Traffic Impact Assessment

Springvale Zone Change

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Revision Details

Revision	Details

1 Introduction

WSP Opus has been engaged by Whanganui District Council to undertake a traffic impact assessment (TIA) for the Springvale Future Development Area proposed in the Springvale Structure Plan. The Springvale Structure Plan will be implemented via the Whanganui District Plan, through a Plan Change.

This TIA aims to identify any significant traffic issues on the existing road network surrounding the proposed Springvale Future Development Area *("the site")* as a result of the potential establishment of 600-700 residential lots at Springvale. Specifically, the TIA will focus on the key intersections servicing future traffic generated by the subdivision. The traffic assessment has been undertaken primarily from capacity and safety viewpoints.

This TIA will be a component of an Assessment of Environmental Effects to support a Notice of Requirement and District Plan change process.

2 Site Description

2.1 Site location

The proposed site is located on the western side of the Whanganui urban area, approximately 3.5 km west of the city centre (refer to Figure 2-1).

Figure 2-1 : Location of Springvale plan change

The site is bounded to the west by Mosston Road, which is a key route linking areas to the south of the city including the residential suburb of Castlecliff and the Heads Road Industrial Area to the north of the city, including State Highway 3. Mosston Road (primary collector) forms a junction with Fox Road (primary collector) which currently runs within the proposed Plan Change site and provides access to Springvale and the centre of Whanganui.

Fitzherbert Avenue currently runs east-west approximately halfway through the site. The Fitzherbert Avenue extension, identified in the Whanganui District Council (WDC) 10-year Plan (2015-2025), will extend Fitzherbert Avenue to the west to connect to Mosston Road. The Fitzherbert Avenue extension is a key precursor for the Springvale Development proposal.

At the time of writing of this TIA, it is understood that WDC are looking at the provision of this connection, including the preferred tie-in location and arrangement. For the purposes of this TIA, the Fitzherbert Avenue extension is assumed to already be in place as a basic priority intersection, and therefore providing an additional connection to Mosston Road.

Indicative Structure Plan Arrangement

The area included within the Proposed Plan Change is outlined in red in Figure 2-2. The existing land is currently zoned Rural Lifestyle within the Whanganui District Council's District Plan.

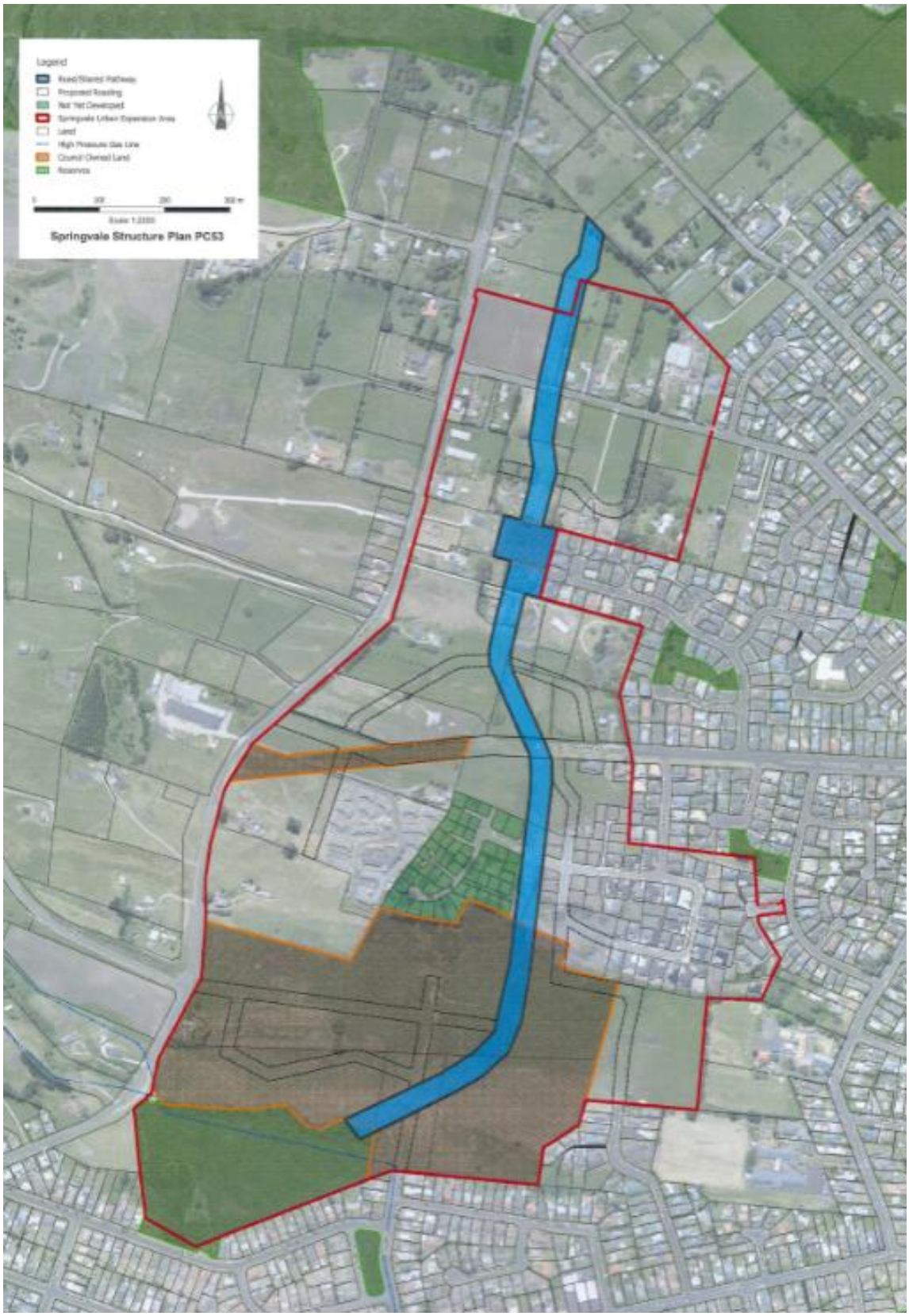

Figure 2-2 : Indicative structure plan layout

Road Network – Classification for the key roads surrounding the development

Key information about the road network surrounding the site is presented in Table 2-1. The Average Daily Traffic (ADT) information are the latest count data provided by the WDC, as denoted by the year of the count.

Table 2-1 : Road Network Surrounding the Site

Existing Road Network	Information	Layout
Mosston Road	**ONRC[1] classification:** Primary Collector **WDC hierarchy[2]:** Secondary Arterial **ADT:** • Between Fox Road and Clarkson Ave: 4494 with 6% Heavy Vehicles (HV) – year 2016 **Speed limit**: 60km/h **Cross section:** Two-way two lane with narrow shoulder. **Parking:** no on-street parking opportunity **Other information**: According to the Whanganui Urban Transportation Strategy, Mosston Road is also classified as Heavy Vehicle Route	 *Figure 2-3 : Mosston Road looking south*
Fitzherbert Avenue	<u>West of Totara Street</u> **ONRC classification:** Primary Collector. Following the establishment of Fitzherbert Avenue extension onto Mosston Road, it is expected that this classification will change to Arterial, to be consistent with	

[1] One Network Road Classification (ONRC) is a classification system, which divides New Zealand's roads into six categories based on how busy they are, whether they connect to important destinations, or are the only route available. https://www.nzta.govt.nz/roads-and-rail/road-efficiency-group/projects/onrc/

[2] The Whanganui District Plan Interactive Map : https://mangomap.com/wdc/maps/71361/district-plan-interactive-mapping-service?preview=true#

	the other side of Fitzherbert Avenue (east of Totara Street) **WDC hierarchy**: Secondary Arterial **ADT**: • Between Totara Street and Karamu Street: 1300 with 6% HV – year 2007 • Between Kakaho Drive and Kelsi Street: 150 with 6% HV – year 2007 **Speed limit**: 50km/h **Cross section**: Two-way two-lane with on-street parking **<u>East of Totara Street</u>** **ONRC classification**: Arterial **WDC hierarchy**: Secondary Arterial **ADT**: • Between Fox Road and Totara Street: 7500 with 5% HV - year 2007 • Between Parsons St and Fox Road: 8407 with 3.2% HV – year 2016 **Speed limit**: 50km/h **Cross section**: Two-way two-lane with on-street parking on shoulder behind the cycle lane	*Figure 2-4 : Fitzherbert Ave looking west (towards the site)*  *Figure 2-5 : Fitzherbert Avenue looking east (towards intersection with Totara St)*
Puriri Street	**ONRC classification**: Arterial **WDC hierarchy**: Secondary Arterial **ADT**: • Between Totara Street and Kauri Street: 6431 with 3% HV – year 2016 • Between Totara Street and York Street: 7400 with 5% HV – year 2009 **Speed limit**: 50km/h	 *Figure 2-6 : Puriri Street (looking east, towards Totara Street)*

	Cross section: Two-way two-lane with on-street parking on shoulder.	
Fox Road	**ONRC classification**: Primary Collector **WDC hierarchy:** Collector Route **ADT:** • Between Fitzherbert Avenue and Oxford Road: 3407 with 4% HV – year 2011 • Between Cornwall Road and Sherwood Road: 2740 with 6% HV – year 2014 **Speed limit**: 50km/h Previously the speed limit west of Sherwood Road is 70km/h, however the Traffic and Speed Limit Bylaw 2017 that was approved in December 2017 [3]brought this limit down to 50km/h **Cross section**: Two-way two lane with on-street parking and footpath on one or both sides of the road between Sherwood Place and Fitzherbert Avenue. Wider carriageway and no footpath is provided on Fox Road west of Sherwood Place.	 *Figure 2-7 : Fox Road east of Sherwood Road*  *Figure 2-8 : Fox Road west of Sherwood Road*

[3] Refer to the Changes made to rules on parking and speed as featured here: https://www.whanganui.govt.nz/our-council/news-media/media-releases/Pages/default.aspx?newsItem=8891

Totara Street	**ONRC classification**: Arterial **WDC hierarchy**: Collector Route **ADT:** • Between Toi Street and Fitzherbert Avenue: 5676 with 3% HV – year 2015 • Between Puriri Street and Nikau Street: 6101 with 2.8% - year 2015 **Speed limit**: 50km/h **Cross section**: Two-way two lane with on-street parking on shoulder.	 *Figure 2-9 : Totara Street (looking south)*
Other roads in the vicinity of the site	**Rogers Street**: Access Road, speed limit 50 km/h **Tawhero Road**: Access Road, speed limit 50km/h **Kelsi Street:** Low Volume Road, speed limit 50km/h Note: the above classification is based on the ONRC only, as there is no hierarchy for these roads according to the Whanganui District Plan.	
Existing Key Intersection	Information	Layout
Fox Road / Mosston Road	Give Way Controlled T-junction	 *Figure 2-10: Mosston Road / Fox Road Intersection*

Fitzherbert Avenue / Fox Road	Stop-controlled priority T-junction	 *Figure 2-11 : Fitzherbert Avenue / Fox Road*
Fitzherbert Avenue / Totara Street	New layout to improve safety (installed July 2018): Priority T-intersection with giving priority to Fitzherbert Avenue (previously Totara Street), with stop and give way signs controlling traffic in and out of Totara Road	 *Figure 2-12: Fitzherbert Avenue / Totara Street*

Other Sites of Interest

The site is surrounded by a combination of rural, rural lifestyle and urban residential land use. It is in close proximity to a number of community facilities including Springvale Park, the Splash Centre and the YMCA community centre. In addition, Tawhero School, St Marcellin Primary School and Rutherford Junior High School are within walking distance and there a number other schools within the surrounding area. Two golf courses, Whanganui Golf Club and Tawhero Golf Club, are both located close to the perimeter of the Study Area. Nearby on Fitzherbert Ave is a cluster of retail and commercial activities. The Whanganui River and coastal marine area lies approximately 1.7km south of the site.

Walking and Cycling

The surrounding road network to the south and east of the proposed site currently has a well-connected network of footpaths. A footpath is currently provided on the eastern side of developed (urbanised) sections on Fox Road. However, to the west of Sherwood Place where previously the speed limit was formerly 70km/h, no footpath is provided. Within the vicinity of the site, Mosston Road does not currently include dedicated pedestrian footpaths or crossing facilities. The provision of footpaths along Mosston and Montgomery Road is identified as a high priority action in the Whanganui Urban Transportation Strategy[4] (WUTS) in order to provide connectivity between residential areas (Action 40 – Mosston Road/Montgomery Road Walkability in the WUTS).

[4] https://www.whanganui.govt.nz/our-council/publications/policies/Documents/WhanganuiUrbanTransportationStrategy.pdf

The WDC 2017 Active Transport Strategy [5]includes a proposed east-west cycleway route along Fitzherbert Avenue (including the proposed Fitzherbert Avenue extension) and a proposed north-south cycleway route running through the middle of the Springvale Structure Plan area. These cycleway routes are expected to be developed as part of the urbanisation of the road network as development occurs, and will enhance a connected and permeable network for encouraging active transport use.

Public Transport

There is currently one bus route (called the 'Castlecliff' bus route) that operates in proximity to the site. This route serves the area between the Whanganui CBD, Gonville and Castlecliff, including the Whanganui Hospital. The route runs along Puriri Street, Totara Street and Fitzherbert Avenue, and passes through the Totara Street / Fitzherbert Avenue intersection and the Fitzherbert Avenue / Fox Road intersection. This route runs every hour in the weekdays from 7am to 5pm, and intermittently on Saturdays.

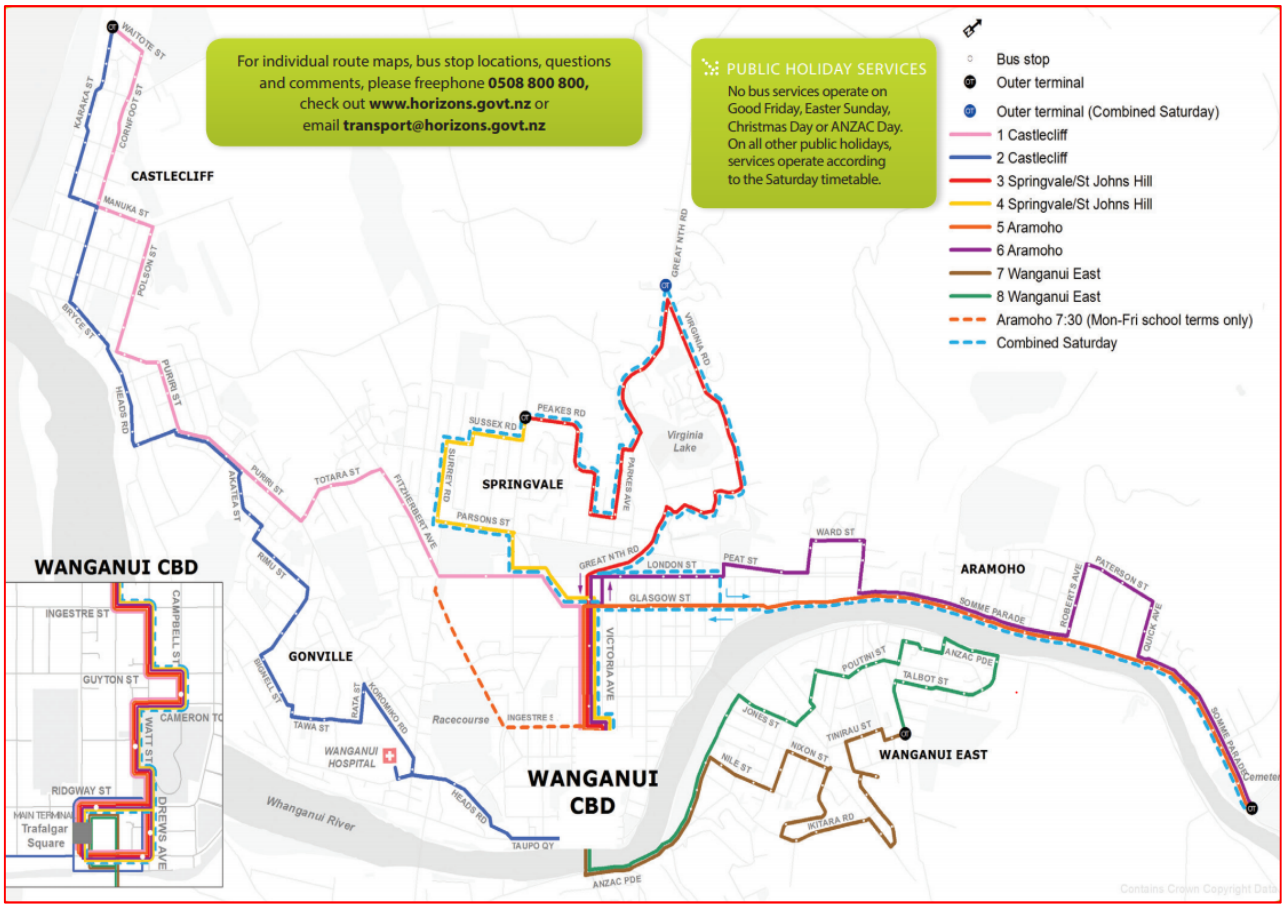

Figure 2-13: Whanganui Public Transport Network - source : http://www.horizons.govt.nz/Buses-Transport/Bus-Routes-Transport/Castlecliff-Pink

2.2 Traffic Data

A survey has been undertaken to obtain turning volumes at key intersections surrounding the site. This survey was completed on 12th February 2019, which was considered a fair representation of a typical day as it was during school period with fine weather. The survey was undertaken in both AM and PM peak periods, between 7:00 – 9:00 and 16:00 – 18:00 respectively. The survey counts

[5] http://letsgowhanganui.org.nz/wp-content/uploads/2017/11/ActiveTransportStrategy2017.pdf

are categorised into cars, trucks, buses and cyclists. Based on the survey, it is found that generally the peak hours for the area are 8:00 – 9:00 and 16:30 – 17:30.

