

Appendix 10: Integrated Traffic Assessment



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Integrated Transport Assessment
prepared for

THE TRICES ROAD REZONING GROUP

Trices Road, Prebbleton

November 2020



Integrated Transport Assessment
prepared for

The Trices Road Rezoning Group

Trices Road, Prebbleton

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Introduction

1. The Trices Road Rezoning Group have commissioned Novo Group to prepare an Integrated Transport Assessment (ITA) for the proposed residential re-zoning submission on the Selwyn District Plan Review and in support of a private plan change request to the Operative Selwyn District Plan.
2. This report provides an assessment of the transport aspects of the proposed development. It also describes the transport environment in the vicinity of the site and describes the transport related components of the proposal. It has been prepared broadly in accordance with the Integrated Transportation Assessment Guidelines specified in New Zealand Transport Agency Research report 422, November 2010.
3. The proposal entails a Rural to Residential rezoning of a block of land to accommodate approximately 290 future residential dwellings. The location is shown in **Figure 1**.

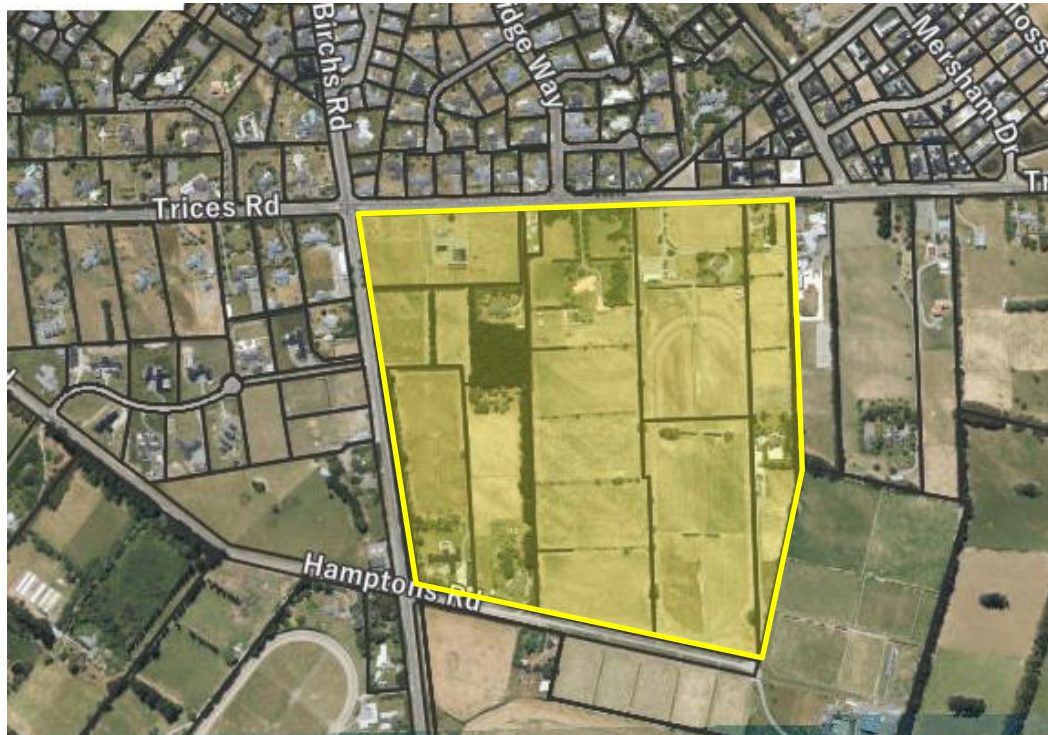


Figure 1: Site Location (source Canterbury Maps)



The Proposal

4. It is proposed to re-zone the site from Rural to Residential, catering for approximately 290 future residential dwellings (and possible retention of 2 dwellings).
5. The proposed road layout is shown in **Figure 2** and the primary roads are shown as solid black lines.

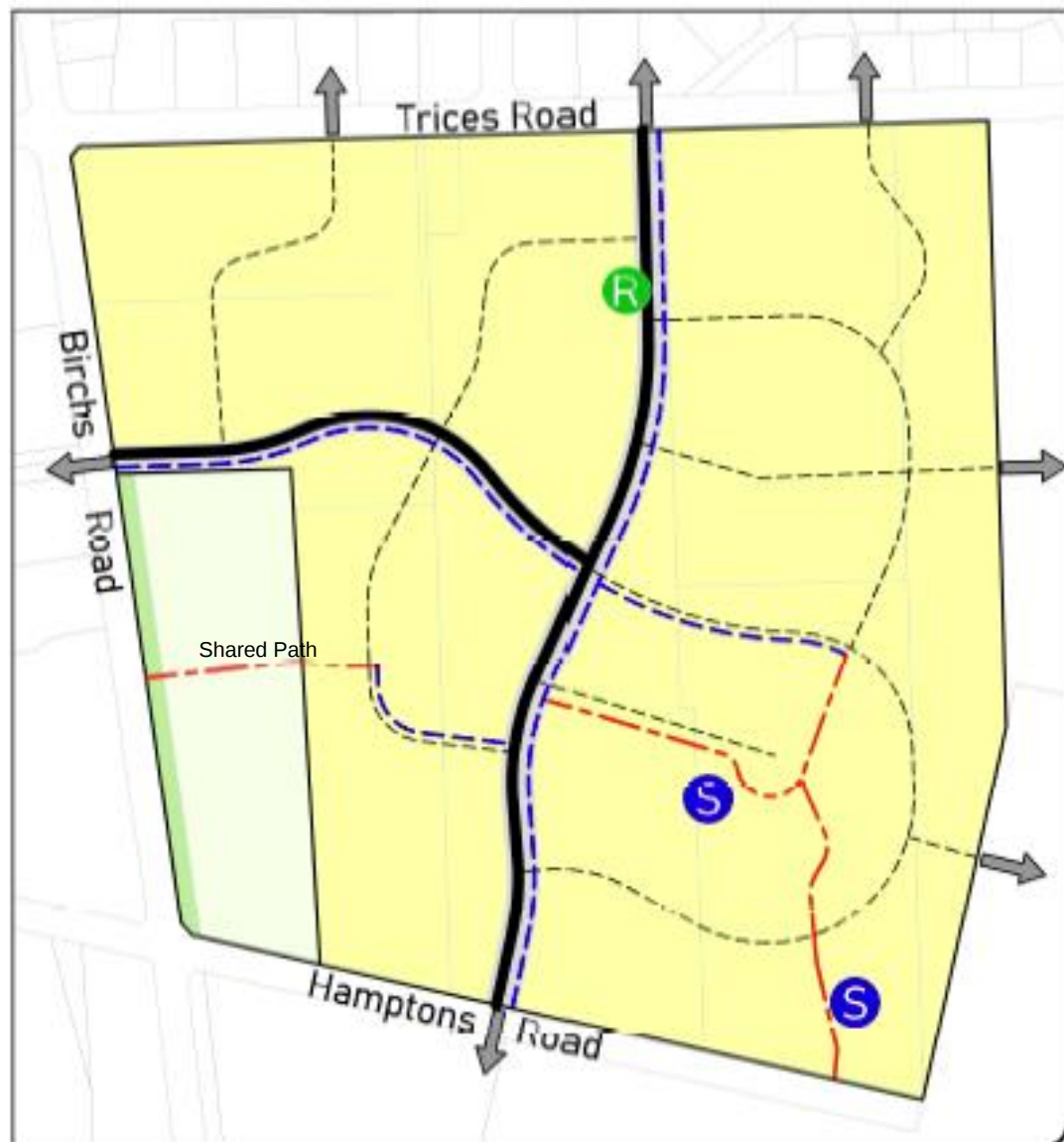


Figure 2: Proposed Road Layout [Extract from Proposed Plan – Refer to Appendix 1 for Legend]

6. The NZ Transport Agency Research Report 453 (*Trips and Parking Related to Land Use*) suggests an 85th percentile traffic generation rate of 0.9 vehicle movements per dwelling per hour in the peak hours. The ITE *Trip Generation* guidebook suggests a split of 63% arrivals and 37% departures in the weekday PM peak and 26% arrivals and 74%



departures in the AM Peak. This suggests **263 trips¹** in the **peak hour** of which 166 are arrivals and 97 are departures in the PM peak hour (68 are arrivals and 195 are departures in the AM peak hour).

