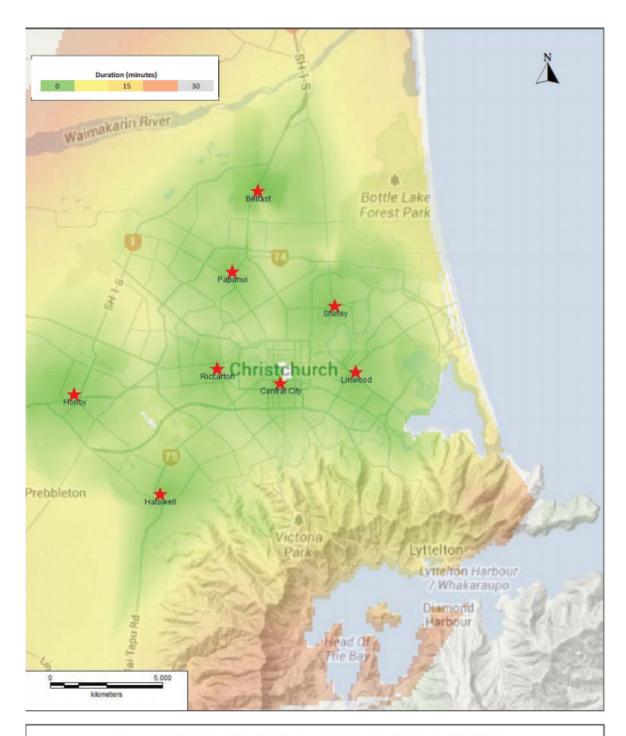




Accessibility to Key Activity Centres by Public Transport
2016 AM Peak

**A**6





# Accessibility to Key Activity Centres by Private Vehicle 2016 AM Peak

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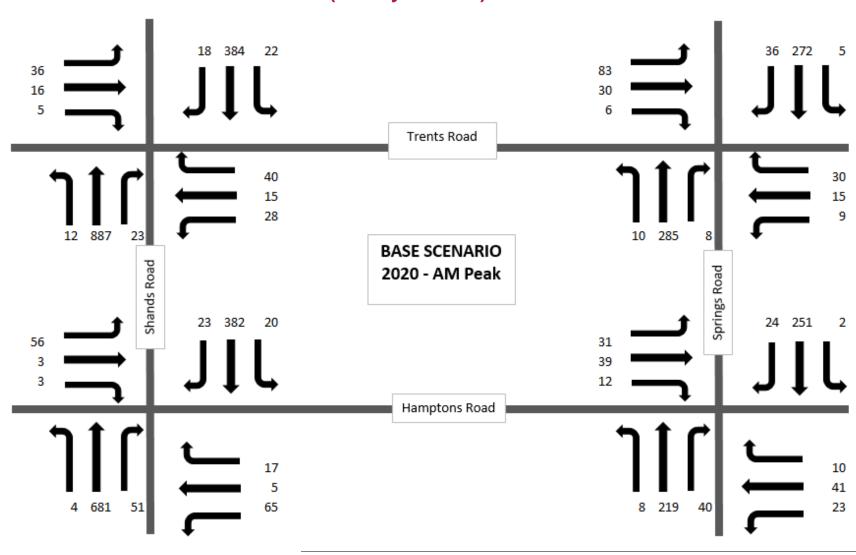


**APPENDIX B Survey Results and Trip Distribution** 



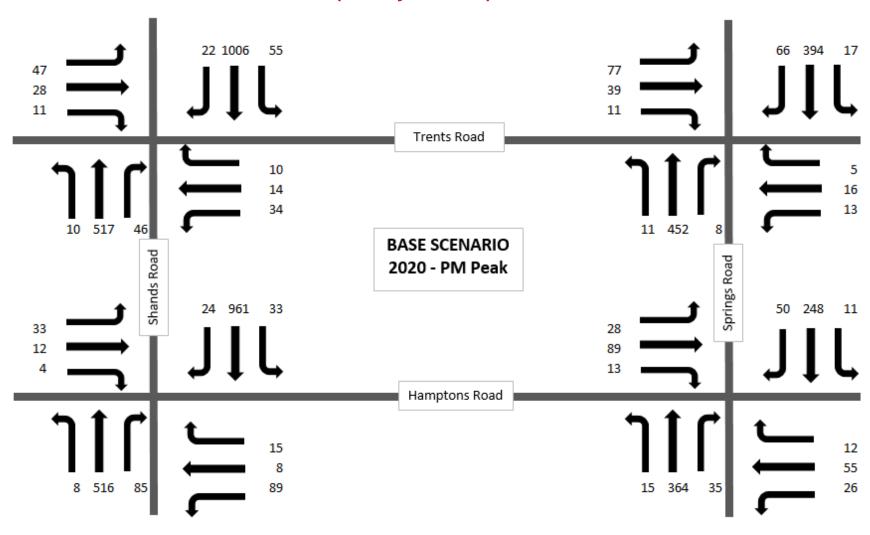


## **B1.1** Base Scenario 2020 – AM Peak (Survey Results)



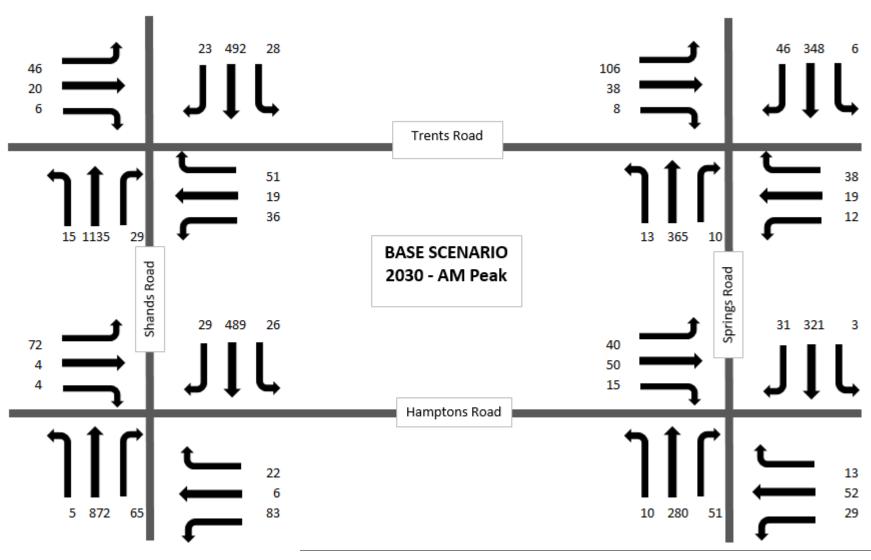


## **B1.2** Base Scenario 2020 – PM Peak (Survey Results)



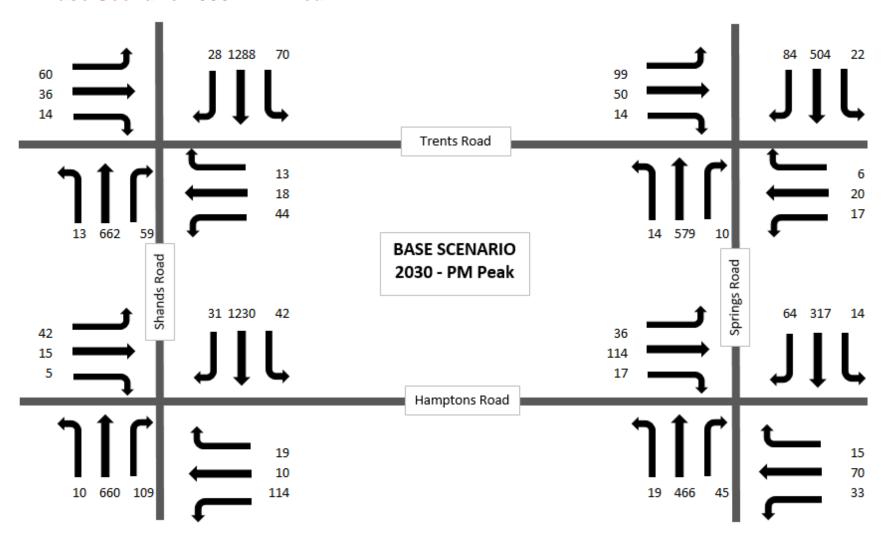


### **B1.3** Base Scenario 2030 – AM Peak



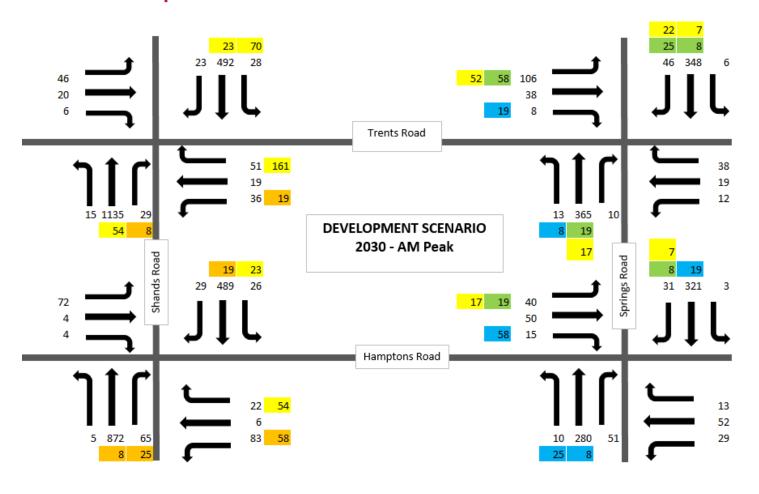


#### B1.4 Base Scenario 2030 – PM Peak





## **B1.5** Development Scenario 2030 – AM Peak

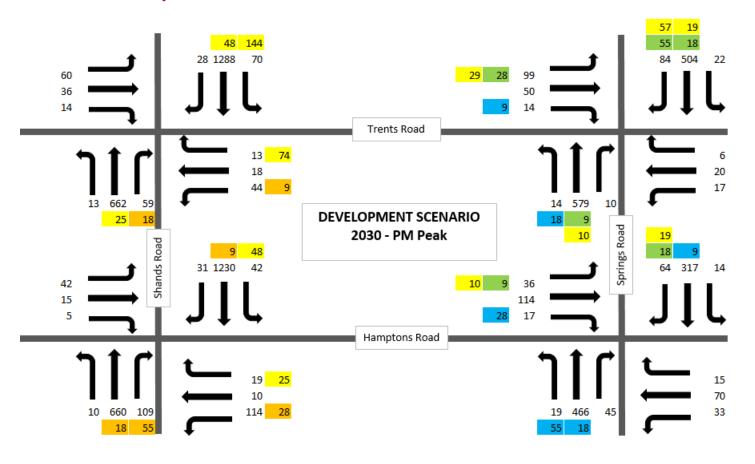


|              | Dwellings               | 820 |
|--------------|-------------------------|-----|
|              | trips/dwelling          | 0.9 |
|              | Total vehicle movements | 738 |
| Prebbleton   | 15%                     | 111 |
| Rolleston    | 15%                     | 111 |
| Lincoln      | 15%                     | 111 |
| Christchurch | 55%                     | 406 |
|              |                         | 738 |
|              |                         |     |
|              | Inbound                 | 30% |
|              | Outbound                | 70% |
|              | Prop Chch use Shands    | 76% |

<sup>\*</sup> The coloured numbers represent the additional development traffic added onto the respective lanes for trip distribution to/from the Site and the four major towns/cities (Prebbleton, Rolleston, Lincoln and Christchurch)



## **B1.6** Development Scenario 2030 – PM Peak



|              | Dwellings               | 820 |
|--------------|-------------------------|-----|
|              | trips/dwelling          | 0.9 |
|              | Total vehicle movements | 738 |
| Prebbleton   | 15%                     | 111 |
| Rolleston    | 15%                     | 111 |
| Lincoln      | 15%                     | 111 |
| Christchurch | 55%                     | 406 |
|              |                         | 738 |
|              |                         |     |
|              | Inbound                 | 66% |
|              | Outbound                | 34% |
|              | Prop Chch use Shands    | 72% |

<sup>\*</sup> The coloured numbers represent the additional development traffic added onto the respective lanes for trip distribution to/from the Site and the four major towns/cities (Prebbleton, Rolleston, Lincoln and Christchurch)



# **APPENDIX C SIDRA Movement Summary**



#### **USER REPORT FOR SITE**

#### **All Movement Classes**

Project: Prebbleton PC Models

**Template: Movement Summary** Report

Site: 101 [Shands Road / Trents Road AM Peak (Site Folder: Existing 2020)]

New Site

Site Category: (None) Stop (Two-Way)

| Vehicle Movement Performance |        |                |             |                 |           |       |       |          |              |                      |      |              |               |       |
|------------------------------|--------|----------------|-------------|-----------------|-----------|-------|-------|----------|--------------|----------------------|------|--------------|---------------|-------|
|                              | Turn   | INP            |             | DEM             |           | Deg.  |       | Level of |              | 95% BACK OF<br>QUEUE |      | Effective    | Aver.         | Aver. |
| ID                           |        | VOLL<br>[Total | JMES<br>HV] | FLO'<br>[ Total | WS<br>HV1 | Satn  | Delay | Service  | QUI<br>[Veh. | =UE<br>Dist ]        | Que  | Stop<br>Rate | No.<br>Cycles | Speed |
|                              |        | veh/h          | %           | veh/h           | %         | v/c   | sec   |          | veh          | m m                  |      | rate         | Cycles        | km/h  |
| Sout                         | hEast: | Trents R       | oad E       |                 |           |       |       |          |              |                      |      |              |               |       |
| 4                            | L2     | 28             | 6.0         | 29              | 6.0       | 0.042 | 11.8  | LOS B    | 0.1          | 1.1                  | 0.46 | 0.91         | 0.46          | 66.2  |
| 5                            | T1     | 15             | 6.0         | 16              | 6.0       | 0.534 | 54.2  | LOS F    | 1.8          | 13.4                 | 0.95 | 1.06         | 1.27          | 48.7  |
| 6                            | R2     | 40             | 6.0         | 42              | 6.0       | 0.534 | 57.2  | LOS F    | 1.8          | 13.4                 | 0.95 | 1.06         | 1.27          | 48.6  |
| Appr                         | oach   | 83             | 6.0         | 87              | 6.0       | 0.534 | 41.3  | LOS E    | 1.8          | 13.4                 | 0.79 | 1.01         | 1.00          | 52.9  |
| North                        | nEast: | Shands F       | Road N      |                 |           |       |       |          |              |                      |      |              |               |       |
| 7                            | L2     | 22             | 6.0         | 23              | 6.0       | 0.230 | 7.1   | LOSA     | 0.0          | 0.0                  | 0.00 | 0.04         | 0.00          | 76.1  |
| 8                            | T1     | 384            | 6.0         | 404             | 6.0       | 0.230 | 0.1   | LOSA     | 0.0          | 0.0                  | 0.00 | 0.04         | 0.00          | 79.5  |
| 9                            | R2     | 18             | 6.0         | 19              | 6.0       | 0.041 | 13.9  | LOS B    | 0.1          | 1.1                  | 0.74 | 0.90         | 0.74          | 66.7  |
| Appr                         | oach   | 424            | 6.0         | 446             | 6.0       | 0.230 | 1.0   | NA       | 0.1          | 1.1                  | 0.03 | 0.07         | 0.03          | 78.5  |
| North                        | nWest: | Trents R       | oad W       |                 |           |       |       |          |              |                      |      |              |               |       |
| 10                           | L2     | 36             | 6.0         | 38              | 6.0       | 0.161 | 23.2  | LOS C    | 0.5          | 3.6                  | 0.82 | 1.00         | 0.83          | 62.6  |
| 11                           | T1     | 16             | 6.0         | 17              | 6.0       | 0.195 | 40.6  | LOS E    | 0.6          | 4.2                  | 0.92 | 1.01         | 0.96          | 54.2  |
| 12                           | R2     | 5              | 6.0         | 5               | 6.0       | 0.195 | 42.7  | LOS E    | 0.6          | 4.2                  | 0.92 | 1.01         | 0.96          | 50.6  |
| Appr                         | oach   | 57             | 6.0         | 60              | 6.0       | 0.195 | 29.8  | LOS D    | 0.6          | 4.2                  | 0.86 | 1.00         | 0.88          | 58.9  |
| Sout                         | hWest  | Shands         | Road S      |                 |           |       |       |          |              |                      |      |              |               |       |
| 1                            | L2     | 12             | 6.0         | 13              | 6.0       | 0.505 | 7.2   | LOSA     | 0.0          | 0.0                  | 0.00 | 0.01         | 0.00          | 75.5  |
| 2                            | T1     | 887            | 6.0         | 934             | 6.0       | 0.505 | 0.2   | LOSA     | 0.0          | 0.0                  | 0.00 | 0.01         | 0.00          | 79.4  |
| 3                            | R2     | 23             | 6.0         | 24              | 6.0       | 0.022 | 8.6   | LOSA     | 0.1          | 0.7                  | 0.47 | 0.65         | 0.47          | 68.5  |
| Appr                         | oach   | 922            | 6.0         | 971             | 6.0       | 0.505 | 0.5   | NA       | 0.1          | 0.7                  | 0.01 | 0.02         | 0.01          | 79.0  |
| All<br>Vehic                 | cles   | 1486           | 6.0         | 1564            | 6.0       | 0.534 | 4.1   | NA       | 1.8          | 13.4                 | 0.09 | 0.13         | 0.11          | 75.5  |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

#### 🧓 Site: 101 [Shands Road / Trents Road PM Peak (Site Folder: Existing 2020)]

New Site Site Category: (None) Stop (Two-Way)

| Vehicle Movement Performance |        |                                 |        |                                  |     |                     |       |                     |      |                              |                |                           |                        |                        |
|------------------------------|--------|---------------------------------|--------|----------------------------------|-----|---------------------|-------|---------------------|------|------------------------------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID                    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |        | DEMA<br>FLO\<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |       | Level of<br>Service |      | ACK OF<br>EUE<br>Dist ]<br>m | Prop. E<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| SouthEast: Trents Road E     |        |                                 |        |                                  |     | ****                |       |                     | 7011 |                              |                |                           |                        | 1311//11               |
| 4                            | L2     | 34                              | 6.0    | 36                               | 6.0 | 0.223               | 31.9  | LOS D               | 0.7  | 5.0                          | 0.89           | 1.01                      | 0.96                   | 54.9                   |
| 5                            | T1     | 14                              | 6.0    | 15                               | 6.0 | 0.527               | 107.5 | LOS F               | 1.5  | 11.3                         | 0.98           | 1.04                      | 1.19                   | 35.1                   |
| 6                            | R2     | 10                              | 6.0    | 11                               | 6.0 | 0.527               | 122.9 | LOS F               | 1.5  | 11.3                         | 0.98           | 1.04                      | 1.19                   | 35.1                   |
| Appr                         | oach   | 58                              | 6.0    | 61                               | 6.0 | 0.527               | 65.9  | LOS F               | 1.5  | 11.3                         | 0.93           | 1.02                      | 1.05                   | 43.7                   |
| North                        | nEast: | Shands R                        | oad N  |                                  |     |                     |       |                     |      |                              |                |                           |                        |                        |
| 7                            | L2     | 55                              | 6.0    | 58                               | 6.0 | 0.597               | 7.4   | LOSA                | 0.0  | 0.0                          | 0.00           | 0.03                      | 0.00                   | 75.6                   |
| 8                            | T1     | 1006                            | 6.0    | 1059                             | 6.0 | 0.597               | 0.4   | LOSA                | 0.0  | 0.0                          | 0.00           | 0.03                      | 0.00                   | 78.9                   |
| 9                            | R2     | 22                              | 6.0    | 23                               | 6.0 | 0.025               | 9.4   | LOSA                | 0.1  | 0.7                          | 0.53           | 0.70                      | 0.53                   | 69.6                   |
| Appr                         | oach   | 1083                            | 6.0    | 1140                             | 6.0 | 0.597               | 1.0   | NA                  | 0.1  | 0.7                          | 0.01           | 0.05                      | 0.01                   | 78.5                   |
| North                        | nWest: | Trents Ro                       | oad W  |                                  |     |                     |       |                     |      |                              |                |                           |                        |                        |
| 10                           | L2     | 47                              | 6.0    | 49                               | 6.0 | 0.088               | 13.5  | LOS B               | 0.3  | 2.2                          | 0.55           | 0.98                      | 0.55                   | 67.9                   |
| 11                           | T1     | 28                              | 6.0    | 29                               | 6.0 | 0.838               | 174.2 | LOS F               | 3.0  | 22.3                         | 0.99           | 1.12                      | 1.68                   | 27.3                   |
| 12                           | R2     | 11                              | 6.0    | 12                               | 6.0 | 0.838               | 170.9 | LOS F               | 3.0  | 22.3                         | 0.99           | 1.12                      | 1.68                   | 24.3                   |
| Appr                         | oach   | 86                              | 6.0    | 91                               | 6.0 | 0.838               | 86.0  | LOS F               | 3.0  | 22.3                         | 0.75           | 1.05                      | 1.06                   | 40.1                   |
| South                        | hWest  | : Shands I                      | Road S |                                  |     |                     |       |                     |      |                              |                |                           |                        |                        |
| 1                            | L2     | 10                              | 6.0    | 11                               | 6.0 | 0.298               | 7.1   | LOSA                | 0.0  | 0.0                          | 0.00           | 0.01                      | 0.00                   | 75.7                   |
| 2                            | T1     | 517                             | 6.0    | 544                              | 6.0 | 0.298               | 0.1   | LOSA                | 0.0  | 0.0                          | 0.00           | 0.01                      | 0.00                   | 79.7                   |
| 3                            | R2     | 46                              | 6.0    | 48                               | 6.0 | 0.160               | 18.9  | LOS C               | 0.5  | 3.9                          | 0.85           | 0.95                      | 0.85                   | 61.5                   |
| Appr                         | oach   | 573                             | 6.0    | 603                              | 6.0 | 0.298               | 1.7   | NA                  | 0.5  | 3.9                          | 0.07           | 0.09                      | 0.07                   | 77.7                   |
| All<br>Vehic                 | cles   | 1800                            | 6.0    | 1895                             | 6.0 | 0.838               | 7.4   | NA                  | 3.0  | 22.3                         | 0.09           | 0.14                      | 0.11                   | 72.5                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

