

Plan Change 58
Avenue Business Park

Integrated Transport Assessment
October 2022



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1.0 Introduction

This Integrated Transport Assessment (ITA) relates to a proposed private plan change (Plan Change 58) to rezone a site on the west side of Morrinsville from rural to industrial. The site is 13.4 ha in size and will be accessed via a new road off Avenue Road North. The site location is shown in Figure 1 and a concept plan, showing an indicative development layout for the site, is provided in Figure 2 and Appendix A.

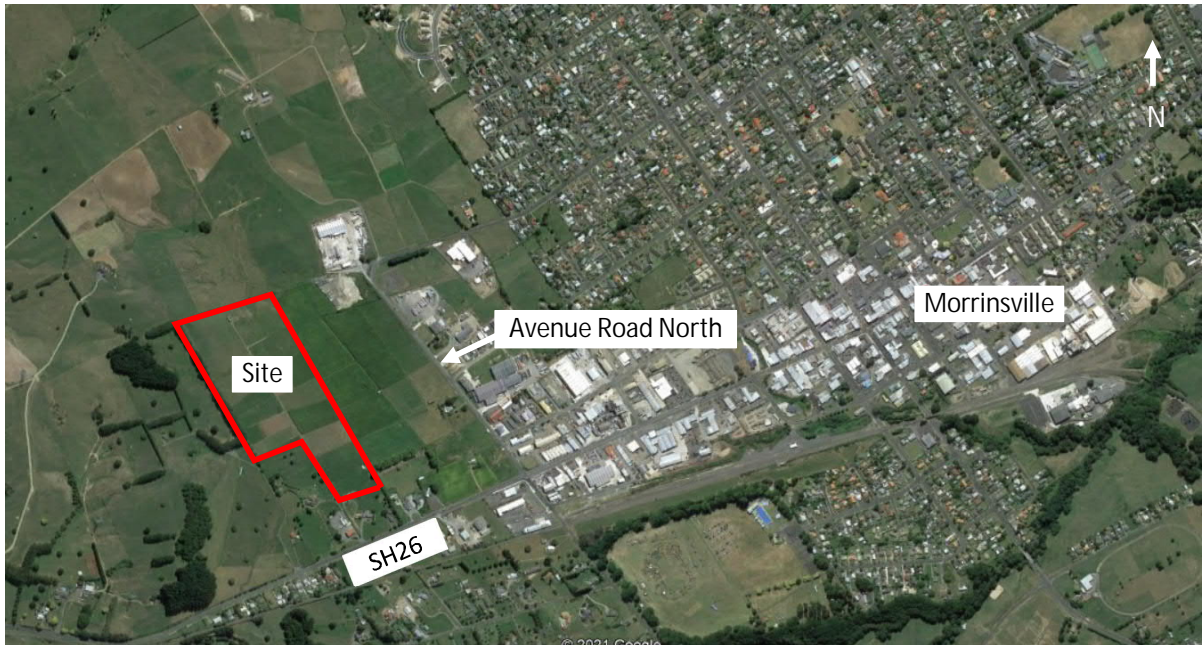


Figure 1: Site location

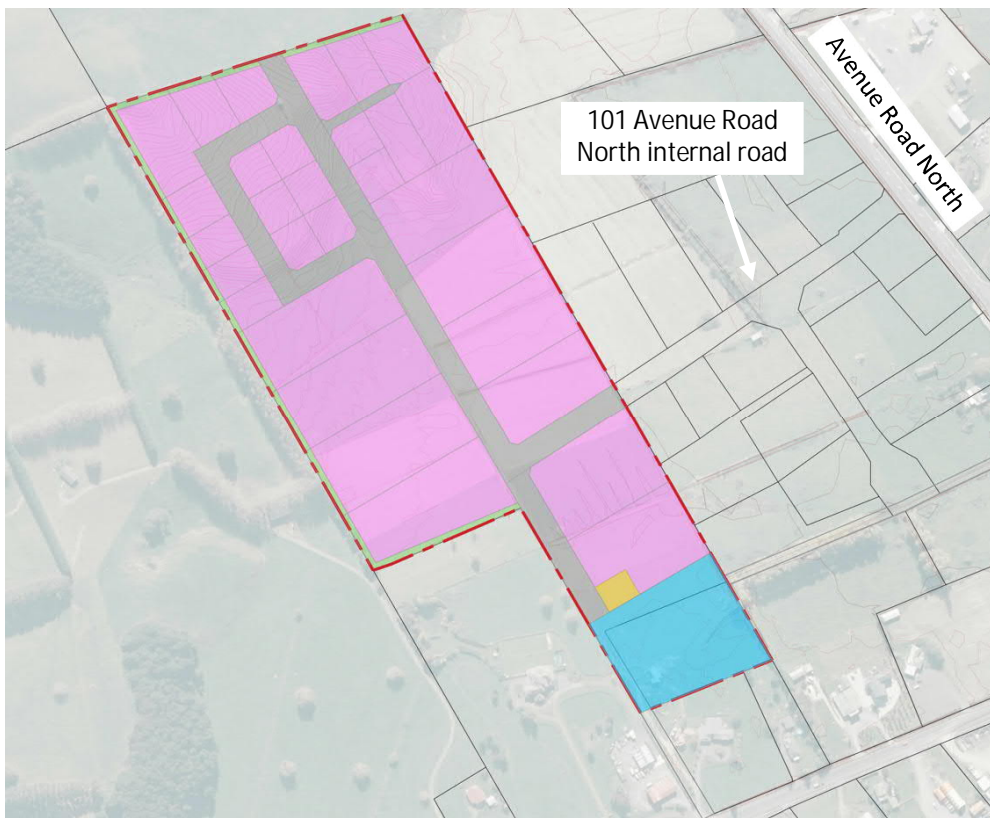


Figure 2: Concept plan

This report considers the safety, efficiency and accessibility of the proposed plan change site and its potential traffic effects on Avenue Road North and the adjacent road network. Comments in this report are relatively high level, as the final site layout will be developed in the subdivision stage.

This report finds that the proposed plan change from rural to industrial is expected to result in less than minor adverse traffic effects. Site traffic flows can be suitably accommodated by the new intersection off Avenue Road North, and the site can be developed in accordance with the Matamata-Piako District Plan and Development Manual. The site location is considered to be appropriate, as it is adjacent to existing industrial land and has good access to State Highway 26.

2.0 Existing and Consented Environment

The site is currently accessed via 2581 State Highway 26, on the west side of Morrinsville. The site is currently in pasture and is relatively flat, but slopes up to the north at the northern end of the site. The surrounding land is also in pasture, except for land to the south of the site which has been developed as lifestyle blocks and light industry. The surrounding zoning immediately to the north, south and west is rural, with industrial to the east, as shown in Figure 4. The industrial land between the site and Avenue Road North forms part of Stage 1 of the Avenue Business Park and has been granted subdivision consent. The plan change land is proposed to be Stage 2 of the Avenue Business Park development.