7. It is anticipated that the internal roads and intersections be laid out in accordance with the Proposed District Plan standards.

Transport Description

8. The proposal includes primary road connections to Trices Road, Hamptons Road and Birchs Road. This will be supported by local roads to provide property access.
9. Future road connections are proposed for any development of the land to the east of the site.
10. On-road cycling is provided to connect to the wider walking and cycling network within the Prebbleton. An off-road pedestrian and cycling connection is also identified to connect to the Christchurch to Little River Rail Trail and the future Prebbleton Park located to the South of the site.

Transport Environment

Existing Road Network

11. The site fronts Trices Road, Birchs Road and Hamptons Road and these roads are described in detail below.

Trices Road

12. Trices Road is classified as a Collector Road and has a 60km/h speed limit.
13. Near the site, Trices Road typically has a 3.0m wide westbound lane with flush grass berms. The eastbound lane includes a 5.6m wide traffic lane with kerb and channel.
14. The Councils RAMM database indicates a daily average volume of 2,551 vehicles per day on this section of Trices Road, and 873 vehicles per day on Trices Road west of Birchs Road.
15. Morning and evening traffic counts undertaken on Thursday 05/11/2020 indicated an AM peak hour volume of 276 vehicles and a PM peak of 507.

Birchs Road

16. Birchs Road is classified as a Collector Road and has a 50 km/h speed limit increasing to 60km/h² from a point 100m south of Trices Road.

¹ including retention of two existing dwellings.

² Currently extending to a point 40m south of Hamptons Road however is proposed to be extended to south of Leadleys Road in association with the development of the Prebbleton Reserve.



17. Near the site, Birchs Road has one 3.4m wide traffic lane in each direction with gravel shoulders and grass berms. There is a flush median and additional line markings at the 50km/h speed threshold.
18. A shared path is provided along the eastern side of Birchs Road and forms part of the Christchurch to Little River Rail Trail.
19. The Councils RAMM database indicates a daily average volume of 4,422 vehicles per day on Birchs Road³. Morning and evening traffic counts undertaken on Thursday 05/11/2020 indicated an AM peak hour volume of 490 vehicles and a PM peak of 516.

Hamptons Road

20. Hamptons Road is a Local Road and has a 5.0m wide metalled carriageway with grass berms on both sides. The Speed Limit Bylaw indicates Hamptons Road has an 80km/h speed limit, although it is envisaged that this would reduce to 60km/h in association with the proposed residential development.
21. Hamptons Road currently terminates 450m east of the intersection with Birchs Road.
22. The Councils RAMM database indicates a daily average volume of 53 vehicles per day on this section of Hamptons Road and 329 vehicles per day on the western side of Birchs Road.

Crash History

23. The NZ Transport Agency Crash Analysis System (CAS) has been reviewed to identify crashes that have been reported on the frontage roads between 2010 and 2020. The output from the CAS database is included in **Appendix 2**. There were 12 reported crashes, all of which occurred at the intersection of Birchs Road and Trices Road and included two serious injury crashes. Both were associated with failure to give way at a stop sign and one involved a bus. The reported crashes are summarised below:
 - One crash resulted from loss of control – inexperienced driver.
 - All remaining crashes were failure to give way at a stop sign, crash factors included:
 - Failure to notice road controls.
 - Environmental factors including bright sun and heavy rain.
 - Migrant driver not adapting to NZ conditions.
24. Median islands have since been installed on the Trices Road approaches (mid 2019). The only crash recorded since this time related to the migrant driver. The islands provide a crossing facility for pedestrians and cyclists; although the islands may also contribute towards making the intersection more visible and reducing crashes relating to failure to

³ 2020 Count, north of Trices Road



notice the intersection / road controls. It is too soon to draw any conclusions as to whether these measures have improved safety at the intersection.

Future Road Networks

25. The Councils *Long Term Plan* 2018/28 includes upgrading the Springs Road / Hamptons Road intersection, which is anticipated to be a roundabout. The wider road network includes a variety of upgrades associated with connections to the Christchurch Southern Motorway.
26. Prebbleton Park, located on the opposite side of Hamptons Road, includes a vehicle access to the main car park from Birchs Road⁴, with service vehicle access only from Hamptons Road.
27. The Prebbleton Structure Plan indicates Council are anticipating upgrades to the Hamptons Road, Trices Road and Candys Road route.

Passenger Transport

28. The nearest bus route is the #80 which connects with Lincoln and Christchurch. The nearest bus stops are on Birchs Road south of Hamptons Road⁵ and north of the site near Glenwood Drive. There are typically two buses per hour and some additional buses in the peak periods.
29. There is also a school bus route from Prebbleton to Lincoln High School.

Active Transport Modes

30. There is a shared path along Birchs Road which forms part of the Rail Trail and connects to Christchurch and Lincoln.
31. There are a variety of landuse destinations within walking and cycling distance of the site, including⁶:
 - Prebbleton School 1.6km north.
 - Shops on Springs Road 1.2km north.
 - Future Prebbleton Park – opposite side of Hamptons Road.
 - Existing Prebbleton Domain – 700m North-east.

⁴ A secondary car park is provided to Leadleys Road.

⁵ Although note there is currently only a north-bound stop in this location. A future south-bound stop is being investigated to service the future Prebbleton Park.

⁶ Measured from the nearest edge of the DEV.



Assessment of Effects

Proposed Transport Layout

32. The proposed layout has been designed to provide a primary road connection to each frontage road with additional local roads facilitating property access. The layout provides for good connectivity for all modes and it is anticipated that cycling be accommodated on-road and footpaths will be provided. In addition, an off-road connection is provided to the Rail Trail on Birchs Road and provides connectivity through an otherwise large block.
33. Two road connections towards the east have been allowed for, to enable integration with any future development of adjacent land.
34. Overall, the proposed layout is considered to provide an appropriate structure of primary roads and future local road connections to be consistent with and integrate into the existing road network and to provide for property access to future residential development. The proposed layout also provides for good connectivity for active modes towards existing public transport routes and key landuse destinations. As such the layout is considered to be appropriate for the proposed location and future use.

Connections to Existing Road Network

35. As outlined above, the future lots are anticipated to generate in **263 trips** in the **peak hour** of which 63% are arrivals and 37% are departures in the PM peak hour and 26% are arrivals and 74% are departures in the AM peak hour.
36. It is noted that some trips will occur via local road connections to Trices Road or direct property access from frontage roads, this is assumed to be 15% of all trips with 85% (224 trips) occurring via the three primary road intersections.
37. Trips via the primary road connections are likely to be dispersed across the road network similar to the proportionate traffic volumes however a 5% adjustment has been made from Birchs Road to Hamptons Road⁷ noting that some trips to and from the south on Birchs Road may occur via Hamptons Road⁸. The resultant volumes via the three primary road intersections are shown in **Table 1**.

⁷ Resulting in the following in the morning peak hour Birchs 58%, Trices 36% and Hamptons 6% and in the evening peak hour: Birchs 45% Trices 49% and Hamptons 6%.

⁸ Associated with properties located at the southern end of the development area, closest to Hamptons Road.



Table 1: Arrival and Departure Trips, Three Primary Road Intersections

Key intersection to:	Direction	AM Peak Hour	PM Peak Hour
Birchs Road	Arrivals	34	64
	Departures	96	41
Trices Road	Arrivals	21	69
	Departures	60	41
Hamptons Road	Arrivals	3	8
	Departures	10	5

38. Noting the low volume of trips anticipated via Hamptons Road, it is considered that a standard 'T' intersection will readily accommodate the anticipated capacity and does not warrant detailed analysis. Further, noting the small volume of extra movements, detailed analysis of the existing stop controlled intersection of Hamptons Road and Birchs Road has not been undertaken.
39. A SIDRA Intersection analysis has been undertaken for the intersections of the Primary Road connections with Birchs Road and Trices Road. This indicates that these connections can operate within good levels of service with standard give-way controlled intersections. The SIDRA intersection layouts and movement summaries are provided in **Appendix 3**, this includes a future scenario assuming +20% growth in traffic volumes on Trices Road and Birchs Road associated with general growth. Results indicate that all movements are expected to operate with Level of Service A⁹.
40. The proposed local road connections are designed such that they are not attractive through routes and service low traffic volumes which can be catered for with basic give-way controlled intersections.
41. In terms of intersection locations, the road intersections with Hamptons Road and Birchs Road comply with the 151m separation distances from existing intersections. The intersections proposed to Trices Road result in several reduced distances which are assessed in turn.
42. The western-most local road connection complies with the setback requirements from the intersection with Birchs Road, although it is 115m from Stonebridge Way. This location allows for retention of an existing dwelling. It is noted the existing distance between Birchs Road and Stonebridge Way does not allow for a complying location without forming a cross-roads intersection. Nothing that both Stonebridge Way and the proposed road are local roads which form 'T' intersections on opposite sides of Trices Road, the 115m separation proposed will be sufficient to avoid any confusion or conflict between turning vehicles.
43. The primary road is approximately 100m from the intersection with Stonebridge Way and again forms a 'T' intersection on the opposite side of the road. Noting their relative location,

⁹ Being the best of a rating of Level of Services A (best) to F (worst).



no right-turn conflicts will occur. The 100m separation distance is more than sufficient to avoid any potential for conflict or confusion associated with turning vehicles.