#### 🧓 Site: 101 [Shands Road / Hamptons Road AM Peak (Site Folder: Existing 2020)]

New Site Site Category: (None) Stop (Two-Way)

| Vehicle Movement Performance |        |                                 |        |                                  |     |                     |      |                     |                                |      |                |                           |                        |                        |
|------------------------------|--------|---------------------------------|--------|----------------------------------|-----|---------------------|------|---------------------|--------------------------------|------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID                    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |        | DEM/<br>FLO'<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service | 95% BA<br>QUE<br>[ Veh.<br>veh |      | Prop. E<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| SouthEast: Hamptons Road E   |        |                                 |        |                                  |     | V/C                 | 300  |                     | VCII                           | - '' |                |                           |                        | KIII/II                |
| 4                            | L2     | 65                              | 6.0    | 68                               | 6.0 | 0.097               | 11.9 | LOS B               | 0.3                            | 2.5  | 0.47           | 0.94                      | 0.47                   | 71.9                   |
| 5                            | T1     | 5                               | 6.0    | 5                                | 6.0 | 0.131               | 26.4 | LOS D               | 0.4                            | 2.9  | 0.86           | 1.00                      | 0.86                   | 63.6                   |
| 6                            | R2     | 17                              | 6.0    | 18                               | 6.0 | 0.131               | 28.8 | LOS D               | 0.4                            | 2.9  | 0.86           | 1.00                      | 0.86                   | 61.2                   |
| Appr                         | oach   | 87                              | 6.0    | 92                               | 6.0 | 0.131               | 16.0 | LOS C               | 0.4                            | 2.9  | 0.57           | 0.95                      | 0.57                   | 69.5                   |
| North                        | nEast: | Shands R                        | Road N |                                  |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 7                            | L2     | 20                              | 6.0    | 21                               | 6.0 | 0.228               | 7.1  | LOSA                | 0.0                            | 0.0  | 0.00           | 0.03                      | 0.00                   | 76.6                   |
| 8                            | T1     | 382                             | 6.0    | 402                              | 6.0 | 0.228               | 0.1  | LOSA                | 0.0                            | 0.0  | 0.00           | 0.03                      | 0.00                   | 79.5                   |
| 9                            | R2     | 23                              | 6.0    | 24                               | 6.0 | 0.033               | 10.8 | LOS B               | 0.1                            | 0.9  | 0.60           | 0.77                      | 0.60                   | 67.0                   |
| Appr                         | oach   | 425                             | 6.0    | 447                              | 6.0 | 0.228               | 1.0  | NA                  | 0.1                            | 0.9  | 0.03           | 0.07                      | 0.03                   | 78.7                   |
| North                        | nWest: | Hampton                         | s Road | W                                |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 10                           | L2     | 56                              | 6.0    | 59                               | 6.0 | 0.147               | 16.6 | LOS C               | 0.5                            | 3.6  | 0.69           | 1.00                      | 0.69                   | 63.2                   |
| 11                           | T1     | 3                               | 6.0    | 3                                | 6.0 | 0.035               | 25.9 | LOS D               | 0.1                            | 0.8  | 0.85           | 1.00                      | 0.85                   | 64.1                   |
| 12                           | R2     | 3                               | 6.0    | 3                                | 6.0 | 0.035               | 28.0 | LOS D               | 0.1                            | 8.0  | 0.85           | 1.00                      | 0.85                   | 62.5                   |
| Appr                         | oach   | 62                              | 6.0    | 65                               | 6.0 | 0.147               | 17.6 | LOS C               | 0.5                            | 3.6  | 0.71           | 1.00                      | 0.71                   | 63.3                   |
| South                        | hWest  | : Shands I                      | Road S |                                  |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 1                            | L2     | 4                               | 6.0    | 4                                | 6.0 | 0.384               | 7.3  | LOSA                | 0.0                            | 0.0  | 0.00           | 0.00                      | 0.00                   | 76.7                   |
| 2                            | T1     | 681                             | 6.0    | 717                              | 6.0 | 0.384               | 0.2  | LOSA                | 0.0                            | 0.0  | 0.00           | 0.00                      | 0.00                   | 79.7                   |
| 3                            | R2     | 51                              | 6.0    | 54                               | 6.0 | 0.048               | 8.6  | LOSA                | 0.2                            | 1.5  | 0.47           | 0.67                      | 0.47                   | 72.8                   |
| Appr                         | oach   | 736                             | 6.0    | 775                              | 6.0 | 0.384               | 0.9  | NA                  | 0.2                            | 1.5  | 0.03           | 0.05                      | 0.03                   | 78.9                   |
| All<br>Vehic                 | cles   | 1310                            | 6.0    | 1379                             | 6.0 | 0.384               | 2.7  | NA                  | 0.5                            | 3.6  | 0.10           | 0.16                      | 0.10                   | 77.1                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

## 🧓 Site: 101 [Shands Road / Hamptons Road PM Peak (Site Folder: Existing 2020)]

New Site Site Category: (None) Stop (Two-Way)

| Vehi           | cle M          | ovemen                          | t Perfo           | rmance                           |                   |                         |                      |                         |                   |                              |                      |                           |                        |                        |
|----------------|----------------|---------------------------------|-------------------|----------------------------------|-------------------|-------------------------|----------------------|-------------------------|-------------------|------------------------------|----------------------|---------------------------|------------------------|------------------------|
| Mov<br>ID      | Turn           | INP<br>VOLU<br>[ Total<br>veh/h |                   | DEM/<br>FLO'<br>[ Total<br>veh/h |                   | Deg.<br>Satn<br>v/c     |                      | Level of<br>Service     |                   | ACK OF<br>EUE<br>Dist ]<br>m | Prop. I<br>Que       | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South          | hEast:         | Hampton                         | s Road            | E                                |                   |                         |                      |                         |                   |                              |                      |                           |                        |                        |
| 4<br>5         | L2<br>T1       | 89<br>8                         | 6.0<br>6.0        | 94<br>8                          | 6.0<br>6.0        | 0.501<br>0.436          | 34.7<br>86.8         | LOS D<br>LOS F          | 1.8<br>1.3        | 13.6<br>9.3                  | 0.91<br>0.97         | 1.07<br>1.03              | 1.26<br>1.13           | 62.5<br>44.6           |
| 6              | R2             | 15                              | 6.0               | 16                               | 6.0               | 0.436                   | 93.8                 | LOSF                    | 1.3               | 9.3                          | 0.97                 | 1.03                      | 1.13                   | 41.8                   |
| Appr           | oach           | 112                             | 6.0               | 118                              | 6.0               | 0.501                   | 46.4                 | LOS E                   | 1.8               | 13.6                         | 0.93                 | 1.06                      | 1.23                   | 57.9                   |
| North          | nEast:         | Shands R                        | Road N            |                                  |                   |                         |                      |                         |                   |                              |                      |                           |                        |                        |
| 7<br>8         | L2<br>T1       | 33<br>961                       | 6.0               | 35<br>1012                       | 6.0               | 0.564<br>0.564          | 7.3<br>0.3           | LOSA                    | 0.0               | 0.0                          | 0.00                 | 0.02                      | 0.00                   | 76.3<br>79.2           |
| 9<br>Appr      | R2<br>oach     | 24<br>1018                      | 6.0               | 25<br>1072                       | 6.0               | 0.027<br>0.564          | 9.3                  | LOS A<br>NA             | 0.1               | 0.8                          | 0.53                 | 0.70                      | 0.53                   | 68.1<br>78.8           |
| North          | nWest:         | Hampton                         | s Road            | W                                |                   |                         |                      |                         |                   |                              |                      |                           |                        |                        |
| 10<br>11<br>12 | L2<br>T1<br>R2 | 33<br>12<br>4                   | 6.0<br>6.0<br>6.0 | 35<br>13<br>4                    | 6.0<br>6.0<br>6.0 | 0.062<br>0.308<br>0.308 | 13.4<br>79.9<br>91.0 | LOS B<br>LOS F<br>LOS F | 0.2<br>0.9<br>0.9 | 1.5<br>6.3<br>6.3            | 0.54<br>0.97<br>0.97 | 0.96<br>1.02<br>1.02      | 0.54<br>1.06<br>1.06   | 65.2<br>46.5<br>44.1   |
| Appr           | oach           | 49                              | 6.0               | 52                               | 6.0               | 0.308                   | 36.0                 | LOS E                   | 0.9               | 6.3                          | 0.68                 | 0.98                      | 0.71                   | 55.5                   |
| South          | hWest          | : Shands I                      | Road S            |                                  |                   |                         |                      |                         |                   |                              |                      |                           |                        |                        |
| 1              | L2             | 8                               | 6.0               | 8                                | 6.0               | 0.294                   | 7.2                  | LOSA                    | 0.0               | 0.0                          | 0.00                 | 0.01                      | 0.00                   | 76.7                   |
| 2              | T1             | 516                             | 6.0               | 543                              | 6.0               | 0.294                   | 0.2                  | LOSA                    | 0.0               | 0.0                          | 0.00                 | 0.01                      | 0.00                   | 79.7                   |
| 3<br>Appr      | R2<br>oach     | 85<br>609                       | 6.0               | 89<br>641                        | 6.0               | 0.244                   | 17.8<br>2.7          | LOS C<br>NA             | 0.9               | 6.7                          | 0.83                 | 0.96<br>0.14              | 0.92                   | 68.5<br>77.3           |
| All<br>Vehic   | cles           | 1788                            | 6.0               | 1882                             | 6.0               | 0.564                   | 5.2                  | NA                      | 1.8               | 13.6                         | 0.12                 | 0.16                      | 0.15                   | 75.2                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## 🧓 Site: 101 [Springs Road / Hamptons Road AM Peak (Site Folder: Existing 2020)]

New Site Site Category: (None) Stop (Two-Way)

| Vehi         | cle M  | ovemen                          | t Perfo | rmance                           |     |                     |      |                     |      |                              |                |                           |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|------|------------------------------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEM/<br>FLO'<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service |      | ACK OF<br>EUE<br>Dist ]<br>m | Prop. E<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Hampton                         |         |                                  | /0  | V/C                 | 366  |                     | Veil | - '''                        |                |                           |                        | KIII/II                |
| 4            | L2     | 23                              | 6.0     | 24                               | 6.0 | 0.028               | 9.7  | LOSA                | 0.1  | 0.7                          | 0.36           | 0.88                      | 0.36                   | 57.0                   |
| 5            | T1     | 41                              | 6.0     | 43                               | 6.0 | 0.093               | 12.0 | LOS B               | 0.3  | 2.4                          | 0.54           | 0.98                      | 0.54                   | 55.4                   |
| 6            | R2     | 10                              | 6.0     | 11                               | 6.0 | 0.093               | 12.8 | LOS B               | 0.3  | 2.4                          | 0.54           | 0.98                      | 0.54                   | 53.2                   |
| Appr         | oach   | 74                              | 6.0     | 78                               | 6.0 | 0.093               | 11.4 | LOS B               | 0.3  | 2.4                          | 0.49           | 0.94                      | 0.49                   | 55.8                   |
| North        | nEast: | Springs F                       | Road N  |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 7            | L2     | 2                               | 6.0     | 2                                | 6.0 | 0.142               | 5.7  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.00                      | 0.00                   | 58.8                   |
| 8            | T1     | 251                             | 6.0     | 264                              | 6.0 | 0.142               | 0.0  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.00                      | 0.00                   | 59.9                   |
| 9            | R2     | 24                              | 6.0     | 25                               | 6.0 | 0.018               | 6.4  | LOSA                | 0.1  | 0.6                          | 0.34           | 0.56                      | 0.34                   | 56.3                   |
| Appr         | oach   | 277                             | 6.0     | 292                              | 6.0 | 0.142               | 0.6  | NA                  | 0.1  | 0.6                          | 0.03           | 0.05                      | 0.03                   | 59.7                   |
| North        | nWest: | Hamptor                         | ns Road | W                                |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 10           | L2     | 31                              | 6.0     | 33                               | 6.0 | 0.036               | 9.5  | LOSA                | 0.1  | 0.9                          | 0.34           | 0.88                      | 0.34                   | 55.7                   |
| 11           | T1     | 39                              | 6.0     | 41                               | 6.0 | 0.093               | 12.0 | LOS B               | 0.3  | 2.4                          | 0.54           | 0.98                      | 0.54                   | 55.4                   |
| 12           | R2     | 12                              | 6.0     | 13                               | 6.0 | 0.093               | 12.8 | LOS B               | 0.3  | 2.4                          | 0.54           | 0.98                      | 0.54                   | 56.9                   |
| Appr         | oach   | 82                              | 6.0     | 86                               | 6.0 | 0.093               | 11.2 | LOS B               | 0.3  | 2.4                          | 0.47           | 0.94                      | 0.47                   | 55.8                   |
| South        | hWest  | : Springs                       | Road S  |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 1            | L2     | 8                               | 6.0     | 8                                | 6.0 | 0.128               | 5.8  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.02                      | 0.00                   | 59.4                   |
| 2            | T1     | 219                             | 6.0     | 231                              | 6.0 | 0.128               | 0.2  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.02                      | 0.00                   | 59.9                   |
| 3            | R2     | 40                              | 6.0     | 42                               | 6.0 | 0.031               | 6.5  | LOSA                | 0.1  | 1.0                          | 0.36           | 0.58                      | 0.36                   | 57.4                   |
| Appr         | oach   | 267                             | 6.0     | 281                              | 6.0 | 0.128               | 1.3  | NA                  | 0.1  | 1.0                          | 0.05           | 0.10                      | 0.05                   | 59.4                   |
| All<br>Vehic | cles   | 700                             | 6.0     | 737                              | 6.0 | 0.142               | 3.3  | NA                  | 0.3  | 2.4                          | 0.14           | 0.27                      | 0.14                   | 58.8                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## 🧓 Site: 101 [Springs Road / Hamptons Road PM Peak (Site Folder: Existing 2020)]

New Site Site Category: (None) Stop (Two-Way)

| Vehi         | cle M  | ovemen                          | t Perfo | rmance                           |     |                     |      |                     |      |                              |                |                           |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|------|------------------------------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEMA<br>FLO\<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service |      | ACK OF<br>EUE<br>Dist ]<br>m | Prop. E<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Hampton                         |         |                                  | /0  | V/C                 | 366  |                     | Veri | - '''                        |                |                           |                        | KIII/II                |
| 4            | L2     | 26                              | 6.0     | 27                               | 6.0 | 0.032               | 9.7  | LOSA                | 0.1  | 0.8                          | 0.36           | 0.88                      | 0.36                   | 57.0                   |
| 5            | T1     | 55                              | 6.0     | 58                               | 6.0 | 0.162               | 14.6 | LOS B               | 0.6  | 4.1                          | 0.67           | 1.01                      | 0.67                   | 54.6                   |
| 6            | R2     | 12                              | 6.0     | 13                               | 6.0 | 0.162               | 16.3 | LOS C               | 0.6  | 4.1                          | 0.67           | 1.01                      | 0.67                   | 52.1                   |
| Appr         | oach   | 93                              | 6.0     | 98                               | 6.0 | 0.162               | 13.5 | LOS B               | 0.6  | 4.1                          | 0.58           | 0.97                      | 0.58                   | 55.2                   |
| North        | nEast: | Springs F                       | Road N  |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 7            | L2     | 11                              | 6.0     | 12                               | 6.0 | 0.146               | 5.7  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.03                      | 0.00                   | 58.6                   |
| 8            | T1     | 248                             | 6.0     | 261                              | 6.0 | 0.146               | 0.1  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.03                      | 0.00                   | 59.9                   |
| 9            | R2     | 50                              | 6.0     | 53                               | 6.0 | 0.046               | 7.1  | LOSA                | 0.2  | 1.4                          | 0.46           | 0.63                      | 0.46                   | 56.1                   |
| Appr         | oach   | 309                             | 6.0     | 325                              | 6.0 | 0.146               | 1.4  | NA                  | 0.2  | 1.4                          | 0.07           | 0.12                      | 0.07                   | 59.3                   |
| North        | nWest: | Hampton                         | s Road  | W                                |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 10           | L2     | 28                              | 6.0     | 29                               | 6.0 | 0.041               | 10.7 | LOS B               | 0.1  | 1.0                          | 0.45           | 0.90                      | 0.45                   | 55.4                   |
| 11           | T1     | 89                              | 6.0     | 94                               | 6.0 | 0.243               | 15.2 | LOS C               | 0.9  | 6.8                          | 0.68           | 1.02                      | 0.75                   | 54.5                   |
| 12           | R2     | 13                              | 6.0     | 14                               | 6.0 | 0.243               | 16.5 | LOS C               | 0.9  | 6.8                          | 0.68           | 1.02                      | 0.75                   | 56.3                   |
| Appr         | oach   | 130                             | 6.0     | 137                              | 6.0 | 0.243               | 14.4 | LOS B               | 0.9  | 6.8                          | 0.63           | 1.00                      | 0.68                   | 54.9                   |
| South        | hWest  | : Springs                       | Road S  |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 1            | L2     | 15                              | 6.0     | 16                               | 6.0 | 0.213               | 5.9  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.02                      | 0.00                   | 59.3                   |
| 2            | T1     | 364                             | 6.0     | 383                              | 6.0 | 0.213               | 0.3  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.02                      | 0.00                   | 59.8                   |
| 3            | R2     | 35                              | 6.0     | 37                               | 6.0 | 0.028               | 6.5  | LOSA                | 0.1  | 0.9                          | 0.37           | 0.58                      | 0.37                   | 57.4                   |
| Appr         | oach   | 414                             | 6.0     | 436                              | 6.0 | 0.213               | 1.0  | NA                  | 0.1  | 0.9                          | 0.03           | 0.07                      | 0.03                   | 59.6                   |
| All<br>Vehic | cles   | 946                             | 6.0     | 996                              | 6.0 | 0.243               | 4.2  | NA                  | 0.9  | 6.8                          | 0.18           | 0.30                      | 0.19                   | 58.5                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## Site: 101 [Springs Road / Trents Road AM Peak (Site Folder: Existing 2020)]