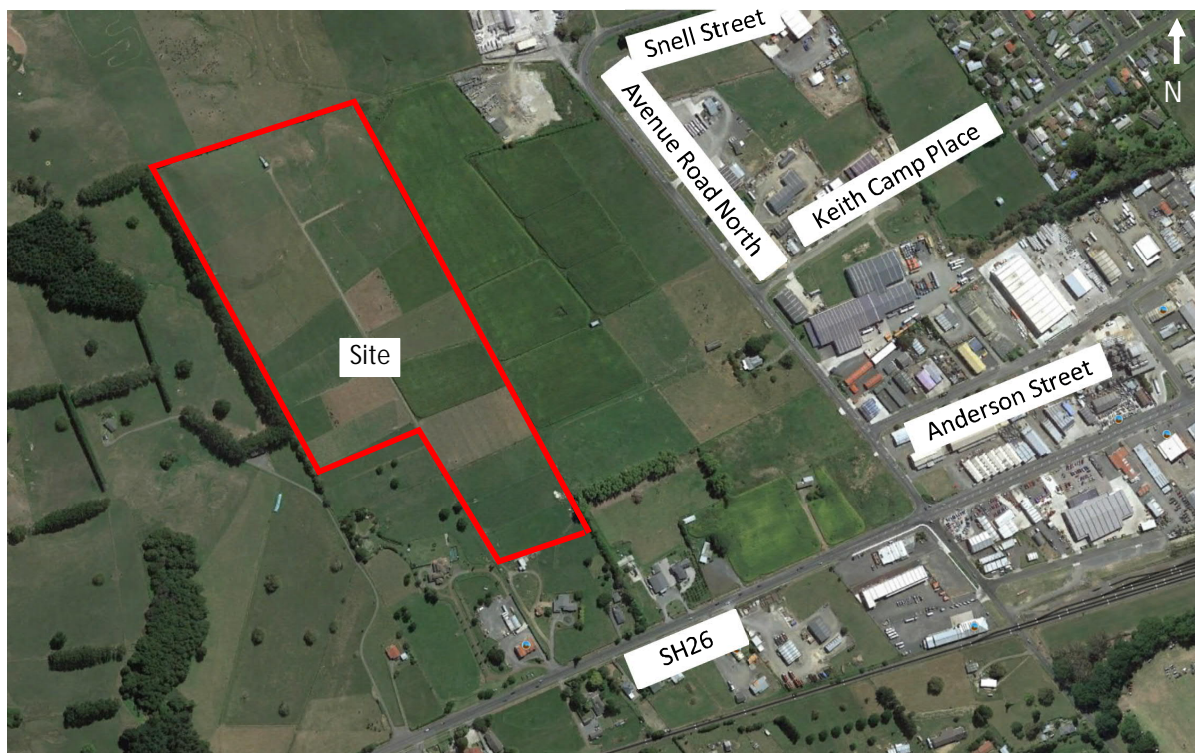


Figure 3: Site vicinity

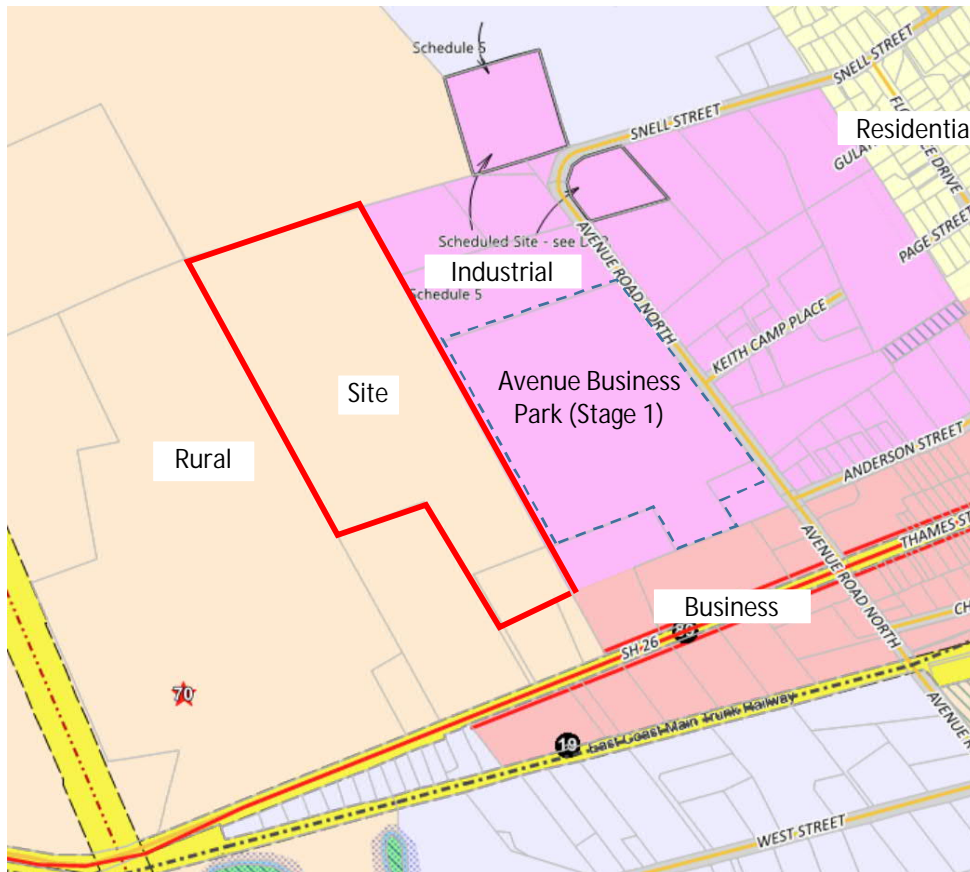


Figure 4: Site zoning

Site Access Road

It is intended that the site will be accessed via Avenue Road North, east of the site. Road access will be via a consented internal road through the Stage 1 development at 101 Avenue Road North, as shown in Figure 2. The internal road through Stage 1 will be a local road with a road reserve of 20 m, a 10 m carriageway, a 1.5m footpath/cycleway on one side and street lighting. This road is intended to have a speed limit of 50 km/h.

The predicted traffic volumes on the internal road from the Stage 1 development are 875 vehicles per day and 247 vehicles in the peak hour. The daily trip flow uses a trip generation rate of 4.11, as a typical daily industrial rate from Table 8.1 of the NZ Transport Agency research report 453. The Gross Floor Area estimated to be serviced by the new road is 21,292 m². The peak hour flow and the Gross Floor Area have been taken from the Direction Traffic Design report "Industrial Subdivision, 101 Avenue Road North, Morrinsville" dated October 2021.

The location of the intersection on Avenue Road North has been approved by Matamata-Piako District Council as part of the subdivision consent for Stage 1. This intersection has good sight distances in both directions, but has limited access separation distances. This is discussed further in Section 6. The subdivision consent conditions for Stage 1 include linemarking the new intersection with a right turn bay.

Avenue Road North