44. The proposed Primary Road intersection is also 130m from the eastern-most proposed local road intersection. Neither road is anticipated to have a high right turn volume and the 130m separation is sufficient to avoid any potential for conflict or confusion associated with turning vehicles.
45. The eastern-most proposed road is 140m from the existing Ashford Road intersection, on the opposite side of Trices Road. Both intersections are 'T' intersections and noting the relative location, right turning conflicts would not occur. There is sufficient separation distance to avoid any potential for confusion from vehicles turning at each intersection.
46. All roads are anticipated to be formed to standard designs consistent with the Proposed District Plan layouts and/or the Code of Practice. This would include an upgrade of adjacent sections of Hamptons Road, Birchs Road and Trices Road to include kerb and channel, and footpaths on Hamptons Road and Trices Road.
47. All intersections will have sight lines that comply with relevant design standards. As such, no issues are anticipated with regards to visibility to traffic when exiting the development.
48. For the above reasons, subject to appropriate detailed design at subdivision, traffic from the proposed development can be safely and efficiently accommodated via the proposed connections to the existing road network.

Wider Road Network

49. The 2013 Census Data indicates that around 12% of people live and work in Prebbleton (equating to 26% of trips) with the remainder commuting in the following directions:

Table 2: Distribution of Wider Network Trips

Location	Proportion	Number of Peak Hour Trips
Springston / Lincoln	6.5%	13
Rolleston / West Melton/ Kirwee	3.5%	7
Yaldhurst, Hornby / west of Chch	19%	36
Chch Other	71%	136

50. This indicates that the majority of commuter trips are towards Christchurch. A similar distribution is anticipated for other trip purposes, for example, school, and recreation.
51. The Christchurch Southern Motorway upgrades are scheduled for completion by 2021 and will be open prior to occupation of any new residential units. This has been specifically



designed to cater for future growth and will provide safe and efficient connections to Christchurch.

52. The Prebbleton Structure Plan indicates Council are anticipating upgrades to the Hamptons Road, Trices Road and Candys Road route (and funding is identified in the Long Term Plan 2028 for Hamptons Road upgrades) and as such the intersections of Hamptons Road - Birchs Road and Birchs Road – Trices Road are likely to be reviewed by Council in the future.
53. A SIDRA model of the Trices Road – Birchs Road intersection shows that this will continue to operate within acceptable levels of service with the additional traffic for the proposed development¹⁰ and allowing for 20% growth in existing traffic volumes. The SIDRA intersection summary is provided in **Appendix 4**.
54. **Table 2** above indicates that only a small number of trips are dispersed across other destinations. These will also disperse over the road network such that any increase in traffic in any one location is not likely to result in any noticeable effects.

Proposed District Plan Objectives and Policies

55. The Operative and Proposed District Plan Transport Related Objectives and Policies are considered in **Appendix 5** and the proposal is considered to be generally consistent with those provisions from a transport perspective.

Conclusion

56. The proposed Rural to Residential rezoning will provide for an estimated 290 future residential dwellings¹¹. The proposed road layout has been designed to integrate with the existing and based on the assessment above can be appropriately designed to operate within acceptable levels of service.
57. The proposal is consistent with the existing road hierarchy and future / planned roads and intersection upgrades. The timing of development appears to be able to be co-ordinated in terms of proposed roads.
58. The proposal includes provision for shared path connections to provide access to the existing Rail Trail and the future Prebbleton Park and good pedestrian and cycle links towards key destinations and public transport stops. The site is appropriately located to support travel by all modes.
59. Overall, from a transport perspective there is no reason that the proposed development cannot be integrated into the transport network in a safe, efficient, and appropriate manner which provides for travel by all modes.

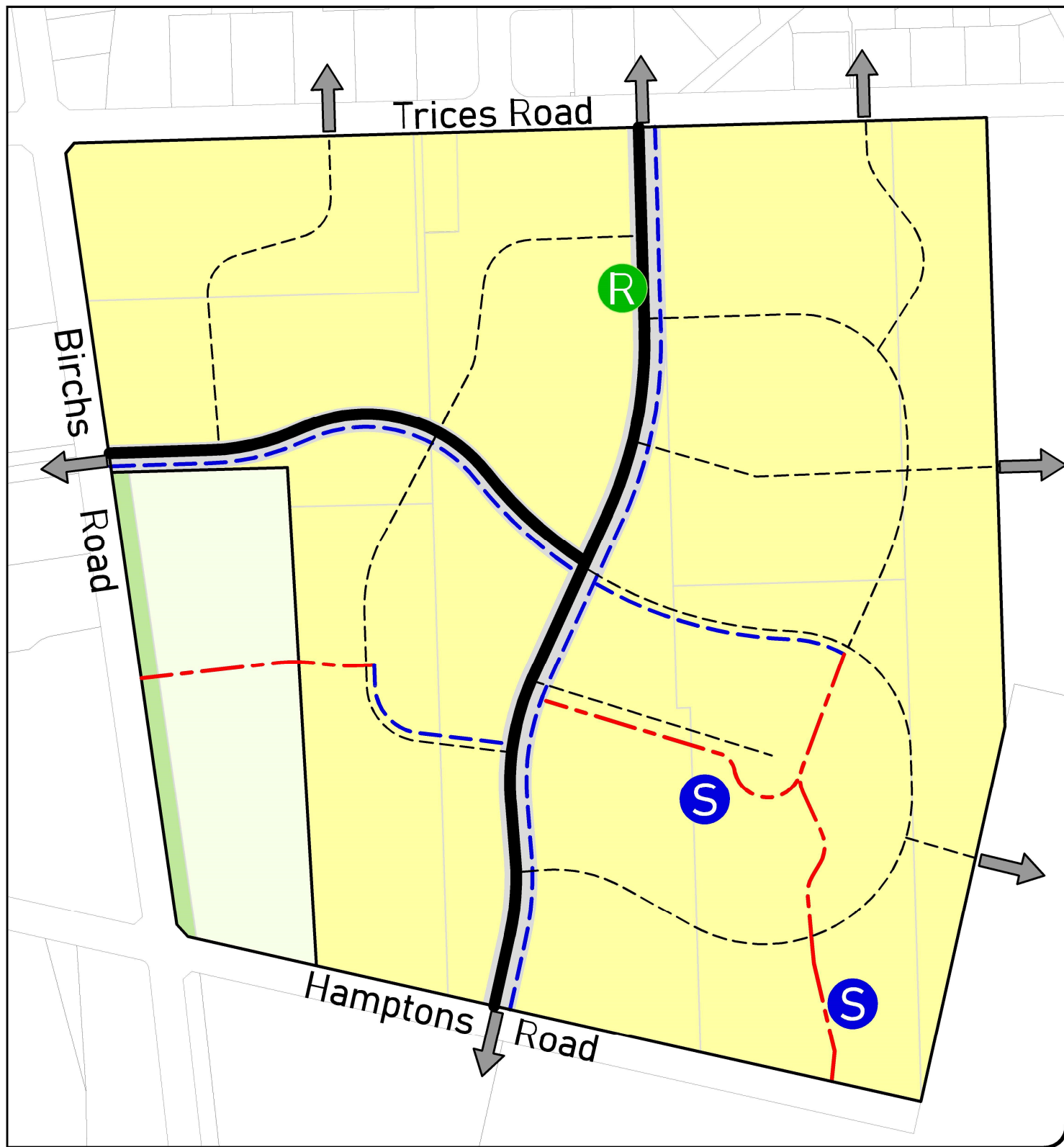
¹⁰ Based on the direction of travel approximately 110 trips associated with the proposal are anticipated to travel through the Trices Road – Birchs Road intersection in the peak hour. This represents approximately 13% increase in traffic in the AM peak and 12% increase in the PM peak. The surveyed traffic at this intersection has therefore been increased to account for the proposed traffic. It has also been increased by a further 20% to account for traffic growth generally on Trices Road and Birchs Road from development elsewhere.