New Site Site Category: (None) Stop (Two-Way)

| Vehi         | cle M  | ovemen                 | t Perfo    | rmance                  |           |              |       |                     |               |                         |                |                           |                        |                |
|--------------|--------|------------------------|------------|-------------------------|-----------|--------------|-------|---------------------|---------------|-------------------------|----------------|---------------------------|------------------------|----------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total | MES<br>HV] | DEM/<br>FLO'<br>[ Total | WS<br>HV] | Deg.<br>Satn | Delay | Level of<br>Service | QUI<br>[ Veh. | ACK OF<br>EUE<br>Dist ] | Prop. I<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed |
| Sout         | hEast: | veh/h Trents Ro        | %          | veh/h                   | %         | v/c          | sec   |                     | veh           | m                       |                |                           |                        | km/h           |
|              |        |                        |            |                         |           | 0.044        |       |                     |               |                         | 0.00           |                           | 2.22                   | 10.0           |
| 4            | L2     | 9                      | 6.0        | 9                       | 6.0       | 0.011        | 9.2   | LOSA                | 0.0           | 0.3                     | 0.38           | 0.86                      | 0.38                   | 43.9           |
| 5            | T1     | 15                     | 6.0        | 16                      | 6.0       | 0.099        | 12.3  | LOS B               | 0.3           | 2.5                     | 0.61           | 1.00                      | 0.61                   | 45.5           |
| 6            | R2     | 30                     | 6.0        | 32                      | 6.0       | 0.099        | 13.6  | LOS B               | 0.3           | 2.5                     | 0.61           | 1.00                      | 0.61                   | 43.6           |
| Appr         | oach   | 54                     | 6.0        | 57                      | 6.0       | 0.099        | 12.5  | LOS B               | 0.3           | 2.5                     | 0.57           | 0.98                      | 0.57                   | 44.3           |
| North        | nEast: | Springs R              | Road N     |                         |           |              |       |                     |               |                         |                |                           |                        |                |
| 7            | L2     | 5                      | 6.0        | 5                       | 6.0       | 0.156        | 4.7   | LOSA                | 0.0           | 0.0                     | 0.00           | 0.01                      | 0.00                   | 49.4           |
| 8            | T1     | 272                    | 6.0        | 286                     | 6.0       | 0.156        | 0.1   | LOSA                | 0.0           | 0.0                     | 0.00           | 0.01                      | 0.00                   | 49.9           |
| 9            | R2     | 36                     | 6.0        | 38                      | 6.0       | 0.030        | 5.7   | LOS A               | 0.1           | 0.9                     | 0.40           | 0.56                      | 0.40                   | 48.1           |
| Appr         | oach   | 313                    | 6.0        | 329                     | 6.0       | 0.156        | 8.0   | NA                  | 0.1           | 0.9                     | 0.05           | 0.07                      | 0.05                   | 49.6           |
| North        | nWest: | Trents Ro              | oad W      |                         |           |              |       |                     |               |                         |                |                           |                        |                |
| 10           | L2     | 83                     | 6.0        | 87                      | 6.0       | 0.107        | 9.6   | LOSA                | 0.4           | 2.9                     | 0.41           | 0.91                      | 0.41                   | 47.6           |
| 11           | T1     | 30                     | 6.0        | 32                      | 6.0       | 0.071        | 12.2  | LOS B               | 0.2           | 1.8                     | 0.56           | 0.98                      | 0.56                   | 45.8           |
| 12           | R2     | 6                      | 6.0        | 6                       | 6.0       | 0.071        | 12.1  | LOS B               | 0.2           | 1.8                     | 0.56           | 0.98                      | 0.56                   | 46.5           |
| Appr         | oach   | 119                    | 6.0        | 125                     | 6.0       | 0.107        | 10.3  | LOS B               | 0.4           | 2.9                     | 0.46           | 0.93                      | 0.46                   | 47.2           |
| Sout         | hWest  | : Springs I            | Road S     |                         |           |              |       |                     |               |                         |                |                           |                        |                |
| 1            | L2     | 10                     | 6.0        | 11                      | 6.0       | 0.172        | 5.3   | LOSA                | 0.1           | 0.7                     | 0.04           | 0.03                      | 0.04                   | 49.6           |
| 2            | T1     | 285                    | 6.0        | 300                     | 6.0       | 0.172        | 0.1   | LOSA                | 0.1           | 0.7                     | 0.04           | 0.03                      | 0.04                   | 49.8           |
| 3            |        |                        |            |                         |           |              |       |                     |               |                         |                |                           |                        |                |
| -            | R2     | 8                      | 6.0        | 8                       | 6.0       | 0.172        | 5.9   | LOSA                | 0.1           | 0.7                     | 0.04           | 0.03                      | 0.04                   | 48.8           |
| Appr         | oacn   | 303                    | 6.0        | 319                     | 6.0       | 0.172        | 0.4   | NA                  | 0.1           | 0.7                     | 0.04           | 0.03                      | 0.04                   | 49.8           |
| All<br>Vehic | cles   | 789                    | 6.0        | 831                     | 6.0       | 0.172        | 2.9   | NA                  | 0.4           | 2.9                     | 0.14           | 0.25                      | 0.14                   | 48.9           |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## Site: 101 [Springs Road / Trents Road PM Peak (Site Folder: Existing 2020)]

Site Category: (None) Stop (Two-Way)

| Vehi         | cle M  | ovement                         | t Perfo | rmance                           |     |                     |      |                     |     |                              |                |                           |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|-----|------------------------------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEMA<br>FLO\<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service |     | ACK OF<br>EUE<br>Dist ]<br>m | Prop. E<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Trents Ro                       |         | VEII/II                          | /0  | V/C                 | 366  |                     | Ven | - '''                        |                |                           |                        | KIII/II                |
| 4            | L2     | 13                              | 6.0     | 14                               | 6.0 | 0.020               | 10.3 | LOS B               | 0.1 | 0.5                          | 0.46           | 0.89                      | 0.46                   | 43.4                   |
| 5            | T1     | 16                              | 6.0     | 17                               | 6.0 | 0.074               | 17.5 | LOS C               | 0.2 | 1.8                          | 0.76           | 1.00                      | 0.76                   | 44.1                   |
| 6            | R2     | 5                               | 6.0     | 5                                | 6.0 | 0.074               | 20.1 | LOS C               | 0.2 | 1.8                          | 0.76           | 1.00                      | 0.76                   | 41.6                   |
| Appr         | oach   | 34                              | 6.0     | 36                               | 6.0 | 0.074               | 15.1 | LOS C               | 0.2 | 1.8                          | 0.65           | 0.96                      | 0.65                   | 43.6                   |
| North        | nEast: | Springs R                       | Road N  |                                  |     |                     |      |                     |     |                              |                |                           |                        |                        |
| 7            | L2     | 17                              | 6.0     | 18                               | 6.0 | 0.232               | 4.8  | LOSA                | 0.0 | 0.0                          | 0.00           | 0.02                      | 0.00                   | 49.3                   |
| 8            | T1     | 394                             | 6.0     | 415                              | 6.0 | 0.232               | 0.2  | LOSA                | 0.0 | 0.0                          | 0.00           | 0.02                      | 0.00                   | 49.8                   |
| 9            | R2     | 66                              | 6.0     | 69                               | 6.0 | 0.067               | 6.7  | LOSA                | 0.3 | 2.1                          | 0.51           | 0.66                      | 0.51                   | 48.0                   |
| Appr         | oach   | 477                             | 6.0     | 502                              | 6.0 | 0.232               | 1.2  | NA                  | 0.3 | 2.1                          | 0.07           | 0.11                      | 0.07                   | 49.4                   |
| North        | nWest: | Trents Ro                       | oad W   |                                  |     |                     |      |                     |     |                              |                |                           |                        |                        |
| 10           | L2     | 77                              | 6.0     | 81                               | 6.0 | 0.129               | 11.3 | LOS B               | 0.5 | 3.3                          | 0.52           | 0.98                      | 0.52                   | 47.3                   |
| 11           | T1     | 39                              | 6.0     | 41                               | 6.0 | 0.171               | 18.1 | LOS C               | 0.6 | 4.1                          | 0.77           | 1.00                      | 0.77                   | 44.1                   |
| 12           | R2     | 11                              | 6.0     | 12                               | 6.0 | 0.171               | 18.1 | LOS C               | 0.6 | 4.1                          | 0.77           | 1.00                      | 0.77                   | 45.1                   |
| Appr         | oach   | 127                             | 6.0     | 134                              | 6.0 | 0.171               | 14.0 | LOS B               | 0.6 | 4.1                          | 0.62           | 0.99                      | 0.62                   | 46.3                   |
| South        | hWest  | : Springs I                     | Road S  |                                  |     |                     |      |                     |     |                              |                |                           |                        |                        |
| 1            | L2     | 11                              | 6.0     | 12                               | 6.0 | 0.268               | 5.9  | LOSA                | 0.1 | 1.0                          | 0.03           | 0.02                      | 0.03                   | 49.6                   |
| 2            | T1     | 452                             | 6.0     | 476                              | 6.0 | 0.268               | 0.1  | LOSA                | 0.1 | 1.0                          | 0.03           | 0.02                      | 0.03                   | 49.9                   |
| 3            | R2     | 8                               | 6.0     | 8                                | 6.0 | 0.268               | 7.1  | LOSA                | 0.1 | 1.0                          | 0.03           | 0.02                      | 0.03                   | 48.9                   |
| Appr         | oach   | 471                             | 6.0     | 496                              | 6.0 | 0.268               | 0.3  | NA                  | 0.1 | 1.0                          | 0.03           | 0.02                      | 0.03                   | 49.8                   |
| All<br>Vehic | cles   | 1109                            | 6.0     | 1167                             | 6.0 | 0.268               | 2.7  | NA                  | 0.6 | 4.1                          | 0.14           | 0.20                      | 0.14                   | 49.0                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: J:\Urban Estates Ltd (UEL)\UEL-J001 West Prebbleton Private Plan Change\DocCalcs\SIDRA Modelling\Prebbleton PC Models.sip9

## **USER REPORT FOR SITE**

### **All Movement Classes**

Project: Prebbleton PC Models

**Template: Movement Summary** Report

▼ Site: 101v [Shands Road / Trents Road AM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                          | t Perfo | rmance                           |     |                     |      |                     |                                |      |                |                          |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|--------------------------------|------|----------------|--------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEM/<br>FLO¹<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service | 95% BA<br>QUE<br>[ Veh.<br>veh |      | Prop. E<br>Que | ffective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Trents Ro                       | oad E   |                                  |     |                     |      |                     |                                |      |                |                          |                        |                        |
| 4            | L2     | 36                              | 6.0     | 38                               | 6.0 | 0.127               | 7.5  | LOSA                | 0.5                            | 3.8  | 0.49           | 0.74                     | 0.49                   | 68.5                   |
| 5            | T1     | 19                              | 6.0     | 20                               | 6.0 | 0.127               | 7.9  | LOSA                | 0.5                            | 3.8  | 0.49           | 0.74                     | 0.49                   | 71.2                   |
| 6            | R2     | 51                              | 6.0     | 54                               | 6.0 | 0.127               | 14.0 | LOS B               | 0.5                            | 3.8  | 0.49           | 0.74                     | 0.49                   | 70.9                   |
| Appr         | oach   | 106                             | 6.0     | 112                              | 6.0 | 0.127               | 10.7 | LOS B               | 0.5                            | 3.8  | 0.49           | 0.74                     | 0.49                   | 70.2                   |
| North        | nEast: | Shands F                        | Road N  |                                  |     |                     |      |                     |                                |      |                |                          |                        |                        |
| 7            | L2     | 28                              | 6.0     | 29                               | 6.0 | 0.134               | 5.9  | LOSA                | 0.7                            | 5.4  | 0.21           | 0.46                     | 0.21                   | 72.4                   |
| 8            | T1     | 492                             | 6.0     | 518                              | 6.0 | 0.237               | 6.1  | LOSA                | 1.5                            | 10.8 | 0.20           | 0.47                     | 0.20                   | 72.7                   |
| 9            | R2     | 23                              | 6.0     | 24                               | 6.0 | 0.237               | 12.0 | LOS B               | 1.5                            | 10.8 | 0.20           | 0.47                     | 0.20                   | 73.2                   |
| Appr         | oach   | 543                             | 6.0     | 572                              | 6.0 | 0.237               | 6.4  | LOSA                | 1.5                            | 10.8 | 0.20           | 0.47                     | 0.20                   | 72.7                   |
| North        | nWest: | Trents R                        | oad W   |                                  |     |                     |      |                     |                                |      |                |                          |                        |                        |
| 10           | L2     | 46                              | 6.0     | 48                               | 6.0 | 0.132               | 11.4 | LOS B               | 0.6                            | 4.5  | 0.71           | 0.87                     | 0.71                   | 69.6                   |
| 11           | T1     | 20                              | 6.0     | 21                               | 6.0 | 0.132               | 11.1 | LOS B               | 0.6                            | 4.5  | 0.71           | 0.87                     | 0.71                   | 70.9                   |
| 12           | R2     | 6                               | 6.0     | 6                                | 6.0 | 0.132               | 17.0 | LOS B               | 0.6                            | 4.5  | 0.71           | 0.87                     | 0.71                   | 68.0                   |
| Appr         | oach   | 72                              | 6.0     | 76                               | 6.0 | 0.132               | 11.8 | LOS B               | 0.6                            | 4.5  | 0.71           | 0.87                     | 0.71                   | 69.8                   |
| South        | hWest  | : Shands                        | Road S  |                                  |     |                     |      |                     |                                |      |                |                          |                        |                        |
| 1            | L2     | 15                              | 6.0     | 16                               | 6.0 | 0.300               | 6.2  | LOSA                | 1.9                            | 14.3 | 0.32           | 0.48                     | 0.32                   | 70.6                   |
| 2            | T1     | 1135                            | 6.0     | 1195                             | 6.0 | 0.530               | 6.8  | LOSA                | 4.7                            | 34.3 | 0.36           | 0.49                     | 0.36                   | 71.9                   |
| 3            | R2     | 29                              | 6.0     | 31                               | 6.0 | 0.530               | 12.3 | LOS B               | 4.7                            | 34.3 | 0.38           | 0.49                     | 0.38                   | 71.4                   |
| Appr         | oach   | 1179                            | 6.0     | 1241                             | 6.0 | 0.530               | 7.0  | LOSA                | 4.7                            | 34.3 | 0.36           | 0.49                     | 0.36                   | 71.8                   |
| All<br>Vehic | cles   | 1900                            | 6.0     | 2000                             | 6.0 | 0.530               | 7.2  | LOSA                | 4.7                            | 34.3 | 0.34           | 0.51                     | 0.34                   | 71.9                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## ▼ Site: 101v [Shands Road / Trents Road PM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                          | t Perfo | rmance                           |     |                     |      |                     |                                |      |              |                           |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|--------------------------------|------|--------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEM/<br>FLO¹<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service | 95% BA<br>QUE<br>[ Veh.<br>veh |      | Prop.<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Trents Ro                       | oad E   |                                  |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 4            | L2     | 44                              | 6.0     | 46                               | 6.0 | 0.157               | 12.9 | LOS B               | 8.0                            | 5.6  | 0.77         | 0.90                      | 0.77                   | 66.9                   |
| 5            | T1     | 18                              | 6.0     | 19                               | 6.0 | 0.157               | 12.2 | LOS B               | 0.8                            | 5.6  | 0.77         | 0.90                      | 0.77                   | 69.7                   |
| 6            | R2     | 13                              | 6.0     | 14                               | 6.0 | 0.157               | 18.1 | LOS B               | 0.8                            | 5.6  | 0.77         | 0.90                      | 0.77                   | 69.4                   |
| Appr         | oach   | 75                              | 6.0     | 79                               | 6.0 | 0.157               | 13.7 | LOS B               | 0.8                            | 5.6  | 0.77         | 0.90                      | 0.77                   | 68.1                   |
| North        | nEast: | Shands F                        | Road N  |                                  |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 7            | L2     | 70                              | 6.0     | 74                               | 6.0 | 0.357               | 6.3  | LOSA                | 2.4                            | 17.5 | 0.36         | 0.51                      | 0.36                   | 71.7                   |
| 8            | T1     | 1288                            | 6.0     | 1356                             | 6.0 | 0.630               | 7.1  | LOSA                | 6.2                            | 45.5 | 0.43         | 0.50                      | 0.43                   | 71.6                   |
| 9            | R2     | 28                              | 6.0     | 29                               | 6.0 | 0.630               | 12.5 | LOS B               | 6.2                            | 45.5 | 0.45         | 0.50                      | 0.45                   | 72.2                   |
| Appr         | oach   | 1386                            | 6.0     | 1459                             | 6.0 | 0.630               | 7.2  | LOSA                | 6.2                            | 45.5 | 0.43         | 0.50                      | 0.43                   | 71.6                   |
| North        | nWest: | Trents R                        | oad W   |                                  |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 10           | L2     | 60                              | 6.0     | 63                               | 6.0 | 0.148               | 8.4  | LOSA                | 0.6                            | 4.5  | 0.57         | 0.76                      | 0.57                   | 70.8                   |
| 11           | T1     | 36                              | 6.0     | 38                               | 6.0 | 0.148               | 8.7  | LOS A               | 0.6                            | 4.5  | 0.57         | 0.76                      | 0.57                   | 72.1                   |
| 12           | R2     | 14                              | 6.0     | 15                               | 6.0 | 0.148               | 14.8 | LOS B               | 0.6                            | 4.5  | 0.57         | 0.76                      | 0.57                   | 69.3                   |
| Appr         | oach   | 110                             | 6.0     | 116                              | 6.0 | 0.148               | 9.3  | LOSA                | 0.6                            | 4.5  | 0.57         | 0.76                      | 0.57                   | 71.0                   |
| South        | hWest  | : Shands                        | Road S  |                                  |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 1            | L2     | 13                              | 6.0     | 14                               | 6.0 | 0.181               | 5.9  | LOSA                | 1.1                            | 7.8  | 0.23         | 0.46                      | 0.23                   | 71.0                   |
| 2            | T1     | 662                             | 6.0     | 697                              | 6.0 | 0.320               | 6.2  | LOSA                | 2.2                            | 16.4 | 0.23         | 0.48                      | 0.23                   | 72.3                   |
| 3            | R2     | 59                              | 6.0     | 62                               | 6.0 | 0.320               | 12.0 | LOS B               | 2.2                            | 16.4 | 0.24         | 0.48                      | 0.24                   | 71.8                   |
| Appr         | oach   | 734                             | 6.0     | 773                              | 6.0 | 0.320               | 6.7  | LOSA                | 2.2                            | 16.4 | 0.23         | 0.48                      | 0.23                   | 72.3                   |
| All<br>Vehic | cles   | 2305                            | 6.0     | 2426                             | 6.0 | 0.630               | 7.4  | LOSA                | 6.2                            | 45.5 | 0.38         | 0.52                      | 0.38                   | 71.6                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## ▼ Site: 101v [Shands Road / Hamptons Road AM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                | t Perfo | rmance                  |     |              |      |                     |     |                         |                |                           |                        |                |
|--------------|--------|-----------------------|---------|-------------------------|-----|--------------|------|---------------------|-----|-------------------------|----------------|---------------------------|------------------------|----------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[Total |         | DEM/<br>FLO¹<br>[ Total |     | Deg.<br>Satn |      | Level of<br>Service |     | ACK OF<br>EUE<br>Dist ] | Prop. I<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed |
|              |        | veh/h                 | %       | veh/h                   | %   | v/c          | sec  |                     | veh | m -                     |                |                           |                        | km/h           |
| South        | hEast: | Hampton               | s Road  | E                       |     |              |      |                     |     |                         |                |                           |                        |                |
| 4            | L2     | 83                    | 6.0     | 87                      | 6.0 | 0.134        | 7.6  | LOSA                | 0.5 | 4.0                     | 0.50           | 0.72                      | 0.50                   | 72.2           |
| 5            | T1     | 6                     | 6.0     | 6                       | 6.0 | 0.134        | 7.9  | LOS A               | 0.5 | 4.0                     | 0.50           | 0.72                      | 0.50                   | 74.1           |
| 6            | R2     | 22                    | 6.0     | 23                      | 6.0 | 0.134        | 14.0 | LOS B               | 0.5 | 4.0                     | 0.50           | 0.72                      | 0.50                   | 73.8           |
| Appr         | oach   | 111                   | 6.0     | 117                     | 6.0 | 0.134        | 8.9  | LOSA                | 0.5 | 4.0                     | 0.50           | 0.72                      | 0.50                   | 72.6           |
| North        | nEast: | Shands F              | Road N  |                         |     |              |      |                     |     |                         |                |                           |                        |                |
| 7            | L2     | 26                    | 6.0     | 27                      | 6.0 | 0.137        | 6.0  | LOSA                | 0.7 | 5.3                     | 0.23           | 0.47                      | 0.23                   | 73.9           |
| 8            | T1     | 489                   | 6.0     | 515                     | 6.0 | 0.242        | 6.2  | LOSA                | 1.4 | 10.6                    | 0.23           | 0.48                      | 0.23                   | 72.5           |
| 9            | R2     | 29                    | 6.0     | 31                      | 6.0 | 0.242        | 12.0 | LOS B               | 1.4 | 10.6                    | 0.23           | 0.48                      | 0.23                   | 73.1           |
| Appr         | oach   | 544                   | 6.0     | 573                     | 6.0 | 0.242        | 6.5  | LOSA                | 1.4 | 10.6                    | 0.23           | 0.48                      | 0.23                   | 72.6           |
| North        | nWest: | Hampton               | s Road  | W                       |     |              |      |                     |     |                         |                |                           |                        |                |
| 10           | L2     | 72                    | 6.0     | 76                      | 6.0 | 0.121        | 9.4  | LOSA                | 0.5 | 3.7                     | 0.62           | 0.80                      | 0.62                   | 70.8           |
| 11           | T1     | 4                     | 6.0     | 4                       | 6.0 | 0.121        | 9.6  | LOSA                | 0.5 | 3.7                     | 0.62           | 0.80                      | 0.62                   | 73.7           |
| 12           | R2     | 4                     | 6.0     | 4                       | 6.0 | 0.121        | 15.5 | LOS B               | 0.5 | 3.7                     | 0.62           | 0.80                      | 0.62                   | 69.3           |
| Appr         | oach   | 80                    | 6.0     | 84                      | 6.0 | 0.121        | 9.7  | LOSA                | 0.5 | 3.7                     | 0.62           | 0.80                      | 0.62                   | 70.9           |
| South        | hWest  | : Shands              | Road S  |                         |     |              |      |                     |     |                         |                |                           |                        |                |
| 1            | L2     | 5                     | 6.0     | 5                       | 6.0 | 0.230        | 5.9  | LOSA                | 1.4 | 10.0                    | 0.22           | 0.46                      | 0.22                   | 71.0           |
| 2            | T1     | 872                   | 6.0     | 918                     | 6.0 | 0.406        | 6.3  | LOSA                | 3.0 | 21.8                    | 0.24           | 0.47                      | 0.24                   | 72.4           |
| 3            | R2     | 65                    | 6.0     | 68                      | 6.0 | 0.406        | 12.0 | LOS B               | 3.0 | 21.8                    | 0.24           | 0.48                      | 0.24                   | 73.8           |
| Appr         | oach   | 942                   | 6.0     | 992                     | 6.0 | 0.406        | 6.7  | LOSA                | 3.0 | 21.8                    | 0.24           | 0.47                      | 0.24                   | 72.5           |
| All<br>Vehic | cles   | 1677                  | 6.0     | 1765                    | 6.0 | 0.406        | 6.9  | LOSA                | 3.0 | 21.8                    | 0.27           | 0.51                      | 0.27                   | 72.5           |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