Avenue Road North is an arterial road. It services the surrounding industrial area and provides a bypass route for east/north traffic around Morrinsville. Avenue Road North intersects with State Highway 26 at the southern end and turns into Snell Road at a 90-degree corner to the north.

Avenue Road North has a sealed width of 10 m, this consists of two 3.5 m lanes, a 2 m central flush median, and 0.5 m sealed shoulders. There is kerb and channel on the east side and a stormwater drain on the west side. There is currently no lighting or footpaths, but it is understood that Council is proposing to install these features on the east side in the near future.



Figure 5: Avenue Road North looking north along the site frontage

The posted and operating speed in the vicinity of the proposed site access road is 70 km/h (operating speed data is provided in Appendix B). The speed limit changes to 50 km/h just north of Anderson Street, south of the site. The 90-degree corner to the north of the site has an advisory warning speed of 45 km/h.

The average annual daily traffic (AADT) on Avenue Road North is 3500 vehicles per day (vpd) (Mobile Road 2021 estimate). The peak hour flow is 355 vehicles per hour (vph) in the pm peak period with 5% Heavy Commercial Vehicles (HCVs) (traffic count data provided in Appendix B). A growth rate of 3% has been assumed for Avenue Road North. This higher than typical growth rate reflects the developing nature of this area.

The directional split of traffic on Avenue Road North at the SH26 roundabout is 39:61 north:southbound in the am peak period, and 65:35 in the pm peak period. This directional split reflects traffic flows towards Hamilton in the am peak and away from Hamilton in the pm peak.