¹¹ And possible retention of two existing dwellings.



Appendix 1

Proposed Plan



-  Indicative Primary Road
-  Indicative Local Road
-  Potential future road connection
-  Indicative Shared Pedestrian / Cycle Lane (on road)
-  Indicative Shared Pedestrian / Cycle Lane (off road)
-  Landscaping strip (existing mature planting)
-  Stormwater management area (size to be determined at time of subdivision)
-  Reserve location (size to be determined at time of subdivision)





Appendix 2

NZTA CAS Data



Untitled query

Saved sites

Hamptons

Crash year

2010 — 2020

Plain English report

12 results from your query.

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Crash road	Distance	Direction	Reference station	Route position	Side road	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Crash count fatal	Crash count severe	Crash count minor	Social cost \$(m)
BIRCHS ROAD		I			TRICES ROAD	1560479	5173391	172.510422	-43.591396	201951001	12/02/2019	Tue	08:30	Car/Wagon1 SDB on Birchs hit Car/Wagon2 crossing at right angle from right	CAR/WAGON3, alcohol test below limit CAR/WAGON2, failed to notice control, other inattentive	Dry	Bright sun	Fine	Crossroads	Stop	0	0	1	0.11
BIRCHS ROAD		I			TRICES ROAD	1560482	5173390	172.510452	-43.591412	201638174	02/05/2016	Mon	12:53	Van1 SDB on BIRCHS ROAD hit Car/Wagon2 crossing at right angle from right	CAR/WAGON2, did not check/notice another party from other dirn, did not stop at stop sign	Dry	Bright sun	Fine	Crossroads	Stop	0	0	0	0.02
BIRCHS ROAD		I			TRICES ROAD	1560482	5173390	172.510452	-43.591412	201072345	06/07/2010	Tue	09:40	Car/Wagon1 NDB on BIRCHS ROAD lost control turning left, Car/Wagon1 hit non specific traffic sign, non specific tree	CAR/WAGON1, lost control when turning, new driver/under instruction, speed entering corner/curve	Dry	Overcast	Fine	Crossroads	Stop	0	0	0	0.02
BIRCHS ROAD		I			TRICES ROAD	1560482	5173390	172.510452	-43.591412	201756496	14/12/2017	Thu	07:30	Car/Wagon1 SDB on Birchs rd hit Car/Wagon2 crossing at right angle from right	CAR/WAGON2, alcohol test below limit, did not stop at stop sign CAR/WAGON1, alcohol test below limit	Dry	Bright sun	Fine	Crossroads	Stop	0	0	0	0.02
BIRCHS ROAD		I			TRICES ROAD	1560482	5173391	172.510452	-43.591404	201022990	23/10/2010	Sat	15:39	Car/Wagon1 SDB on BIRCHS ROAD hit Car/Wagon2 turning right onto AXROAD from the left	CAR/WAGON2, did not check/notice another party from other dirn, did not stop at stop sign, driver dazzled, ENV: dazzling sun	Dry	Bright sun	Fine	Crossroads	Stop	0	0	4	0.10
BIRCHS ROAD		I			TRICES ROAD	1560482	5173390	172.510452	-43.591412	201741037	04/06/2017	Sun	12:00	SUV1 WDB on Trices road hit SUV2 crossing at right angle from right	SUV1, did not stop at stop sign, failed to notice signs, ENV: heavy rain	Wet	Overcast	Heavy rain	Crossroads	Stop	0	0	0	0.02
BIRCHS ROAD		I			TRICES ROAD	1560480	5173380	172.510425	-43.591496	201985033	11/11/2019	Mon	16:25	Car/Wagon1 NDB on BIRCHS ROAD hit Car/Wagon2 crossing at right angle from right	CAR/WAGON1, alcohol test below limit CAR/WAGON2, alcohol test below limit, did not stop at stop sign, overseas/migrant driver fail to adjust to nz roads	Dry	Overcast	Fine	Crossroads	Stop	0	0	0	0.02
TRICES ROAD		I			BIRCHS ROAD	1560482	5173390	172.510452	-43.591412	201744617	04/07/2017	Tue	15:30	Car/Wagon1 WDB on Trices rd hit Car/Wagon2 crossing at right angle from right	CAR/WAGON1, failed to notice signs	Dry	Bright sun	Fine	Crossroads	Stop	0	0	0	0.02
TRICES ROAD		I			BIRCHS ROAD	1560482	5173390	172.510452	-43.591412	201819930	28/11/2018	Wed	16:30	Car/Wagon1 WDB on Birchs Rd hit Car/Wagon2 crossing	CAR/WAGON1, alcohol test below limit CAR/WAGON3, alcohol test below limit CAR/WAGON4, alcohol test below limit CAR/WAGON2, alcohol test below limit, did not stop at stop sign, other attention diverted	Wet	Overcast	Light rain	Crossroads	Stop	0	0	1	0.11
TRICES ROAD		I			BIRCHS ROAD	1560475	5173391	172.510361	-43.591396	201950042	15/01/2019	Tue	15:27	Car/Wagon1 WDB on TRICES ROAD, PREBBLETON, SELWYN hit Bus2 crossing at right angle from right	CAR/WAGON1, did not check/notice another party from other dirn, did not stop at stop sign	Dry	Bright sun	Fine	Crossroads	Stop	0	1	0	0.97

<u>Crash road</u>	<u>Distance</u>	<u>Direction</u>	<u>Reference station</u>	<u>Route position</u>	<u>Side road</u>	<u>Easting</u>	<u>Northing</u>	<u>Longitude</u>	<u>Latitude</u>	<u>ID</u>	<u>Date</u>	<u>Day of week</u>	<u>Time</u>	Description of events	Crash factors	<u>Surface condition</u>	<u>Natural light</u>	<u>Weather</u>	<u>Junction</u>	<u>Control</u>	<u>Crash count fatal</u>	<u>Crash count severe</u>	<u>Crash count minor</u>	<u>Social cost \$(m)</u>
TRICES ROAD		I			BIRCHS ROAD	1560482	5173390	172.510452	-43.591412	201810374	15/01/2018	Mon	17:15	Car/Wagon1 SDB on Birchs Rd hit Car/Wagon2 crossing at right angle from right	CAR/WAGON2, alcohol test below limit, did not stop at stop sign CAR/WAGON1, alcohol test below limit	Dry	Bright sun	Fine	Crossroads	Stop	0	1	0	0.97
TRICES ROAD		I			BIRCHS ROAD	1560482	5173390	172.510452	-43.591412	201842728	23/06/2018	Sat	13:00	Car/Wagon1 NDB on BIRCHS ROAD, PREBBLETON, SELWYN hit turning Bus2	CAR/WAGON1, alcohol test below limit CAR/WAGON3, alcohol test below limit BUS2, alcohol test below limit, failed to give way at priority traffic control	Dry	Bright sun	Fine	T Junction	Stop	0	0	0	0.02

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Appendix 3

Proposed Intersection SIDRA Inputs and Outputs

MOVEMENT SUMMARY

▼ Site: 101 [Birchs Proposed AM - +20 (Site Folder: General)]

Birchs Proposed AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [Total veh/h %]		DEMAND FLOWS [Total HV] [Total veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh m		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Birchs (south)														
2	T1	385	10.0	405	10.0	0.235	0.1	LOS A	0.2	1.6	0.05	0.03	0.05	59.5
3	R2	21	5.0	22	5.0	0.235	6.7	LOS A	0.2	1.6	0.05	0.03	0.05	53.1
Approach		406	9.7	427	9.7	0.235	0.4	NA	0.2	1.6	0.05	0.03	0.05	59.1
East: Proposed														
4	L2	36	5.0	38	5.0	0.135	5.5	LOS A	0.5	3.4	0.44	0.68	0.44	47.8
6	R2	60	5.0	63	5.0	0.135	8.7	LOS A	0.5	3.4	0.44	0.68	0.44	47.5
Approach		96	5.0	101	5.0	0.135	7.5	LOS A	0.5	3.4	0.44	0.68	0.44	47.6
North: Birchs (North)														
7	L2	13	5.0	14	5.0	0.137	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	57.8
8	T1	228	10.0	240	10.0	0.137	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.6
Approach		241	9.7	254	9.7	0.137	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.5
All Vehicles		743	9.1	782	9.1	0.235	1.3	NA	0.5	3.4	0.09	0.12	0.09	57.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: 101 [Birchs Proposed PM - +20 (Site Folder: General)]