 $\label{eq:hv} \mbox{HV (\%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.}$ 

## ▼ Site: 101v [Shands Road / Hamptons Road PM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                 | t Perfo | rmance                  |     |              |      |                     |                                 |      |              |                           |                        |                |
|--------------|--------|------------------------|---------|-------------------------|-----|--------------|------|---------------------|---------------------------------|------|--------------|---------------------------|------------------------|----------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total |         | DEM/<br>FLO¹<br>[ Total |     | Deg.<br>Satn |      | Level of<br>Service | 95% B <i>A</i><br>QUE<br>[ Veh. |      | Prop.<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed |
|              |        | veh/h                  | %       | veh/h                   | %   | v/c          | sec  |                     | veh                             | m -  |              |                           |                        | km/h           |
| Sout         | hEast: | Hampton                | s Road  | E                       |     |              |      |                     |                                 |      |              |                           |                        |                |
| 4            | L2     | 114                    | 6.0     | 120                     | 6.0 | 0.284        | 12.5 | LOS B               | 1.4                             | 10.4 | 0.78         | 0.90                      | 0.78                   | 70.2           |
| 5            | T1     | 10                     | 6.0     | 11                      | 6.0 | 0.284        | 11.9 | LOS B               | 1.4                             | 10.4 | 0.78         | 0.90                      | 0.78                   | 72.2           |
| 6            | R2     | 19                     | 6.0     | 20                      | 6.0 | 0.284        | 17.9 | LOS B               | 1.4                             | 10.4 | 0.78         | 0.90                      | 0.78                   | 71.9           |
| Appr         | oach   | 143                    | 6.0     | 151                     | 6.0 | 0.284        | 13.2 | LOS B               | 1.4                             | 10.4 | 0.78         | 0.90                      | 0.78                   | 70.6           |
| North        | nEast: | Shands R               | load N  |                         |     |              |      |                     |                                 |      |              |                           |                        |                |
| 7            | L2     | 42                     | 6.0     | 44                      | 6.0 | 0.342        | 6.5  | LOSA                | 2.2                             | 16.1 | 0.38         | 0.52                      | 0.38                   | 73.3           |
| 8            | T1     | 1230                   | 6.0     | 1295                    | 6.0 | 0.603        | 7.2  | LOSA                | 5.5                             | 40.5 | 0.44         | 0.52                      | 0.44                   | 71.5           |
| 9            | R2     | 31                     | 6.0     | 33                      | 6.0 | 0.603        | 12.6 | LOS B               | 5.5                             | 40.5 | 0.47         | 0.52                      | 0.47                   | 72.1           |
| Appr         | oach   | 1303                   | 6.0     | 1372                    | 6.0 | 0.603        | 7.3  | LOSA                | 5.5                             | 40.5 | 0.44         | 0.52                      | 0.44                   | 71.6           |
| North        | nWest: | Hampton                | s Road  | W                       |     |              |      |                     |                                 |      |              |                           |                        |                |
| 10           | L2     | 42                     | 6.0     | 44                      | 6.0 | 0.086        | 8.4  | LOSA                | 0.3                             | 2.5  | 0.57         | 0.74                      | 0.57                   | 71.0           |
| 11           | T1     | 15                     | 6.0     | 16                      | 6.0 | 0.086        | 8.8  | LOSA                | 0.3                             | 2.5  | 0.57         | 0.74                      | 0.57                   | 73.9           |
| 12           | R2     | 5                      | 6.0     | 5                       | 6.0 | 0.086        | 14.9 | LOS B               | 0.3                             | 2.5  | 0.57         | 0.74                      | 0.57                   | 69.6           |
| Appr         | oach   | 62                     | 6.0     | 65                      | 6.0 | 0.086        | 9.1  | LOSA                | 0.3                             | 2.5  | 0.57         | 0.74                      | 0.57                   | 71.8           |
| South        | hWest  | : Shands               | Road S  |                         |     |              |      |                     |                                 |      |              |                           |                        |                |
| 1            | L2     | 10                     | 6.0     | 11                      | 6.0 | 0.193        | 5.9  | LOSA                | 1.1                             | 8.3  | 0.23         | 0.46                      | 0.23                   | 71.0           |
| 2            | T1     | 660                    | 6.0     | 695                     | 6.0 | 0.340        | 6.2  | LOSA                | 2.4                             | 17.6 | 0.24         | 0.49                      | 0.24                   | 72.1           |
| 3            | R2     | 109                    | 6.0     | 115                     | 6.0 | 0.340        | 12.0 | LOS B               | 2.4                             | 17.6 | 0.24         | 0.50                      | 0.24                   | 73.5           |
| Appr         | oach   | 779                    | 6.0     | 820                     | 6.0 | 0.340        | 7.0  | LOSA                | 2.4                             | 17.6 | 0.24         | 0.49                      | 0.24                   | 72.3           |
| All<br>Vehic | cles   | 2287                   | 6.0     | 2407                    | 6.0 | 0.603        | 7.7  | LOSA                | 5.5                             | 40.5 | 0.40         | 0.54                      | 0.40                   | 71.8           |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## 🧓 Site: 101 [Springs Road / Hamptons Road AM Peak 2030 (Site Folder: Future 2030)]

New Site Site Category: (None) Stop (Two-Way)

| Vehi         | cle M  | ovemen                          | t Perfo | rmance                           |     |                     |      |                     |      |                              |                |                           |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|------|------------------------------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEM/<br>FLO'<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service |      | ACK OF<br>EUE<br>Dist ]<br>m | Prop. E<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| Sout         | hEast: | Hampton                         |         |                                  | 70  | <b>V/O</b>          |      |                     | VC11 | - '''                        |                |                           |                        | KITI/TI                |
| 4            | L2     | 29                              | 6.0     | 31                               | 6.0 | 0.039               | 10.3 | LOS B               | 0.1  | 1.0                          | 0.42           | 0.89                      | 0.42                   | 56.9                   |
| 5            | T1     | 52                              | 6.0     | 55                               | 6.0 | 0.150               | 14.1 | LOS B               | 0.5  | 3.8                          | 0.64           | 1.01                      | 0.64                   | 54.8                   |
| 6            | R2     | 13                              | 6.0     | 14                               | 6.0 | 0.150               | 15.4 | LOS C               | 0.5  | 3.8                          | 0.64           | 1.01                      | 0.64                   | 52.3                   |
| Appr         | oach   | 94                              | 6.0     | 99                               | 6.0 | 0.150               | 13.1 | LOS B               | 0.5  | 3.8                          | 0.57           | 0.97                      | 0.57                   | 55.3                   |
| North        | nEast: | Springs F                       | Road N  |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 7            | L2     | 3                               | 6.0     | 3                                | 6.0 | 0.183               | 5.7  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.01                      | 0.00                   | 58.7                   |
| 8            | T1     | 321                             | 6.0     | 338                              | 6.0 | 0.183               | 0.1  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.01                      | 0.00                   | 59.9                   |
| 9            | R2     | 31                              | 6.0     | 33                               | 6.0 | 0.025               | 6.7  | LOSA                | 0.1  | 8.0                          | 0.39           | 0.59                      | 0.39                   | 56.2                   |
| Appr         | oach   | 355                             | 6.0     | 374                              | 6.0 | 0.183               | 0.7  | NA                  | 0.1  | 8.0                          | 0.03           | 0.06                      | 0.03                   | 59.6                   |
| North        | nWest: | Hampton                         | s Road  | W                                |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 10           | L2     | 40                              | 6.0     | 42                               | 6.0 | 0.051               | 10.0 | LOS B               | 0.2  | 1.3                          | 0.39           | 0.89                      | 0.39                   | 55.6                   |
| 11           | T1     | 50                              | 6.0     | 53                               | 6.0 | 0.149               | 14.1 | LOS B               | 0.5  | 3.8                          | 0.64           | 1.01                      | 0.64                   | 54.8                   |
| 12           | R2     | 15                              | 6.0     | 16                               | 6.0 | 0.149               | 15.3 | LOS C               | 0.5  | 3.8                          | 0.64           | 1.01                      | 0.64                   | 56.5                   |
| Appr         | oach   | 105                             | 6.0     | 111                              | 6.0 | 0.149               | 12.7 | LOS B               | 0.5  | 3.8                          | 0.55           | 0.96                      | 0.55                   | 55.4                   |
| Sout         | hWest: | Springs                         | Road S  |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 1            | L2     | 10                              | 6.0     | 11                               | 6.0 | 0.164               | 5.8  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.02                      | 0.00                   | 59.4                   |
| 2            | T1     | 280                             | 6.0     | 295                              | 6.0 | 0.164               | 0.2  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.02                      | 0.00                   | 59.9                   |
| 3            | R2     | 51                              | 6.0     | 54                               | 6.0 | 0.043               | 6.8  | LOSA                | 0.2  | 1.4                          | 0.42           | 0.61                      | 0.42                   | 57.3                   |
| Appr         | oach   | 341                             | 6.0     | 359                              | 6.0 | 0.164               | 1.4  | NA                  | 0.2  | 1.4                          | 0.06           | 0.11                      | 0.06                   | 59.4                   |
| All<br>Vehic | cles   | 895                             | 6.0     | 942                              | 6.0 | 0.183               | 3.7  | NA                  | 0.5  | 3.8                          | 0.16           | 0.28                      | 0.16                   | 58.6                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## 🧓 Site: 101 [Springs Road / Hamptons Road PM Peak 2030 (Site Folder: Future 2030)]

New Site Site Category: (None) Stop (Two-Way)

| Vehi         | cle M  | ovemen                          | t Perfo | rmance                           |     |                     |      |                     |                                |      |                |                           |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|--------------------------------|------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEM/<br>FLO¹<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service | 95% BA<br>QUE<br>[ Veh.<br>veh |      | Prop.  <br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Hampton                         | s Road  | E                                |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 4            | L2     | 33                              | 6.0     | 35                               | 6.0 | 0.045               | 10.3 | LOS B               | 0.2                            | 1.1  | 0.42           | 0.90                      | 0.42                   | 56.9                   |
| 5            | T1     | 70                              | 6.0     | 74                               | 6.0 | 0.294               | 20.1 | LOS C               | 1.1                            | 8.1  | 0.80           | 1.04                      | 0.94                   | 52.9                   |
| 6            | R2     | 15                              | 6.0     | 16                               | 6.0 | 0.294               | 23.4 | LOS C               | 1.1                            | 8.1  | 0.80           | 1.04                      | 0.94                   | 49.8                   |
| Appr         | oach   | 118                             | 6.0     | 124                              | 6.0 | 0.294               | 17.8 | LOS C               | 1.1                            | 8.1  | 0.69           | 1.00                      | 0.79                   | 54.0                   |
| North        | nEast: | Springs F                       | Road N  |                                  |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 7            | L2     | 14                              | 6.0     | 15                               | 6.0 | 0.187               | 5.7  | LOSA                | 0.0                            | 0.0  | 0.00           | 0.03                      | 0.00                   | 58.6                   |
| 8            | T1     | 317                             | 6.0     | 334                              | 6.0 | 0.187               | 0.1  | LOSA                | 0.0                            | 0.0  | 0.00           | 0.03                      | 0.00                   | 59.8                   |
| 9            | R2     | 64                              | 6.0     | 67                               | 6.0 | 0.067               | 7.8  | LOSA                | 0.3                            | 2.1  | 0.52           | 0.70                      | 0.52                   | 55.9                   |
| Appr         | oach   | 395                             | 6.0     | 416                              | 6.0 | 0.187               | 1.5  | NA                  | 0.3                            | 2.1  | 0.08           | 0.13                      | 0.08                   | 59.3                   |
| North        | nWest: | Hampton                         | s Road  | W                                |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 10           | L2     | 36                              | 6.0     | 38                               | 6.0 | 0.062               | 11.9 | LOS B               | 0.2                            | 1.5  | 0.51           | 0.95                      | 0.51                   | 55.0                   |
| 11           | T1     | 114                             | 6.0     | 120                              | 6.0 | 0.441               | 22.2 | LOS C               | 1.9                            | 13.9 | 0.83           | 1.09                      | 1.15                   | 52.4                   |
| 12           | R2     | 17                              | 6.0     | 18                               | 6.0 | 0.441               | 24.8 | LOS C               | 1.9                            | 13.9 | 0.83           | 1.09                      | 1.15                   | 54.8                   |
| Appr         | oach   | 167                             | 6.0     | 176                              | 6.0 | 0.441               | 20.2 | LOS C               | 1.9                            | 13.9 | 0.76           | 1.06                      | 1.01                   | 53.2                   |
| South        | hWest: | Springs                         | Road S  |                                  |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 1            | L2     | 19                              | 6.0     | 20                               | 6.0 | 0.273               | 6.0  | LOSA                | 0.0                            | 0.0  | 0.00           | 0.02                      | 0.00                   | 59.3                   |
| 2            | T1     | 466                             | 6.0     | 491                              | 6.0 | 0.273               | 0.4  | LOSA                | 0.0                            | 0.0  | 0.00           | 0.02                      | 0.00                   | 59.8                   |
| 3            | R2     | 45                              | 6.0     | 47                               | 6.0 | 0.039               | 6.9  | LOSA                | 0.2                            | 1.2  | 0.42           | 0.61                      | 0.42                   | 57.3                   |
| Appr         | oach   | 530                             | 6.0     | 558                              | 6.0 | 0.273               | 1.1  | NA                  | 0.2                            | 1.2  | 0.04           | 0.07                      | 0.04                   | 59.5                   |
| All<br>Vehic | cles   | 1210                            | 6.0     | 1274                             | 6.0 | 0.441               | 5.5  | NA                  | 1.9                            | 13.9 | 0.22           | 0.32                      | 0.26                   | 58.1                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## ▼ Site: 101v [Springs Road / Hamptons Road AM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                 | t Perfo | rmance      |     |              |      |                     |                                 |      |                |                           |                        |                |
|--------------|--------|------------------------|---------|-------------|-----|--------------|------|---------------------|---------------------------------|------|----------------|---------------------------|------------------------|----------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total |         | DEM/<br>FLO |     | Deg.<br>Satn |      | Level of<br>Service | 95% B <i>A</i><br>QUE<br>[ Veh. |      | Prop. I<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed |
|              |        | veh/h                  | %       | veh/h       | %   | v/c          | sec  |                     | veh                             | m    |                |                           |                        | km/h           |
| South        | hEast: | Hampton                | s Road  | E           |     |              |      |                     |                                 |      |                |                           |                        |                |
| 4            | L2     | 29                     | 6.0     | 31          | 6.0 | 0.106        | 6.4  | LOSA                | 0.6                             | 4.2  | 0.53           | 0.62                      | 0.53                   | 57.5           |
| 5            | T1     | 52                     | 6.0     | 55          | 6.0 | 0.106        | 6.6  | LOSA                | 0.6                             | 4.2  | 0.53           | 0.62                      | 0.53                   | 57.2           |
| 6            | R2     | 13                     | 6.0     | 14          | 6.0 | 0.106        | 10.6 | LOS B               | 0.6                             | 4.2  | 0.53           | 0.62                      | 0.53                   | 55.7           |
| Appr         | oach   | 94                     | 6.0     | 99          | 6.0 | 0.106        | 7.1  | LOSA                | 0.6                             | 4.2  | 0.53           | 0.62                      | 0.53                   | 57.2           |
| North        | nEast: | Springs F              | Road N  |             |     |              |      |                     |                                 |      |                |                           |                        |                |
| 7            | L2     | 3                      | 6.0     | 3           | 6.0 | 0.303        | 5.0  | LOSA                | 1.9                             | 14.0 | 0.36           | 0.50                      | 0.36                   | 55.6           |
| 8            | T1     | 321                    | 6.0     | 338         | 6.0 | 0.303        | 5.2  | LOSA                | 1.9                             | 14.0 | 0.36           | 0.50                      | 0.36                   | 57.9           |
| 9            | R2     | 31                     | 6.0     | 33          | 6.0 | 0.303        | 9.2  | LOSA                | 1.9                             | 14.0 | 0.36           | 0.50                      | 0.36                   | 57.1           |
| Appr         | oach   | 355                    | 6.0     | 374         | 6.0 | 0.303        | 5.6  | LOSA                | 1.9                             | 14.0 | 0.36           | 0.50                      | 0.36                   | 57.9           |
| North        | nWest: | Hampton                | ns Road | W           |     |              |      |                     |                                 |      |                |                           |                        |                |
| 10           | L2     | 40                     | 6.0     | 42          | 6.0 | 0.116        | 6.2  | LOSA                | 0.6                             | 4.6  | 0.52           | 0.62                      | 0.52                   | 56.4           |
| 11           | T1     | 50                     | 6.0     | 53          | 6.0 | 0.116        | 6.5  | LOSA                | 0.6                             | 4.6  | 0.52           | 0.62                      | 0.52                   | 57.3           |
| 12           | R2     | 15                     | 6.0     | 16          | 6.0 | 0.116        | 10.5 | LOS B               | 0.6                             | 4.6  | 0.52           | 0.62                      | 0.52                   | 58.1           |
| Appr         | oach   | 105                    | 6.0     | 111         | 6.0 | 0.116        | 7.0  | LOSA                | 0.6                             | 4.6  | 0.52           | 0.62                      | 0.52                   | 57.2           |
| South        | hWest  | : Springs              | Road S  |             |     |              |      |                     |                                 |      |                |                           |                        |                |
| 1            | L2     | 10                     | 6.0     | 11          | 6.0 | 0.283        | 4.8  | LOSA                | 1.8                             | 13.2 | 0.32           | 0.50                      | 0.32                   | 58.0           |
| 2            | T1     | 280                    | 6.0     | 295         | 6.0 | 0.283        | 5.1  | LOSA                | 1.8                             | 13.2 | 0.32           | 0.50                      | 0.32                   | 57.9           |
| 3            | R2     | 51                     | 6.0     | 54          | 6.0 | 0.283        | 9.1  | LOSA                | 1.8                             | 13.2 | 0.32           | 0.50                      | 0.32                   | 58.0           |
| Appr         | oach   | 341                    | 6.0     | 359         | 6.0 | 0.283        | 5.7  | LOSA                | 1.8                             | 13.2 | 0.32           | 0.50                      | 0.32                   | 57.9           |
| All<br>Vehic | cles   | 895                    | 6.0     | 942         | 6.0 | 0.303        | 5.9  | LOSA                | 1.9                             | 14.0 | 0.38           | 0.53                      | 0.38                   | 57.8           |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

 $\label{eq:hv} \mbox{HV (\%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.}$ 