The key intersections surveyed are as follows:

- Mosston Road / Fox Road
- Fitzherbert Avenue / Totara Street
- Fitzherbert Avenue Fox Road

A summary the traffic movements recorded during the AM and PM peak hours are shown in Table 2-2 and Table 2-4 below.

Table 2-2 : Mosston Road / Fox Road Intersection Traffic Counts

	Mosston Road / Fox Road Intersection									
	AM				**AM Total**	**PM**				**PM Total**
	Cars	**Trucks**	**Buses**	**Cyclists**		**Cars**	**Trucks**	**Buses**	**Cyclists**	
Mosston Rd (North)	**219**	**16**	**1**	**2**	**238**	**212**	**12**	**0**	**0**	**224**
Left into Fox Rd	91	1	1	0	93	52	3	0	0	55
Thru to Mosston Rd (South)	128	12	0	3	143	160	9	0	0	169
Fox Rd	**116**	**6**	**1**	**1**	**124**	**74**	**3**	**1**	**1**	**79**
Left into Mosston Rd (South)	38	3	1	1	43	37	3	1	1	42
Right into Mosston Rd (North)	78	3	0	0	81	37	0	0	0	37
Mosston Rd (South)	**176**	**12**	**0**	**1**	**189**	**207**	**16**	**0**	**1**	**224**
Thru to Mosston Rd (North)	136	8	0	0	144	155	11	0	1	167
Right into Fox Rd	40	4	0	1	45	52	5	0	0	57
Grand Total	**511**	**34**	**2**	**4**	**551**	**493**	**31**	**1**	**2**	**527**

Table 2-3 : Fitzherbert Avenue / Totara Street Intersection Traffic Counts

	Fitzherbert Avenue / Totara Street Intersection									
	AM				**AM Total**	**PM**				**PM Total**
	Cars	**Trucks**	**Buses**	**Cyclists**		**Cars**	**Trucks**	**Buses**	**Cyclists**	
Fitzherbert Ave (East)	**248**	**11**	**1**	**3**	**263**	**366**	**10**	**1**	**5**	**382**
Left into Totara St	211	11	1	2	225	267	9	1	4	281
Thru to Fitzherbert Ave (West)	37	0	0	1	38	99	1	0	1	101
Totara St	**339**	**11**	**3**	**5**	**358**	**300**	**9**	**1**	**7**	**317**
Left into Fitzherbert Ave (West)	1	0	0	0	1	4	0	0	0	4
Right into Fitzherbert Ave (East)	338	11	3	5	357	296	9	1	7	313
Fitzherbert Ave (West)	**98**	**2**	**0**	**2**	**102**	**62**	**1**	**0**	**2**	**65**
Thru to Fitzherbert Ave (East)	94	2	0	2	98	55	1	0	2	58
Right into Totara St	4	0	0	0	4	7	0	0	0	7
Grand Total	**685**	**24**	**4**	**10**	**723**	**728**	**20**	**2**	**14**	**764**

Table 2-4 : Fitzherbert Avenue / Fox Road Intersection Traffic Counts

	Fitzherbert Avenue / Fox Road Intersection									
	AM				**AM Total**	**PM**				**PM Total**
	Cars	**Trucks**	**Buses**	**Cyclists**		**Cars**	**Trucks**	**Buses**	**Cyclists**	
Fox Rd	206	7	2	3	218	135	8	0	0	143
Left into Fitzherbert Ave (East)	169	6	1	3	179	103	7	0	0	110

Right into Fitzherbert Ave (West)	37	1	1	0	39	32	1	0	0	33
Fitzherbert Ave (East)	**283**	**18**	**0**	**3**	**304**	**463**	**17**	**1**	**6**	**487**
Thru to Fitzherbert Ave (West)	211	10	0	3	224	345	10	1	5	361
Right into Fox Rd	72	8	0	0	80	118	7	0	1	126
Fitzherbert Ave (West)	**441**	**13**	**3**	**7**	**464**	**359**	**10**	**1**	**9**	**379**
Left into Fox Rd	30	1	0	0	31	37	1	0	2	40
Thru to Fitzherbert Ave (East)	411	12	3	7	433	322	9	1	7	339
Grand Total	930	38	5	13	986	957	35	2	15	1009

3 The Proposal

The proposed Springvale Plan Change seeks to incorporate the Springvale Future Development Area identified in the Springvale Structure Plan into the Whanganui District Plan. The location and indicative layout of the area is shown previously in Figure 2-1 and Figure 2-2.

The proposal includes the rezoning of properties in the identified area from the Rural Lifestyle Zone to the Residential Zone. The Structure Plan estimates that within this area, around 600-700 houses could be built over the next 50 years. A new residential spine road ("*New Swale Road*") is proposed to run north-south in the middle of the residential area, providing a new connection to Fox Road and Fitzherbert Avenue.

It is to be noted that according to the WDC Springvale Structure Plan Report, within the suburb of Springvale, development in the Rural Lifestyle Zone is currently already expected to occur at a rate of approximately 10 dwellings per year for the period until 2043. This accounts for 35% of the total growth in the suburb, irrespective of the proposed Springvale Plan Change.

4 Traffic Operation Assessment

4.1 Traffic Generation

According to the 2005 NZ Trips and Parking Database Bureau (NZTPDB) Research Report [6] each residential dwelling typically generates 1.2 trip in the peak hour.

Given that in 50 years there will be additional 600-700 residential dwellings within the site, based on the trip generation above, it is estimated that up to 840 new trips will be generated by the proposed Springvale Development in the AM and PM peak hours. It is noted that according to the WDC Springvale Structure Plan Report, within the suburb of Springvale, the development in the Rural Lifestyle Zone is currently expected to occur at a rate of approximately 10 dwellings per year for the period until 2043.

At this stage, the future development rate of the site is unknown. There is a potential for acceleration of the development rate once the Plan Change is implemented and the site is rezoned as 'Residential'. However, it should be noted that there is also potential for an irregular or slower build rate should unforeseen circumstances arise in the future. Therefore, to balance off the uncertainties in this assessment, this assessment has been assumed that up to 14 new dwellings will be built within the site per year, and thereby assuming that the target subdivision development of 700 dwellings is achieved in 50 years. With this assumption, there would be 17 additional peak hour trips related to the development per year.

To simulate a worst-case scenario, it has been further assumed that all the additional traffic generated by the residential dwellings commute out of the area in the AM peak and commute back into the area in the PM peak. It is to be noted that in reality, there will be some split between arrivals and departures to/from the site in both peak periods. However, as the site is residential in context, it is expected that the majority of the AM peak trips depart the site. This is supported by the travel to work census data, discussed in the next section, for Tawhero survey zone which shows that the split between outgoing commute and incoming commute from and to the zone to be 85% and 15% respectively.

This additional traffic is included in the trip distribution analysis, discussed in the next section.

4.2 Trip Distribution Assumptions

The existing commuting travel patterns around the site have been obtained from the StatsNZ[7] 2013 travel to work survey data for the Tawhero and Mosston zones. These locations are the two census area units that are geographically most relevant to the site. The complete survey data are attached in Appendix A.

The key survey data from the above two area units are summarised below:

Tawhero Area Unit

- 88% of Tawhero residents commute out of the Tawhero, while 12% live and work in the area.
- 89% of trips in Tawhero are undertaken in a car, truck, van or company bus

[6] Trips and parking related to land use (Nov 2011), NZTA Research Report 453 https://www.nzta.govt.nz/assets/resources/research/reports/453/docs/453.pdf

[7] The StatsNZ commuter platform provides an indication of existing travel patterns at a census block level. http://archive.stats.govt.nz/datavisualisation/commuterview/index.html#

- 5% and 3% of the trips were completed by bicycle and on foot, respectively.
- 69% of the outgoing commute trips from Tawhero are eastbound towards the major employment centres in the city centre and industrial areas near Gonville, while the rest are towards the north, south and west of the area.

Mosston Area Unit

- 90% of Mosston residents commute out of the Mosston while 10% live and work in the area.
- 86% of trips in Mosston are undertaken in a car, truck, van or company bus
- 5% and 5% of the trips were completed by bicycle and on foot, respectively.
- 60% of the commute trips is towards the major employment areas east of Mosston, while the rest are towards the Balgownie (south of Mosston) and Castlecliff South (west of Mosston).

The traffic modelling for this assessment has required a reassignment of traffic demands through the surrounding existing intersections to account for the future network conditions, including the Fitzherbert Avenue extension and the connection with Mosston Road. The existing travel data from census area units noted above has been used as a basis for adjusting the demand on the surrounding network. It is to be noted that the assumptions underlying these adjustments have been made based on the available traffic data and travel patterns, and information outlined within the Springvale Structure Plan Report (April 2018).

The future "with development" scenarios for the traffic modelling include the additional trips generated by the development in addition to background growth rates. The assumed distribution of the development trips in the peak hours are illustrated in Figure 4-1 below. The full list of trip distribution assumptions that have been used in this assessment are included in Appendix B.

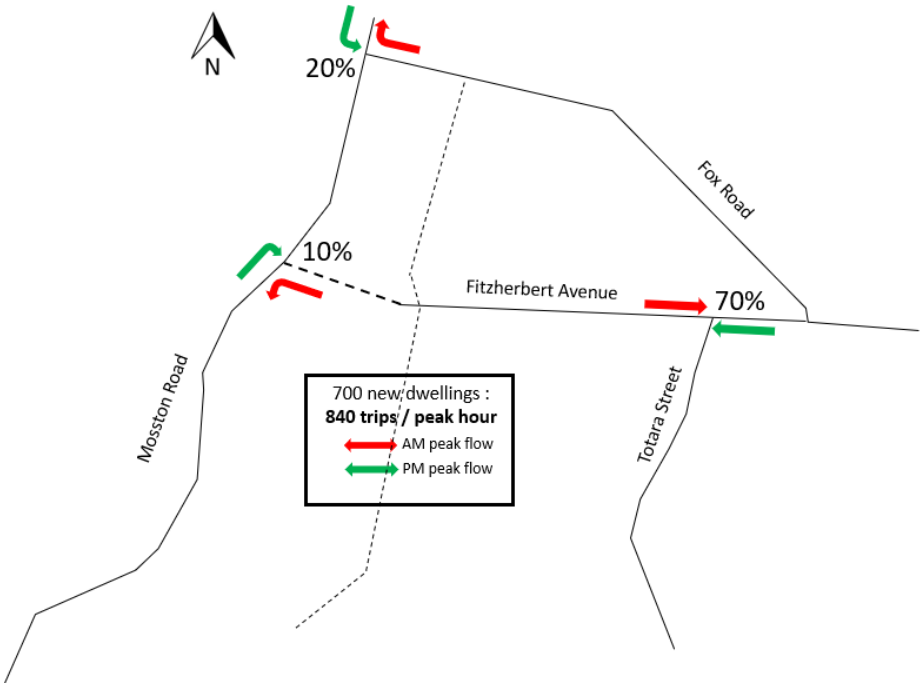

Figure 4-1: Assumed distribution of the full development trips at peak periods

4.3 Modelling Scenarios

The traffic operation assessment considers the current and future capacity of the existing and proposed intersections around the site, taking into account the traffic distribution and development growth assumptions contained in the previous sections. The intersections considered in the assessment include:

- Mosston Road / Fox Road
- Fitzherbert Avenue / Totara Street
- Fitzherbert Avenue / Fox Road
- Proposed Fitzherbert Avenue Extension / Mosston Road

The performance of the above intersections has been modelled using SIDRA 8 software. This assessment considers that the minimum acceptable Level of Service [8](LoS) for each intersection approach is LoS D.

The modelling has been undertaken for the following scenarios:

- **Existing Scenario – Year 2019: The "Base Case".**

  Under this scenario, the Fitzherbert Avenue Extension is assumed to be in place, connecting to Mosston Road. No new dwellings within the site is assumed to have been built and occupied. The surveyed traffic volumes on the existing intersections have been adjusted according to the assumptions in Section 4.2.

- **Future Scenario 1a – Year 2029 with no development growth**

  This scenario assumes a compound annual growth rate (CAGR) of 4% of general traffic, based on the historical traffic data and the Springvale Structure Plan report. No development growth has been included, i.e. no development traffic has been included.

  Future Scenario 1b – Year 2029 with some development growth

  This scenario assumes 140 new occupied dwellings within the site. A background traffic compound annual growth rate (CAGR) of 4% has been applied, based on the historical traffic data and the Springvale Structure Plan report.

- **Future Scenario 2a – Year 2069 with no development growth**

  Similar to Scenario 1a, this scenario assumes that the subdivision has not taken place and therefore no development traffic is included. The assumed background traffic growth of 4% has been capped at 25 years (year 2044).

  Future Scenario 2b – Year 2069 with full development growth

  This scenario assumes that by 2069 that the target establishment of 700 new dwellings within 50 years is achieved. The background traffic growth of 4% is capped at 25 years (year 2044).

In addition to the above, commentary has also been provided around the proposed New Swale Road intersections with Fox Road and Fitzherbert Avenue in the following section.

[8] Level of Service (LoS) is an index of the operational performance of traffic on a given roadway, traffic lane, approach, intersection route or network, based on measures such as delay, degree of saturation, density, speed, and congestion during a given flow period. This provides a quantitative stratification of a performance measure that represent quality of service, measured on an A to F scale, with LoS A representing the best operating conditions from the traveller's per

Refer to Appendix C for the traffic volumes for the above scenarios.

4.4 Intersections Performance

The capacity and performance of the key intersections surrounding the site has been modelled for the scenarios discussed in previous section. The outcomes of the modelling are summarised in Table 4-1.

Detailed modelling outputs are included in Appendix D.

Table 4-1 : Summary of Modelling Results for Key Intersections

Scenario	Base Case: 2019 - existing		1a: 2029 without development		1b: 2029 with 140 new dwellings		2a: 2069 without development		2b: 2069 with 700 new dwellings	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
	Level of Service									
Mosston Road / Fox Road										
Mosston Road (North)	A	A	A	A	A	A	A	A	A	A
Fox Road (East)	A	A	A	A	A	A	B	B	D	B
Mosston Road (South)	A	A	A	A	A	A	A	A	A	A
Fitzherbert Avenue / Totara Street										
Fitzherbert Avenue (East)	A	A	A	A	A	A	A	A	A	A
Totara Street (South)	B	B	C	C	D	D	F	F	F	F
Fitzherbert Avenue (West)	A	A	A	A	A	A	A	A	A	A
Fitzherbert Avenue / Fox Road										
Fox Road (North)	A	A	C	B	D	C	F	F	F	F
Fitzherbert Avenue (East)	A	A	B	A	B	A	F	D*	F	F
Fitzherbert Avenue (West)	A	A	A	A	A	A	A	A	A	A
Fitzherbert Avenue Extension/Mosston Road										
Mosston Road (North)	A	A	A	A	A	A	A	A	A	A
Fitzherbert Avenue Extension (East)	A	A	A	A	A	A	A	B	A	B
Mosston Road (South)	A	A	A	A	A	A	A	A	A	A

** The level of service for the right turn into Fox Road from Fitzherbert Avenue (East) in Scenario 2a PM Peak is LoS F, where the westbound traffic experiences LoS C*

Mosston Road / Fox Road

Modelling shows that this intersection will continue to provide sufficient capacity and satisfactory performance throughout the modelling horizon years between 2019 and 2069, both with and without the Springvale development. The turning movements into and out of Mosston Road from Fox Road, in the AM peak and PM peak respectively, will be subjected to increasing delay and queue lengths, however to the extent still considered acceptable. In 50 years, with the full development, the predicted LoS on Fox Road is LoS D and B in AM and PM peak periods respectively. Without the development in place, the LoS for Fox Road is LoS B on both peak periods.