State Highway 26/Avenue Road North Intersection

The State Highway 26/Avenue Road North intersection currently consists of a temporary roundabout. The AADT on State Highway 26 is 11,315 vpd with 12% HCV (Mobile Road 2021

estimate). The AADT on Avenue Road South is 2000 vpd with 12% HCV (Mobile Road 2021 estimate).

Waka Kotahi/the New Zealand Transport Agency have advised that the construction of a permanent roundabout at this intersection is funded. Construction is expected to be completed by March 2023. Construction of this roundabout will ensure the safety and efficiency of this intersection into the future. It is anticipated that the future roundabout will be able to safely accommodate all industrial traffic generated by this site. Intersection capacity is not expected to be a concern at this roundabout, with current maximum queuing during a peak hour AM traffic count on the 9th of April 2021 of eight vehicles on Avenue Road North. This intersection typically flows smoothly with typical queuing of several cars only on the approaches in peak periods.



Figure 6: Avenue Road North approach to the SH26 roundabout

State Highway 26

State Highway 26 in the vicinity of the current site access at 2581 State Highway 26 has two 3.5m wide lanes, 2.0 m wide sealed shoulders, a 1.2 m wide footpath on the south (opposite) side of the road, street lighting over the footpath, and a posted speed limit of 70 km/h.



Figure 7: State Highway 26, from the site looking east

Pedestrian/Cyclist/Public Transport Facilities

The rural and industrial nature of land in the vicinity of this site means that there are currently limited pedestrian and cyclist trips on either Avenue Road North or State Highway 26.

A 1.5 m wide footpath/cycleway will be provided on the north side of the Stage 1 internal road and along the Avenue Road North site frontage. A footpath is provided on the east side of Avenue Road North. A footpath is provided on the south side of SH26 in the vicinity of the site.

Avenue Road North has limited sealed shoulders (approximately 0.5 m wide) to provide for cyclists. The relatively wide sealed shoulders on either side of State Highway 26 provides well for cyclists in this area.

There is no public transport provided in the direct vicinity of the site. The regional Morrinsville/Paeroa bus passes through Morrinsville five times a day during the working week in both directions. This bus stops at Lorne Street in central Morrinsville, approximately 1.3 km from the site. The limited public transport services are typical for a small town such as Morrinsville.

Crash History

The New Zealand Transport Agency Crash Analysis System has four reported crashes on Avenue Road North in the last five years, 15 crashes at the State Highway 26/Avenue Road intersection, and nine crashes along State Highway 26. The crash locations are shown in Figure 8, with details provided in Appendix C.

Of the three crashes on Avenue Road North, two involved northbound vehicles U-turning, one was a rear end crash involving a vehicle turning right from the centre, and one involved a vehicle turning out of a side access. The one crash located in the vicinity of the proposed new road servicing 101 Avenue Road North was one of the U-turning crashes.

The crash record in the vicinity of the site indicates that there are no particular safety issues in this area. The two U-turning crashes appearing to be unrelated, and the turning crashes are expected for a road with a relatively high number of side accesses.



Figure 8: Crash locations

Of the ten crashes along State Highway 26, five involved eastbound rear end crashes, three involved eastbound loss of control crashes, one involved an eastbound vehicle changing lanes, and one involved a westbound vehicle which hit a parked vehicle. Three of the crashes involved fatigued drivers. The crash history shows a clear pattern of rear end and loss of control crashes involving eastbound vehicles.

The State Highway 26/Avenue Road intersection crash record has significantly improved since the installation of the temporary roundabout at the end of 2019. In the three years prior to the roundabout installation there were 13 crashes, including one fatality, one serious, and six minor injury crashes. In the two and a half years since installation there have only been three crashes, with only one crash resulting in a minor injury. All three recent crashes involved eastbound traffic on State Highway 26. The proposed upgrade of this roundabout by Waka Kotahi/the NZ Transport Agency is expected to result in further safety improvements.