## ▼ Site: 101v [Springs Road / Hamptons Road PM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                          | t Perfo | rmance                           |     |                     |      |                     |                                |      |                |                           |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|--------------------------------|------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEM/<br>FLO¹<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service | 95% BA<br>QUE<br>[ Veh.<br>veh |      | Prop.  <br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Hampton                         | s Road  | E                                |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 4            | L2     | 33                              | 6.0     | 35                               | 6.0 | 0.140               | 6.7  | LOSA                | 8.0                            | 5.8  | 0.58           | 0.65                      | 0.58                   | 57.4                   |
| 5            | T1     | 70                              | 6.0     | 74                               | 6.0 | 0.140               | 6.9  | LOSA                | 8.0                            | 5.8  | 0.58           | 0.65                      | 0.58                   | 57.2                   |
| 6            | R2     | 15                              | 6.0     | 16                               | 6.0 | 0.140               | 10.9 | LOS B               | 0.8                            | 5.8  | 0.58           | 0.65                      | 0.58                   | 55.6                   |
| Appr         | oach   | 118                             | 6.0     | 124                              | 6.0 | 0.140               | 7.3  | LOSA                | 8.0                            | 5.8  | 0.58           | 0.65                      | 0.58                   | 57.1                   |
| North        | nEast: | Springs F                       | Road N  |                                  |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 7            | L2     | 14                              | 6.0     | 15                               | 6.0 | 0.368               | 5.5  | LOSA                | 2.5                            | 18.7 | 0.49           | 0.57                      | 0.49                   | 55.2                   |
| 8            | T1     | 317                             | 6.0     | 334                              | 6.0 | 0.368               | 5.7  | LOSA                | 2.5                            | 18.7 | 0.49           | 0.57                      | 0.49                   | 57.7                   |
| 9            | R2     | 64                              | 6.0     | 67                               | 6.0 | 0.368               | 9.8  | LOSA                | 2.5                            | 18.7 | 0.49           | 0.57                      | 0.49                   | 56.8                   |
| Appr         | oach   | 395                             | 6.0     | 416                              | 6.0 | 0.368               | 6.4  | LOSA                | 2.5                            | 18.7 | 0.49           | 0.57                      | 0.49                   | 57.5                   |
| North        | nWest: | Hampton                         | s Road  | W                                |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 10           | L2     | 36                              | 6.0     | 38                               | 6.0 | 0.225               | 7.9  | LOSA                | 1.4                            | 10.1 | 0.69           | 0.74                      | 0.69                   | 55.9                   |
| 11           | T1     | 114                             | 6.0     | 120                              | 6.0 | 0.225               | 8.1  | LOSA                | 1.4                            | 10.1 | 0.69           | 0.74                      | 0.69                   | 56.9                   |
| 12           | R2     | 17                              | 6.0     | 18                               | 6.0 | 0.225               | 12.1 | LOS B               | 1.4                            | 10.1 | 0.69           | 0.74                      | 0.69                   | 57.8                   |
| Appr         | oach   | 167                             | 6.0     | 176                              | 6.0 | 0.225               | 8.5  | LOSA                | 1.4                            | 10.1 | 0.69           | 0.74                      | 0.69                   | 56.9                   |
| South        | hWest: | Springs                         | Road S  |                                  |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 1            | L2     | 19                              | 6.0     | 20                               | 6.0 | 0.464               | 5.4  | LOSA                | 3.5                            | 25.7 | 0.48           | 0.55                      | 0.48                   | 57.9                   |
| 2            | T1     | 466                             | 6.0     | 491                              | 6.0 | 0.464               | 5.7  | LOSA                | 3.5                            | 25.7 | 0.48           | 0.55                      | 0.48                   | 57.7                   |
| 3            | R2     | 45                              | 6.0     | 47                               | 6.0 | 0.464               | 9.7  | LOSA                | 3.5                            | 25.7 | 0.48           | 0.55                      | 0.48                   | 57.8                   |
| Appr         | oach   | 530                             | 6.0     | 558                              | 6.0 | 0.464               | 6.0  | LOSA                | 3.5                            | 25.7 | 0.48           | 0.55                      | 0.48                   | 57.8                   |
| All<br>Vehic | cles   | 1210                            | 6.0     | 1274                             | 6.0 | 0.464               | 6.6  | LOSA                | 3.5                            | 25.7 | 0.52           | 0.59                      | 0.52                   | 57.5                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## 🧓 Site: 101 [Springs Road / Trents Road AM Peak 2030 (Site Folder: Future 2030)]

New Site Site Category: (None) Stop (Two-Way)

| Vehi         | cle M  | ovement                         | t Perfo | rmance                           |     |                     |      |                     |      |                              |                |                           |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|------|------------------------------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEMA<br>FLO\<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service |      | ACK OF<br>EUE<br>Dist ]<br>m | Prop. I<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Trents Ro                       |         | VEII/II                          | /0  | V/C                 | 366  |                     | Veri | - '''                        |                | _                         |                        | KIII/II                |
| 4            | L2     | 12                              | 6.0     | 13                               | 6.0 | 0.017               | 9.9  | LOSA                | 0.1  | 0.4                          | 0.43           | 0.88                      | 0.43                   | 43.6                   |
| 5            | T1     | 19                              | 6.0     | 20                               | 6.0 | 0.170               | 14.9 | LOS B               | 0.6  | 4.2                          | 0.73           | 1.00                      | 0.73                   | 44.6                   |
| 6            | R2     | 38                              | 6.0     | 40                               | 6.0 | 0.170               | 17.3 | LOS C               | 0.6  | 4.2                          | 0.73           | 1.00                      | 0.73                   | 42.2                   |
| Appr         | oach   | 69                              | 6.0     | 73                               | 6.0 | 0.170               | 15.4 | LOS C               | 0.6  | 4.2                          | 0.68           | 0.98                      | 0.68                   | 43.3                   |
| North        | nEast: | Springs R                       | load N  |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 7            | L2     | 6                               | 6.0     | 6                                | 6.0 | 0.200               | 4.7  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.01                      | 0.00                   | 49.4                   |
| 8            | T1     | 348                             | 6.0     | 366                              | 6.0 | 0.200               | 0.1  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.01                      | 0.00                   | 49.9                   |
| 9            | R2     | 46                              | 6.0     | 48                               | 6.0 | 0.042               | 6.2  | LOSA                | 0.2  | 1.3                          | 0.46           | 0.61                      | 0.46                   | 48.1                   |
| Appr         | oach   | 400                             | 6.0     | 421                              | 6.0 | 0.200               | 0.9  | NA                  | 0.2  | 1.3                          | 0.05           | 0.08                      | 0.05                   | 49.6                   |
| North        | nWest: | Trents Ro                       | oad W   |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 10           | L2     | 106                             | 6.0     | 112                              | 6.0 | 0.154               | 10.4 | LOS B               | 0.6  | 4.2                          | 0.48           | 0.95                      | 0.48                   | 47.5                   |
| 11           | T1     | 38                              | 6.0     | 40                               | 6.0 | 0.119               | 14.7 | LOS B               | 0.4  | 3.0                          | 0.68           | 1.01                      | 0.68                   | 45.1                   |
| 12           | R2     | 8                               | 6.0     | 8                                | 6.0 | 0.119               | 14.9 | LOS B               | 0.4  | 3.0                          | 0.68           | 1.01                      | 0.68                   | 45.9                   |
| Appr         | oach   | 152                             | 6.0     | 160                              | 6.0 | 0.154               | 11.7 | LOS B               | 0.6  | 4.2                          | 0.54           | 0.97                      | 0.54                   | 46.9                   |
| South        | hWest  | : Springs I                     | Road S  |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 1            | L2     | 13                              | 6.0     | 14                               | 6.0 | 0.222               | 5.6  | LOSA                | 0.1  | 1.1                          | 0.04           | 0.03                      | 0.04                   | 49.6                   |
| 2            | T1     | 365                             | 6.0     | 384                              | 6.0 | 0.222               | 0.1  | LOSA                | 0.1  | 1.1                          | 0.04           | 0.03                      | 0.04                   | 49.8                   |
| 3            | R2     | 10                              | 6.0     | 11                               | 6.0 | 0.222               | 6.5  | LOSA                | 0.1  | 1.1                          | 0.04           | 0.03                      | 0.04                   | 48.8                   |
| Appr         | oach   | 388                             | 6.0     | 408                              | 6.0 | 0.222               | 0.4  | NA                  | 0.1  | 1.1                          | 0.04           | 0.03                      | 0.04                   | 49.8                   |
| All<br>Vehic | cles   | 1009                            | 6.0     | 1062                             | 6.0 | 0.222               | 3.3  | NA                  | 0.6  | 4.2                          | 0.17           | 0.26                      | 0.17                   | 48.7                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## 🧓 Site: 101 [Springs Road / Trents Road PM Peak 2030 (Site Folder: Future 2030)]

New Site Site Category: (None) Stop (Two-Way)

| Vehi         | cle M  | ovement                         | Perfo  | rmance                           |     |                     |      |                     |      |                              |                |                           |                        |                        |
|--------------|--------|---------------------------------|--------|----------------------------------|-----|---------------------|------|---------------------|------|------------------------------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |        | DEMA<br>FLO\<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service |      | ACK OF<br>EUE<br>Dist ]<br>m | Prop. I<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Trents Ro                       |        | VEII/II                          | 70  | V/C                 | 366  |                     | Veri | - '''                        |                |                           |                        | KIII/II                |
| 4            | L2     | 17                              | 6.0    | 18                               | 6.0 | 0.031               | 11.6 | LOS B               | 0.1  | 0.8                          | 0.53           | 0.93                      | 0.53                   | 42.8                   |
| 5            | T1     | 20                              | 6.0    | 21                               | 6.0 | 0.156               | 25.8 | LOS D               | 0.5  | 3.5                          | 0.87           | 1.00                      | 0.87                   | 41.6                   |
| 6            | R2     | 6                               | 6.0    | 6                                | 6.0 | 0.156               | 32.0 | LOS D               | 0.5  | 3.5                          | 0.87           | 1.00                      | 0.87                   | 38.4                   |
| Appr         | oach   | 43                              | 6.0    | 45                               | 6.0 | 0.156               | 21.0 | LOS C               | 0.5  | 3.5                          | 0.73           | 0.97                      | 0.73                   | 41.5                   |
| North        | nEast: | Springs R                       | oad N  |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 7            | L2     | 22                              | 6.0    | 23                               | 6.0 | 0.298               | 4.8  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.02                      | 0.00                   | 49.3                   |
| 8            | T1     | 504                             | 6.0    | 531                              | 6.0 | 0.298               | 0.2  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.02                      | 0.00                   | 49.8                   |
| 9            | R2     | 84                              | 6.0    | 88                               | 6.0 | 0.104               | 7.8  | LOSA                | 0.4  | 3.1                          | 0.58           | 0.76                      | 0.58                   | 47.7                   |
| Appr         | oach   | 610                             | 6.0    | 642                              | 6.0 | 0.298               | 1.4  | NA                  | 0.4  | 3.1                          | 0.08           | 0.12                      | 0.08                   | 49.3                   |
| North        | nWest: | Trents Ro                       | oad W  |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 10           | L2     | 99                              | 6.0    | 104                              | 6.0 | 0.209               | 13.4 | LOS B               | 0.7  | 5.5                          | 0.63           | 1.01                      | 0.64                   | 46.8                   |
| 11           | T1     | 50                              | 6.0    | 53                               | 6.0 | 0.362               | 30.4 | LOS D               | 1.3  | 9.3                          | 0.89           | 1.06                      | 1.09                   | 40.8                   |
| 12           | R2     | 14                              | 6.0    | 15                               | 6.0 | 0.362               | 30.9 | LOS D               | 1.3  | 9.3                          | 0.89           | 1.06                      | 1.09                   | 42.4                   |
| Appr         | oach   | 163                             | 6.0    | 172                              | 6.0 | 0.362               | 20.1 | LOS C               | 1.3  | 9.3                          | 0.73           | 1.03                      | 0.82                   | 44.8                   |
| South        | hWest  | : Springs I                     | Road S |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 1            | L2     | 14                              | 6.0    | 15                               | 6.0 | 0.345               | 6.8  | LOSA                | 0.3  | 1.9                          | 0.04           | 0.02                      | 0.05                   | 49.6                   |
| 2            | T1     | 579                             | 6.0    | 609                              | 6.0 | 0.345               | 0.1  | LOSA                | 0.3  | 1.9                          | 0.04           | 0.02                      | 0.05                   | 49.8                   |
| 3            | R2     | 10                              | 6.0    | 11                               | 6.0 | 0.345               | 8.7  | LOSA                | 0.3  | 1.9                          | 0.04           | 0.02                      | 0.05                   | 48.8                   |
| Appr         | oach   | 603                             | 6.0    | 635                              | 6.0 | 0.345               | 0.4  | NA                  | 0.3  | 1.9                          | 0.04           | 0.02                      | 0.05                   | 49.8                   |
| All<br>Vehic | cles   | 1419                            | 6.0    | 1494                             | 6.0 | 0.362               | 3.7  | NA                  | 1.3  | 9.3                          | 0.16           | 0.21                      | 0.17                   | 48.6                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## ▼ Site: 101v [Springs Road / Trents Road AM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                | t Perfo   | rmance      |           |              |     |                     |                         |      |                |                           |                        |                |
|--------------|--------|-----------------------|-----------|-------------|-----------|--------------|-----|---------------------|-------------------------|------|----------------|---------------------------|------------------------|----------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[Total |           | DEM/<br>FLO |           | Deg.<br>Satn |     | Level of<br>Service | 95% BA<br>QUE<br>[ Veh. |      | Prop. E<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed |
|              |        | veh/h                 | пv ј<br>% | veh/h       | пv ј<br>% | v/c          | sec |                     | veh                     | m m  |                | Rale                      | Cycles                 | km/h           |
| South        | nEast: | Trents Ro             | oad E     |             |           |              |     |                     |                         |      |                |                           |                        |                |
| 4            | L2     | 12                    | 6.0       | 13          | 6.0       | 0.080        | 5.5 | LOSA                | 0.4                     | 3.1  | 0.54           | 0.64                      | 0.54                   | 44.4           |
| 5            | T1     | 19                    | 6.0       | 20          | 6.0       | 0.080        | 5.6 | LOSA                | 0.4                     | 3.1  | 0.54           | 0.64                      | 0.54                   | 47.6           |
| 6            | R2     | 38                    | 6.0       | 40          | 6.0       | 0.080        | 9.5 | LOSA                | 0.4                     | 3.1  | 0.54           | 0.64                      | 0.54                   | 46.4           |
| Appro        | oach   | 69                    | 6.0       | 73          | 6.0       | 0.080        | 7.7 | LOSA                | 0.4                     | 3.1  | 0.54           | 0.64                      | 0.54                   | 46.6           |
| North        | East:  | Springs F             | Road N    |             |           |              |     |                     |                         |      |                |                           |                        |                |
| 7            | L2     | 6                     | 6.0       | 6           | 6.0       | 0.307        | 3.5 | LOSA                | 2.1                     | 15.5 | 0.25           | 0.41                      | 0.25                   | 47.1           |
| 8            | T1     | 348                   | 6.0       | 366         | 6.0       | 0.307        | 3.6 | LOSA                | 2.1                     | 15.5 | 0.25           | 0.41                      | 0.25                   | 48.5           |
| 9            | R2     | 46                    | 6.0       | 48          | 6.0       | 0.307        | 7.5 | LOSA                | 2.1                     | 15.5 | 0.25           | 0.41                      | 0.25                   | 49.0           |
| Appro        | oach   | 400                   | 6.0       | 421         | 6.0       | 0.307        | 4.0 | LOSA                | 2.1                     | 15.5 | 0.25           | 0.41                      | 0.25                   | 48.6           |
| North        | West:  | Trents R              | oad W     |             |           |              |     |                     |                         |      |                |                           |                        |                |
| 10           | L2     | 106                   | 6.0       | 112         | 6.0       | 0.179        | 5.9 | LOSA                | 1.0                     | 7.4  | 0.59           | 0.64                      | 0.59                   | 48.3           |
| 11           | T1     | 38                    | 6.0       | 40          | 6.0       | 0.179        | 5.9 | LOSA                | 1.0                     | 7.4  | 0.59           | 0.64                      | 0.59                   | 48.1           |
| 12           | R2     | 8                     | 6.0       | 8           | 6.0       | 0.179        | 9.8 | LOSA                | 1.0                     | 7.4  | 0.59           | 0.64                      | 0.59                   | 48.5           |
| Appro        | oach   | 152                   | 6.0       | 160         | 6.0       | 0.179        | 6.1 | LOSA                | 1.0                     | 7.4  | 0.59           | 0.64                      | 0.59                   | 48.3           |
| South        | nWest: | Springs               | Road S    |             |           |              |     |                     |                         |      |                |                           |                        |                |
| 1            | L2     | 13                    | 6.0       | 14          | 6.0       | 0.323        | 3.9 | LOSA                | 2.1                     | 15.4 | 0.34           | 0.43                      | 0.34                   | 48.4           |
| 2            | T1     | 365                   | 6.0       | 384         | 6.0       | 0.323        | 3.9 | LOSA                | 2.1                     | 15.4 | 0.34           | 0.43                      | 0.34                   | 48.4           |
| 3            | R2     | 10                    | 6.0       | 11          | 6.0       | 0.323        | 7.9 | LOSA                | 2.1                     | 15.4 | 0.34           | 0.43                      | 0.34                   | 47.1           |
| Appro        | oach   | 388                   | 6.0       | 408         | 6.0       | 0.323        | 4.0 | LOSA                | 2.1                     | 15.4 | 0.34           | 0.43                      | 0.34                   | 48.4           |
| All<br>Vehic | eles   | 1009                  | 6.0       | 1062        | 6.0       | 0.323        | 4.6 | LOSA                | 2.1                     | 15.5 | 0.36           | 0.47                      | 0.36                   | 48.3           |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

 $\label{eq:hv} \mbox{HV (\%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.}$ 

## ▼ Site: 101v [Springs Road / Trents Road PM Peak 2030 (Site Folder: Future 2030)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                          | t Perfo | rmance                           |     |                     |      |                     |                                |      |              |                           |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|--------------------------------|------|--------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEM/<br>FLO¹<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service | 95% BA<br>QUE<br>[ Veh.<br>veh |      | Prop.<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Trents Ro                       | oad E   |                                  |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 4            | L2     | 17                              | 6.0     | 18                               | 6.0 | 0.061               | 7.0  | LOSA                | 0.3                            | 2.5  | 0.67         | 0.66                      | 0.67                   | 44.6                   |
| 5            | T1     | 20                              | 6.0     | 21                               | 6.0 | 0.061               | 7.0  | LOSA                | 0.3                            | 2.5  | 0.67         | 0.66                      | 0.67                   | 47.7                   |
| 6            | R2     | 6                               | 6.0     | 6                                | 6.0 | 0.061               | 11.0 | LOS B               | 0.3                            | 2.5  | 0.67         | 0.66                      | 0.67                   | 46.5                   |
| Appr         | oach   | 43                              | 6.0     | 45                               | 6.0 | 0.061               | 7.6  | LOSA                | 0.3                            | 2.5  | 0.67         | 0.66                      | 0.67                   | 46.7                   |
| North        | nEast: | Springs F                       | Road N  |                                  |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 7            | L2     | 22                              | 6.0     | 23                               | 6.0 | 0.476               | 3.8  | LOSA                | 4.1                            | 30.5 | 0.37         | 0.44                      | 0.37                   | 46.8                   |
| 8            | T1     | 504                             | 6.0     | 531                              | 6.0 | 0.476               | 3.8  | LOSA                | 4.1                            | 30.5 | 0.37         | 0.44                      | 0.37                   | 48.2                   |
| 9            | R2     | 84                              | 6.0     | 88                               | 6.0 | 0.476               | 7.7  | LOSA                | 4.1                            | 30.5 | 0.37         | 0.44                      | 0.37                   | 48.8                   |
| Appr         | oach   | 610                             | 6.0     | 642                              | 6.0 | 0.476               | 4.3  | LOSA                | 4.1                            | 30.5 | 0.37         | 0.44                      | 0.37                   | 48.3                   |
| North        | nWest: | Trents Ro                       | oad W   |                                  |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 10           | L2     | 99                              | 6.0     | 104                              | 6.0 | 0.233               | 7.5  | LOSA                | 1.4                            | 10.6 | 0.73         | 0.76                      | 0.73                   | 47.9                   |
| 11           | T1     | 50                              | 6.0     | 53                               | 6.0 | 0.233               | 7.5  | LOSA                | 1.4                            | 10.6 | 0.73         | 0.76                      | 0.73                   | 47.6                   |
| 12           | R2     | 14                              | 6.0     | 15                               | 6.0 | 0.233               | 11.5 | LOS B               | 1.4                            | 10.6 | 0.73         | 0.76                      | 0.73                   | 48.0                   |
| Appr         | oach   | 163                             | 6.0     | 172                              | 6.0 | 0.233               | 7.8  | LOSA                | 1.4                            | 10.6 | 0.73         | 0.76                      | 0.73                   | 47.8                   |
| South        | hWest  | : Springs                       | Road S  |                                  |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 1            | L2     | 14                              | 6.0     | 15                               | 6.0 | 0.495               | 4.1  | LOSA                | 3.9                            | 29.0 | 0.43         | 0.45                      | 0.43                   | 48.2                   |
| 2            | T1     | 579                             | 6.0     | 609                              | 6.0 | 0.495               | 4.1  | LOSA                | 3.9                            | 29.0 | 0.43         | 0.45                      | 0.43                   | 48.3                   |
| 3            | R2     | 10                              | 6.0     | 11                               | 6.0 | 0.495               | 8.1  | LOSA                | 3.9                            | 29.0 | 0.43         | 0.45                      | 0.43                   | 46.8                   |
| Appr         | oach   | 603                             | 6.0     | 635                              | 6.0 | 0.495               | 4.2  | LOSA                | 3.9                            | 29.0 | 0.43         | 0.45                      | 0.43                   | 48.2                   |
| All<br>Vehic | cles   | 1419                            | 6.0     | 1494                             | 6.0 | 0.495               | 4.8  | LOSA                | 4.1                            | 30.5 | 0.44         | 0.49                      | 0.44                   | 48.2                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: J:\Urban Estates Ltd (UEL)\UEL-J001 West Prebbleton Private Plan Change\DocCalcs\SIDRA Modelling\Prebbleton PC Models.sip9