Birchs Proposed AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [Total veh/h %]		DEMAND FLOWS [Total HV] [Total veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] [Veh. veh m]		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Birchs (south)														
2	T1	218	10.0	229	10.0	0.146	0.4	LOS A	0.3	1.9	0.13	0.06	0.13	58.9
3	R2	22	5.0	23	5.0	0.146	7.9	LOS A	0.3	1.9	0.13	0.06	0.13	52.7
Approach		240	9.5	253	9.5	0.146	1.1	NA	0.3	1.9	0.13	0.06	0.13	58.3
East: Proposed														
4	L2	26	5.0	27	5.0	0.052	6.3	LOS A	0.2	1.3	0.48	0.67	0.48	48.0
6	R2	14	5.0	15	5.0	0.052	8.6	LOS A	0.2	1.3	0.48	0.67	0.48	47.7
Approach		40	5.0	42	5.0	0.052	7.1	LOS A	0.2	1.3	0.48	0.67	0.48	47.9
North: Birchs (North)														
7	L2	41	5.0	43	5.0	0.252	5.7	LOS A	0.0	0.0	0.00	0.06	0.00	57.5
8	T1	401	10.0	422	10.0	0.252	0.1	LOS A	0.0	0.0	0.00	0.06	0.00	59.3
Approach		442	9.5	465	9.5	0.252	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.2
All Vehicles		722	9.3	760	9.3	0.252	1.1	NA	0.3	1.9	0.07	0.09	0.07	58.1

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

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

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

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

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

Queue Model: SIDRA Standard.

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

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

MOVEMENT SUMMARY

▽ Site: 101 [Trices Road, Proposed AM - +20 (Site Folder: General)]

Trices Road, Proposed Intersection AM

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] veh/h %		DEMAND FLOWS [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh m		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Proposed Road														
1	L2	26	5.0	27	5.0	0.062	5.2	LOS A	0.2	1.6	0.32	0.58	0.32	48.8
3	R2	33	5.0	35	5.0	0.062	6.5	LOS A	0.2	1.6	0.32	0.58	0.32	48.6
Approach		59	5.0	62	5.0	0.062	5.9	LOS A	0.2	1.6	0.32	0.58	0.32	48.7
East: Trices (East)														
4	L2	9	5.0	9	5.0	0.095	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	57.8
5	T1	166	10.0	175	10.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
Approach		175	9.7	184	9.7	0.095	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.6
West: Trices Road (west)														
11	T1	211	10.0	222	10.0	0.123	0.1	LOS A	0.1	0.8	0.04	0.03	0.04	59.5
12	R2	12	5.0	13	5.0	0.123	6.3	LOS A	0.1	0.8	0.04	0.03	0.04	53.3
Approach		223	9.7	235	9.7	0.123	0.4	NA	0.1	0.8	0.04	0.03	0.04	59.1
All Vehicles		457	9.1	481	9.1	0.123	1.1	NA	0.2	1.6	0.06	0.10	0.06	57.7

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

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

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

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

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

Queue Model: SIDRA Standard.

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

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

MOVEMENT SUMMARY

▽ Site: 101 [Trices Road, Proposed PM - +20 (Site Folder: General)]

Trices Road, Proposed Intersection AM

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] veh/h %		DEMAND FLOWS [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh m		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Proposed Road														
1	L2	21	5.0	22	5.0	0.045	5.4	LOS A	0.2	1.1	0.36	0.59	0.36	48.6
3	R2	20	5.0	21	5.0	0.045	7.0	LOS A	0.2	1.1	0.36	0.59	0.36	48.4
Approach		41	5.0	43	5.0	0.045	6.2	LOS A	0.2	1.1	0.36	0.59	0.36	48.5
East: Trices (East)														
4	L2	35	5.0	37	5.0	0.137	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	57.3
5	T1	218	10.0	229	10.0	0.137	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	59.2
Approach		253	9.3	266	9.3	0.137	0.8	NA	0.0	0.0	0.00	0.08	0.00	58.9
West: Trices Road (west)														
11	T1	211	10.0	222	10.0	0.141	0.2	LOS A	0.3	2.3	0.13	0.09	0.13	58.7
12	R2	34	5.0	36	5.0	0.141	6.7	LOS A	0.3	2.3	0.13	0.09	0.13	52.6
Approach		245	9.3	258	9.3	0.141	1.1	NA	0.3	2.3	0.13	0.09	0.13	57.7
All Vehicles		539	9.0	567	9.0	0.141	1.4	NA	0.3	2.3	0.09	0.12	0.09	57.4

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

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

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

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

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

Queue Model: SIDRA Standard.

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

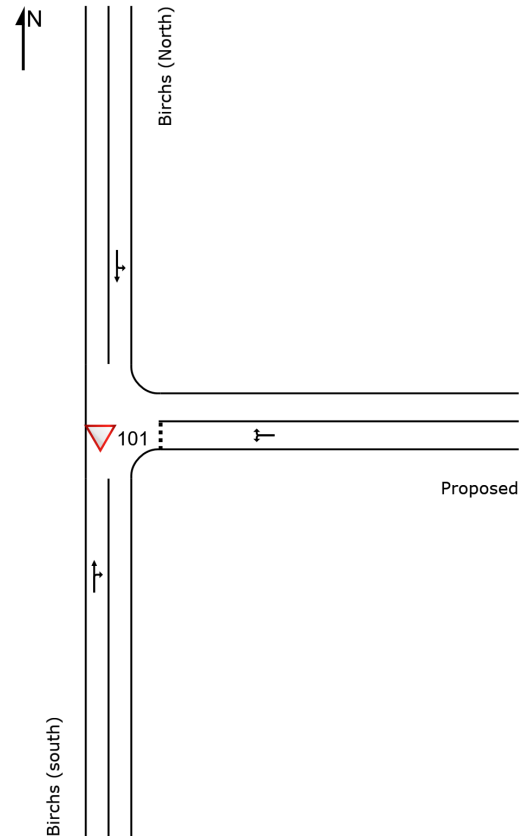
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

▽ Site: 101 [Birchs Proposed AM (Site Folder: General)]

Birchs Proposed AM
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

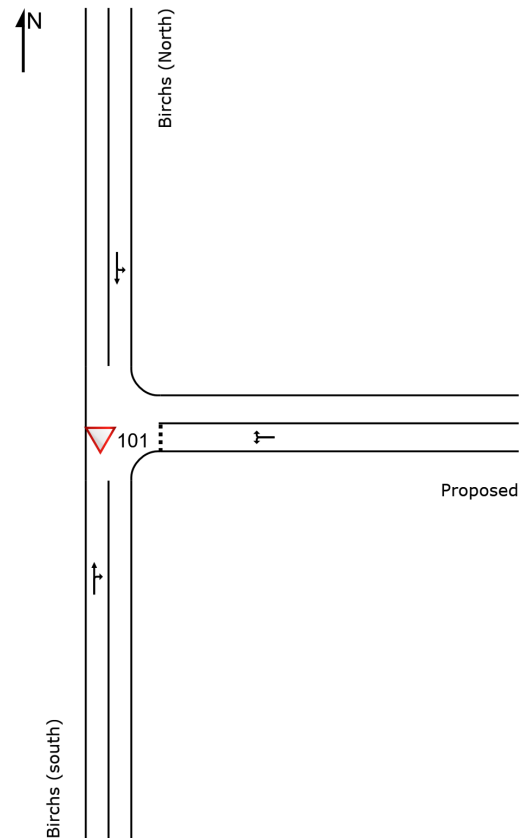


SITE LAYOUT

▽ Site: 101 [Birchs Proposed PM (Site Folder: General)]

Birchs Proposed AM
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITE LAYOUT