3.0 Proposal

The proposed plan change is expected to result in future industrial subdivision of the site creating a range of lot sizes, as indicated in the concept plan in Figure 9. The concept roading layout is for a main north/south road which will connect with an extension of the Stage 1

internal road. Smaller lots are intended to be created at the north end of the site, where terracing will be required on the slope in this area. Servicing of land at the north end may be via either a crescent as shown, or via private ways.

The north/south road will extend to the northern boundary, allowing land to the north to be accessed. Although the land to the north and west of the site is current zoned rural, the concept plan has been developed to anticipate and allow for future roading connections in the event they may be required. The north/south road will extend directly to the northern boundary to allow the land to the north to be accessed. The north/south road will also directly adjoin the boundary of the rural site to the west of the plan change site to allow a future western access.

The direct continuation of the Stage 1 internal road was considered as a potential alternative option to provide access to land to the west. This option has not been proposed for the following reasons:

- Any development to the west of the site is expected to justify the construction of a direct connection to State Highway 26 to improve site accessibility;
- This connection would only service a relatively small area;
- A western connection at this location results in poor site utilisation with additional roading plus a narrow strip of unusable land to the south of any such connection; and
- A connection to land to the west is able to be provided along the southern end of the north/south road.



Figure 9: Concept plan

All site access will be via Avenue Road North, with no access proposed via State Highway 26. The site can be serviced via the Stage 1 intersection to Avenue Road North, with the State

Avenue Road roundabout providing safe access to State Highway 26. Pedestrian and cyclist access directly onto State Highway 26 has been considered but is not proposed, as there is expected to be limited demand for this route, and safer access is provided via the internal roads.

The stormwater pond at the south end of the site will be located away from the west boundary, ensuring that this feature does not preclude any future roading or pedestrian/cyclist connection to the site which may be required in the future.

The Morrinsville Town Strategy (2013-2033) indicates that a future road link may be constructed between State Highway 26 and Hangawera Road, as shown in Figure 10. Although it is understood the Council currently has no plans to build a road in this location, the proposed roading layout of the site supports the Town Strategy, with a connection provided to the north of the site, and with the ability retained for a connection to be provided to State Highway 26 in the south should it be required in future.