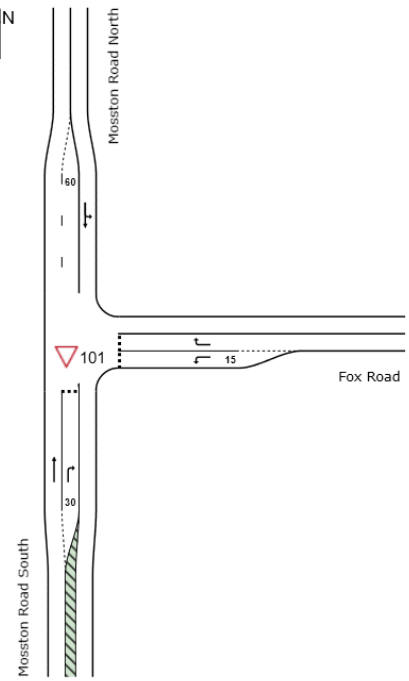

Figure 4-2 : Modelled Layout of Mosston Road / Fox Road Intersection

Fitzherbert Avenue / Totara Street

The performance of the intersection of Fitzherbert Avenue and Totara Street is expected to be acceptable throughout to 2029, with or without the development traffic. Without the development, Totara Street will operate at LOS C, however with the development in place, the performance falls to LoS D.

Under all scenarios in 2069, the Totara Street (south) leg will no longer cope with the predicted traffic demand, indicated with an overall LoS F. This is due to the heavy eastbound and westbound commute traffic in the AM and PM peak, respectively, which will result in an excessive delay to right-turning traffic from Totara Street.

This suggests that there is a need for monitoring and possibly upgrading of this intersection in the long term, to ensure appropriate capacity and performance of this intersection.

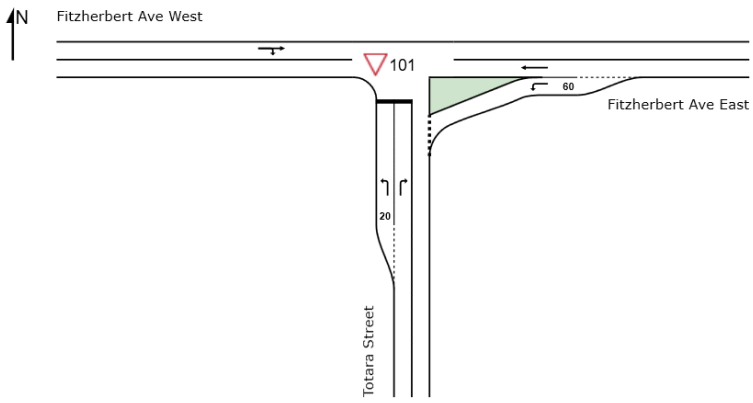

Figure 4-3 : Modelled Layout of the Fitzherbert Avenue / Totara Street Intersection

Fitzherbert Avenue/Fox Road

Similar to the intersection of Fitzherbert Avenue and Totara Street, the intersection of Fitzherbert Avenue and Fox Road is expected to have sufficient capacity throughout to 2029. The performance of the Fox Road (north) leg is however slightly worse with the additional development traffic.

In the longer term, the heavy east and westbound flow will worsen the LoS of Fox Road and Fitzherbert Avenue East. Both movements on Fox Road are predicted to experience LoS F in 2069, both with or without the development traffic. The performance of the Fitzherbert Avenue East leg will also be at LoS F in all 2069 scenarios, primarily due to the right-turning queue spill back from the short lane onto the westbound through lane.

Therefore, it is recommended that the demand and performance of this intersection is monitored in the future, to ensure that any requirement for a future upgrade can be identified in timely manner.

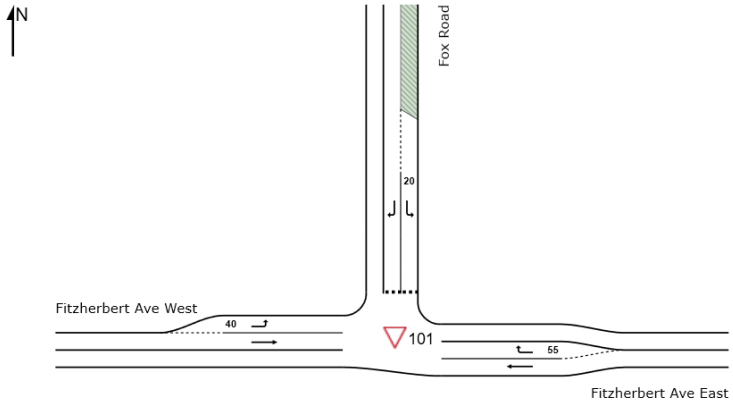

Figure 4-4: Modelled Layout of the Fitzherbert Avenue / Fox Road Intersection

Fitzherbert Avenue Extension / Mosston Road

The intersection of the Fitzherbert Avenue Extension and Mosston Road has been modelled as a priority give-way controlled intersection, as currently intended by the WDC. Under all scenarios and given the predicted traffic demand, this future intersection is expected to be performing well throughout to year 2069. It should be noted that the capacity and performance of this intersection will be directly influenced by the actual trip distribution and travel behaviour in the future, following the establishment of the Fitzherbert Avenue extension, the subdivisions within the site, and overall traffic growth in the area.

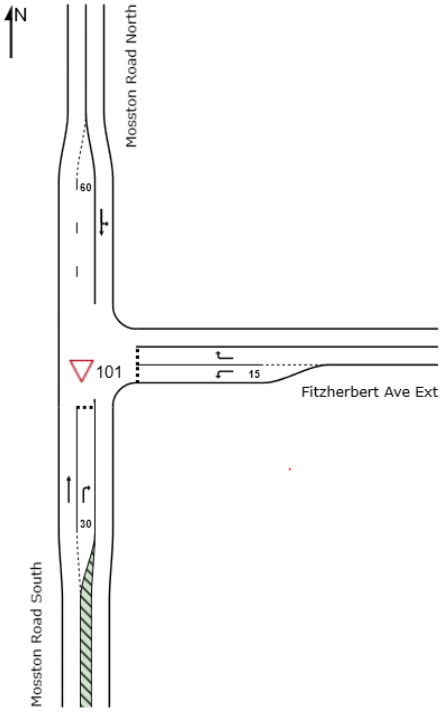

Figure 4-5 : Modelled Layout of the Fitzherbert Avenue Extension / Mosston Road Intersection

New Swale Road Intersections with Fox Road and Fitzherbert Avenue

The performance of the proposed connections within the site; including the intersection of Fox Road and New Swale Road, and Fitzherbert Avenue and New Swale Road have not been modelled in SIDRA 8. Given the predicted low traffic demand on the New Swale Road and the high proportion of residential traffic, it is expected that there would not be any capacity issue at the intersections throughout the foreseeable future. It is noted that the form of the intersection has not yet been determined, however given the classification of Fox Road and Fitzherbert Avenue, the predicted trip distribution and expected demands, the recommended form for both intersections is priority control (give-way) intersection. Any future provision of cycleway along the New Swale Road should be incorporated into the intersections ensuring safety of all road users.

4.5 Cycling

Traffic surveys undertaken in February 2019 shows that the cycling demand is low, with less than 20 cyclists recorded during a peak hour at the Fitzherbert Avenue / Totara Street and Fitzherbert Avenue / Fox Road intersections. This is consistent with the travel to work survey data where the proportion of cyclists to all modes of traffic is low (5%).

It is to be noted that currently around the site dedicated cycle lanes are only available along Fitzherbert Avenue east of Totara Street. While it is acknowledged that the low demand may be associated with the lack of facility, as discussed previously the Active Transport Strategy has identified the provision of a more continuous east-west cycleway route including the proposed Fitzherbert Avenue extension, and a north-south cycleway route through the middle of the site. This proposal may positively impact the uptake of cycling by the Whanganui residents and road users and increase the quality and safety of the ride along the corridor.

4.6 Public Transport

The interaction between the extra traffic generated by the development and the current public transport network has not been modelled. The increased traffic demand on Fitzherbert Avenue / Totara Street and Fitzherbert Avenue / Fox intersections will impose additional delay to the bus

service that currently runs along the Castlecliff bus route. Considering the frequency of the bus services and the assumed timing of development delivery, the overall impact is considered minor in the short to medium future. Beyond that, closer monitoring and consideration for public transport network optimisation or re-routing may be necessary.

4.7 Construction Traffic

Additional heavy vehicle movements will be expected to access the site during the construction phase of the development which may have the potential to impact on the site and the local network surroundings. However, the effects of development will be relatively short-term and should not be a reason for restricting development of the site.

Construction traffic is likely to access the site via Fitzherbert Ave and Fox Road. Fitzherbert Avenue and Fox are classified as primary collector road and therefore have more suitable physical characteristics to accommodate larger vehicles, compared to the other access / local volume roads around the site. Moreover, the extension of Fitzherbert Road west to Mosston Road will enable wider range of movements in and out of the site.

Given that approximately 14 new dwellings will be built within the site per year, the volume of construction traffic at one point in time is expected to be very low; however, it is acknowledged that the construction of the infrastructure, such as internal roads, will likely to involve higher volumes of construction traffic.

Should WDC have concerns relating to the potential impacts of construction traffic associated with specific components of the Structure Plan, this could be managed and controlled through the development of a Construction Traffic Management Plan (CTMP).

Key recommendations on the scope of the CTMP are included in Section 6.3.

5 Safety Assessment

A review of the number and type of crashes that have occurred near the proposed site within the past five full years (2014 – 2018) has been undertaken. It is to be noted that data from August 2018 onwards have not been made available in the NZ Transport Agency Crash Analysis System (CAS).

The Fitzherbert Avenue/Totara Road intersection has undergone a layout change in July 2018. The new T-intersection now gives priority to Fitzherbert Avenue (previously Totara Road), with stop and give way signs controlling traffic in and out of Totara Road. As such, there is no CAS data available to support the safety assessment of this intersection.

5.1 Mosston Road/Fox Road

There has been one non-injury crash where a vehicle hit an obstruction at the intersection. There have been four loss-of-control crashes at the intersection, one of which resulted in injuries while the rest were non-injury crashes. All of these loss-of-control crashes involved a vehicle turning out of Fox Road into Moston Road.

The new subdivision will add more traffic to the intersection particularly in the peak periods. However, given the low scale of this extra demand, it will likely not to exacerbate the safety issue at the intersection.

A high-level crash risk assessment based on the NZ Transport Agency Crash Estimation Compendium (CEC) [9] has been undertaken to compare the existing injury crash rate at the intersection, prior to the development of the site, and the predicted injury crash rate (A_T) when the development is completed. The full development traffic resulting from the establishment of 700 new dwellings has been overlain onto the existing AADT to allow a direct comparison in order to better understand the impact of the development traffic on the safety of the intersection.

The crash risk assessment using the CEC indicates that the addition of full development traffic is not expected to increase the injury crash rate at the Mosston Road / Fox Road intersection. This is shown by the increase of A_T from 0.15 per year to 0.20 year for the existing and future scenario, respectively.

Refer to Table 5-1 below for the summary of the crash risk assessment.

[9] According to crash prediction method in the Crash Estimation Compendium section 6.1 Urban Priority and Signalised Cross roads and T-junctions 50-70km/h

Table 5-1 : Crash Risk Assessment for Mosston Road / Fox Road Intersection

Crash Risk Assessment	Mosston Road	Fox Road
Existing AADT, without development traffic	4500vpd	3500vpd
Predicted AADT, including full development traffic	6100vpd	5100vpd
A_T – existing, based on CAS data	0.20 per year	
A_T – existing, based on CEC	0.15 per year	
A_T - future, with development traffic, based on CEC	0.20 per year	

5.2 Fitzherbert Avenue/Fox Road

There has been one severe and one minor injury crashes at this intersection, both involving a cyclist and a merging vehicle. There have also been two non-injury rear-end crashes at the intersection, both occuring when one vehicle was slowing down or stopping to turn into either Fox Road or Fitzherbert Avenue. One minor injury rear-end crash occurred 25m east of the intersection.

It is expected that the general growth in traffic demand in the future will result in slower travel speed at this intersection. The implementation of Fitzherbert Avenue extension and its new connection to Mosston Road is also expected to provide alternative routes for eastbound and westbound traffic and therefore reduce the turning-traffic into and out of Fox Road from Fitzherbert Avenue.

A crash risk assessment for this intersection has also been undertaken based on the CEC crash prediction method, in the same manner as the Mosston Road/Fox Road intersection.

Table 5-2 shows the results of the crash risk assessment. The crash risk assessment using the CEC indicates that the addition of full development traffic is not expected to result in a significant increase in the injury crash rate at the Fitzherbert Avenue / Fox Road intersection. This is shown by the increase of AT from 0.24 per year to 0.35 per year for the existing and future scenario, respectively. It is to be noted that the CEC existing injury crash rate is lower than the actual injury crash rate based on CAS data.

Table 5-2 : Crash Risk Assessment for Fitzherbert Avenue / Fox Road Intersection

Crash Risk Assessment	Fitzherbert Avenue	Fox Road
Existing AADT, without development traffic	8400vpd	3500vpd
Predicted AADT, including full development traffic	14000vpd	3500vpd
A_T – existing, based on CAS data	0.60 per year	
A_T – existing, based on CEC	0.24 per year	
A_T - future, with development traffic, based on CEC	0.35 per year	

Refer to Appendix E for the crash listings and collision diagrams for the intersections reported above.

5.3 Fitzherbert Road/Totara Road

Given the recent form changes, historical CAS data has not been investigated for the safety assessment of this intersection. To predict the future crash risk at this intersection, a crash risk assessment for this intersection has been undertaken using the CEC crash prediction method. The results of the crash risk assessment is presented in Table 5-3. The results show that the addition of full development traffic is not expected to increase the injury crash rate at the Fitzherbert Road / Totara Road intersection significantly. This is shown by the increase of A_T from 0.27 per year to 0.40 year for the existing and future scenario, respectively.

Table 5-3 : Crash Risk Assessment for Fitzherbert Road / Totara Road

Crash Risk Assessment	Fitzherbert Avenue	Totara Street
Existing AADT, without development traffic	8400vpd	6000vpd
Predicted AADT, including full development traffic	14000vpd	6000vpd
A_T – existing, based on CEC	0.27 per year	
A_T - future, with development traffic, based on CEC	0.40 per year	

6 Recommendations

6.1 Design Standards and Requirements

Although cross sections and designs for the internal road network have not been assessed as part of this Traffic Impact Assessment, it is expected that the internal network within the Springvale Plan Change area will be designed and constructed to conform with its intended network hierarchy, and adhere with the relevant requirements of the Whanganui District Plan[10] and appropriate subdivision engineering standards[11]. This includes (but is not limited to) vehicle crossing spacings, sight distance, and parking requirements as specified in Chapter 12.5 of the Whanganui District Plan.

It is expected that existing roads will be upgraded and urbanised to appropriate standards as the site development occurs; including the installation of footpaths, lighting and cycleway within the site. This will also need to conform to the relevant WDC design and engineering standards.

The Whanganui Shared Pathways Strategy (2012)[12] seeks the development of a shared pathway network that is safe, convenient, interconnected, accessible, attractive and expressive to support an active and healthy community. As previously noted, there are intentions to develop the shared path network on Fitzherbert Avenue and the north-south collector route through the Springvale Structure Plan area. It is expected that the proposed internal road network would provide high quality cycling facilities that are consistent with the desired outcomes of the Shared Path Strategy and the Active Transport Strategy.

6.2 General Traffic Operations

The future traffic demand around the road network, both with or without the development traffic in place, gives rises to a potential need for capacity upgrade of the Fitzherbert Avenue/Totara

[10] https://www.whanganui.govt.nz/our-services/planning-services/district-plan/Documents/Chapters/Chapter%2012%20Parking%20Loading%20and%20vehicle%20crossings.pdf
[11] NZS4404 - Land Development and Subdivision Engineering
[12] http://letsgowhanganui.org.nz/wp-content/uploads/2016/06/SharedPathwaysStrategy.pdf

Street and Fitzherbert Avenue/Fox Road intersections. Therefore, an appropriate long-term monitoring of the intersections performance and safety is recommended. It is expected that in the medium to long term, changes to intersection form for the aforementioned intersections will be required.

As previously noted, the proposed connections between the New Swale Road and Fitzherbert Avenue, as well as with Fox Road, shall consider the future demand and purpose of the roads, as well as the future provision of cycleway along the New Swale Road. The recommended form for the two connections is priority controlled (give-way) intersection.

Funding options for the implementation of the above provision and upgrades should be explored, with one of the potential options being through the WDC Long Term Plan (LTP)[13].

6.3 Construction Traffic

As noted within Section 4.7, it is expected that there would be an increase in construction traffic on the local roading network associated with the subdivision, however, this is not expected to impact on the safe and efficient function of the network. It is expected that any future roading upgrades required to support development within the Springvale Structure Plan area would be undertaken with appropriate level of Temporary Traffic Management (TTM).