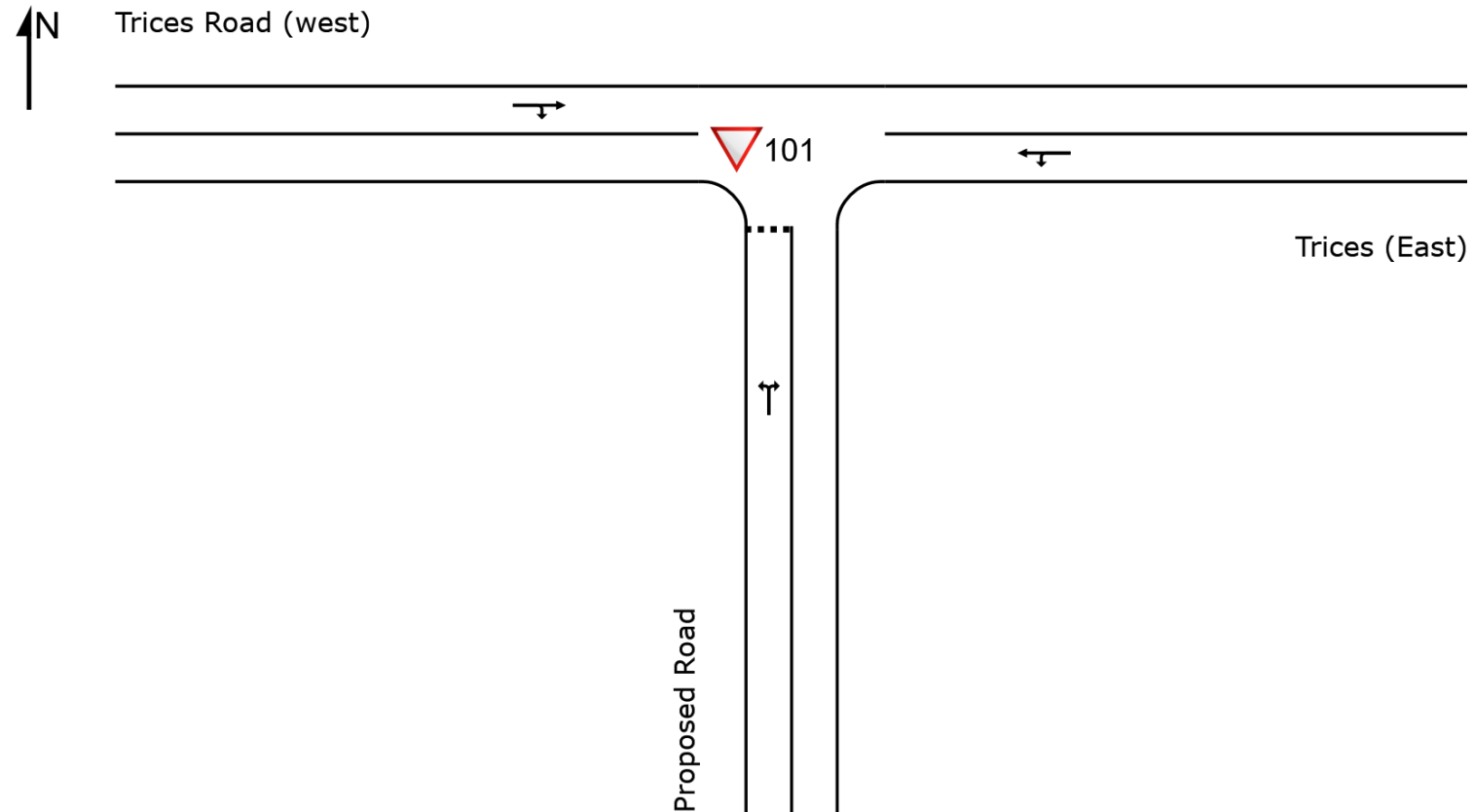
▽ Site: 101 [Trices Road, Proposed Intersection AM (Site Folder: General)]

Trices Road, Proposed Intersection AM

Site Category: (None)

Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITE LAYOUT

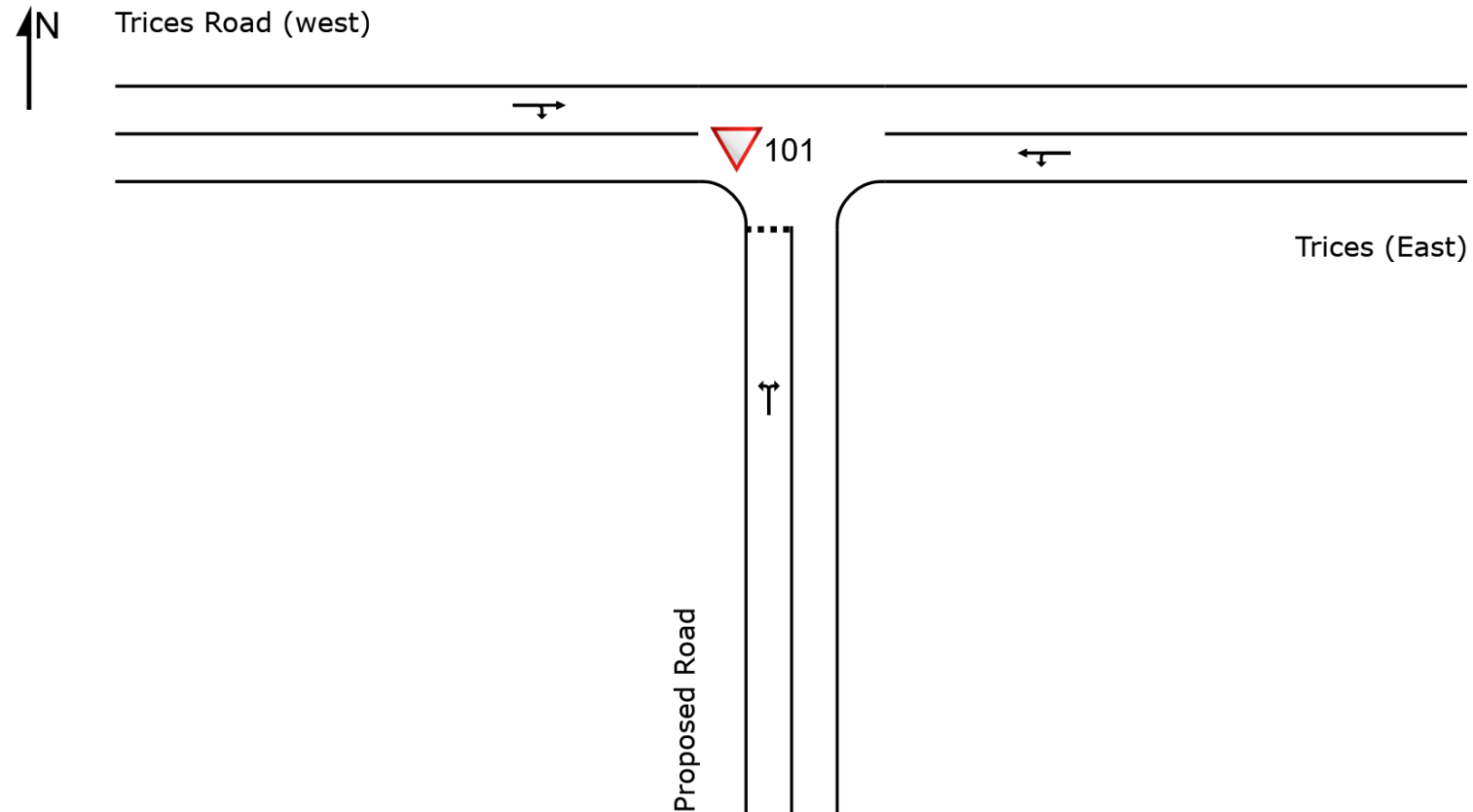
▽ Site: 101 [Trices Road, Proposed Intersection PM (Site Folder: General)]

Trices Road, Proposed Intersection AM

Site Category: (None)

Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.