## **USER REPORT FOR SITE**

#### **All Movement Classes**

Project: Prebbleton PC Models

**Template: Movement Summary** Report

## **♥** Site: 101v [Shands Road / Trents Road AM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                          | t Perfo | rmance                           |     |                     |      |                     |     |                              |                |                           |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|-----|------------------------------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEM/<br>FLO¹<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service |     | ACK OF<br>EUE<br>Dist ]<br>m | Prop. E<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Trents Ro                       | oad E   |                                  |     |                     |      |                     |     |                              |                |                           |                        |                        |
| 4            | L2     | 55                              | 6.0     | 58                               | 6.0 | 0.352               | 8.3  | LOSA                | 1.7 | 12.5                         | 0.59           | 0.83                      | 0.59                   | 67.0                   |
| 5            | T1     | 19                              | 6.0     | 20                               | 6.0 | 0.352               | 8.6  | LOSA                | 1.7 | 12.5                         | 0.59           | 0.83                      | 0.59                   | 69.8                   |
| 6            | R2     | 212                             | 6.0     | 223                              | 6.0 | 0.352               | 14.8 | LOS B               | 1.7 | 12.5                         | 0.59           | 0.83                      | 0.59                   | 69.5                   |
| Appr         | oach   | 286                             | 6.0     | 301                              | 6.0 | 0.352               | 13.1 | LOS B               | 1.7 | 12.5                         | 0.59           | 0.83                      | 0.59                   | 69.1                   |
| North        | nEast: | Shands F                        | Road N  |                                  |     |                     |      |                     |     |                              |                |                           |                        |                        |
| 7            | L2     | 98                              | 6.0     | 103                              | 6.0 | 0.159               | 5.9  | LOSA                | 0.9 | 6.7                          | 0.24           | 0.49                      | 0.24                   | 72.4                   |
| 8            | T1     | 515                             | 6.0     | 542                              | 6.0 | 0.280               | 6.2  | LOSA                | 1.9 | 13.8                         | 0.24           | 0.47                      | 0.24                   | 72.5                   |
| 9            | R2     | 23                              | 6.0     | 24                               | 6.0 | 0.280               | 12.0 | LOS B               | 1.9 | 13.8                         | 0.24           | 0.47                      | 0.24                   | 73.1                   |
| Appr         | oach   | 636                             | 6.0     | 669                              | 6.0 | 0.280               | 6.4  | LOSA                | 1.9 | 13.8                         | 0.24           | 0.47                      | 0.24                   | 72.5                   |
| North        | nWest: | Trents R                        | oad W   |                                  |     |                     |      |                     |     |                              |                |                           |                        |                        |
| 10           | L2     | 46                              | 6.0     | 48                               | 6.0 | 0.183               | 14.7 | LOS B               | 0.9 | 7.0                          | 0.83           | 0.92                      | 0.83                   | 68.0                   |
| 11           | T1     | 20                              | 6.0     | 21                               | 6.0 | 0.183               | 13.5 | LOS B               | 0.9 | 7.0                          | 0.83           | 0.92                      | 0.83                   | 69.2                   |
| 12           | R2     | 6                               | 6.0     | 6                                | 6.0 | 0.183               | 19.5 | LOS B               | 0.9 | 7.0                          | 0.83           | 0.92                      | 0.83                   | 66.2                   |
| Appr         | oach   | 72                              | 6.0     | 76                               | 6.0 | 0.183               | 14.8 | LOS B               | 0.9 | 7.0                          | 0.83           | 0.92                      | 0.83                   | 68.2                   |
| South        | hWest  | : Shands                        | Road S  |                                  |     |                     |      |                     |     |                              |                |                           |                        |                        |
| 1            | L2     | 15                              | 6.0     | 16                               | 6.0 | 0.372               | 7.4  | LOSA                | 2.5 | 18.7                         | 0.57           | 0.62                      | 0.57                   | 69.3                   |
| 2            | T1     | 1189                            | 6.0     | 1252                             | 6.0 | 0.656               | 8.4  | LOSA                | 6.7 | 49.1                         | 0.67           | 0.63                      | 0.67                   | 70.3                   |
| 3            | R2     | 38                              | 6.0     | 40                               | 6.0 | 0.656               | 13.7 | LOS B               | 6.7 | 49.1                         | 0.71           | 0.64                      | 0.72                   | 69.7                   |
| Appr         | oach   | 1242                            | 6.0     | 1307                             | 6.0 | 0.656               | 8.6  | LOSA                | 6.7 | 49.1                         | 0.67           | 0.63                      | 0.67                   | 70.3                   |
| All<br>Vehic | cles   | 2236                            | 6.0     | 2354                             | 6.0 | 0.656               | 8.7  | LOSA                | 6.7 | 49.1                         | 0.54           | 0.62                      | 0.54                   | 70.6                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## ▼ Site: 101v [Shands Road / Trents Road PM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

| Vehi         | icle M | ovemen                          | t Perfo | rmance                          |     |                     |      |                     |                                |      |                |                           |                        |                        |
|--------------|--------|---------------------------------|---------|---------------------------------|-----|---------------------|------|---------------------|--------------------------------|------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEM/<br>FLO<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service | 95% BA<br>QUE<br>[ Veh.<br>veh |      | Prop. E<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| Sout         | hEast: | Trents Ro                       |         |                                 |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 4            | L2     | 53                              | 6.0     | 56                              | 6.0 | 0.389               | 17.2 | LOS B               | 2.3                            | 17.0 | 0.87           | 0.99                      | 1.01                   | 62.9                   |
| 5            | T1     | 18                              | 6.0     | 19                              | 6.0 | 0.389               | 16.0 | LOS B               | 2.3                            | 17.0 | 0.87           | 0.99                      | 1.01                   | 66.0                   |
| 6            | R2     | 87                              | 6.0     | 92                              | 6.0 | 0.389               | 22.0 | LOS C               | 2.3                            | 17.0 | 0.87           | 0.99                      | 1.01                   | 65.7                   |
| Appr         | oach   | 158                             | 6.0     | 166                             | 6.0 | 0.389               | 19.7 | LOS B               | 2.3                            | 17.0 | 0.87           | 0.99                      | 1.01                   | 64.9                   |
| North        | nEast: | Shands R                        | load N  |                                 |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 7            | L2     | 215                             | 6.0     | 226                             | 6.0 | 0.413               | 6.5  | LOSA                | 2.9                            | 21.3 | 0.41           | 0.54                      | 0.41                   | 71.7                   |
| 8            | T1     | 1336                            | 6.0     | 1406                            | 6.0 | 0.729               | 7.5  | LOSA                | 8.5                            | 62.3 | 0.54           | 0.53                      | 0.54                   | 71.0                   |
| 9            | R2     | 28                              | 6.0     | 29                              | 6.0 | 0.729               | 12.9 | LOS B               | 8.5                            | 62.3 | 0.57           | 0.53                      | 0.57                   | 71.7                   |
| Appr         | oach   | 1579                            | 6.0     | 1662                            | 6.0 | 0.729               | 7.4  | LOSA                | 8.5                            | 62.3 | 0.52           | 0.53                      | 0.52                   | 71.1                   |
| North        | nWest: | Trents Ro                       | oad W   |                                 |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 10           | L2     | 60                              | 6.0     | 63                              | 6.0 | 0.164               | 9.0  | LOSA                | 0.7                            | 5.3  | 0.63           | 0.80                      | 0.63                   | 70.4                   |
| 11           | T1     | 36                              | 6.0     | 38                              | 6.0 | 0.164               | 9.3  | LOSA                | 0.7                            | 5.3  | 0.63           | 0.80                      | 0.63                   | 71.7                   |
| 12           | R2     | 14                              | 6.0     | 15                              | 6.0 | 0.164               | 15.4 | LOS B               | 0.7                            | 5.3  | 0.63           | 0.80                      | 0.63                   | 68.9                   |
| Appr         | oach   | 110                             | 6.0     | 116                             | 6.0 | 0.164               | 9.9  | LOSA                | 0.7                            | 5.3  | 0.63           | 0.80                      | 0.63                   | 70.7                   |
| Sout         | hWest: | : Shands I                      | Road S  |                                 |     |                     |      |                     |                                |      |                |                           |                        |                        |
| 1            | L2     | 13                              | 6.0     | 14                              | 6.0 | 0.211               | 6.4  | LOSA                | 1.3                            | 9.7  | 0.38           | 0.51                      | 0.38                   | 70.3                   |
| 2            | T1     | 687                             | 6.0     | 723                             | 6.0 | 0.372               | 6.7  | LOSA                | 2.9                            | 21.2 | 0.40           | 0.52                      | 0.40                   | 71.4                   |
| 3            | R2     | 77                              | 6.0     | 81                              | 6.0 | 0.372               | 12.4 | LOS B               | 2.9                            | 21.2 | 0.41           | 0.53                      | 0.41                   | 70.9                   |
| Appr         | oach   | 777                             | 6.0     | 818                             | 6.0 | 0.372               | 7.2  | LOSA                | 2.9                            | 21.2 | 0.40           | 0.52                      | 0.40                   | 71.4                   |
| All<br>Vehic | cles   | 2624                            | 6.0     | 2762                            | 6.0 | 0.729               | 8.2  | LOSA                | 8.5                            | 62.3 | 0.51           | 0.57                      | 0.52                   | 70.7                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

 $\label{eq:hv} \mbox{HV (\%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.}$ 

## **♥** Site: 101v [Shands Road / Hamptons Road AM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

| Vehi           | cle M          | ovemen                          | t Perfo           | rmance                           |                   |                         |                      |                         |                                |                              |                      |                           |                        |                        |
|----------------|----------------|---------------------------------|-------------------|----------------------------------|-------------------|-------------------------|----------------------|-------------------------|--------------------------------|------------------------------|----------------------|---------------------------|------------------------|------------------------|
| Mov<br>ID      | Turn           | INP<br>VOLU<br>[ Total<br>veh/h |                   | DEM/<br>FLO¹<br>[ Total<br>veh/h |                   | Deg.<br>Satn<br>v/c     |                      | Level of<br>Service     | 95% BA<br>QUI<br>[ Veh.<br>veh | ACK OF<br>EUE<br>Dist ]<br>m | Prop. I<br>Que       | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South          | nEast:         | Hampton                         | s Road            | E                                |                   |                         |                      |                         |                                |                              |                      |                           |                        |                        |
| 4<br>5         | L2<br>T1       | 141<br>6                        | 6.0               | 148<br>6                         | 6.0               | 0.273<br>0.273          | 8.0<br>8.3           | LOS A                   | 1.2                            | 9.1<br>9.1                   | 0.56<br>0.56         | 0.78<br>0.78              | 0.56<br>0.56           | 71.5<br>73.4           |
| 6<br>Appro     | R2<br>pach     | 75<br>222                       | 6.0               | 79<br>234                        | 6.0               | 0.273<br>0.273          | 10.1                 | LOS B                   | 1.2                            | 9.1                          | 0.56<br>0.56         | 0.78                      | 0.56<br>0.56           | 73.2<br>72.2           |
| North          | East:          | Shands F                        | Road N            |                                  |                   |                         |                      |                         |                                |                              |                      |                           |                        |                        |
| 7<br>8<br>9    | L2<br>T1<br>R2 | 49<br>508<br>29                 | 6.0<br>6.0<br>6.0 | 52<br>535<br>31                  | 6.0<br>6.0<br>6.0 | 0.152<br>0.268<br>0.268 | 6.1<br>6.4<br>12.1   | LOS A<br>LOS A<br>LOS B | 0.8<br>1.7<br>1.7              | 6.2<br>12.6<br>12.6          | 0.29<br>0.29<br>0.29 | 0.49<br>0.49<br>0.49      | 0.29<br>0.29<br>0.29   | 73.7<br>72.2<br>72.8   |
| Appro          |                | 586                             | 6.0               | 617                              | 6.0               | 0.268                   | 6.6                  | LOSA                    | 1.7                            | 12.6                         | 0.29                 | 0.49                      | 0.29                   | 72.4                   |
| North          | West:          | Hamptor                         | ns Road           | W                                |                   |                         |                      |                         |                                |                              |                      |                           |                        |                        |
| 10<br>11<br>12 | L2<br>T1<br>R2 | 72<br>4<br>4                    | 6.0<br>6.0<br>6.0 | 76<br>4<br>4                     | 6.0<br>6.0<br>6.0 | 0.132<br>0.132<br>0.132 | 10.0<br>10.1<br>16.1 | LOS A<br>LOS B          | 0.6<br>0.6<br>0.6              | 4.3<br>4.3<br>4.3            | 0.67<br>0.67<br>0.67 | 0.84<br>0.84<br>0.84      | 0.67<br>0.67<br>0.67   | 70.4<br>73.5<br>68.9   |
| Appro          | oach           | 80                              | 6.0               | 84                               | 6.0               | 0.132                   | 10.3                 | LOS B                   | 0.6                            | 4.3                          | 0.67                 | 0.84                      | 0.67                   | 70.5                   |
| South          | nWest          | : Shands                        | Road S            |                                  |                   |                         |                      |                         |                                |                              |                      |                           |                        |                        |
| 1<br>2<br>3    | L2<br>T1<br>R2 | 5<br>880<br>90                  | 6.0<br>6.0<br>6.0 | 5<br>926<br>95                   | 6.0<br>6.0<br>6.0 | 0.254<br>0.448<br>0.448 | 6.3<br>6.7<br>12.3   | LOS A<br>LOS B          | 1.6<br>3.6<br>3.6              | 11.5<br>26.2<br>26.2         | 0.34<br>0.36<br>0.38 | 0.49<br>0.51<br>0.52      | 0.34<br>0.36<br>0.38   | 70.5<br>71.6<br>73.2   |
| Appro          |                | 975                             | 6.0               | 1026                             | 6.0               | 0.448                   | 7.2                  | LOSA                    | 3.6                            | 26.2                         | 0.37                 | 0.51                      | 0.37                   | 71.8                   |
| All<br>Vehic   | eles           | 1863                            | 6.0               | 1961                             | 6.0               | 0.448                   | 7.5                  | LOSA                    | 3.6                            | 26.2                         | 0.38                 | 0.55                      | 0.38                   | 72.0                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## **♥** Site: 101v [Shands Road / Hamptons Road PM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

| Vehi           | cle M          | ovement                         | t Perfo           | rmance                           |                   |                         |                    |                     |                                |                   |                      |                           |                        |                        |
|----------------|----------------|---------------------------------|-------------------|----------------------------------|-------------------|-------------------------|--------------------|---------------------|--------------------------------|-------------------|----------------------|---------------------------|------------------------|------------------------|
| Mov<br>ID      | Turn           | INP<br>VOLU<br>[ Total<br>veh/h |                   | DEM/<br>FLO\<br>[ Total<br>veh/h |                   | Deg.<br>Satn<br>v/c     |                    | Level of<br>Service | 95% BA<br>QUE<br>[ Veh.<br>veh |                   | Prop.<br>Que         | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South          | hEast:         | Hampton                         | s Road            | E                                |                   |                         |                    |                     |                                |                   |                      |                           |                        |                        |
| 4<br>5         | L2<br>T1       | 142<br>10                       | 6.0<br>6.0        | 149<br>11                        | 6.0<br>6.0        | 0.425<br>0.425          | 14.8<br>14.0       | LOS B<br>LOS B      | 2.5<br>2.5                     | 18.4<br>18.4      | 0.84<br>0.84         | 0.98<br>0.98              | 1.00<br>1.00           | 68.6<br>70.7           |
| 6              | R2             | 44                              | 6.0               | 46                               | 6.0               | 0.425                   | 20.0               | LOS B               | 2.5                            | 18.4              | 0.84                 | 0.98                      | 1.00                   | 70.7                   |
| Appr           | oach           | 196                             | 6.0               | 206                              | 6.0               | 0.425                   | 15.9               | LOS B               | 2.5                            | 18.4              | 0.84                 | 0.98                      | 1.00                   | 69.2                   |
| North          | nEast:         | Shands R                        | load N            |                                  |                   |                         |                    |                     |                                |                   |                      |                           |                        |                        |
| 7<br>8         | L2<br>T1       | 90<br>1239                      | 6.0<br>6.0        | 95<br>1304                       | 6.0<br>6.0        | 0.376<br>0.664          | 6.9<br>7.7         | LOS A<br>LOS A      | 2.5<br>6.6                     | 18.4<br>48.3      | 0.47<br>0.57         | 0.57<br>0.58              | 0.47<br>0.57           | 73.1<br>70.8           |
| 9              | R2             | 31                              | 6.0               | 33                               | 6.0               | 0.664                   | 13.1               | LOS B               | 6.6                            | 48.3              | 0.60                 | 0.58                      | 0.60                   | 71.5                   |
| Appr           | oach           | 1360                            | 6.0               | 1432                             | 6.0               | 0.664                   | 7.8                | LOSA                | 6.6                            | 48.3              | 0.56                 | 0.57                      | 0.56                   | 71.1                   |
| North          | nWest:         | Hampton                         | s Road            | W                                |                   |                         |                    |                     |                                |                   |                      |                           |                        |                        |
| 10<br>11<br>12 | L2<br>T1<br>R2 | 42<br>15<br>5                   | 6.0<br>6.0<br>6.0 | 44<br>16<br>5                    | 6.0<br>6.0<br>6.0 | 0.092<br>0.092<br>0.092 | 8.9<br>9.2<br>15.4 | LOS A<br>LOS B      | 0.4<br>0.4<br>0.4              | 2.8<br>2.8<br>2.8 | 0.61<br>0.61<br>0.61 | 0.77<br>0.77<br>0.77      | 0.61<br>0.61<br>0.61   | 70.8<br>73.7<br>69.3   |
| Appr           |                | 62                              | 6.0               | 65                               | 6.0               | 0.092                   | 9.5                | LOSA                | 0.4                            | 2.8               | 0.61                 | 0.77                      | 0.61                   | 71.5                   |
| South          | hWest:         | Shands I                        | Road S            |                                  |                   |                         |                    |                     |                                |                   |                      |                           |                        |                        |
| 1              | L2             | 10                              | 6.0               | 11                               | 6.0               | 0.218                   | 6.1                | LOSA                | 1.3                            | 9.9               | 0.30                 | 0.47                      | 0.30                   | 70.7                   |
| 2              | T1             | 679                             | 6.0               | 715                              | 6.0               | 0.384                   | 6.4                | LOS A               | 3.0                            | 21.8              | 0.31                 | 0.51                      | 0.31                   | 71.6                   |
| 3              | R2             | 164                             | 6.0               | 173                              | 6.0               | 0.384                   | 12.1               | LOS B               | 3.0                            | 21.8              | 0.32                 | 0.53                      | 0.32                   | 72.9                   |
| Appr           | oach           | 853                             | 6.0               | 898                              | 6.0               | 0.384                   | 7.5                | LOSA                | 3.0                            | 21.8              | 0.31                 | 0.51                      | 0.31                   | 71.9                   |
| All<br>Vehic   | cles           | 2471                            | 6.0               | 2601                             | 6.0               | 0.664                   | 8.4                | LOSA                | 6.6                            | 48.3              | 0.50                 | 0.59                      | 0.51                   | 71.2                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## 🧓 Site: 101 [Springs Road / Hamptons Road AM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site Site Category: (None) Stop (Two-Way)