Some specific elements of the proposed development are expected to generate higher levels of construction related traffic, and Council may wish to consider the use of Construction Traffic Management Plan's (CTMP) to manage onsite activity; in particular, the building or upgrading of the local roading network. CTMP's outline how activities would be managed on site and should include (but not be limited to):

- Details of how construction material deliveries would be made to the site, including the location of stockpiling areas, loading areas, and routes for heavy or over dimension vehicles accessing the site; and
- General site operational information including details of hours of operation, location of parking for construction workers, provision for managing dust / debris migration onto the public road network, temporary traffic management requirements, maintenance of existing pedestrian and cyclist access, and access to neighbouring properties. It should also cover the requirement for communications and problem/incident reporting.

7 Conclusions

The traffic impact assessment undertaken for the Springvale Future Development Area has considered the following:

- General traffic demand and trip distribution around the site
- Development traffic
- Performance assessment of surrounding intersections
- Safety assessment of surrounding intersections
- Construction Traffic Impact

The performance of the key intersections surrounding the sites are expected to remain acceptable in the short to medium term (10 years), with or without the additional Springvale Future

[13] https://www.whanganui.govt.nz/our-council/publications/plans/Documents/10%20Year%20Plan%202018-28%20-%20Volume%201.pdf

Development Area traffic. However, in the longer term (beyond 2029), it is expected that future capacity upgrades of Fitzherbert Avenue / Totara Street and Fitzherbert Avenue / Fox Road intersections will be necessary regardless of the future development.

The construction traffic effects relating to the development, including dwellings and supporting infrastructure, are considered to be minor, particularly with the consideration and adoption of the suggested CTMP mitigation measures recommended in Section 6.3.

The impact of the development traffic on local intersection safety is considered to be minor. The results of the predictive crash risk assessment of existing intersections show that there will not be significant increase in the injury crash risk at the intersections under future network conditions, with or without the development traffic. This is consistent with the qualitative assessment of the safety risk given the expected traffic pattern and current intersections arrangements. As with intersections capacity, however, there may be need for monitoring and upgrade of the intersections to maintain safety well into the future.

Appendix A

Travel to Work Survey Data

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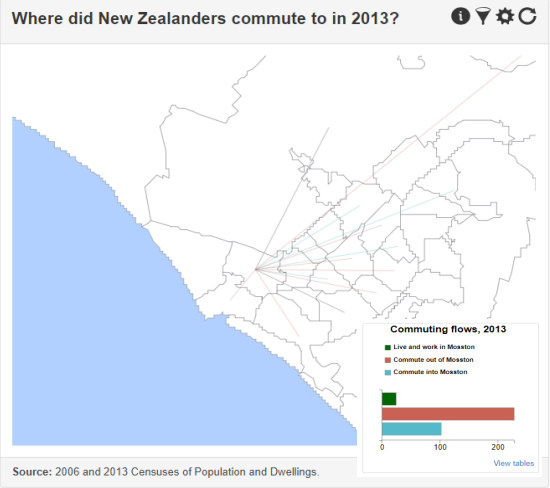
Mosston Survey Block

Commuting flows			
Commuting type	**Totals, 2006**	**Totals, 2013**	***% of total, 2013***
Live and work in area unit	24	24	
Commute out	264	228	*69%*
Commute in	51	102	*31%*
Total people working in area unit	75	126	
Total commuting trips	**315**	**330**	

Main means of travel to work			
Travel	**Totals, 2006**	**Totals, 2013**	***% of total modes, 2013***
Worked at home	9	9	*n/a*
Did not go to work today	39	39	*n/a*
Drove a private car, truck, or van	222	168	*69%*
Drove a company car, truck, or van	36	24	*10%*
Passenger in a car, truck, van, or company bus	36	18	*7%*
Public bus	..	..	*0%*
Train	..	..	*0%*
Motorbike or powercycle	..	6	*2%*
Bicycle	..	12	*5%*
Walked or jogged	15	12	*5%*
Other	..	..	*0%*
Not elsewhere included	27	18	**7%**
Totals stated	375	291	
Total people who went to work on census day	**330**	**243**	



Total people commuting out					
Area unit code	**Area unit name**	**Type of flow**	**2006**	**2013**	***% of total, 2013***
556000	Balgownie	out	63	42	*25%*
555300	Blueskin	out	6	6	*4%*
555800	Castlecliff South	out	27	27	*16%*
557100	Cooks Gardens	out	48	42	*25%*
558300	Fordell-Kakatahi	out	15	6	*4%*
556200	Gonville South	out	12	9	*5%*
556800	Laird Park	out	15	18	*11%*
557000	Spriggens Park	out	..	12	*7%*
556700	Wanganui Collegiate	out	9	9	*5%*
Total commute out			**195**	**171**	

Total people commuting in					
Area unit code	**Area unit name**	**Type of flow**	**2006**	**2013**	***% of total, 2013***
555300	Blueskin	in	..	6	*14%*
556300	Gonville East	in	..	6	*14%*
556200	Gonville South	in	9	9	*14%*
557200	St Johns Hill	in	..	6	*14%*
556900	Wanganui Central	in	..	6	*21%*
557600	Wembley Park	in	..	6	*21%*
Total commute in			**9**	**39**	

Tawhero Survey Block

Commuting flows			
Commuting type	**Totals, 2006**	**Totals, 2013**	***% of total, 2013***
Live and work in area unit	60	84	
Commute out	582	588	*84%*
Commute in	111	114	*16%*
Total people working in area unit	171	198	
Total commuting trips	**693**	**702**	

Main means of travel to work			
Travel	**Totals, 2006**	**Totals, 2013**	***% of total modes, 2013***
Worked at home	30	30	*n/a*
Did not go to work today	87	87	*n/a*
Drove a private car, truck, or van	465	417	*67%*
Drove a company car, truck, or van	90	87	*14%*
Passenger in a car, truck, van, or company bus	33	45	*7%*
Public bus	..	..	*0%*
Train	..	..	*0%*
Motorbike or powercycle	15	9	*1%*
Bicycle	..	33	*5%*
Walked or jogged	18	21	*3%*
Other	..	..	*0%*
Not elsewhere included	48	33	**5%**
Totals stated	774	738	
Total people who went to work on census day	**657**	**618**	

Total people commuting out					
Area unit code	**Area unit name**	**Type of flow**	**2006**	**2013**	***% of total, 2013***
556000	Balgownie	out	66	69	*13%*
555300	Blueskin	out	12	9	*2%*
555800	Castlecliff South	out	33	33	*6%*
557100	Cooks Gardens	out	186	171	*33%*
558300	Fordell-Kakatahi	out	21	21	*4%*
556300	Gonville East	out	..	6	*1%*
556200	Gonville South	out	45	45	*9%*
557700	Kowhai Park	out	12	6	*1%*
556800	Laird Park	out	42	48	*9%*
557300	Lower Aramoho	out	18	21	*4%*
555200	Otamatea	out	..	12	*2%*
557000	Spriggens Park	out	9	12	*2%*
556500	Springvale West	out	..	9	*2%*
557200	St Johns Hill	out	12	15	*3%*
556900	Wanganui Central	out	12	9	*2%*
556700	Wanganui Collegiate	out	27	30	*6%*
557500	Williams Domain	out	12	6	*1%*
Total commute out			**507**	**522**	

Total people commuting in					
Area unit code	**Area unit name**	**Type of flow**	**2006**	**2013**	***% of total, 2013***
556300	Gonville East	in	..	6	*14%*
556200	Gonville South	in	12	6	*14%*
556400	Gonville West	in	6	6	*14%*
556500	Springvale West	in	9	6	*14%*
557400	Upper Aramoho	in	..	9	*21%*
557500	Williams Domain	in	..	9	*21%*
Total commute in			**27**	**42**	

Appendix B

Trip Distribution Assumptions

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Trip Distribution Assumptions

Springvale Future Development Area – New Trips

The following are the assumptions related to the trips generated by the subdivision within the Springvale Future Development Area ("*the site*").

i. The first 10 new dwellings within the site will be built in 2020, with a continuous average build-rate of 14 new dwellings per year. This is aligned with the high range of the specified target of 600-700 new dwellings in 50 years and therefore considered fairly conservative.

ii. The new dwellings will all generate outgoing commuting trips in the AM peak. 20% of the AM commute trips will be via new Fox Road / Swale Road intersection towards Mosston Road (travelling northbound), 70% of trips via Fitzherbert Avenue/Totara Street intersection (travelling eastbound and north-eastbound), and the remaining 10% will be travelling westbound and southbound via the Fitzherbert Avenue extension and Mosston Road. In the PM peak, counter-flow pattern is assumed.

Intersections Surrounding the Springvale Future Development Area

The following are the assumptions used to adjust the current turning volumes at the key intersections surrounding the site, ***considering the new Fitzherbert Avenue Extension is in place***. It is to be noted that the redistribution does not included buses and cyclists.

a) Mosston Road / Fox Road intersection

AM and PM Peak

i. Considering the new Fitzherbert Avenue / Mosston Road intersection, and the proportion of commute to/from the east from Mosston and Tawhero areas, 20% of the traffic turning into and out of Fox Road at this intersection in AM and PM peak, respectively, are transferred to the Fitzherbert Avenue / Mosston Road intersection and will be travelling via Fitzherbert Avenue instead.

b) Fitzherbert Avenue / Totara Street intersection

AM Peak

i. 10% left-turning traffic from Fitzherbert Avenue (East) will travel through to Fitzherbert Avenue. This is based on 13% of Tawhero residents commuting west towards Balgownie.

ii. Additional eastbound through traffic on Fitzherbert Avenue (West) originating from the Fitzherbert Avenue / Mosston Road intersection, as per assumption a(i). This additional traffic is balanced with the adjustment to the corresponding movements at Fitzherbert Avenue / Fox Road intersection.

PM Peak

iii. 30% of left-turning traffic from Fitzherbert Ave (East) will travel through to Fitzherbert Avenue, This is largely based on the assumptions that the Tawhero and Mosston area residents will commute back from the east (primarily Cooks Garden area) via Fitzherbert Avenue / Totara Street intersection. 50% of the westbound through traffic on Fitzherbert Avenue will travel through to Fitzherbert Avenue / Mosston Road intersection.

iv. Additional westbound through traffic on Fitzherbert Avenue (East), also towards the Fitzherbert Avenue / Mosston Road intersection, as a result of the additional westbound traffic from the Fitzherbert Avenue / Fox Road intersection (corresponding to assumption a(i))w

c) Fitzherbert Avenue / Fox Road intersection

AM Peak

i. Reduction to the left-turning traffic into Fitzherbert Avenue (east), corresponding with the reduction in traffic turning into Fox Road from Mosston Road (assumption a(i)).

ii. Additional eastbound through traffic on Fitzherbert Avenue (west), corresponding to assumptions a(i) and b(ii)

PM Peak

iii. Reduction to the right-turning traffic into Fox Road from Fitzherbert Avenue (east), corresponding to the reduction of traffic on Fox Road, corresponding to assumption a(i).

iv. Additional westbound through traffic on Fitzherbert Avenue (east), corresponding to assumptions a(i) and b(iv).

d) Fitzherbert Avenue / Mosston Road intersection (*assumed in place*)

AM and PM Peak

i. Traffic volumes and turning movements are consistent with assumptions a(i), b(i), b(iii), b(iv).

Appendix C

Traffic Volumes

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Surveyed Traffic Volumes

Mosston Road / Fox Road Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Mosston Rd (North)	**219**	**16**	**1**	**2**	**238**	**212**	**12**	**0**	**0**	**224**
Left into Fox Rd	91	1	1	0	93	52	3	0	0	55
Thru to Mosston Rd (South)	128	12	0	3	143	160	9	0	0	169
Fox Rd	**116**	**6**	**1**	**1**	**124**	**74**	**3**	**1**	**1**	**79**
Left into Mosston Rd (South)	38	3	1	1	43	37	3	1	1	42
Right into Mosston Rd (North)	78	3	0	0	81	37	0	0	0	37
Mosston Rd (South)	**176**	**12**	**0**	**1**	**189**	**207**	**16**	**0**	**1**	**224**
Thru to Mosston Rd (North)	136	8	0	0	144	155	11	0	1	167
Right into Fox Rd	40	4	0	1	45	52	5	0	0	57
Grand Total	**511**	**34**	**2**	**4**	**551**	**493**	**31**	**1**	**2**	**527**

Fitzherbert Avenue / Totara Street Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Fitzherbert Ave (East)	**248**	**11**	**1**	**3**	**263**	**366**	**10**	**1**	**5**	**382**
Left into Totara St	211	11	1	2	225	267	9	1	4	281
Thru to Fitzherbert Ave (West)	37	0	0	1	38	99	1	0	1	101
Totara St	**339**	**11**	**3**	**5**	**358**	**300**	**9**	**1**	**7**	**317**
Left into Fitzherbert Ave (West)	1	0	0	0	1	4	0	0	0	4
Right into Fitzherbert Ave (East)	338	11	3	5	357	296	9	1	7	313
Fitzherbert Ave (West)	**98**	**2**	**0**	**2**	**102**	**62**	**1**	**0**	**2**	**65**
Thru to Fitzherbert Ave (East)	94	2	0	2	98	55	1	0	2	58
Right into Totara St	4	0	0	0	4	7	0	0	0	7
Grand Total	**685**	**24**	**4**	**10**	**723**	**728**	**20**	**2**	**14**	**764**

Fitzherbert Avenue / Fox Road Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Fox Rd	**206**	**7**	**2**	**3**	**218**	**135**	**8**	**0**	**0**	**143**
Left into Fitzherbert Ave (East)	169	6	1	3	179	103	7	0	0	110
Right into Fitzherbert Ave (Wes	37	1	1	0	39	32	1	0	0	33
Fitzherbert Ave (East)	**283**	**18**	**0**	**3**	**304**	**463**	**17**	**1**	**6**	**487**
Thru to Fitzherbert Ave (West)	211	10	0	3	224	345	10	1	5	361
Right into Fox Rd	72	8	0	0	80	118	7	0	1	126
Fitzherbert Ave (West)	**441**	**13**	**3**	**7**	**464**	**359**	**10**	**1**	**9**	**379**
Left into Fox Rd	30	1	0	0	31	37	1	0	2	40
Thru to Fitzherbert Ave (East)	411	12	3	7	433	322	9	1	7	339
Grand Total	**930**	**38**	**5**	**13**	**986**	**957**	**35**	**2**	**15**	**1009**

EXISTING : With Fitzherbert Avenue Extension in place - 2019, no new dwellings

Cells with highlights are movements affected by traffic re-distribution

Mosston Road / Fox Road Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Mosston Rd (North)	**201**	**13**	**1**	**3**	**218**	**212**	**12**	**0**	**0**	**224**
Left into Fox Rd	73	1	1	0	75	52	3	0	0	55
Thru to Mosston Rd (South)	128	12	0	3	143	160	9	0	0	169
Fox Rd	**116**	**6**	**1**	**1**	**124**	**59**	**2**	**1**	**1**	**63**
Left into Mosston Rd (South)	38	3	1	1	43	30	2	1	1	34
Right into Mosston Rd (North)	78	3	0	0	81	30	0	0	0	30
Mosston Rd (South)	**168**	**11**	**0**	**1**	**180**	**207**	**16**	**0**	**1**	**224**
Thru to Mosston Rd (North)	136	8	0	0	144	155	11	0	1	167
Right into Fox Rd	32	3	0	1	36	52	5	0	0	57
Grand Total	**485**	**30**	**2**	**5**	**522**	**478**	**30**	**1**	**2**	**511**

Fitzherbert Avenue / Totara Street Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Fitzherbert Ave (East)	**248**	**11**	**1**	**3**	**263**	**381**	**11**	**1**	**5**	**398**
Left into Totara St	190	10	1	2	203	187	6	1	3	197
Thru to Fitzherbert Ave (West)	58	1	0	1	60	194	4	0	2	201
Totara St	**339**	**11**	**3**	**5**	**358**	**300**	**9**	**1**	**7**	**317**
Left into Fitzherbert Ave (West)	1	0	0	0	1	4	0	0	0	4
Right into Fitzherbert Ave (East)	338	11	3	5	357	296	9	1	7	313
Fitzherbert Ave (West)	**124**	**3**	**0**	**2**	**129**	**62**	**1**	**0**	**2**	**65**
Thru to Fitzherbert Ave (East)	120	3	0	2	125	55	1	0	2	58
Right into Totara St	4	0	0	0	4	7	0	0	0	7
Grand Total	**711**	**25**	**4**	**10**	**750**	**743**	**21**	**2**	**14**	**780**