Appendix 4

Birchs Road – Trices Road Intersection SIDRA Inputs and Outputs (including development and 20% traffic growth)

MOVEMENT SUMMARY

 Site: 101 [Birchs Rd Trices Rd - AM + proposed +20% growth - Copy (Site Folder: General)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh m		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Birchs (South)														
1	L2	2	10.0	2	10.0	0.266	6.0	LOS A	0.7	5.5	0.18	0.10	0.18	48.4
2	T1	358	10.0	377	10.0	0.266	0.3	LOS A	0.7	5.5	0.18	0.10	0.18	49.0
3	R2	71	10.0	75	10.0	0.266	6.0	LOS A	0.7	5.5	0.18	0.10	0.18	48.0
Approach		431	10.0	454	10.0	0.266	1.3	NA	0.7	5.5	0.18	0.10	0.18	48.8
East: Trices (east)														
4	L2	41	10.0	43	10.0	0.441	11.0	LOS B	2.2	16.4	0.65	1.10	0.93	40.9
5	T1	104	10.0	109	10.0	0.441	17.4	LOS C	2.2	16.4	0.65	1.10	0.93	40.7
6	R2	41	10.0	43	10.0	0.441	22.3	LOS C	2.2	16.4	0.65	1.10	0.93	40.6
Approach		186	10.0	196	10.0	0.441	17.1	LOS C	2.2	16.4	0.65	1.10	0.93	40.7
North: Birchs (north)														
7	L2	37	10.0	39	10.0	0.152	5.0	LOS A	0.1	0.9	0.05	0.09	0.05	48.7
8	T1	212	10.0	223	10.0	0.152	0.1	LOS A	0.1	0.9	0.05	0.09	0.05	49.3
9	R2	8	10.0	8	10.0	0.152	6.5	LOS A	0.1	0.9	0.05	0.09	0.05	48.3
Approach		257	10.0	271	10.0	0.152	1.0	NA	0.1	0.9	0.05	0.09	0.05	49.2
West: Trices (wes)														
10	L2	2	10.0	2	10.0	0.325	11.1	LOS B	1.3	10.2	0.71	1.09	0.87	41.4
11	T1	127	10.0	134	10.0	0.325	16.2	LOS C	1.3	10.2	0.71	1.09	0.87	41.2
12	R2	2	10.0	2	10.0	0.325	20.4	LOS C	1.3	10.2	0.71	1.09	0.87	41.2
Approach		131	10.0	138	10.0	0.325	16.2	LOS C	1.3	10.2	0.71	1.09	0.87	41.2
All Vehicles		1005	10.0	1058	10.0	0.441	6.1	NA	2.2	16.4	0.30	0.41	0.38	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.

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

Queue Model: SIDRA Standard.

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

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

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Project: S:\Novo Projects\020-100 Favourites\035 Aston Consulting (Fiona Aston)\035034 Trices Road Rezoning\Modelling\Trices Birchs Intersection.sip9

MOVEMENT SUMMARY

 Site: 101 [Birchs Rd Trices Rd - PM + proposed +20% growth (Site Folder: General)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] [veh/h %]		DEMAND FLOWS [Total HV] [veh/h %]		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh m		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Birchs (South)														
1	L2	10	10.0	11	10.0	0.162	6.8	LOS A	0.5	4.2	0.26	0.13	0.26	47.9
2	T1	190	10.0	200	10.0	0.162	0.8	LOS A	0.5	4.2	0.26	0.13	0.26	48.6
3	R2	46	10.0	48	10.0	0.162	6.9	LOS A	0.5	4.2	0.26	0.13	0.26	47.6
Approach		246	10.0	259	10.0	0.162	2.2	NA	0.5	4.2	0.26	0.13	0.26	48.3
East: Trices (east)														
4	L2	86	10.0	91	10.0	0.511	12.8	LOS B	2.9	21.9	0.68	1.16	1.08	41.1
5	T1	115	10.0	121	10.0	0.511	17.5	LOS C	2.9	21.9	0.68	1.16	1.08	40.9
6	R2	43	10.0	45	10.0	0.511	22.5	LOS C	2.9	21.9	0.68	1.16	1.08	40.8
Approach		244	10.0	257	10.0	0.511	16.7	LOS C	2.9	21.9	0.68	1.16	1.08	41.0
North: Birchs (north)														
7	L2	58	10.0	61	10.0	0.243	4.7	LOS A	0.0	0.1	0.00	0.08	0.00	48.9
8	T1	360	10.0	379	10.0	0.243	0.0	LOS A	0.0	0.1	0.00	0.08	0.00	49.6
9	R2	1	10.0	1	10.0	0.243	5.7	LOS A	0.0	0.1	0.00	0.08	0.00	48.5
Approach		419	10.0	441	10.0	0.243	0.7	NA	0.0	0.1	0.00	0.08	0.00	49.5
West: Trices (wes)														
10	L2	8	10.0	8	10.0	0.330	9.8	LOS A	1.4	10.7	0.67	1.09	0.82	41.7
11	T1	133	10.0	140	10.0	0.330	15.8	LOS C	1.4	10.7	0.67	1.09	0.82	41.5
12	R2	2	10.0	2	10.0	0.330	20.3	LOS C	1.4	10.7	0.67	1.09	0.82	41.4
Approach		143	10.0	151	10.0	0.330	15.5	LOS C	1.4	10.7	0.67	1.09	0.82	41.5
All Vehicles		1052	10.0	1107	10.0	0.511	6.8	NA	2.9	21.9	0.31	0.48	0.43	45.8

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

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

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

Queue Model: SIDRA Standard.

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

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

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Project: S:\Novo Projects\020-100 Favourites\035 Aston Consulting (Fiona Aston)\035034 Trices Road Rezoning\Modelling\Trices Birchs Intersection.sip9

SITE LAYOUT

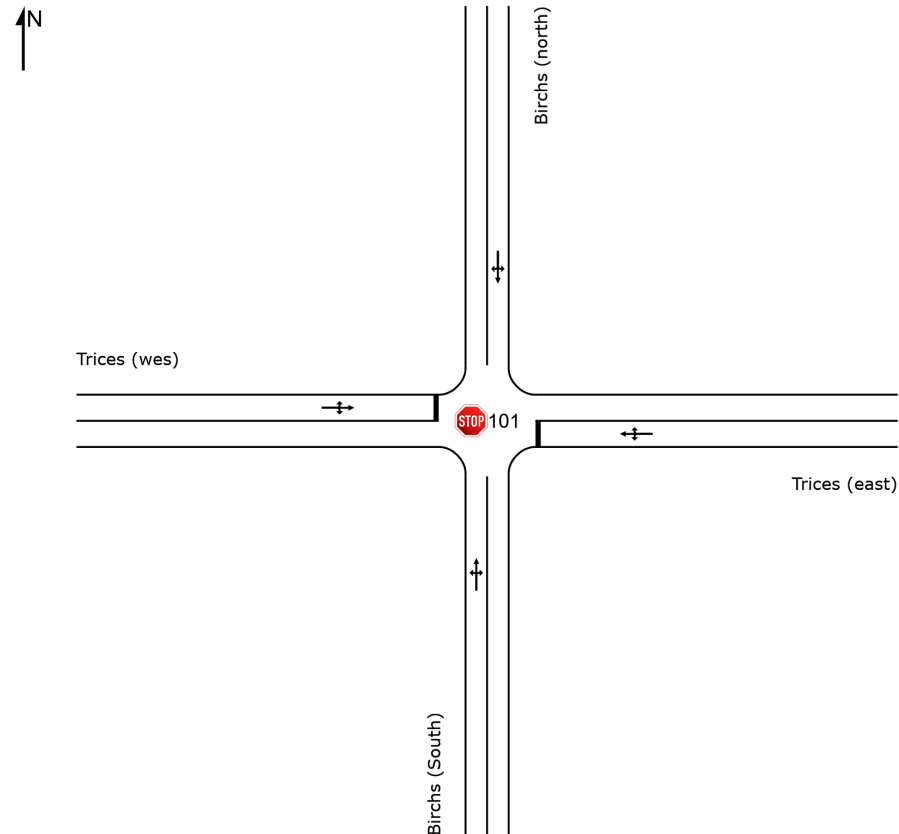
 **Site: 101 [Birchs Rd Trices Rd - PM + proposed +20% growth (Site Folder: General)]**

New Site

Site Category: (None)

Stop (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.