| Vehi         | cle M              | ovemen                 | t Perfo     | rmance                  |           |              |       |                     |               |                         |                |                           |                        |                |
|--------------|--------------------|------------------------|-------------|-------------------------|-----------|--------------|-------|---------------------|---------------|-------------------------|----------------|---------------------------|------------------------|----------------|
| Mov<br>ID    | Turn               | INP<br>VOLU<br>[ Total | MES<br>HV]  | DEMA<br>FLOV<br>[ Total | WS<br>HV] | Deg.<br>Satn | Delay | Level of<br>Service | QUI<br>[ Veh. | ACK OF<br>EUE<br>Dist ] | Prop. I<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed |
| South        | hFast <sup>.</sup> | veh/h<br>Hampton       | %<br>s Road | veh/h<br>F              | %         | v/c          | sec   |                     | veh           | m                       |                |                           |                        | km/h           |
| 4            | L2                 | 29                     | 6.0         | 31                      | 6.0       | 0.041        | 10.5  | LOS B               | 0.1           | 1.0                     | 0.43           | 0.90                      | 0.43                   | 56.8           |
| 5            | T1                 | 52                     | 6.0         | 55                      | 6.0       | 0.168        | 15.2  | LOS C               | 0.6           | 4.2                     | 0.49           | 1.00                      | 0.49                   | 54.4           |
| 6            | R2                 | 13                     | 6.0         | 14                      | 6.0       | 0.168        | 16.9  | LOS C               | 0.6           | 4.2                     | 0.69           | 1.00                      | 0.69                   | 51.8           |
| Appr         |                    | 94                     | 6.0         | 99                      | 6.0       | 0.168        | 14.0  | LOS B               | 0.6           | 4.2                     | 0.61           | 0.97                      | 0.61                   | 55.1           |
| North        | nEast:             | Springs R              | Road N      |                         |           |              |       |                     |               |                         |                |                           |                        |                |
| 7            | L2                 | 3                      | 6.0         | 3                       | 6.0       | 0.194        | 5.7   | LOSA                | 0.0           | 0.0                     | 0.00           | 0.01                      | 0.00                   | 58.7           |
| 8            | T1                 | 341                    | 6.0         | 359                     | 6.0       | 0.194        | 0.1   | LOSA                | 0.0           | 0.0                     | 0.00           | 0.01                      | 0.00                   | 59.9           |
| 9            | R2                 | 47                     | 6.0         | 49                      | 6.0       | 0.040        | 6.8   | LOSA                | 0.2           | 1.3                     | 0.42           | 0.61                      | 0.42                   | 56.2           |
| Appr         | oach               | 391                    | 6.0         | 412                     | 6.0       | 0.194        | 0.9   | NA                  | 0.2           | 1.3                     | 0.05           | 0.08                      | 0.05                   | 59.5           |
| North        | nWest:             | Hampton                | s Road      | W                       |           |              |       |                     |               |                         |                |                           |                        |                |
| 10           | L2                 | 76                     | 6.0         | 80                      | 6.0       | 0.098        | 10.2  | LOS B               | 0.4           | 2.6                     | 0.41           | 0.91                      | 0.41                   | 55.6           |
| 11           | T1                 | 50                     | 6.0         | 53                      | 6.0       | 0.324        | 16.6  | LOS C               | 1.3           | 9.8                     | 0.74           | 1.05                      | 0.91                   | 53.8           |
| 12           | R2                 | 73                     | 6.0         | 77                      | 6.0       | 0.324        | 18.1  | LOS C               | 1.3           | 9.8                     | 0.74           | 1.05                      | 0.91                   | 55.8           |
| Appr         | oach               | 199                    | 6.0         | 209                     | 6.0       | 0.324        | 14.7  | LOS B               | 1.3           | 9.8                     | 0.61           | 1.00                      | 0.72                   | 55.3           |
| South        | hWest              | : Springs I            | Road S      |                         |           |              |       |                     |               |                         |                |                           |                        |                |
| 1            | L2                 | 35                     | 6.0         | 37                      | 6.0       | 0.184        | 5.8   | LOSA                | 0.0           | 0.0                     | 0.00           | 0.06                      | 0.00                   | 59.3           |
| 2            | T1                 | 289                    | 6.0         | 304                     | 6.0       | 0.184        | 0.2   | LOSA                | 0.0           | 0.0                     | 0.00           | 0.06                      | 0.00                   | 59.7           |
| 3            | R2                 | 51                     | 6.0         | 54                      | 6.0       | 0.045        | 6.9   | LOSA                | 0.2           | 1.4                     | 0.43           | 0.62                      | 0.43                   | 57.3           |
| Appr         | oach               | 375                    | 6.0         | 395                     | 6.0       | 0.184        | 1.7   | NA                  | 0.2           | 1.4                     | 0.06           | 0.14                      | 0.06                   | 59.3           |
| All<br>Vehic | cles               | 1059                   | 6.0         | 1115                    | 6.0       | 0.324        | 4.9   | NA                  | 1.3           | 9.8                     | 0.21           | 0.35                      | 0.23                   | 58.2           |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## 🧓 Site: 101 [Springs Road / Hamptons Road PM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site Site Category: (None) Stop (Two-Way)

| Vehi         | cle M  | ovemen                          | t Perfo | rmance                           |     |                     |      |                     |     |                              |                |                           |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|-----|------------------------------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEM/<br>FLO'<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service |     | ACK OF<br>EUE<br>Dist ]<br>m | Prop. I<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Hampton                         |         |                                  | 70  | V/C                 | 366  |                     | Ven | - '''                        |                |                           |                        | KIII/II                |
| 4            | L2     | 33                              | 6.0     | 35                               | 6.0 | 0.045               | 10.4 | LOS B               | 0.2 | 1.2                          | 0.42           | 0.90                      | 0.42                   | 56.9                   |
| 5            | T1     | 70                              | 6.0     | 74                               | 6.0 | 0.364               | 24.8 | LOS C               | 1.4 | 10.0                         | 0.85           | 1.06                      | 1.07                   | 51.6                   |
| 6            | R2     | 15                              | 6.0     | 16                               | 6.0 | 0.364               | 27.7 | LOS D               | 1.4 | 10.0                         | 0.85           | 1.06                      | 1.07                   | 48.0                   |
| Appr         | oach   | 118                             | 6.0     | 124                              | 6.0 | 0.364               | 21.1 | LOS C               | 1.4 | 10.0                         | 0.73           | 1.01                      | 0.89                   | 53.0                   |
| North        | nEast: | Springs R                       | Road N  |                                  |     |                     |      |                     |     |                              |                |                           |                        |                        |
| 7            | L2     | 14                              | 6.0     | 15                               | 6.0 | 0.193               | 5.7  | LOSA                | 0.0 | 0.0                          | 0.00           | 0.02                      | 0.00                   | 58.6                   |
| 8            | T1     | 327                             | 6.0     | 344                              | 6.0 | 0.193               | 0.1  | LOSA                | 0.0 | 0.0                          | 0.00           | 0.02                      | 0.00                   | 59.8                   |
| 9            | R2     | 101                             | 6.0     | 106                              | 6.0 | 0.119               | 8.5  | LOSA                | 0.5 | 3.6                          | 0.57           | 0.76                      | 0.57                   | 55.7                   |
| Appr         | oach   | 442                             | 6.0     | 465                              | 6.0 | 0.193               | 2.2  | NA                  | 0.5 | 3.6                          | 0.13           | 0.19                      | 0.13                   | 59.0                   |
| North        | nWest: | Hampton                         | s Road  | W                                |     |                     |      |                     |     |                              |                |                           |                        |                        |
| 10           | L2     | 55                              | 6.0     | 58                               | 6.0 | 0.097               | 12.2 | LOS B               | 0.3 | 2.5                          | 0.53           | 0.98                      | 0.53                   | 54.9                   |
| 11           | T1     | 114                             | 6.0     | 120                              | 6.0 | 0.650               | 30.6 | LOS D               | 3.2 | 23.6                         | 0.91           | 1.18                      | 1.60                   | 49.9                   |
| 12           | R2     | 45                              | 6.0     | 47                               | 6.0 | 0.650               | 33.9 | LOS D               | 3.2 | 23.6                         | 0.91           | 1.18                      | 1.60                   | 53.0                   |
| Appr         | oach   | 214                             | 6.0     | 225                              | 6.0 | 0.650               | 26.6 | LOS D               | 3.2 | 23.6                         | 0.81           | 1.13                      | 1.32                   | 51.8                   |
| South        | hWest  | : Springs I                     | Road S  |                                  |     |                     |      |                     |     |                              |                |                           |                        |                        |
| 1            | L2     | 74                              | 6.0     | 78                               | 6.0 | 0.316               | 6.1  | LOSA                | 0.0 | 0.0                          | 0.00           | 0.08                      | 0.00                   | 59.1                   |
| 2            | T1     | 484                             | 6.0     | 509                              | 6.0 | 0.316               | 0.5  | LOSA                | 0.0 | 0.0                          | 0.00           | 0.08                      | 0.00                   | 59.6                   |
| 3            | R2     | 45                              | 6.0     | 47                               | 6.0 | 0.039               | 6.9  | LOSA                | 0.2 | 1.2                          | 0.43           | 0.61                      | 0.43                   | 57.3                   |
| Appr         | oach   | 603                             | 6.0     | 635                              | 6.0 | 0.316               | 1.6  | NA                  | 0.2 | 1.2                          | 0.03           | 0.12                      | 0.03                   | 59.3                   |
| All<br>Vehic | cles   | 1377                            | 6.0     | 1449                             | 6.0 | 0.650               | 7.4  | NA                  | 3.2 | 23.6                         | 0.25           | 0.38                      | 0.34                   | 57.5                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## **♥** Site: 101v [Springs Road / Hamptons Road AM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                 | t Perfo | rmance                  |     |              |      |                     |                                 |      |                |                           |                        |                |
|--------------|--------|------------------------|---------|-------------------------|-----|--------------|------|---------------------|---------------------------------|------|----------------|---------------------------|------------------------|----------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total |         | DEM/<br>FLO¹<br>[ Total |     | Deg.<br>Satn |      | Level of<br>Service | 95% B <i>A</i><br>QUE<br>[ Veh. |      | Prop. I<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed |
|              |        | veh/h                  | %       | veh/h                   | %   | v/c          | sec  |                     | veh                             | m m  |                | rate                      |                        | km/h           |
| South        | hEast: | Hampton                | s Road  | E                       |     |              |      |                     |                                 |      |                |                           |                        |                |
| 4            | L2     | 29                     | 6.0     | 31                      | 6.0 | 0.117        | 7.1  | LOSA                | 0.7                             | 4.8  | 0.60           | 0.67                      | 0.60                   | 57.3           |
| 5            | T1     | 52                     | 6.0     | 55                      | 6.0 | 0.117        | 7.3  | LOSA                | 0.7                             | 4.8  | 0.60           | 0.67                      | 0.60                   | 57.1           |
| 6            | R2     | 13                     | 6.0     | 14                      | 6.0 | 0.117        | 11.3 | LOS B               | 0.7                             | 4.8  | 0.60           | 0.67                      | 0.60                   | 55.5           |
| Appr         | oach   | 94                     | 6.0     | 99                      | 6.0 | 0.117        | 7.8  | LOSA                | 0.7                             | 4.8  | 0.60           | 0.67                      | 0.60                   | 57.0           |
| North        | nEast: | Springs F              | Road N  |                         |     |              |      |                     |                                 |      |                |                           |                        |                |
| 7            | L2     | 3                      | 6.0     | 3                       | 6.0 | 0.361        | 5.5  | LOSA                | 2.4                             | 17.8 | 0.47           | 0.56                      | 0.47                   | 55.3           |
| 8            | T1     | 341                    | 6.0     | 359                     | 6.0 | 0.361        | 5.7  | LOSA                | 2.4                             | 17.8 | 0.47           | 0.56                      | 0.47                   | 57.7           |
| 9            | R2     | 47                     | 6.0     | 49                      | 6.0 | 0.361        | 9.7  | LOSA                | 2.4                             | 17.8 | 0.47           | 0.56                      | 0.47                   | 56.8           |
| Appr         | oach   | 391                    | 6.0     | 412                     | 6.0 | 0.361        | 6.2  | LOSA                | 2.4                             | 17.8 | 0.47           | 0.56                      | 0.47                   | 57.6           |
| North        | nWest: | Hampton                | s Road  | W                       |     |              |      |                     |                                 |      |                |                           |                        |                |
| 10           | L2     | 76                     | 6.0     | 80                      | 6.0 | 0.224        | 6.5  | LOSA                | 1.3                             | 9.5  | 0.57           | 0.69                      | 0.57                   | 56.0           |
| 11           | T1     | 50                     | 6.0     | 53                      | 6.0 | 0.224        | 6.8  | LOSA                | 1.3                             | 9.5  | 0.57           | 0.69                      | 0.57                   | 57.0           |
| 12           | R2     | 73                     | 6.0     | 77                      | 6.0 | 0.224        | 10.8 | LOS B               | 1.3                             | 9.5  | 0.57           | 0.69                      | 0.57                   | 57.9           |
| Appr         | oach   | 199                    | 6.0     | 209                     | 6.0 | 0.224        | 8.2  | LOSA                | 1.3                             | 9.5  | 0.57           | 0.69                      | 0.57                   | 57.1           |
| South        | hWest  | : Springs              | Road S  |                         |     |              |      |                     |                                 |      |                |                           |                        |                |
| 1            | L2     | 35                     | 6.0     | 37                      | 6.0 | 0.318        | 5.0  | LOSA                | 2.1                             | 15.2 | 0.36           | 0.51                      | 0.36                   | 58.0           |
| 2            | T1     | 289                    | 6.0     | 304                     | 6.0 | 0.318        | 5.2  | LOSA                | 2.1                             | 15.2 | 0.36           | 0.51                      | 0.36                   | 57.9           |
| 3            | R2     | 51                     | 6.0     | 54                      | 6.0 | 0.318        | 9.2  | LOSA                | 2.1                             | 15.2 | 0.36           | 0.51                      | 0.36                   | 58.0           |
| Appr         | oach   | 375                    | 6.0     | 395                     | 6.0 | 0.318        | 5.7  | LOSA                | 2.1                             | 15.2 | 0.36           | 0.51                      | 0.36                   | 57.9           |
| All<br>Vehic | cles   | 1059                   | 6.0     | 1115                    | 6.0 | 0.361        | 6.5  | LOSA                | 2.4                             | 17.8 | 0.46           | 0.58                      | 0.46                   | 57.6           |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## **♥** Site: 101v [Springs Road / Hamptons Road PM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                | t Perfo | rmance      |     |              |      |                     |                                 |      |                |                           |                        |                |
|--------------|--------|-----------------------|---------|-------------|-----|--------------|------|---------------------|---------------------------------|------|----------------|---------------------------|------------------------|----------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[Total |         | DEM/<br>FLO |     | Deg.<br>Satn |      | Level of<br>Service | 95% B <i>A</i><br>QUE<br>[ Veh. |      | Prop. I<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed |
|              |        | veh/h                 | %       | veh/h       | %   | v/c          | sec  |                     | veh                             | m    |                |                           |                        | km/h           |
| South        | nEast: | Hampton               | s Road  | E           |     |              |      |                     |                                 |      |                |                           |                        |                |
| 4            | L2     | 33                    | 6.0     | 35          | 6.0 | 0.151        | 7.2  | LOSA                | 0.9                             | 6.5  | 0.64           | 0.69                      | 0.64                   | 57.3           |
| 5            | T1     | 70                    | 6.0     | 74          | 6.0 | 0.151        | 7.5  | LOSA                | 0.9                             | 6.5  | 0.64           | 0.69                      | 0.64                   | 57.0           |
| 6            | R2     | 15                    | 6.0     | 16          | 6.0 | 0.151        | 11.5 | LOS B               | 0.9                             | 6.5  | 0.64           | 0.69                      | 0.64                   | 55.4           |
| Appro        | oach   | 118                   | 6.0     | 124         | 6.0 | 0.151        | 7.9  | LOSA                | 0.9                             | 6.5  | 0.64           | 0.69                      | 0.64                   | 57.0           |
| North        | East:  | Springs F             | Road N  |             |     |              |      |                     |                                 |      |                |                           |                        |                |
| 7            | L2     | 14                    | 6.0     | 15          | 6.0 | 0.425        | 5.8  | LOSA                | 3.1                             | 23.0 | 0.55           | 0.61                      | 0.55                   | 54.9           |
| 8            | T1     | 327                   | 6.0     | 344         | 6.0 | 0.425        | 6.0  | LOSA                | 3.1                             | 23.0 | 0.55           | 0.61                      | 0.55                   | 57.5           |
| 9            | R2     | 101                   | 6.0     | 106         | 6.0 | 0.425        | 10.1 | LOS B               | 3.1                             | 23.0 | 0.55           | 0.61                      | 0.55                   | 56.6           |
| Appro        | oach   | 442                   | 6.0     | 465         | 6.0 | 0.425        | 7.0  | LOSA                | 3.1                             | 23.0 | 0.55           | 0.61                      | 0.55                   | 57.3           |
| North        | West:  | Hamptor               | ns Road | W           |     |              |      |                     |                                 |      |                |                           |                        |                |
| 10           | L2     | 55                    | 6.0     | 58          | 6.0 | 0.298        | 8.2  | LOSA                | 1.9                             | 14.2 | 0.74           | 0.79                      | 0.74                   | 55.7           |
| 11           | T1     | 114                   | 6.0     | 120         | 6.0 | 0.298        | 8.5  | LOSA                | 1.9                             | 14.2 | 0.74           | 0.79                      | 0.74                   | 56.6           |
| 12           | R2     | 45                    | 6.0     | 47          | 6.0 | 0.298        | 12.5 | LOS B               | 1.9                             | 14.2 | 0.74           | 0.79                      | 0.74                   | 57.7           |
| Appro        | oach   | 214                   | 6.0     | 225         | 6.0 | 0.298        | 9.2  | LOSA                | 1.9                             | 14.2 | 0.74           | 0.79                      | 0.74                   | 56.7           |
| South        | nWest: | Springs               | Road S  |             |     |              |      |                     |                                 |      |                |                           |                        |                |
| 1            | L2     | 74                    | 6.0     | 78          | 6.0 | 0.549        | 5.9  | LOSA                | 4.5                             | 32.8 | 0.58           | 0.60                      | 0.58                   | 57.8           |
| 2            | T1     | 484                   | 6.0     | 509         | 6.0 | 0.549        | 6.2  | LOSA                | 4.5                             | 32.8 | 0.58           | 0.60                      | 0.58                   | 57.6           |
| 3            | R2     | 45                    | 6.0     | 47          | 6.0 | 0.549        | 10.2 | LOS B               | 4.5                             | 32.8 | 0.58           | 0.60                      | 0.58                   | 57.7           |
| Appro        | oach   | 603                   | 6.0     | 635         | 6.0 | 0.549        | 6.4  | LOSA                | 4.5                             | 32.8 | 0.58           | 0.60                      | 0.58                   | 57.7           |
| All<br>Vehic | les    | 1377                  | 6.0     | 1449        | 6.0 | 0.549        | 7.2  | LOSA                | 4.5                             | 32.8 | 0.60           | 0.64                      | 0.60                   | 57.4           |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## 🧓 Site: 101 [Springs Road / Trents Road AM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site Site Category: (None) Stop (Two-Way)

| Vehi         | cle M  | ovement                         | Perfo  | rmance                           |     |                     |      |                     |      |                              |                |                           |                        |                        |
|--------------|--------|---------------------------------|--------|----------------------------------|-----|---------------------|------|---------------------|------|------------------------------|----------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |        | DEMA<br>FLO\<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service |      | ACK OF<br>EUE<br>Dist ]<br>m | Prop. I<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Trents Ro                       |        | VCII/II                          | 70  | VIC                 | 300  |                     | VCII | - ''                         |                |                           |                        | KIII/II                |
| 4            | L2     | 12                              | 6.0    | 13                               | 6.0 | 0.017               | 10.0 | LOS B               | 0.1  | 0.4                          | 0.44           | 0.88                      | 0.44                   | 43.6                   |
| 5            | T1     | 19                              | 6.0    | 20                               | 6.0 | 0.229               | 17.7 | LOS C               | 8.0  | 5.8                          | 0.81           | 1.03                      | 0.89                   | 43.2                   |
| 6            | R2     | 38                              | 6.0    | 40                               | 6.0 | 0.229               | 23.3 | LOS C               | 8.0  | 5.8                          | 0.81           | 1.03                      | 0.89                   | 40.4                   |
| Appr         | oach   | 69                              | 6.0    | 73                               | 6.0 | 0.229               | 19.4 | LOS C               | 0.8  | 5.8                          | 0.75           | 1.00                      | 0.81                   | 41.8                   |
| North        | nEast: | Springs R                       | oad N  |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 7            | L2     | 6                               | 6.0    | 6                                | 6.0 | 0.209               | 4.7  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.01                      | 0.00                   | 49.4                   |
| 8            | T1     | 364                             | 6.0    | 383                              | 6.0 | 0.209               | 0.1  | LOSA                | 0.0  | 0.0                          | 0.00           | 0.01                      | 0.00                   | 49.9                   |
| 9            | R2     | 94                              | 6.0    | 99                               | 6.0 | 0.091               | 6.5  | LOSA                | 0.4  | 2.9                          | 0.50           | 0.66                      | 0.50                   | 48.0                   |
| Appr         | oach   | 464                             | 6.0    | 488                              | 6.0 | 0.209               | 1.5  | NA                  | 0.4  | 2.9                          | 0.10           | 0.14                      | 0.10                   | 49.3                   |
| North        | nWest: | Trents Ro                       | oad W  |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 10           | L2     | 216                             | 6.0    | 227                              | 6.0 | 0.332               | 11.7 | LOS B               | 1.5  | 11.3                         | 0.56           | 1.04                      | 0.65                   | 47.2                   |
| 11           | T1     | 38                              | 6.0    | 40                               | 6.0 | 0.202               | 17.1 | LOS C               | 0.7  | 5.1                          | 0.75           | 1.01                      | 0.79                   | 44.4                   |
| 12           | R2     | 27                              | 6.0    | 28                               | 6.0 | 0.202               | 17.4 | LOS C               | 0.7  | 5.1                          | 0.75           | 1.01                      | 0.79                   | 45.3                   |
| Appr         | oach   | 281                             | 6.0    | 296                              | 6.0 | 0.332               | 13.0 | LOS B               | 1.5  | 11.3                         | 0.60           | 1.03                      | 0.68                   | 46.7                   |
| South        | hWest  | : Springs I                     | Road S |                                  |     |                     |      |                     |      |                              |                |                           |                        |                        |
| 1            | L2     | 21                              | 6.0    | 22                               | 6.0 | 0.247               | 5.4  | LOSA                | 0.2  | 1.2                          | 0.04           | 0.04                      | 0.04                   | 49.6                   |
| 2            | T1     | 401                             | 6.0    | 422                              | 6.0 | 0.247               | 0.1  | LOSA                | 0.2  | 1.2                          | 0.04           | 0.04                      | 0.04                   | 49.8                   |
| 3            | R2     | 10                              | 6.0    | 11                               | 6.0 | 0.247               | 6.7  | LOSA                | 0.2  | 1.2                          | 0.04           | 0.04                      | 0.04                   | 48.7                   |
| Appr         | oach   | 432                             | 6.0    | 455                              | 6.0 | 0.247               | 0.5  | NA                  | 0.2  | 1.2                          | 0.04           | 0.04                      | 0.04                   | 49.8                   |
| All<br>Vehic | cles   | 1246                            | 6.0    | 1312                             | 6.0 | 0.332               | 4.7  | NA                  | 1.5  | 11.3                         | 0.23           | 0.35                      | 0.25                   | 48.4                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## Site: 101 [Springs Road / Trents Road PM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site Site Category: (None) Stop (Two-Way)