Fitzherbert Avenue / Fox Road Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Fox Rd	**180**	**6**	**2**	**3**	**191**	**135**	**8**	**0**	**0**	**143**
Left into Fitzherbert Ave (East)	143	5	1	3	152	103	7	0	0	110
Right into Fitzherbert Ave (Wes	37	1	1	0	39	32	1	0	0	33
Fitzherbert Ave (East)	**283**	**18**	**0**	**3**	**304**	**448**	**16**	**1**	**6**	**471**
Thru to Fitzherbert Ave (West)	211	10	0	3	224	345	10	1	5	361
Right into Fox Rd	72	8	0	0	80	103	6	0	1	110
Fitzherbert Ave (West)	**467**	**14**	**3**	**7**	**491**	**359**	**10**	**1**	**9**	**379**
Left into Fox Rd	30	1	0	0	31	37	1	0	2	40
Thru to Fitzherbert Ave (East)	437	13	3	7	460	322	9	1	7	339
Grand Total	**930**	**38**	**5**	**13**	**986**	**942**	**34**	**2**	**15**	**993**

Fitzherbert Avenue Extension / Mosston Road Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Mosston Road (North)	**146**	**12**	**0**	**3**	**161**	**170**	**14**	**0**	**0**	**184**
Left into Fitzherbert Avenue	18	0	0	0	18	10	5	0	0	15
Thru to Mosston Road (South)	128	12	0	3	143	160	9	0	0	169
Fitzherbert Ave (Extension)	**58**	**1**	**0**	**1**	**60**	**209**	**5**	**0**	**3**	**216**
Left into Mosston Road (South)	29	1	0	1	30	104	3	0	1	109
Right into Mosston Road (North)	29	1	0	1	30	104	2	0	1	108
Mosston Road (South)	**144**	**9**	**0**	**0**	**153**	**165**	**16**	**0**	**1**	**182**
Thru to Mosston Road (North)	136	8	0	0	144	155	11	0	1	167
Right into Fitzherbert Avenue	8	1	0	0	9	10	5	0	0	15
Grand Total	**348**	**22**	**0**	**4**	**375**	**544**	**35**	**0**	**4**	**582**

assumed traffic volumes

Scenario 1a : Year 2029, 0 development, CAGR 4%

Cells with highlights are movements affected by development traffic

Mosston Road / Fox Road Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Mosston Rd (North)	**297**	**19**	**1**	**4**	**322**	**314**	**18**	**0**	**0**	**332**
Left into Fox Rd	108	1	1	0	110	77	4	0	0	81
Thru to Mosston Rd (South)	189	18	0	4	212	237	13	0	0	250
Fox Rd	**172**	**9**	**1**	**1**	**184**	**88**	**4**	**1**	**1**	**94**
Left into Mosston Rd (South)	56	4	1	1	64	44	4	1	1	50
Right into Mosston Rd (North)	115	4	0	0	120	44	0	0	0	44
Mosston Rd (South)	**249**	**17**	**0**	**1**	**266**	**306**	**24**	**0**	**1**	**332**
Thru to Mosston Rd (North)	201	12	0	0	213	229	16	0	1	247
Right into Fox Rd	47	5	0	1	53	77	7	0	0	84
Grand Total	**718**	**44**	**3**	**7**	**772**	**708**	**45**	**1**	**3**	**757**

Fitzherbert Avenue / Totara Street Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Fitzherbert Ave (East)	**367**	**16**	**1**	**4**	**389**	**564**	**16**	**1**	**8**	**589**
Left into Totara St	281	15	1	3	300	277	9	1	4	292
Thru to Fitzherbert Ave (West)	86	2	0	2	89	287	6	0	4	297
Totara St	**502**	**16**	**4**	**7**	**530**	**444**	**13**	**1**	**10**	**469**
Left into Fitzherbert Ave (West)	1	0	0	0	1	6	0	0	0	6
Right into Fitzherbert Ave (East)	500	16	4	7	528	438	13	1	10	463
Fitzherbert Ave (West)	**184**	**4**	**0**	**3**	**192**	**92**	**1**	**0**	**3**	**96**
Thru to Fitzherbert Ave (East)	178	4	0	3	186	81	1	0	3	86
Right into Totara St	6	0	0	0	6	10	0	0	0	10
Grand Total	**1053**	**37**	**6**	**15**	**1111**	**1100**	**30**	**3**	**21**	**1154**

Fitzherbert Avenue / Fox Road Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Fox Rd	**266**	**9**	**3**	**4**	**282**	**200**	**12**	**0**	**0**	**212**
Left into Fitzherbert Ave (East)	211	7	1	4	224	152	10	0	0	163
Right into Fitzherbert Ave (Wes	55	1	1	0	58	47	1	0	0	49
Fitzherbert Ave (East)	**419**	**27**	**0**	**4**	**450**	**663**	**24**	**1**	**9**	**698**
Thru to Fitzherbert Ave (West)	312	15	0	4	332	511	15	1	7	534
Right into Fox Rd	107	12	0	0	118	153	9	0	1	163
Fitzherbert Ave (West)	**692**	**21**	**4**	**11**	**727**	**531**	**15**	**1**	**13**	**561**
Left into Fox Rd	44	1	0	0	46	55	1	0	3	59
Thru to Fitzherbert Ave (East)	647	19	4	11	682	477	13	1	10	502
Grand Total	**1377**	**56**	**7**	**19**	**1460**	**1395**	**51**	**3**	**22**	**1470**

Fitzherbert Avenue Extension / Mosston Road Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Mosston Road (North)	**216**	**18**	**0**	**4**	**239**	**252**	**21**	**0**	**0**	**272**
Left into Fitzherbert Avenue	27	0	0	0	27	15	7	0	0	22
Thru to Mosston Road (South)	189	18	0	4	212	237	13	0	0	250
Fitzherbert Ave (Extension)	**86**	**2**	**0**	**2**	**89**	**309**	**7**	**0**	**4**	**320**
Left into Mosston Road (South)	43	1	0	1	45	154	4	0	2	161
Right into Mosston Road (North)	43	1	0	1	45	154	3	0	2	159
Mosston Road (South)	**213**	**13**	**0**	**0**	**226**	**244**	**24**	**0**	**1**	**269**
Thru to Mosston Road (North)	201	12	0	0	213	229	16	0	1	247
Right into Fitzherbert Avenue	12	1	0	0	13	15	7	0	0	22
Grand Total	**516**	**33**	**0**	**7**	**555**	**805**	**52**	**0**	**5**	**862**

Scenario 1b : Year 2029, 140 new residentials, CAGR 4%

Mosston Road / Fox Road Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Mosston Rd (North)	**297**	**19**	**1**	**4**	**322**	**348**	**18**	**0**	**0**	**366**
Left into Fox Rd	108	1	1	0	110	111	4	0	0	115
Thru to Mosston Rd (South)	189	18	0	4	212	237	13	0	0	250
Fox Rd	**206**	**9**	**1**	**1**	**218**	**88**	**4**	**1**	**1**	**94**
Left into Mosston Rd (South)	56	4	1	1	64	44	4	1	1	50
Right into Mosston Rd (North)	149	4	0	0	154	44	0	0	0	44
Mosston Rd (South)	**249**	**17**	**0**	**1**	**266**	**306**	**24**	**0**	**1**	**332**
Thru to Mosston Rd (North)	201	12	0	0	213	229	16	0	1	247
Right into Fox Rd	47	5	0	1	53	77	7	0	0	84
Grand Total	**752**	**44**	**3**	**7**	**806**	**742**	**45**	**1**	**3**	**791**

Fitzherbert Avenue / Totara Street Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Fitzherbert Ave (East)	**367**	**16**	**1**	**4**	**389**	**682**	**16**	**1**	**8**	**707**
Left into Totara St	281	15	1	3	300	277	9	1	4	292
Thru to Fitzherbert Ave (West)	86	2	0	2	89	405	6	0	4	415
Totara St	**502**	**16**	**4**	**7**	**530**	**444**	**13**	**1**	**10**	**469**
Left into Fitzherbert Ave (West)	1	0	0	0	1	6	0	0	0	6
Right into Fitzherbert Ave (East)	500	16	4	7	528	438	13	1	10	463
Fitzherbert Ave (West)	**302**	**4**	**0**	**3**	**310**	**92**	**1**	**0**	**3**	**96**
Thru to Fitzherbert Ave (East)	296	4	0	3	304	81	1	0	3	86
Right into Totara St	6	0	0	0	6	10	0	0	0	10
Grand Total	**1171**	**37**	**6**	**15**	**1229**	**1218**	**30**	**3**	**21**	**1272**

Fitzherbert Avenue / Fox Road Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Fox Rd	**266**	**9**	**3**	**4**	**282**	**200**	**12**	**0**	**0**	**212**
Left into Fitzherbert Ave (East)	211	7	1	4	224	152	10	0	0	163
Right into Fitzherbert Ave (Wes	55	1	1	0	58	47	1	0	0	49
Fitzherbert Ave (East)	**419**	**27**	**0**	**4**	**450**	**781**	**24**	**1**	**9**	**816**
Thru to Fitzherbert Ave (West)	312	15	0	4	332	629	15	1	7	652
Right into Fox Rd	107	12	0	0	118	153	9	0	1	163
Fitzherbert Ave (West)	**810**	**21**	**4**	**11**	**845**	**531**	**15**	**1**	**13**	**561**
Left into Fox Rd	44	1	0	0	46	55	1	0	3	59
Thru to Fitzherbert Ave (East)	765	19	4	11	800	477	13	1	10	502
Grand Total	**1495**	**56**	**7**	**19**	**1578**	**1513**	**51**	**3**	**22**	**1588**

Fitzherbert Avenue Extension / Mosston Road Intersection

	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Mosston Road (North)	**216**	**18**	**0**	**4**	**239**	**252**	**21**	**0**	**0**	**272**
Left into Fitzherbert Avenue	27	0	0	0	27	15	7	0	0	22
Thru to Mosston Road (South)	189	18	0	4	212	237	13	0	0	250
Fitzherbert Ave (Extension)	**102**	**2**	**0**	**2**	**105**	**309**	**7**	**0**	**4**	**320**
Left into Mosston Road (South)	59	1	0	1	61	154	4	0	2	161
Right into Mosston Road (North)	43	1	0	1	45	154	3	0	2	159
Mosston Road (South)	**213**	**13**	**0**	**0**	**226**	**260**	**24**	**0**	**1**	**285**
Thru to Mosston Road (North)	201	12	0	0	213	229	16	0	1	247
Right into Fitzherbert Avenue	12	1	0	0	13	31	7	0	0	38
Grand Total	**532**	**33**	**0**	**7**	**571**	**821**	**52**	**0**	**5**	**878**

Scenario 2a : Year 2069, 0 development, CAGR 4% capped at 2044

Cells with highlights are movements affected by development traffic

Mosston Road / Fox Road Intersection	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Mosston Rd (North)	**535**	**34**	**3**	**8**	**580**	**565**	**32**	**0**	**0**	**597**
Left into Fox Rd	194	2	3	0	199	139	8	0	0	147
Thru to Mosston Rd (South)	341	32	0	8	381	427	24	0	0	451
Fox Rd	**309**	**16**	**3**	**3**	**331**	**158**	**6**	**3**	**2**	**169**
Left into Mosston Rd (South)	101	8	3	3	115	79	6	3	2	90
Right into Mosston Rd (North)	208	8	0	0	216	79	0	0	0	79
Mosston Rd (South)	**448**	**30**	**0**	**2**	**480**	**552**	**43**	**0**	**3**	**597**
Thru to Mosston Rd (North)	363	21	0	0	384	413	29	0	3	445
Right into Fox Rd	85	9	0	2	96	139	13	0	0	152
Grand Total	**1292**	**80**	**5**	**13**	**1391**	**1275**	**81**	**3**	**5**	**1363**

Fitzherbert Avenue / Totara Street Intersection	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Fitzherbert Ave (East)	**661**	**29**	**3**	**8**	**701**	**1015**	**28**	**3**	**14**	**1060**
Left into Totara St	506	26	3	5	540	498	17	3	7	525
Thru to Fitzherbert Ave (West)	155	3	0	3	161	517	11	0	6	535
Totara St	**904**	**29**	**8**	**13**	**954**	**800**	**24**	**3**	**19**	**845**
Left into Fitzherbert Ave (West)	3	0	0	0	3	11	0	0	0	11
Right into Fitzherbert Ave (East)	901	29	8	13	952	789	24	3	19	834
Fitzherbert Ave (West)	**331**	**8**	**0**	**6**	**345**	**165**	**3**	**0**	**5**	**173**
Thru to Fitzherbert Ave (East)	320	8	0	6	334	147	3	0	5	155
Right into Totara St	11	0	0	0	11	19	0	0	0	19
Grand Total	**1896**	**67**	**11**	**27**	**2000**	**1980**	**55**	**5**	**38**	**2078**

Fitzherbert Avenue / Fox Road Intersection	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Fox Rd	**479**	**16**	**5**	**7**	**508**	**360**	**21**	**0**	**0**	**381**
Left into Fitzherbert Ave (East)	381	13	3	7	404	275	19	0	0	293
Right into Fitzherbert Ave (Wes	99	3	3	0	104	85	3	0	0	88
Fitzherbert Ave (East)	**754**	**48**	**0**	**8**	**810**	**1195**	**44**	**3**	**15**	**1257**
Thru to Fitzherbert Ave (West)	562	27	0	8	597	920	27	3	13	962
Right into Fox Rd	192	21	0	0	213	275	17	0	2	294
Fitzherbert Ave (West)	**1245**	**37**	**8**	**19**	**1310**	**957**	**27**	**3**	**24**	**1010**
Left into Fox Rd	80	3	0	0	83	99	3	0	5	107
Thru to Fitzherbert Ave (East)	1166	35	8	19	1227	858	24	3	19	904
Grand Total	**2479**	**101**	**13**	**35**	**2629**	**2512**	**92**	**5**	**39**	**2648**

Fitzherbert Avenue Extension / Mosston Road Intersection	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Mosston Road (North)	**390**	**33**	**0**	**8**	**430**	**453**	**37**	**0**	**0**	**491**
Left into Fitzherbert Avenue	49	1	0	0	49	27	13	0	0	40
Thru to Mosston Road (South)	341	32	0	8	381	427	24	0	0	451
Fitzherbert Ave (Extension)	**155**	**3**	**0**	**3**	**161**	**556**	**13**	**0**	**7**	**576**
Left into Mosston Road (South)	77	1	0	2	81	278	7	0	4	289
Right into Mosston Road (North)	77	1	0	2	81	278	6	0	3	287
Mosston Road (South)	**384**	**23**	**0**	**1**	**408**	**440**	**43**	**0**	**3**	**485**
Thru to Mosston Road (North)	363	21	0	0	384	413	29	0	3	445
Right into Fitzherbert Avenue	21	2	0	1	24	27	13	0	0	40
Grand Total	**929**	**59**	**0**	**12**	**999**	**1449**	**93**	**0**	**10**	**1552**

Scenario 2b : Year 2069, 700 new residentials, CAGR 4% capped at 2044

Mosston Road / Fox Road Intersection	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Mosston Rd (North)	**535**	**34**	**3**	**8**	**580**	**733**	**32**	**0**	**0**	**765**
Left into Fox Rd	194	2	3	0	199	307	8	0	0	315
Thru to Mosston Rd (South)	341	32	0	8	381	427	24	0	0	451
Fox Rd	**477**	**16**	**3**	**3**	**499**	**158**	**6**	**3**	**2**	**169**
Left into Mosston Rd (South)	101	8	3	3	115	79	6	3	2	90
Right into Mosston Rd (North)	376	8	0	0	384	79	0	0	0	79
Mosston Rd (South)	**448**	**30**	**0**	**2**	**480**	**552**	**43**	**0**	**3**	**597**
Thru to Mosston Rd (North)	363	21	0	0	384	413	29	0	3	445
Right into Fox Rd	85	9	0	2	96	139	13	0	0	152
Grand Total	**1460**	**80**	**5**	**13**	**1559**	**1443**	**81**	**3**	**5**	**1531**

Fitzherbert Avenue / Totara Street Intersection	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Fitzherbert Ave (East)	**661**	**29**	**3**	**8**	**701**	**1603**	**28**	**3**	**14**	**1648**
Left into Totara St	506	26	3	5	540	498	17	3	7	525
Thru to Fitzherbert Ave (West)	155	3	0	3	161	1105	11	0	6	1123
Totara St	**904**	**29**	**8**	**13**	**954**	**800**	**24**	**3**	**19**	**845**
Left into Fitzherbert Ave (West)	3	0	0	0	3	11	0	0	0	11
Right into Fitzherbert Ave (East)	901	29	8	13	952	789	24	3	19	834
Fitzherbert Ave (West)	**919**	**8**	**0**	**6**	**933**	**165**	**3**	**0**	**5**	**173**
Thru to Fitzherbert Ave (East)	908	8	0	6	922	147	3	0	5	155
Right into Totara St	11	0	0	0	11	19	0	0	0	19
Grand Total	**2484**	**67**	**11**	**27**	**2588**	**2568**	**55**	**5**	**38**	**2666**