Appendix 5

District Plan Objectives and Policies



Proposed District Plan provision	Comment / Assessment
<i>TRAN-O1 People and places are connected through safe, efficient, and convenient land transport corridors and land transport infrastructure which is well integrated with land use activities and subdivision development.</i>	Noting the assessment above, the proposal is consistent with this objective.
<i>TRAN-O2 Land transport corridors and land transport infrastructure are protected from incompatible land use activities and subdivision development.</i>	The traffic generation associated with the proposed residential landuse is considered to be acceptable within the existing transport infrastructure of the recommended upgrades.
<i>TRAN-O3 Land transport corridors and land transport infrastructure support the needs of people and freight, while ensuring adverse effects on the surrounding environment from their establishment and operation are managed.</i>	The proposed transport infrastructure will accommodate the needs of the future residents. Any adverse effects on the existing transport infrastructure can be mitigated by the recommended upgrades.
<i>TRAN-P1 The safety and efficiency of the District's land transport network and systems are enabled through integrated land use and subdivision development that:</i> <i>Manages the levels of service, formation standards and the types of land transport corridors and land transport infrastructure, including through the network road classifications and compliance with the design and operational standards;</i> <i>Provides land transport infrastructure that is consistent with the form, function, and character of each zone;</i> <i>Ensures there is enough space within land transport corridors to support the efficient and effective operation of network utilities;</i> <i>Provides for the safe and efficient movement and operation of emergency services; and</i> <i>Recognises cross-boundary connections with adjoining districts.</i>	The assessment above outlines that appropriate priority has been given to road classifications and the proposed road network can be developed in accordance with standard design. The proposed road structure is consistent with and specifically designed to cater for residential landuse. The proposed DEV layout will provide good access for emergency services. The site is appropriately located to utilise existing arterial connections to Christchurch District.
<i>TRAN-P2 Manage any extensions to the District's land transport network to ensure it occurs in an integrated way by:</i> <i>Co-coordinating the timing of land use activities and subdivision development with the availability of capacity in land transport corridors;</i> <i>Providing a range of travel modes and ensuring these are integrated, including between walking, cycling, public transport, freight and private vehicle modes; and</i> <i>Ensuring land use activities and subdivision development do not foreclose on the opportunity for land transport corridors to meet future land transport needs.</i>	CSM2 Upgrades will be complete prior to occupation of future residential units. All proposed road infrastructure and frontage road upgrades would be co-ordinated with subdivision. The assessment above includes considerations of travel by all modes. The proposed layout has been specifically designed for connections to service any future development to the east.
<i>TRAN-P5 Promote a range of transport options to reduce the number of trips and distances travelled in private motor vehicles by:</i> <i>Encouraging land use activities and subdivision development to include connected walking and cycling networks and access to public transport and public transport facilities, including within and between townships; and</i> <i>Managing the design, layout and function of new land transport infrastructure to ensure they integrate with existing and future land transport corridors.</i>	The proposed layout includes direct links for active modes, to the existing Rail Trail on Birchs Road and to existing public transport routes and key landuse destinations. As outlined above the DEV has been specifically designed to integrate with existing and future transport connections.
<i>TRAN-P6 Enable safe, multi-modal connections that support walking, cycling, and access to public transport and public transport facilities through land use activities and subdivision development that:</i>	The assessment above concludes that the proposed layout appropriately provides for connections for all modes.



Establish levels of service and multi-modal transport options based on the network road classifications, including the provision of strategic level walking and cycling connections where they are identified in Development Plans or ODP;

Encourage residential blocks to be small, navigable and convenient to move around through legible, convenient and attractive walking and cycling routes to public transport facilities and between residential areas, business centres, community facilities, recreation space and local services;

Manage the number and design of cul de sacs, rear lots and accessways;

Provide for the interaction between vehicle access and manoeuvring, loading and parking areas when determining on-site pedestrian and cycling routes; and

Align street layouts to maximise views and landscape features to promote attractive streets.

TRAN-P7 Recognise and protect the function of the District's land transport network and systems by managing land use activities and subdivision development to ensure the safe and efficient movement of people and goods by:

Managing adverse effects from activities on land transport corridors and land transport infrastructure, particularly where it may reduce safe and efficient traffic flows within the strategic transport network and links with Christchurch City;

Ensuring land transport corridors and land transport infrastructure can support the volume and type of transport movements based on the network road classifications; and

Requiring the design, positioning, and maintenance of accessways, corner splays, vehicle crossings, intersections, footpaths, plantings, and signs to ensure appropriate sightline visibility is provided to road users to support safe and efficient vehicle, pedestrian, and cycle movements.

The assessment above concludes that the site is appropriately located in respect of road connections to Chch, the volume of traffic anticipated, and road function.



Operative District Plan Provision	Comment / Assessment
Objective B2.1.1 <i>An integrated approach to land use and transport planning to ensure the safe and efficient operation of the District's roads, pathways, railway lines and airfields is not compromised by adverse effects from activities on surrounding land or by residential growth.</i>	The assessment concludes the proposed road and shared paths will provide for safe and convenience connections and the proposed development can be appropriately integrated into the existing transport network
Objective B2.1.2 <i>An integrated approach to land use and transport planning to manage and minimise adverse effects of transport networks on adjoining land uses, and to avoid "reverse sensitivity" effects on the operation of transport networks.</i>	
Objective B2.1.3 <i>Future road networks and transport corridors are designed, located and protected, to promote transport choice and provide for: a range of sustainable transport modes; and alternatives to road movement of freight such as rail.</i>	The assessment above outlines that the site is well located for travel by private vehicle, public transport, walking and cycling.
Policy B2.1.2 <i>Manage effects of activities on the safe and efficient operation of the District's existing and planned road network, considering the classification and function of each road in the hierarchy.</i>	The proposed development and occupation of dwellings / generation of traffic, will be co-ordinated with the proposed upgrades through subdivision additional local upgrades on the wider road network outlined in the assessment are scheduled prior to 2028 and will be available to provide additional capacity for arterial routes.
Policy B2.1.4(a) <i>Ensure all sites, allotments or properties have legal access to a legal road which is formed to the standard necessary to meet the needs of the activity considering:</i> <i>the number and type of vehicle movements generated by the activity;</i> <i>the road classification and function; and</i> <i>any pedestrian, cycle, public transport or other access required by the activity.</i>	The assessment above does not identify any constraints in achieving this.
Policy B2.1.5 <i>Ensure the development of new roads is:</i> <i>integrated with existing and future transport networks and landuses; and</i> <i>is designed and located to maximise permeability and accessibility; through achieving a high level of connectivity within and through new developments to encourage use of public and active transport; whilst having regard to the road hierarchy.</i>	The assessment above concludes that the proposal can be well integrated with the existing and future transport network. The proposal includes direct links for active modes towards the Town Centre, to the existing shared path and to existing public transport routes. The site is in close proximity to existing public transport routes.
Policy B2.1.12 <i>Address the impact of new residential or business activities on both the local roads around the site and the District's road network, particularly Arterial Road links with Christchurch City.</i>	The assessment above concludes that the proposal can be readily accommodated in this respect.
Policy B2.1.13 <i>Minimise the effects of increasing transport demand associated with areas identified for urban growth by promoting efficient and consolidated land use patterns that will reduce the demand for transport.</i>	The assessment of effects above outlines that the site is well located in this respect.



Policy B2.1.14

Encourage people to walk or cycle within and between townships by providing a choice of routes for active transport modes and ensuring there is supporting infrastructure such as parking for cycles, at destinations.

As outlined above the site is close to the town centre and the existing shared path between Lincoln and Christchurch (Rail Trail).

Policy B2.1.15

Require pedestrian and cycle links in new and redeveloped residential or business areas, where such links are likely to provide a safe, attractive and accessible alternative route for pedestrians and cyclists, to surrounding residential areas, business or community facilities

A shared path is proposed connecting to the existing Rail Trail.

Policy B4.2.10

Ensure that new residential blocks are small in scale, easily navigable and convenient to public transport services and community infrastructure such as schools, shops, sports fields and medical facilities, particularly for pedestrians and cyclists.

The primary roads provide an appropriate structure for a subdivision layout of the local roads and pedestrian connections to accommodate this.

Objective B4.3.4

New areas for residential or business development support the timely, efficient and integrated provision of infrastructure, including appropriate transport and movement networks through a coordinated and phased development approach

As outlined above the timing of future roads and development is and can be well co-ordinated.

Policy B4.3.8

Each Outline Development Plan shall include:

These matters are achieved and addressed in the assessment of effects above.

Principal through roads, connection and integration with the surrounding road networks, relevant infrastructure services and areas for possible future development;

.....

Indicate how required infrastructure will be provided and how it will be funded;

.....

Demonstrate how effective provision is made for a range of transport options, including public transport systems, pedestrian walkways and cycleways, both within and adjoining the ODP area;

Show how other potential adverse effects on and/or from nearby existing or designated strategic infrastructure (including requirements for designations, or planned infrastructure) will be avoided, remedied or appropriately mitigated;

.....