| Vehicle Movement Performance |                |                                  |                   |                                  |                   |                         |                      |                         |                   |                              |                      |                           |                        |                        |
|------------------------------|----------------|----------------------------------|-------------------|----------------------------------|-------------------|-------------------------|----------------------|-------------------------|-------------------|------------------------------|----------------------|---------------------------|------------------------|------------------------|
| Mov<br>ID                    | Turn           | INPI<br>VOLU<br>[ Total<br>veh/h |                   | DEM/<br>FLO\<br>[ Total<br>veh/h |                   | Deg.<br>Satn<br>v/c     |                      | Level of<br>Service     |                   | ACK OF<br>EUE<br>Dist ]<br>m | Prop. E<br>Que       | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South                        | hEast:         | Trents Ro                        | ad E              |                                  |                   |                         |                      |                         |                   |                              |                      |                           |                        |                        |
| 4<br>5<br>6                  | L2<br>T1<br>R2 | 17<br>20<br>6                    | 6.0<br>6.0<br>6.0 | 18<br>21<br>6                    | 6.0<br>6.0<br>6.0 | 0.033<br>0.227<br>0.227 | 12.1<br>36.1<br>48.4 | LOS B<br>LOS E<br>LOS E | 0.1<br>0.7<br>0.7 | 0.8<br>5.1<br>5.1            | 0.55<br>0.92<br>0.92 | 0.94<br>1.02<br>1.02      | 0.55<br>0.98<br>0.98   | 42.5<br>38.8<br>34.8   |
| Appr                         | oach           | 43                               | 6.0               | 45                               | 6.0               | 0.227                   | 28.3                 | LOS D                   | 0.7               | 5.1                          | 0.77                 | 0.99                      | 0.81                   | 39.1                   |
| North                        | nEast:         | Springs R                        | oad N             |                                  |                   |                         |                      |                         |                   |                              |                      |                           |                        |                        |
| 7<br>8<br>9                  | L2<br>T1<br>R2 | 22<br>541<br>196                 | 6.0<br>6.0<br>6.0 | 23<br>569<br>206                 | 6.0<br>6.0<br>6.0 | 0.319<br>0.319<br>0.259 | 4.8<br>0.2<br>8.7    | LOS A<br>LOS A          | 0.0<br>0.0<br>1.2 | 0.0<br>0.0<br>8.6            | 0.00<br>0.00<br>0.64 | 0.02<br>0.02<br>0.85      | 0.00<br>0.00<br>0.68   | 49.3<br>49.8<br>47.5   |
| Appr                         | oach           | 759                              | 6.0               | 799                              | 6.0               | 0.319                   | 2.6                  | NA                      | 1.2               | 8.6                          | 0.16                 | 0.24                      | 0.18                   | 48.9                   |
| North                        | nWest:         | Trents Ro                        | oad W             |                                  |                   |                         |                      |                         |                   |                              |                      |                           |                        |                        |
| 10<br>11<br>12               | L2<br>T1<br>R2 | 156<br>50<br>23                  | 6.0<br>6.0<br>6.0 | 164<br>53<br>24                  | 6.0<br>6.0<br>6.0 | 0.342<br>0.572<br>0.572 | 15.1<br>47.6<br>48.4 | LOS C<br>LOS E<br>LOS E | 1.5<br>2.1<br>2.1 | 10.7<br>15.6<br>15.6         | 0.68<br>0.95<br>0.95 | 1.06<br>1.11<br>1.11      | 0.86<br>1.35<br>1.35   | 46.5<br>36.8<br>38.9   |
| Appr                         | oach           | 229                              | 6.0               | 241                              | 6.0               | 0.572                   | 25.5                 | LOS D                   | 2.1               | 15.6                         | 0.77                 | 1.08                      | 1.02                   | 43.8                   |
| South                        | hWest          | : Springs I                      | Road S            |                                  |                   |                         |                      |                         |                   |                              |                      |                           |                        |                        |
| 1<br>2<br>3                  | L2<br>T1<br>R2 | 32<br>598<br>10                  | 6.0<br>6.0<br>6.0 | 34<br>629<br>11                  | 6.0<br>6.0<br>6.0 | 0.366<br>0.366<br>0.366 | 6.2<br>0.2<br>9.3    | LOS A<br>LOS A          | 0.3<br>0.3<br>0.3 | 2.3<br>2.3<br>2.3            | 0.05<br>0.05<br>0.05 | 0.03<br>0.03<br>0.03      | 0.06<br>0.06<br>0.06   | 49.6<br>49.8<br>48.7   |
| Appr                         | oach           | 640                              | 6.0               | 674                              | 6.0               | 0.366                   | 0.6                  | NA                      | 0.3               | 2.3                          | 0.05                 | 0.03                      | 0.06                   | 49.7                   |
| All<br>Vehic                 | cles           | 1671                             | 6.0               | 1759                             | 6.0               | 0.572                   | 5.6                  | NA                      | 2.1               | 15.6                         | 0.22                 | 0.29                      | 0.26                   | 48.0                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

## ▼ Site: 101v [Springs Road / Trents Road AM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                          | t Perfo | rmance                          |     |                     |      |                     |                                |      |              |                           |                        |                        |
|--------------|--------|---------------------------------|---------|---------------------------------|-----|---------------------|------|---------------------|--------------------------------|------|--------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEM/<br>FLO<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service | 95% BA<br>QUE<br>[ Veh.<br>veh |      | Prop.<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| Sout         | hEast: | Trents Ro                       | oad E   |                                 |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 4            | L2     | 12                              | 6.0     | 13                              | 6.0 | 0.087               | 6.2  | LOSA                | 0.5                            | 3.5  | 0.60         | 0.68                      | 0.60                   | 44.1                   |
| 5            | T1     | 19                              | 6.0     | 20                              | 6.0 | 0.087               | 6.2  | LOSA                | 0.5                            | 3.5  | 0.60         | 0.68                      | 0.60                   | 47.4                   |
| 6            | R2     | 38                              | 6.0     | 40                              | 6.0 | 0.087               | 10.1 | LOS B               | 0.5                            | 3.5  | 0.60         | 0.68                      | 0.60                   | 46.2                   |
| Appr         | oach   | 69                              | 6.0     | 73                              | 6.0 | 0.087               | 8.3  | LOSA                | 0.5                            | 3.5  | 0.60         | 0.68                      | 0.60                   | 46.3                   |
| North        | nEast: | Springs F                       | Road N  |                                 |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 7            | L2     | 6                               | 6.0     | 6                               | 6.0 | 0.368               | 3.7  | LOSA                | 2.8                            | 20.3 | 0.33         | 0.45                      | 0.33                   | 46.8                   |
| 8            | T1     | 364                             | 6.0     | 383                             | 6.0 | 0.368               | 3.7  | LOSA                | 2.8                            | 20.3 | 0.33         | 0.45                      | 0.33                   | 48.3                   |
| 9            | R2     | 94                              | 6.0     | 99                              | 6.0 | 0.368               | 7.7  | LOS A               | 2.8                            | 20.3 | 0.33         | 0.45                      | 0.33                   | 48.8                   |
| Appr         | oach   | 464                             | 6.0     | 488                             | 6.0 | 0.368               | 4.5  | LOSA                | 2.8                            | 20.3 | 0.33         | 0.45                      | 0.33                   | 48.4                   |
| North        | nWest: | Trents R                        | oad W   |                                 |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 10           | L2     | 216                             | 6.0     | 227                             | 6.0 | 0.346               | 6.6  | LOSA                | 2.2                            | 16.3 | 0.69         | 0.73                      | 0.69                   | 48.1                   |
| 11           | T1     | 38                              | 6.0     | 40                              | 6.0 | 0.346               | 6.6  | LOSA                | 2.2                            | 16.3 | 0.69         | 0.73                      | 0.69                   | 47.9                   |
| 12           | R2     | 27                              | 6.0     | 28                              | 6.0 | 0.346               | 10.5 | LOS B               | 2.2                            | 16.3 | 0.69         | 0.73                      | 0.69                   | 48.3                   |
| Appr         | oach   | 281                             | 6.0     | 296                             | 6.0 | 0.346               | 6.9  | LOSA                | 2.2                            | 16.3 | 0.69         | 0.73                      | 0.69                   | 48.1                   |
| South        | hWest  | : Springs                       | Road S  |                                 |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 1            | L2     | 21                              | 6.0     | 22                              | 6.0 | 0.382               | 4.3  | LOSA                | 2.5                            | 18.7 | 0.43         | 0.48                      | 0.43                   | 48.2                   |
| 2            | T1     | 401                             | 6.0     | 422                             | 6.0 | 0.382               | 4.3  | LOSA                | 2.5                            | 18.7 | 0.43         | 0.48                      | 0.43                   | 48.2                   |
| 3            | R2     | 10                              | 6.0     | 11                              | 6.0 | 0.382               | 8.3  | LOS A               | 2.5                            | 18.7 | 0.43         | 0.48                      | 0.43                   | 46.8                   |
| Appr         | oach   | 432                             | 6.0     | 455                             | 6.0 | 0.382               | 4.4  | LOSA                | 2.5                            | 18.7 | 0.43         | 0.48                      | 0.43                   | 48.2                   |
| All<br>Vehic | cles   | 1246                            | 6.0     | 1312                            | 6.0 | 0.382               | 5.2  | LOSA                | 2.8                            | 20.3 | 0.46         | 0.54                      | 0.46                   | 48.2                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

 $\label{eq:hv} \mbox{HV (\%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.}$ 

## ▼ Site: 101v [Springs Road / Trents Road PM Peak 2030+PC (Site Folder: Future 2030+PC)]

New Site

Site Category: (None)

Roundabout

| Vehi         | cle M  | ovemen                          | t Perfo | rmance                           |     |                     |      |                     |                                |      |              |                           |                        |                        |
|--------------|--------|---------------------------------|---------|----------------------------------|-----|---------------------|------|---------------------|--------------------------------|------|--------------|---------------------------|------------------------|------------------------|
| Mov<br>ID    | Turn   | INP<br>VOLU<br>[ Total<br>veh/h |         | DEM/<br>FLO¹<br>[ Total<br>veh/h |     | Deg.<br>Satn<br>v/c |      | Level of<br>Service | 95% BA<br>QUE<br>[ Veh.<br>veh |      | Prop.<br>Que | Effective<br>Stop<br>Rate | Aver.<br>No.<br>Cycles | Aver.<br>Speed<br>km/h |
| South        | hEast: | Trents Ro                       | oad E   |                                  |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 4            | L2     | 17                              | 6.0     | 18                               | 6.0 | 0.075               | 8.7  | LOSA                | 0.5                            | 3.4  | 0.77         | 0.74                      | 0.77                   | 43.6                   |
| 5            | T1     | 20                              | 6.0     | 21                               | 6.0 | 0.075               | 8.8  | LOSA                | 0.5                            | 3.4  | 0.77         | 0.74                      | 0.77                   | 47.1                   |
| 6            | R2     | 6                               | 6.0     | 6                                | 6.0 | 0.075               | 12.7 | LOS B               | 0.5                            | 3.4  | 0.77         | 0.74                      | 0.77                   | 45.7                   |
| Appr         | oach   | 43                              | 6.0     | 45                               | 6.0 | 0.075               | 9.3  | LOSA                | 0.5                            | 3.4  | 0.77         | 0.74                      | 0.77                   | 45.9                   |
| North        | nEast: | Springs F                       | Road N  |                                  |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 7            | L2     | 22                              | 6.0     | 23                               | 6.0 | 0.596               | 4.0  | LOSA                | 6.3                            | 46.4 | 0.47         | 0.48                      | 0.47                   | 46.3                   |
| 8            | T1     | 541                             | 6.0     | 569                              | 6.0 | 0.596               | 4.0  | LOSA                | 6.3                            | 46.4 | 0.47         | 0.48                      | 0.47                   | 47.9                   |
| 9            | R2     | 196                             | 6.0     | 206                              | 6.0 | 0.596               | 8.0  | LOSA                | 6.3                            | 46.4 | 0.47         | 0.48                      | 0.47                   | 48.6                   |
| Appr         | oach   | 759                             | 6.0     | 799                              | 6.0 | 0.596               | 5.0  | LOSA                | 6.3                            | 46.4 | 0.47         | 0.48                      | 0.47                   | 48.1                   |
| North        | nWest: | Trents R                        | oad W   |                                  |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 10           | L2     | 156                             | 6.0     | 164                              | 6.0 | 0.355               | 8.0  | LOSA                | 2.4                            | 17.9 | 0.82         | 0.84                      | 0.82                   | 47.7                   |
| 11           | T1     | 50                              | 6.0     | 53                               | 6.0 | 0.355               | 8.0  | LOSA                | 2.4                            | 17.9 | 0.82         | 0.84                      | 0.82                   | 47.4                   |
| 12           | R2     | 23                              | 6.0     | 24                               | 6.0 | 0.355               | 12.0 | LOS B               | 2.4                            | 17.9 | 0.82         | 0.84                      | 0.82                   | 47.9                   |
| Appr         | oach   | 229                             | 6.0     | 241                              | 6.0 | 0.355               | 8.4  | LOSA                | 2.4                            | 17.9 | 0.82         | 0.84                      | 0.82                   | 47.7                   |
| South        | hWest  | : Springs                       | Road S  |                                  |     |                     |      |                     |                                |      |              |                           |                        |                        |
| 1            | L2     | 32                              | 6.0     | 34                               | 6.0 | 0.611               | 5.5  | LOSA                | 5.5                            | 40.3 | 0.68         | 0.62                      | 0.69                   | 47.9                   |
| 2            | T1     | 598                             | 6.0     | 629                              | 6.0 | 0.611               | 5.5  | LOSA                | 5.5                            | 40.3 | 0.68         | 0.62                      | 0.69                   | 47.8                   |
| 3            | R2     | 10                              | 6.0     | 11                               | 6.0 | 0.611               | 9.5  | LOSA                | 5.5                            | 40.3 | 0.68         | 0.62                      | 0.69                   | 45.9                   |
| Appr         | oach   | 640                             | 6.0     | 674                              | 6.0 | 0.611               | 5.6  | LOSA                | 5.5                            | 40.3 | 0.68         | 0.62                      | 0.69                   | 47.7                   |
| All<br>Vehic | cles   | 1671                            | 6.0     | 1759                             | 6.0 | 0.611               | 5.8  | LOSA                | 6.3                            | 46.4 | 0.61         | 0.59                      | 0.61                   | 47.9                   |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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p.m

Project: J:\Urban Estates Ltd (UEL)\UEL-J001 West Prebbleton Private Plan Change\DocCalcs\SIDRA Modelling\Prebbleton PC Models.sip9

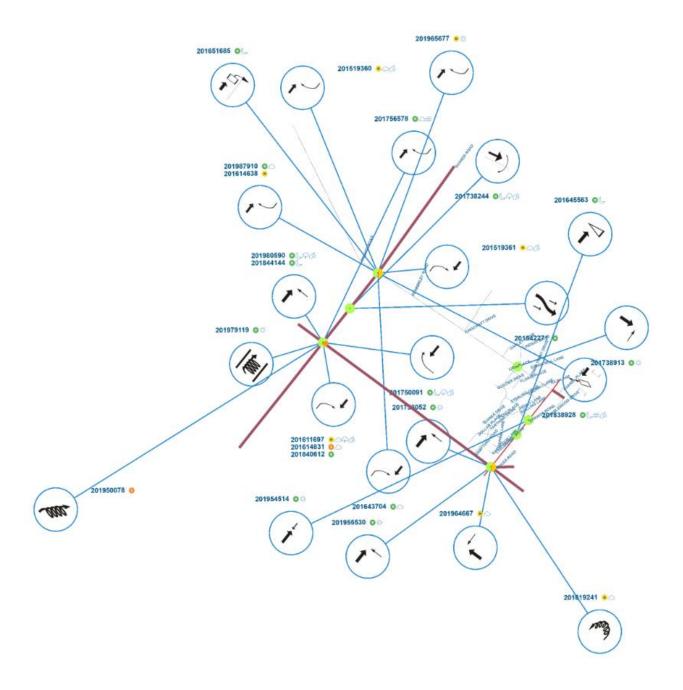


**Appendix D CAS extract - Collision Diagram Exports** 



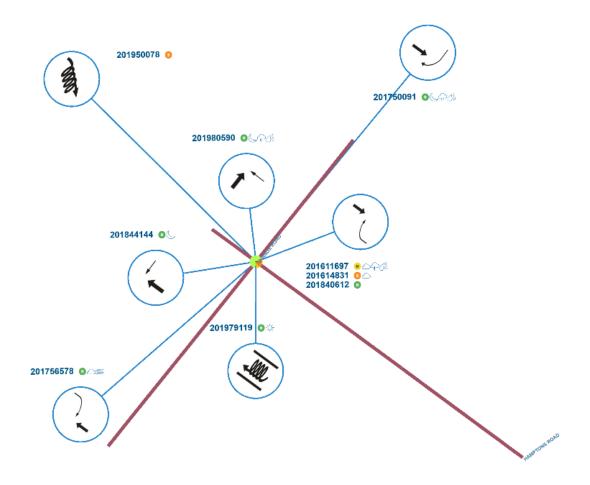


## D1 - All crashes



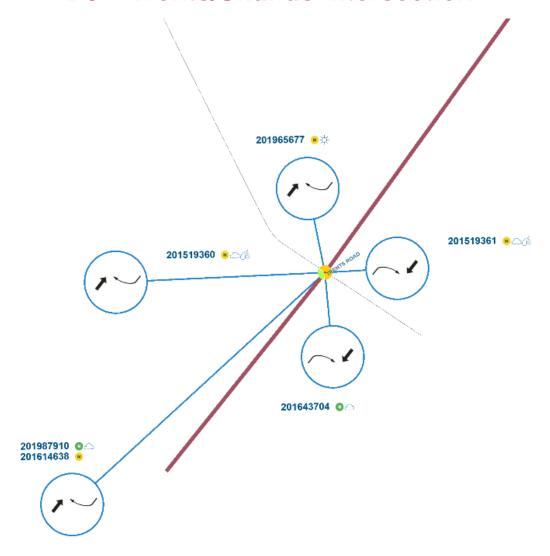


## **D2 – Hamptons/Shands Intersection**



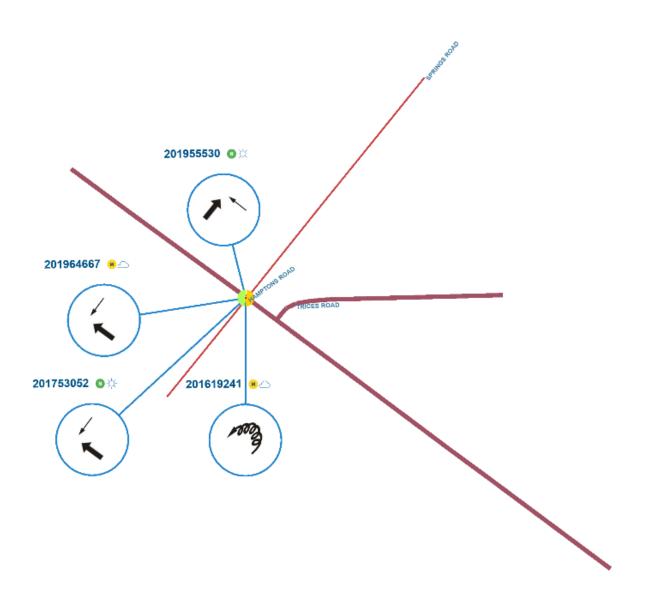


## **D3 – Trents/Shands Intersection**





## **D4 – Hamptons/Springs Intersection**





# **D5 – Trents/Springs Intersection**

No crashes at this intersection.

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