Fitzherbert Avenue / Fox Road Intersection	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Fox Rd	**479**	**16**	**5**	**7**	**508**	**360**	**21**	**0**	**0**	**381**
Left into Fitzherbert Ave (East)	381	13	3	7	404	275	19	0	0	293
Right into Fitzherbert Ave (Wes	99	3	3	0	104	85	3	0	0	88
Fitzherbert Ave (East)	**754**	**48**	**0**	**8**	**810**	**1783**	**44**	**3**	**15**	**1845**
Thru to Fitzherbert Ave (West)	562	27	0	8	597	1508	27	3	13	1550
Right into Fox Rd	192	21	0	0	213	275	17	0	2	294
Fitzherbert Ave (West)	**1833**	**37**	**8**	**19**	**1898**	**957**	**27**	**3**	**24**	**1010**
Left into Fox Rd	80	3	0	0	83	99	3	0	5	107
Thru to Fitzherbert Ave (East)	1754	35	8	19	1815	858	24	3	19	904
Grand Total	**3067**	**101**	**13**	**35**	**3217**	**3100**	**92**	**5**	**39**	**3236**

Fitzherbert Avenue Extension / Mosston Road Intersection	AM				AM Total	PM				PM Total
	Cars	Trucks	Buses	Cyclists		Cars	Trucks	Buses	Cyclists	
Mosston Road (North)	**390**	**33**	**0**	**8**	**430**	**453**	**37**	**0**	**0**	**491**
Left into Fitzherbert Avenue	49	1	0	0	49	27	13	0	0	40
Thru to Mosston Road (South)	341	32	0	8	381	427	24	0	0	451
Fitzherbert Ave (Extension)	**239**	**3**	**0**	**3**	**245**	**556**	**13**	**0**	**7**	**576**
Left into Mosston Road (South)	161	1	0	2	165	278	7	0	4	289
Right into Mosston Road (North)	77	1	0	2	81	278	6	0	3	287
Mosston Road (South)	**384**	**23**	**0**	**1**	**408**	**524**	**43**	**0**	**3**	**569**
Thru to Mosston Road (North)	363	21	0	0	384	413	29	0	3	445
Right into Fitzherbert Avenue	21	2	0	1	24	111	13	0	0	124
Grand Total	**1013**	**59**	**0**	**12**	**1083**	**1533**	**93**	**0**	**10**	**1636**

Appendix D
Sidra Modelling Output

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MOVEMENT SUMMARY

Site: 101 [Fitzherbert Avenue / Fox Road - 2019 AM]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Fitzherbert Ave East												
5	T1	233	4.5	0.124	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
6	R2	84	10.0	0.112	7.7	LOS A	0.4	3.2	0.53	0.73	0.53	44.5
Approach		317	6.0	0.124	2.1	NA	0.4	3.2	0.14	0.19	0.14	48.4
North: Fox Road												
7	L2	157	4.0	0.205	7.5	LOS A	0.8	5.5	0.52	0.75	0.52	44.9
9	R2	41	5.1	0.132	15.2	LOS C	0.5	3.3	0.74	0.88	0.74	40.9
Approach		198	4.3	0.205	9.1	LOS A	0.8	5.5	0.56	0.77	0.56	44.0
West: Fitzherbert Ave West												
10	L2	33	3.2	0.018	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
11	T1	477	3.5	0.250	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		509	3.5	0.250	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.7
All Vehicles		1024	4.4	0.250	2.6	NA	0.8	5.5	0.15	0.23	0.15	48.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Avenue / Fox Road - 2019 PM]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Fitzherbert Ave East												
5	T1	375	3.1	0.198	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
6	R2	115	5.5	0.125	6.7	LOS A	0.5	3.7	0.46	0.66	0.46	45.2
Approach		489	3.7	0.198	1.6	NA	0.5	3.7	0.11	0.16	0.11	48.8
North: Fox Road												
7	L2	116	6.4	0.130	6.5	LOS A	0.5	3.5	0.42	0.64	0.42	45.5
9	R2	35	3.0	0.113	15.3	LOS C	0.4	2.8	0.74	0.88	0.74	40.8
Approach		151	5.6	0.130	8.5	LOS A	0.5	3.5	0.50	0.70	0.50	44.3
West: Fitzherbert Ave West												
10	L2	40	2.6	0.022	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
11	T1	349	3.0	0.183	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		389	3.0	0.183	0.5	NA	0.0	0.0	0.00	0.05	0.00	49.6
All Vehicles		1029	3.7	0.198	2.2	NA	0.5	3.7	0.12	0.20	0.12	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Avenue / Fox Road - 2029 AM - 1a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Fitzherbert Ave East												
5	T1	344	4.6	0.183	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
6	R2	125	10.1	0.245	11.3	LOS B	1.0	7.4	0.69	0.88	0.75	42.7
Approach		469	6.1	0.245	3.0	NA	1.0	7.4	0.18	0.23	0.20	47.8
North: Fox Road												
7	L2	231	3.7	0.432	12.1	LOS B	2.0	14.5	0.72	0.97	1.00	42.5
9	R2	60	3.5	0.423	38.2	LOS E	1.5	11.1	0.92	1.03	1.17	32.5
Approach		291	3.6	0.432	17.5	LOS C	2.0	14.5	0.76	0.98	1.04	40.0
West: Fitzherbert Ave West												
10	L2	47	2.2	0.026	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
11	T1	705	3.4	0.370	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		753	3.4	0.370	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.7
All Vehicles		1513	4.2	0.432	4.5	NA	2.0	14.5	0.20	0.28	0.26	46.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Avenue / Fox Road - 2029 AM - 1b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Fitzherbert Ave East												
5	T1	344	4.6	0.183	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
6	R2	125	10.1	0.310	14.4	LOS B	1.3	9.5	0.78	0.95	0.93	41.2
Approach		469	6.1	0.310	3.9	NA	1.3	9.5	0.21	0.25	0.25	47.3
North: Fox Road												
7	L2	231	3.7	0.546	16.1	LOS C	2.6	19.0	0.82	1.07	1.30	40.6
9	R2	60	3.5	0.588	60.9	LOS F	2.2	15.7	0.96	1.09	1.36	27.0
Approach		291	3.6	0.588	25.3	LOS D	2.6	19.0	0.85	1.07	1.31	36.8
West: Fitzherbert Ave West												
10	L2	47	2.2	0.026	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
11	T1	829	2.9	0.433	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		877	2.9	0.433	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.7
All Vehicles		1637	3.9	0.588	5.8	NA	2.6	19.0	0.21	0.28	0.30	46.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Avenue / Fox Road - 2029 PM - 1a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Fitzherbert Ave East												
5	T1	555	3.0	0.292	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
6	R2	171	5.6	0.238	8.5	LOS A	1.0	7.1	0.59	0.81	0.60	44.2
Approach		725	3.6	0.292	2.0	NA	1.0	7.1	0.14	0.19	0.14	48.5
North: Fox Road												
7	L2	171	6.2	0.240	8.1	LOS A	0.9	6.7	0.55	0.79	0.56	44.6
9	R2	51	2.1	0.360	36.6	LOS E	1.3	9.0	0.91	1.01	1.10	33.0
Approach		221	5.2	0.360	14.6	LOS B	1.3	9.0	0.63	0.84	0.68	41.3
West: Fitzherbert Ave West												
10	L2	59	1.8	0.032	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
11	T1	517	2.9	0.270	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		576	2.7	0.270	0.5	NA	0.0	0.0	0.00	0.05	0.00	49.6
All Vehicles		1522	3.5	0.360	3.3	NA	1.3	9.0	0.16	0.23	0.17	47.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Avenue / Fox Road - 2029 PM - 1b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Fitzherbert Ave East												
5	T1	679	2.5	0.356	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	171	5.6	0.238	8.5	LOS A	1.0	7.1	0.59	0.81	0.60	44.2
Approach		849	3.1	0.356	1.7	NA	1.0	7.1	0.12	0.16	0.12	48.7
North: Fox Road												
7	L2	171	6.2	0.240	8.1	LOS A	0.9	6.7	0.55	0.79	0.56	44.6
9	R2	51	2.1	0.494	54.8	LOS F	1.7	12.3	0.95	1.05	1.23	28.3
Approach		221	5.2	0.494	18.8	LOS C	1.7	12.3	0.64	0.85	0.71	39.4
West: Fitzherbert Ave West												
10	L2	59	1.8	0.032	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
11	T1	517	2.9	0.270	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		576	2.7	0.270	0.5	NA	0.0	0.0	0.00	0.05	0.00	49.6
All Vehicles		1646	3.3	0.494	3.6	NA	1.7	12.3	0.15	0.22	0.16	47.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Avenue / Fox Road - 2069 AM - 2a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Fitzherbert Ave East												
5	T1	620	4.6	1.343	402.1	LOS F	144.3	1049.7	1.00	0.00	10.36	7.5
6	R2	224	9.9	1.968	911.7	LOS F	75.5	572.8	1.00	4.83	14.86	3.6
Approach		844	6.0	1.968	537.4	NA	144.3	1049.7	1.00	1.28	11.55	5.9
North: Fox Road												
7	L2	418	4.0	3.594	2356.4	LOS F	198.6	1438.1	1.00	6.68	22.45	1.5
9	R2	111	5.7	17.375	14903.5	LOS F	105.4	774.0	1.00	1.47	2.93	0.2
Approach		528	4.4	17.375	4980.8	LOS F	198.6	1438.1	1.00	5.59	18.37	0.7
West: Fitzherbert Ave West												
10	L2	87	3.6	0.048	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
11	T1	1273	3.6	0.668	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
Approach		1360	3.6	0.668	0.5	NA	0.0	0.0	0.00	0.03	0.00	49.6
All Vehicles		2733	4.5	17.375	1129.4	NA	198.6	1438.1	0.50	1.49	7.12	3.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Avenue / Fox Road - 2069 AM - 2b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Fitzherbert Ave East												
5	T1	620	4.6	17.679	15472.9	LOS F	598.9	4357.3	1.00	0.00	3.07	0.2
6	R2	224	9.9	37.368	32842.0	LOS F	215.6	1636.9	1.00	1.48	3.05	0.1
Approach		844	6.0	37.368	20085.9	NA	598.9	4357.3	1.00	0.39	3.07	0.2
North: Fox Road												
7	L2	418	4.0	69.649	61851.5	LOS F	393.2	2847.3	1.00	1.50	3.25	0.1
9	R2	111	5.7	18.421	15798.8	LOS F	100.9	741.1	1.00	1.49	3.19	0.2
Approach		528	4.4	69.649	52218.9	LOS F	393.2	2847.3	1.00	1.50	3.23	0.1
West: Fitzherbert Ave West												
10	L2	87	3.6	0.048	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
11	T1	1892	2.4	0.985	3.6	LOS A	0.0	0.0	0.00	0.00	0.00	45.5
Approach		1979	2.4	0.985	3.7	NA	0.0	0.0	0.00	0.02	0.00	45.6
All Vehicles		3352	3.6	69.649	13294.5	NA	598.9	4357.3	0.41	0.35	1.28	0.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Avenue / Fox Road - 2069 PM - 2a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Fitzherbert Ave East												
5	T1	1000	3.2	0.967	24.9	LOS C	37.5	269.4	1.00	0.00	3.47	37.3
6	R2	307	5.8	0.985	69.6	LOS F	14.0	102.7	1.00	2.24	5.01	25.4
Approach		1307	3.8	0.985	35.4	NA	37.5	269.4	1.00	0.53	3.83	33.6
North: Fox Road												
7	L2	309	6.5	0.952	51.3	LOS F	10.8	79.5	0.98	2.00	4.26	29.2
9	R2	93	3.4	11.080	9228.6	LOS F	78.9	568.5	1.00	1.58	3.41	0.4
Approach		402	5.8	11.080	2165.4	LOS F	78.9	568.5	0.99	1.90	4.07	1.6
West: Fitzherbert Ave West												
10	L2	107	2.9	0.059	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
11	T1	932	3.1	0.487	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		1039	3.0	0.487	0.5	NA	0.0	0.0	0.00	0.05	0.00	49.5
All Vehicles		2748	3.8	11.080	333.9	NA	78.9	568.5	0.62	0.55	2.42	8.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Avenue / Fox Road - 2069 PM - 2b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Fitzherbert Ave East												
5	T1	1619	2.0	1.303	279.7	LOS F	261.9	1864.1	1.00	0.00	14.64	10.3
6	R2	307	5.8	0.985	69.6	LOS F	14.0	102.7	1.00	2.24	5.01	25.4
Approach		1926	2.6	1.303	246.1	NA	261.9	1864.1	1.00	0.36	13.11	11.4
North: Fox Road												
7	L2	309	6.5	0.952	51.3	LOS F	10.8	79.5	0.98	2.00	4.26	29.2
9	R2	93	3.4	15.439	13134.6	LOS F	84.8	611.1	1.00	1.47	3.11	0.3
Approach		402	5.8	15.439	3065.2	LOS F	84.8	611.1	0.99	1.88	4.00	1.1
West: Fitzherbert Ave West												
10	L2	107	2.9	0.059	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
11	T1	932	3.1	0.487	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		1039	3.0	0.487	0.5	NA	0.0	0.0	0.00	0.05	0.00	49.5
All Vehicles		3367	3.1	15.439	507.0	NA	261.9	1864.1	0.69	0.45	7.98	6.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave Ext / Mosston Road - 2019 AM]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	152	5.6	0.081	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	9	11.1	0.010	6.5	LOS A	0.0	0.2	0.29	0.57	0.29	48.8
Approach		161	5.9	0.081	4.6	LOS A	0.0	0.2	0.02	0.52	0.02	54.2
East: Fitzherbert Ave Ext												
4	L2	32	3.3	0.022	5.0	LOS A	0.1	0.6	0.24	0.51	0.24	46.0
6	R2	32	3.3	0.035	5.9	LOS A	0.1	0.8	0.35	0.60	0.35	45.4
Approach		63	3.3	0.035	5.5	LOS A	0.1	0.8	0.30	0.55	0.30	45.7
North: Mosston Road North												
7	L2	19	0.0	0.090	5.5	LOS A	0.0	0.0	0.00	0.07	0.00	57.7
8	T1	147	8.6	0.090	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.3
Approach		166	7.6	0.090	0.6	NA	0.0	0.0	0.00	0.07	0.00	59.1
All Vehicles		391	6.2	0.090	3.1	NA	0.1	0.8	0.05	0.33	0.05	54.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave Ext / Mosston Road - 2019 PM]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	175	6.6	0.093	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	16	33.3	0.022	8.0	LOS A	0.1	0.6	0.40	0.64	0.40	47.8
Approach		191	8.8	0.093	4.8	LOS A	0.1	0.6	0.03	0.53	0.03	53.9
East: Fitzherbert Ave Ext												
4	L2	113	2.8	0.082	5.2	LOS A	0.3	2.4	0.28	0.53	0.28	45.9
6	R2	112	1.9	0.129	6.4	LOS A	0.4	3.2	0.40	0.66	0.40	45.1
Approach		224	2.3	0.129	5.8	LOS A	0.4	3.2	0.34	0.60	0.34	45.5
North: Mosston Road North												
7	L2	16	33.3	0.105	5.9	LOS A	0.0	0.0	0.00	0.05	0.00	56.4
8	T1	178	5.3	0.105	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.7
Approach		194	7.6	0.105	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.4
All Vehicles		608	6.1	0.129	3.8	NA	0.4	3.2	0.14	0.40	0.14	51.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave Ext / Mosston Road - 2029 AM - 1a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	224	5.6	0.119	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	14	7.7	0.016	7.0	LOS A	0.1	0.4	0.36	0.60	0.36	48.7
Approach		238	5.8	0.119	4.6	LOS A	0.1	0.4	0.02	0.52	0.02	54.2
East: Fitzherbert Ave Ext												
4	L2	46	2.3	0.035	5.3	LOS A	0.1	1.0	0.31	0.53	0.31	45.9
6	R2	46	2.3	0.060	6.8	LOS A	0.2	1.4	0.44	0.67	0.44	44.9
Approach		93	2.3	0.060	6.1	LOS A	0.2	1.4	0.37	0.60	0.37	45.4
North: Mosston Road North												
7	L2	28	0.0	0.133	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	57.7
8	T1	218	8.7	0.133	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.3
Approach		246	7.7	0.133	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.1
All Vehicles		577	6.0	0.133	3.2	NA	0.2	1.4	0.07	0.34	0.07	54.4

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave Ext / Mosston Road - 2029 AM - 1b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	224	5.6	0.119	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	14	7.7	0.016	7.0	LOS A	0.1	0.4	0.36	0.61	0.36	48.6
Approach		238	5.8	0.119	4.6	LOS A	0.1	0.4	0.02	0.52	0.02	54.2
East: Fitzherbert Ave Ext												
4	L2	63	1.7	0.048	5.3	LOS A	0.2	1.3	0.31	0.54	0.31	45.9
6	R2	46	2.3	0.060	6.8	LOS A	0.2	1.4	0.44	0.67	0.44	44.9
Approach		109	1.9	0.060	5.9	LOS A	0.2	1.4	0.36	0.59	0.36	45.4
North: Mosston Road North												
7	L2	28	0.0	0.133	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	57.7
8	T1	218	8.7	0.133	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.3
Approach		246	7.7	0.133	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.1
All Vehicles		594	5.9	0.133	3.2	NA	0.2	1.4	0.08	0.35	0.08	54.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave Ext / Mosston Road - 2029 PM - 1a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	258	6.5	0.138	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	23	31.8	0.040	9.5	LOS A	0.1	1.2	0.49	0.72	0.49	46.9
Approach		281	8.6	0.138	4.9	LOS A	0.1	1.2	0.04	0.53	0.04	53.9
East: Fitzherbert Ave Ext												
4	L2	166	2.5	0.131	5.6	LOS A	0.5	3.9	0.36	0.58	0.36	45.7
6	R2	165	1.9	0.233	7.8	LOS A	0.8	5.9	0.52	0.78	0.52	44.4
Approach		332	2.2	0.233	6.7	LOS A	0.8	5.9	0.44	0.68	0.44	45.0
North: Mosston Road North												
7	L2	23	31.8	0.155	5.9	LOS A	0.0	0.0	0.00	0.05	0.00	56.5
8	T1	263	5.2	0.155	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.6
Approach		286	7.4	0.155	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.4
All Vehicles		899	5.9	0.233	4.1	NA	0.8	5.9	0.17	0.43	0.18	51.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave Ext / Mosston Road - 2029 PM - 1b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	258	6.5	0.138	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	40	18.4	0.063	8.9	LOS A	0.2	1.7	0.49	0.73	0.49	47.3
Approach		298	8.1	0.138	5.1	LOS A	0.2	1.7	0.07	0.55	0.07	53.5
East: Fitzherbert Ave Ext												
4	L2	166	2.5	0.131	5.6	LOS A	0.5	3.9	0.36	0.58	0.36	45.7
6	R2	165	1.9	0.233	7.8	LOS A	0.8	5.9	0.52	0.78	0.52	44.4
Approach		332	2.2	0.233	6.7	LOS A	0.8	5.9	0.44	0.68	0.44	45.0
North: Mosston Road North												
7	L2	23	31.8	0.155	5.9	LOS A	0.0	0.0	0.00	0.05	0.00	56.5
8	T1	263	5.2	0.155	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.6
Approach		286	7.4	0.155	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.4
All Vehicles		916	5.7	0.233	4.2	NA	0.8	5.9	0.18	0.44	0.18	51.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave Ext / Mosston Road - 2069 AM - 2a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	404	5.5	0.215	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	24	8.7	0.038	8.9	LOS A	0.1	0.9	0.49	0.72	0.49	47.5
Approach		428	5.7	0.215	4.7	LOS A	0.1	0.9	0.03	0.53	0.03	54.2
East: Fitzherbert Ave Ext												
4	L2	82	1.3	0.075	6.1	LOS A	0.3	2.0	0.43	0.62	0.43	45.6
6	R2	82	1.3	0.169	10.3	LOS B	0.5	3.9	0.65	0.84	0.65	43.0
Approach		164	1.3	0.169	8.2	LOS A	0.5	3.9	0.54	0.73	0.54	44.3
North: Mosston Road North												
7	L2	53	2.0	0.241	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	57.6
8	T1	393	8.6	0.241	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.3
Approach		445	7.8	0.241	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.1
All Vehicles		1038	5.9	0.241	3.5	NA	0.5	3.9	0.10	0.36	0.10	54.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave Ext / Mosston Road - 2069 AM - 2b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	404	5.5	0.215	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	24	8.7	0.040	9.2	LOS A	0.1	1.0	0.51	0.74	0.51	47.3
Approach		428	5.7	0.215	4.7	LOS A	0.1	1.0	0.03	0.53	0.03	54.1
East: Fitzherbert Ave Ext												
4	L2	171	0.6	0.154	6.2	LOS A	0.6	4.4	0.45	0.65	0.45	45.5
6	R2	82	1.3	0.169	10.3	LOS B	0.5	3.9	0.65	0.84	0.65	43.0
Approach		253	0.8	0.169	7.6	LOS A	0.6	4.4	0.52	0.71	0.52	44.7
North: Mosston Road North												
7	L2	53	2.0	0.241	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	57.6
8	T1	393	8.6	0.241	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.3
Approach		445	7.8	0.241	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.1
All Vehicles		1126	5.4	0.241	3.8	NA	0.6	4.4	0.13	0.39	0.13	53.4

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave Ext / Mosston Road - 2069 PM - 2a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	465	6.6	0.249	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	42	32.5	0.141	16.3	LOS C	0.4	3.9	0.75	0.90	0.75	43.1
Approach		507	8.7	0.249	5.5	LOS A	0.4	3.9	0.06	0.55	0.06	53.4
East: Fitzherbert Ave Ext												
4	L2	300	2.5	0.302	7.1	LOS A	1.4	10.0	0.54	0.76	0.58	45.1
6	R2	299	2.1	0.759	22.0	LOS C	4.9	34.7	0.90	1.31	2.02	37.8
Approach		599	2.3	0.759	14.6	LOS B	4.9	34.7	0.72	1.03	1.30	41.2
North: Mosston Road North												
7	L2	42	32.5	0.280	5.9	LOS A	0.0	0.0	0.00	0.05	0.00	56.4
8	T1	475	5.3	0.280	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.6
Approach		517	7.5	0.280	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
All Vehicles		1623	6.0	0.759	7.2	NA	4.9	34.7	0.29	0.57	0.50	49.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave Ext / Mosston Road - 2069 PM - 2b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	465	6.6	0.249	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	131	10.5	0.348	15.7	LOS C	1.3	10.2	0.77	0.96	0.96	43.6
Approach		596	7.4	0.348	6.9	LOS A	1.3	10.2	0.17	0.61	0.21	51.7
East: Fitzherbert Ave Ext												
4	L2	300	2.5	0.302	7.1	LOS A	1.4	10.0	0.54	0.76	0.58	45.1
6	R2	299	2.1	0.759	22.0	LOS C	4.9	34.7	0.90	1.31	2.02	37.8
Approach		599	2.3	0.759	14.6	LOS B	4.9	34.7	0.72	1.03	1.30	41.2
North: Mosston Road North												
7	L2	42	32.5	0.280	5.9	LOS A	0.0	0.0	0.00	0.05	0.00	56.4
8	T1	475	5.3	0.280	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.6
Approach		517	7.5	0.280	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
All Vehicles		1712	5.7	0.759	7.7	NA	4.9	34.7	0.31	0.59	0.53	49.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave / Totara Street - 2019 AM]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Totara Street												
1	L2	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.15	0.89	0.15	45.0
3	R2	371	4.0	0.441	10.2	LOS B	2.5	18.3	0.49	0.99	0.60	43.8
Approach		372	4.0	0.441	10.2	LOS B	2.5	18.3	0.49	0.99	0.60	43.8
East: Fitzherbert Ave East												
4	L2	212	5.5	0.133	4.6	LOS A	0.6	4.3	0.03	0.48	0.03	47.1
5	T1	62	1.7	0.032	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		274	4.6	0.133	3.5	LOS A	0.6	4.3	0.02	0.37	0.02	47.7
West: Fitzherbert Ave West												
11	T1	129	2.4	0.070	0.0	LOS A	0.0	0.2	0.01	0.02	0.01	49.9
12	R2	4	0.0	0.070	4.8	LOS A	0.0	0.2	0.01	0.02	0.01	49.2
Approach		134	2.4	0.070	0.2	NA	0.0	0.2	0.01	0.02	0.01	49.8
All Vehicles		779	3.9	0.441	6.1	NA	2.5	18.3	0.24	0.61	0.30	46.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave / Totara Street - 2019 PM]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Totara Street												
1	L2	4	0.0	0.004	8.2	LOS A	0.0	0.1	0.30	0.83	0.30	44.9
3	R2	322	3.3	0.415	10.7	LOS B	2.2	15.8	0.52	1.03	0.65	43.6
Approach		326	3.2	0.415	10.7	LOS B	2.2	15.8	0.52	1.03	0.65	43.6
East: Fitzherbert Ave East												
4	L2	204	3.6	0.128	4.6	LOS A	0.6	4.1	0.04	0.48	0.04	47.1
5	T1	208	2.0	0.108	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		413	2.8	0.128	2.3	LOS A	0.6	4.1	0.02	0.24	0.02	48.5
West: Fitzherbert Ave West												
11	T1	59	1.8	0.036	0.1	LOS A	0.1	0.4	0.08	0.06	0.08	49.4
12	R2	7	0.0	0.036	5.2	LOS A	0.1	0.4	0.08	0.06	0.08	48.7
Approach		66	1.6	0.036	0.7	NA	0.1	0.4	0.08	0.06	0.08	49.3
All Vehicles		805	2.9	0.415	5.5	NA	2.2	15.8	0.23	0.54	0.28	46.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave / Totara Street - 2029 AM - 1a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Totara Street												
1	L2	1	0.0	0.001	7.7	LOS A	0.0	0.0	0.19	0.86	0.19	45.0
3	R2	547	3.8	0.765	16.3	LOS C	8.3	60.0	0.76	1.37	1.63	41.1
Approach		548	3.8	0.765	16.3	LOS C	8.3	60.0	0.76	1.37	1.63	41.1
East: Fitzherbert Ave East												
4	L2	313	5.4	0.197	4.6	LOS A	0.9	6.9	0.04	0.48	0.04	47.1
5	T1	93	2.3	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		405	4.7	0.197	3.5	LOS A	0.9	6.9	0.03	0.37	0.03	47.7
West: Fitzherbert Ave West												
11	T1	192	2.2	0.104	0.0	LOS A	0.0	0.3	0.02	0.02	0.02	49.9
12	R2	6	0.0	0.104	4.9	LOS A	0.0	0.3	0.02	0.02	0.02	49.2
Approach		198	2.1	0.104	0.2	NA	0.0	0.3	0.02	0.02	0.02	49.8
All Vehicles		1152	3.8	0.765	9.0	NA	8.3	60.0	0.38	0.78	0.79	44.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave / Totara Street - 2029 AM - 1b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Totara Street												
1	L2	1	0.0	0.001	7.7	LOS A	0.0	0.0	0.19	0.86	0.19	45.0
3	R2	547	3.8	0.894	25.4	LOS D	13.2	95.7	0.89	1.81	3.02	37.4
Approach		548	3.8	0.894	25.4	LOS D	13.2	95.7	0.89	1.81	3.01	37.4
East: Fitzherbert Ave East												
4	L2	313	5.4	0.197	4.6	LOS A	0.9	6.9	0.04	0.48	0.04	47.1
5	T1	93	2.3	0.048	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		405	4.7	0.197	3.5	LOS A	0.9	6.9	0.03	0.37	0.03	47.7
West: Fitzherbert Ave West												
11	T1	316	1.3	0.167	0.0	LOS A	0.0	0.3	0.01	0.01	0.01	49.9
12	R2	6	0.0	0.167	4.9	LOS A	0.0	0.3	0.01	0.01	0.01	49.2
Approach		322	1.3	0.167	0.1	NA	0.0	0.3	0.01	0.01	0.01	49.9
All Vehicles		1276	3.5	0.894	12.1	NA	13.2	95.7	0.40	0.90	1.31	43.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave / Totara Street - 2029 PM - 1a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Totara Street												
1	L2	6	0.0	0.006	8.7	LOS A	0.0	0.2	0.38	0.83	0.38	44.7
3	R2	476	3.1	0.757	17.6	LOS C	7.1	50.8	0.77	1.37	1.74	40.5
Approach		482	3.1	0.757	17.5	LOS C	7.1	50.8	0.77	1.37	1.72	40.5
East: Fitzherbert Ave East												
4	L2	302	3.5	0.189	4.6	LOS A	0.9	6.4	0.06	0.48	0.06	47.0
5	T1	308	2.0	0.160	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		611	2.8	0.189	2.3	LOS A	0.9	6.4	0.03	0.24	0.03	48.5
West: Fitzherbert Ave West												
11	T1	86	1.2	0.053	0.2	LOS A	0.1	0.6	0.10	0.06	0.10	49.4
12	R2	11	0.0	0.053	5.6	LOS A	0.1	0.6	0.10	0.06	0.10	48.7
Approach		97	1.1	0.053	0.8	NA	0.1	0.6	0.10	0.06	0.10	49.3
All Vehicles		1189	2.7	0.757	8.3	NA	7.1	50.8	0.33	0.68	0.72	45.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave / Totara Street - 2029 PM - 1b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Totara Street												
1	L2	6	0.0	0.007	9.4	LOS A	0.0	0.2	0.45	0.83	0.45	44.4
3	R2	476	3.1	0.896	28.2	LOS D	11.6	83.4	0.92	1.82	3.21	36.3
Approach		482	3.1	0.896	28.0	LOS D	11.6	83.4	0.91	1.80	3.18	36.4
East: Fitzherbert Ave East												
4	L2	302	3.5	0.189	4.6	LOS A	0.9	6.4	0.06	0.48	0.06	47.0
5	T1	433	1.5	0.224	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		735	2.3	0.224	1.9	LOS A	0.9	6.4	0.02	0.20	0.02	48.7
West: Fitzherbert Ave West												
11	T1	86	1.2	0.054	0.3	LOS A	0.1	0.7	0.13	0.06	0.13	49.3
12	R2	11	0.0	0.054	6.2	LOS A	0.1	0.7	0.13	0.06	0.13	48.6
Approach		97	1.1	0.054	0.9	NA	0.1	0.7	0.13	0.06	0.13	49.2
All Vehicles		1314	2.5	0.896	11.4	NA	11.6	83.4	0.36	0.78	1.19	43.4

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave / Totara Street - 2069 AM - 2a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Totara Street												
1	L2	3	0.0	0.003	8.0	LOS A	0.0	0.1	0.26	0.84	0.26	45.0
3	R2	987	3.9	2.165	1063.6	LOS F	343.1	2483.1	1.00	13.18	37.01	3.2
Approach		991	3.9	2.165	1060.2	LOS F	343.1	2483.1	1.00	13.14	36.89	3.2
East: Fitzherbert Ave East												
4	L2	563	5.4	0.357	4.6	LOS A	2.0	14.9	0.07	0.47	0.07	47.0
5	T1	166	1.9	0.086	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		729	4.6	0.357	3.5	LOS A	2.0	14.9	0.06	0.36	0.06	47.6
West: Fitzherbert Ave West												
11	T1	345	2.4	0.188	0.0	LOS A	0.1	0.7	0.02	0.02	0.02	49.8
12	R2	12	0.0	0.188	5.2	LOS A	0.1	0.7	0.02	0.02	0.02	49.1
Approach		357	2.4	0.188	0.2	NA	0.1	0.7	0.02	0.02	0.02	49.8
All Vehicles		2077	3.9	2.165	506.9	NA	343.1	2483.1	0.50	6.40	17.62	6.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave / Totara Street - 2069 AM - 2b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Totara Street												
1	L2	3	0.0	0.003	8.0	LOS A	0.0	0.1	0.26	0.84	0.26	45.0
3	R2	987	3.9	6.972	5389.9	LOS F	548.1	3966.5	1.00	8.86	29.78	0.7
Approach		991	3.9	6.972	5372.7	LOS F	548.1	3966.5	1.00	8.84	29.69	0.7
East: Fitzherbert Ave East												
4	L2	563	5.4	0.357	4.6	LOS A	2.0	14.9	0.07	0.47	0.07	47.0
5	T1	166	1.9	0.086	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		729	4.6	0.357	3.5	LOS A	2.0	14.9	0.06	0.36	0.06	47.6
West: Fitzherbert Ave West												
11	T1	964	0.9	0.505	0.0	LOS A	0.1	1.0	0.01	0.01	0.01	49.9
12	R2	12	0.0	0.505	5.6	LOS A	0.1	1.0	0.01	0.01	0.01	49.2
Approach		976	0.9	0.505	0.1	NA	0.1	1.0	0.01	0.01	0.01	49.9
All Vehicles		2696	3.0	6.972	1975.1	NA	548.1	3966.5	0.39	3.35	10.93	1.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave / Totara Street - 2069 PM - 2a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Totara Street												
1	L2	12	0.0	0.015	10.3	LOS B	0.1	0.4	0.52	0.87	0.52	44.0
3	R2	859	3.3	2.566	1424.8	LOS F	337.9	2432.7	1.00	12.25	37.22	2.4
Approach		871	3.3	2.566	1406.0	LOS F	337.9	2432.7	0.99	12.09	36.73	2.5
East: Fitzherbert Ave East												
4	L2	545	3.9	0.345	4.6	LOS A	1.9	14.0	0.10	0.47	0.10	46.9
5	T1	556	2.1	0.289	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		1101	3.0	0.345	2.3	LOS A	1.9	14.0	0.05	0.23	0.05	48.4
West: Fitzherbert Ave West												
11	T1	158	2.0	0.102	0.5	LOS A	0.2	1.6	0.16	0.07	0.16	49.1
12	R2	20	0.0	0.102	7.1	LOS A	0.2	1.6	0.16	0.07	0.16	48.5
Approach		178	1.8	0.102	1.3	NA	0.2	1.6	0.16	0.07	0.16	49.1
All Vehicles		2149	3.0	2.566	570.7	NA	337.9	2432.7	0.44	5.02	14.91	5.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Fitzherbert Ave / Totara Street - 2069 PM - 2b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Totara Street												
1	L2	12	0.0	0.059	24.5	LOS C	0.2	1.2	0.87	1.00	0.87	37.9
3	R2	859	3.3	10.215	8310.9	LOS F	510.9	3677.9	1.00	6.20	21.01	0.4
Approach		871	3.3	10.215	8200.7	LOS F	510.9	3677.9	1.00	6.14	20.74	0.4
East: Fitzherbert Ave East												
4	L2	545	3.9	0.345	4.6	LOS A	1.9	14.0	0.10	0.47	0.10	46.9
5	T1	1175	1.0	0.606	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
Approach		1720	1.9	0.606	1.6	LOS A	1.9	14.0	0.03	0.15	0.03	48.9
West: Fitzherbert Ave West												
11	T1	158	2.0	0.148	5.1	LOS A	0.9	6.6	0.42	0.08	0.42	45.9
12	R2	20	0.0	0.148	17.8	LOS C	0.9	6.6	0.42	0.08	0.42	45.3
Approach		178	1.8	0.148	6.5	NA	0.9	6.6	0.42	0.08	0.42	45.8
All Vehicles		2768	2.3	10.215	2580.1	NA	510.9	3677.9	0.36	2.03	6.57	1.4

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Mosston Road / Fox Road - 2019 AM]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	152	5.6	0.081	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	37	8.6	0.043	7.2	LOS A	0.1	1.1	0.37	0.63	0.37	48.5
Approach		188	6.1	0.081	5.0	LOS A	0.1	1.1	0.07	0.54	0.07	53.3
East: Fox Road												
4	L2	44	9.5	0.032	5.1	LOS A	0.1	1.0	0.25	0.51	0.25	45.9
6	R2	85	3.7	0.098	6.2	LOS A	0.3	2.4	0.38	0.64	0.38	45.2
Approach		129	5.7	0.098	5.9	LOS A	0.3	2.4	0.34	0.60	0.34	45.4
North: Mosston Road North												
7	L2	79	2.7	0.123	5.6	LOS A	0.0	0.0	0.00	0.21	0.00	56.4
8	T1	147	8.6	0.123	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	58.1
Approach		226	6.5	0.123	2.0	NA	0.0	0.0	0.00	0.21	0.00	57.5
All Vehicles		544	6.2	0.123	3.9	NA	0.3	2.4	0.11	0.41	0.11	52.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Mosston Road / Fox Road - 2019 PM]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	175	6.6	0.093	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	60	8.8	0.067	7.0	LOS A	0.2	1.7	0.35	0.63	0.35	48.7
Approach		235	7.2	0.093	5.1	LOS A	0.2	1.7	0.09	0.55	0.09	52.9
East: Fox Road												
4	L2	35	9.1	0.026	5.2	LOS A	0.1	0.8	0.27	0.52	0.27	45.8
6	R2	32	0.0	0.037	6.2	LOS A	0.1	0.8	0.39	0.62	0.39	45.2
Approach		66	4.8	0.037	5.7	LOS A	0.1	0.8	0.33	0.57	0.33	45.5
North: Mosston Road North												
7	L2	58	5.5	0.127	5.6	LOS A	0.0	0.0	0.00	0.15	0.00	56.8
8	T1	178	5.3	0.127	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	58.7
Approach		236	5.4	0.127	1.4	NA	0.0	0.0	0.00	0.15	0.00	58.2
All Vehicles		537	6.1	0.127	3.6	NA	0.2	1.7	0.08	0.37	0.08	54.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Mosston Road / Fox Road - 2029 AM - 1a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	224	5.6	0.119	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	55	9.6	0.078	8.3	LOS A	0.3	1.9	0.47	0.72	0.47	47.8
Approach		279	6.4	0.119	5.2	LOS A	0.3	1.9	0.09	0.56	0.09	53.1
East: Fox Road												
4	L2	64	8.2	0.050	5.4	LOS A	0.2	1.5	0.31	0.54	0.31	45.8
6	R2	125	3.4	0.172	7.4	LOS A	0.6	4.3	0.49	0.75	0.49	44.5
Approach		189	5.0	0.172	6.8	LOS A	0.6	4.3	0.43	0.68	0.43	44.9
North: Mosston Road North												
7	L2	116	1.8	0.181	5.6	LOS A	0.0	0.0	0.00	0.21	0.00	56.4
8	T1	218	8.7	0.181	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	58.0
Approach		334	6.3	0.181	1.9	NA	0.0	0.0	0.00	0.21	0.00	57.5
All Vehicles		802	6.0	0.181	4.2	NA	0.6	4.3	0.13	0.44	0.13	52.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Mosston Road / Fox Road - 2029 AM - 1b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	224	5.6	0.119	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	55	9.6	0.081	8.6	LOS A	0.3	2.0	0.48	0.74	0.48	47.6
Approach		279	6.4	0.119	5.3	LOS A	0.3	2.0	0.09	0.56	0.09	53.1
East: Fox Road												
4	L2	64	8.2	0.050	5.4	LOS A	0.2	1.5	0.31	0.54	0.31	45.8
6	R2	161	2.6	0.220	7.5	LOS A	0.8	5.6	0.50	0.76	0.50	44.5
Approach		225	4.2	0.220	6.9	LOS A	0.8	5.6	0.45	0.70	0.45	44.8
North: Mosston Road North												
7	L2	116	1.8	0.181	5.6	LOS A	0.0	0.0	0.00	0.21	0.00	56.4
8	T1	218	8.7	0.181	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	58.0
Approach		334	6.3	0.181	1.9	NA	0.0	0.0	0.00	0.21	0.00	57.5
All Vehicles		838	5.8	0.220	4.4	NA	0.8	5.6	0.15	0.46	0.15	52.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Mosston Road / Fox Road - 2029 PM - 1a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	258	6.5	0.138	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	88	8.3	0.115	7.9	LOS A	0.4	2.9	0.44	0.71	0.44	48.1
Approach		346	7.0	0.138	5.4	LOS A	0.4	2.9	0.11	0.57	0.11	52.8
East: Fox Road												
4	L2	52	10.2	0.043	5.6	LOS A	0.2	1.3	0.35	0.55	0.35	45.7
6	R2	46	0.0	0.067	7.5	LOS A	0.2	1.5	0.48	0.72	0.48	44.5
Approach		98	5.4	0.067	6.5	LOS A	0.2	1.5	0.41	0.63	0.41	45.1
North: Mosston Road North												
7	L2	85	4.9	0.187	5.6	LOS A	0.0	0.0	0.00	0.15	0.00	56.9
8	T1	263	5.2	0.187	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	58.7
Approach		348	5.1	0.187	1.4	NA	0.0	0.0	0.00	0.15	0.00	58.2
All Vehicles		793	6.0	0.187	3.8	NA	0.4	2.9	0.10	0.39	0.10	53.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Mosston Road / Fox Road - 2029 PM - 1b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	258	6.5	0.138	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	88	8.3	0.120	8.2	LOS A	0.4	3.0	0.46	0.73	0.46	47.9
Approach		346	7.0	0.138	5.4	LOS A	0.4	3.0	0.12	0.57	0.12	52.7
East: Fox Road												
4	L2	52	10.2	0.043	5.6	LOS A	0.2	1.3	0.35	0.55	0.35	45.7
6	R2	46	0.0	0.068	7.6	LOS A	0.2	1.5	0.49	0.73	0.49	44.5
Approach		98	5.4	0.068	6.6	LOS A	0.2	1.5	0.42	0.64	0.42	45.1
North: Mosston Road North												
7	L2	121	3.5	0.206	5.6	LOS A	0.0	0.0	0.00	0.19	0.00	56.6
8	T1	263	5.2	0.206	0.0	LOS A	0.0	0.0	0.00	0.19	0.00	58.3
Approach		384	4.7	0.206	1.8	NA	0.0	0.0	0.00	0.19	0.00	57.7
All Vehicles		828	5.7	0.206	3.9	NA	0.4	3.0	0.10	0.40	0.10	53.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Mosston Road / Fox Road - 2069 AM - 2a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	404	5.5	0.215	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	99	9.6	0.244	13.7	LOS B	0.9	6.5	0.72	0.91	0.80	44.7
Approach		503	6.3	0.244	6.3	LOS A	0.9	6.5	0.14	0.59	0.16	52.3
East: Fox Road												
4	L2	118	9.8	0.114	6.4	LOS A	0.4	3.4	0.45	0.64	0.45	45.4
6	R2	227	3.7	0.543	15.8	LOS C	2.6	18.7	0.81	1.07	1.27	40.4
Approach		345	5.8	0.543	12.6	LOS B	2.6	18.7	0.69	0.92	0.99	42.0
North: Mosston Road North												
7	L2	209	2.5	0.327	5.6	LOS A	0.0	0.0	0.00	0.21	0.00	56.4
8	T1	393	8.6	0.327	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	58.0
Approach		602	6.5	0.327	2.0	NA	0.0	0.0	0.00	0.21	0.00	57.4
All Vehicles		1451	6.2	0.543	6.0	NA	2.6	18.7	0.21	0.51	0.29	51.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Mosston Road / Fox Road - 2069 AM - 2b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	404	5.5	0.215	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	99	9.6	0.311	17.4	LOS C	1.1	8.4	0.80	0.96	0.96	42.7
Approach		503	6.3	0.311	7.0	LOS A	1.1	8.4	0.16	0.60	0.19	51.8
East: Fox Road												
4	L2	118	9.8	0.114	6.4	LOS A	0.4	3.4	0.45	0.64	0.45	45.4
6	R2	404	2.1	0.949	40.1	LOS E	12.8	91.2	0.97	2.08	4.38	31.8
Approach		522	3.8	0.949	32.5	LOS D	12.8	91.2	0.86	1.76	3.49	34.1
North: Mosston Road North												
7	L2	209	2.5	0.327	5.6	LOS A	0.0	0.0	0.00	0.21	0.00	56.4
8	T1	393	8.6	0.327	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	58.0
Approach		602	6.5	0.327	2.0	NA	0.0	0.0	0.00	0.21	0.00	57.4
All Vehicles		1627	5.6	0.949	13.3	NA	12.8	91.2	0.32	0.83	1.18	45.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Mosston Road / Fox Road - 2069 PM - 2a]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	465	6.6	0.249	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	160	8.6	0.330	12.6	LOS B	1.3	9.9	0.68	0.92	0.85	45.3
Approach		625	7.1	0.330	6.6	LOS A	1.3	9.9	0.18	0.62	0.22	51.8
East: Fox Road												
4	L2	93	10.2	0.099	6.8	LOS A	0.4	2.9	0.49	0.68	0.49	45.2
6	R2	83	0.0	0.227	13.6	LOS B	0.8	5.3	0.76	0.91	0.82	41.4
Approach		176	5.4	0.227	10.0	LOS B	0.8	5.3	0.62	0.79	0.65	43.3
North: Mosston Road North												
7	L2	155	5.4	0.338	5.6	LOS A	0.0	0.0	0.00	0.15	0.00	56.8
8	T1	475	5.3	0.338	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	58.6
Approach		629	5.4	0.338	1.4	NA	0.0	0.0	0.00	0.15	0.00	58.1
All Vehicles		1431	6.1	0.338	4.7	NA	1.3	9.9	0.15	0.43	0.17	53.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Mosston Road / Fox Road - 2069 PM - 2b]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mosston Road South												
2	T1	465	6.6	0.249	4.5	LOS A	0.0	0.0	0.00	0.52	0.00	54.6
3	R2	160	8.6	0.442	17.2	LOS C	1.8	13.6	0.80	1.00	1.12	42.8
Approach		625	7.1	0.442	7.8	LOS A	1.8	13.6	0.21	0.64	0.29	51.0
East: Fox Road												
4	L2	93	10.2	0.099	6.8	LOS A	0.4	2.9	0.49	0.68	0.49	45.2
6	R2	83	0.0	0.266	16.0	LOS C	0.9	6.3	0.80	0.95	0.91	40.3
Approach		176	5.4	0.266	11.2	LOS B	0.9	6.3	0.64	0.80	0.69	42.8
North: Mosston Road North												
7	L2	332	2.5	0.434	5.6	LOS A	0.0	0.0	0.00	0.24	0.00	56.1
8	T1	475	5.3	0.434	0.1	LOS A	0.0	0.0	0.00	0.24	0.00	57.7
Approach		806	4.2	0.434	2.4	NA	0.0	0.0	0.00	0.24	0.00	57.0
All Vehicles		1607	5.4	0.442	5.4	NA	1.8	13.6	0.15	0.46	0.19	52.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix E
Crash Data

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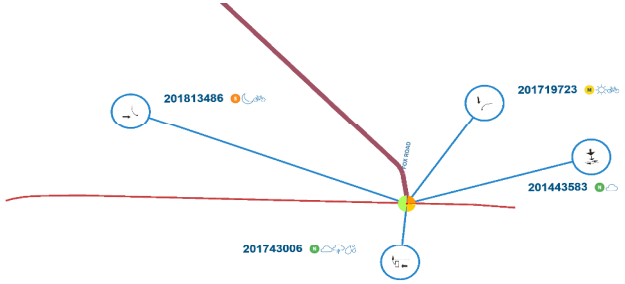
Fox Road/Fitzherbert Avenue Intersection - Crash History

CODED CRASH ID	Crash road	Direction	Side road	ID	Date	Description of events	Surface condition	Natural light	Weather	Control	Crash count fatal	Crash count severe	Crash count minor
1028501	FOX ROAD	I	FITZHERBERT AVENUE	201443583	28/07/2014	Car/Wagon1 SDB on FOX ROAD hit rear end of Van2 stop/slow for cross traffic	Dry	Overcast	Fine	Give way	0	0	0
1115084	FOX ROAD	I	FITZHERBERT AVENUE	201719723	2/12/2017	Cycle1 EDB on Fitzherbert Avenue hit Car/Wagon2 merging from the left	Dry	Bright sun	Fine	Give way	0	0	1
1129154	FITZHERBERT AVENUE	I	FOX ROAD	201743006	23/06/2017	Car/Wagon1 WDB on Fitzerbert Avenue hit rear of Car/Wagon2 WDB on Fitzerbert Avenue turning right from centre line	Wet	Overcast	Light rain	Give way	0	0	0
1147816	FITZHERBERT AVENUE	I	FOX ROAD	201813486	30/04/2018	Cycle1 EDB on Fitzherbert Avenue, Wanganui hit Van2 merging from the left	Dry	Dark	Fine	Give way	0	1	0
1150436	FITZHERBERT AVENUE	E	FOX ROAD	201816115	4/06/2018	Car/Wagon1 EDB on FITZHERBERT AVENUE, SPRINGVALE, WHANGANUI hit Moped2 parking/unparking	Wet	Dark	Light rain	Unknown	0	0	1



Mosston Road / Fox Road Intersection - Crash History

CODED CRASH ID	Crash road	Direction	Side road	ID	Date	Description of events	Surface co	Natural light	Weather	Crash count fatal	Crash count severe	Crash count minor
1061549	FOX ROAD	I	MOSSTON ROAD	201547434	8/09/2015	Car/Wagon1 WDB on FOX ROAD lost control turning right	Dry	Dark	Null	0	0	0
1061584	MOSSTON ROAD	I	FOX ROAD	201547469	3/10/2015	Car/Wagon1 SDB on MOSSTON ROAD hit obstruction, Car/Wagon1 hit Animals	Dry	Dark	Fine	0	0	0
1067560	FOX ROAD	I	MOSSTON ROAD	201553729	25/11/2015	Car/Wagon1 NDB on FOX ROAD lost control turning right, Car/Wagon1 hit Fences, Poles	Dry	Bright sun	Fine	0	0	0
1123536	FOX ROAD	I	MOSSTON ROAD	201737301	23/04/2017	Car/Wagon1 WDB on Fox road missed intersection or end of road, Car/Wagon1 hit Fences	Wet	Dark	Mist or Fog	0	0	0
1149860	FOX ROAD	I	MOSSTON ROAD	201815539	23/06/2018	Car/Wagon1 WDB on Fox Road missed intersection or end of road, Car/Wagon1 hit Ditches	Wet	Dark	Fine	0	0	2