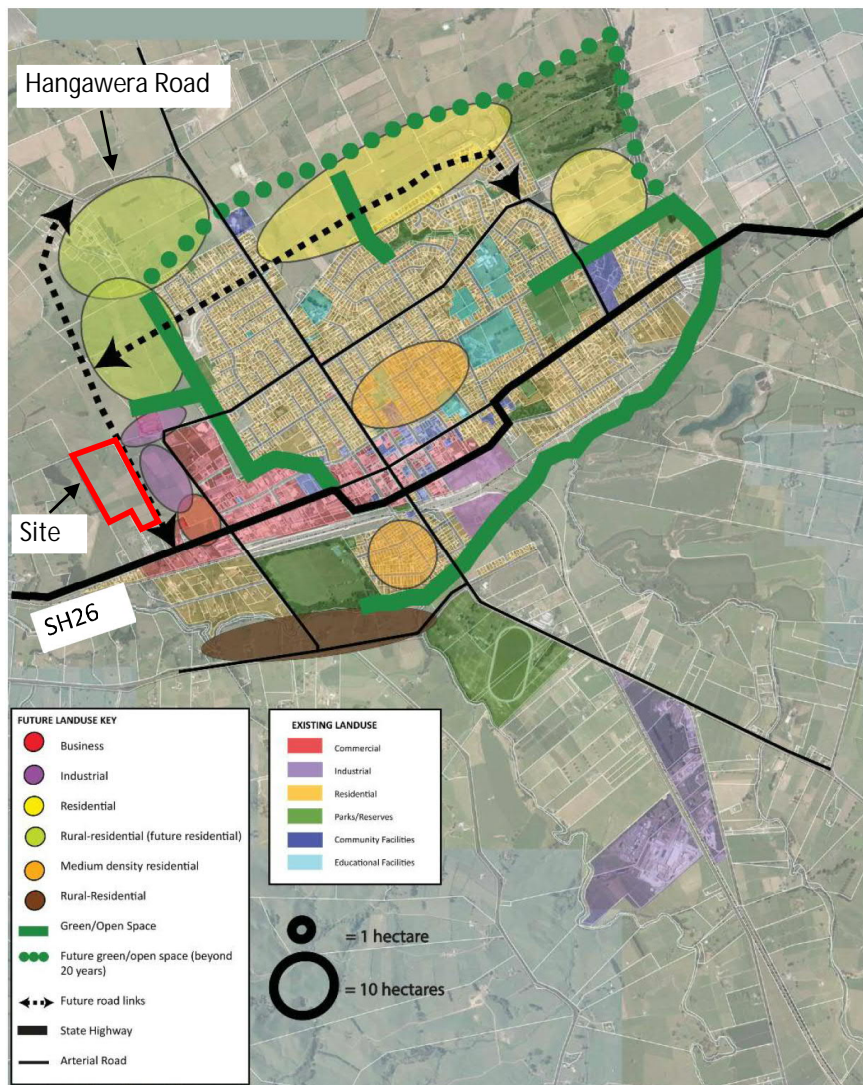


Figure 10: Morrinsville Town Strategy, potential future road links

4.0 Trip Generation

The predicted trip generation for the site is 256 vph, with an expected maximum of 534 vph. This is based on the following factors:

- A gross land area of 13.4 ha.
- A net land area of approximately 10.3 ha (excluding indicative roads and stormwater and wastewater reserves shown on the concept plan).
- 35% of the remaining available land being developed into Gross Floor Area (GFA). This site coverage has been taken from an average of surrounding industrial sites.
- The predicted GFA for this site is therefore 3.6 ha.
- A predicted trip rate of 0.71 trips/100 m² GFA with a maximum trip rate of 1.48 trips/100 m² GFA.

The trip rate of 0.71 trips/100 m² has been taken from the traffic count at Keith Camp Place. The NZ Transport Agency Research Report 453 gives a range of peak hour trips for different industry uses, ranging from 1 trips/100 m² GFA for warehousing, 2.7 trips/100 m² GFA for manufacturing and 6.2 trips/100 m² GFA for contractor land use. The New Zealand trips and parking database indicates an average peak hour trip generation for industrial facilities of 1.48 trips/100 m² GFA.

It is noted that the Research Report 453 trip generation rates are relatively high compared to other countries. Research Report 453 Table 8.10 gives manufacturing trip rates of 1 and 0.79 trips/100 m² GFA for Australia and the USA respectively, and warehouse rates of 0.5 and 0.34 trips/100 m² GFA for these countries. The international trip rates indicate an industry trip generation rate of 0.66 trips/100 m² GFA for a simple average of the provided figures. This trip rate supports the Keith Camp Place trip rate of 0.71 trips/100 m². For sensitivity testing trip rates of 1.0, 1.48 and 2.7 from Research Report 453 have been assessed. A summary of predicted site trips from these trip rates is provided in Table 1.

Table 1: Peak hour trip generation

Predicted GFA	Trip Generation			
	0.71 trips/100m ² (Keith Camp Place rate)	1.0 trips/100m ² (NZTA 453 rate)	1.48 trips/100m ² (NZTA 453 rate)	2.7 trips/100m ² (NZTA 453 rate)
36,050 m ²	256	361	534	973

Reasons why the higher sensitivity trip rates are less reliable include that not all of the site will be developed at the higher manufacturing trip rate, and applying standard trip generation rates to larger areas results in an overestimate of trips, as trip rates decrease with increasing area. Trip rates decrease with area as arrival times spread out with more than one facility at a site, and some facilities will have lower trip rates, bringing down the overall trip rate. Larger sites reflect this with lower trip rates, as shown in Figure 11. Figure 11 plots trip rates from the New Zealand Trips Database Bureau database for the land use of "industry" excluding "commercial" and "shop" uses. Commercial and shop uses have not been included as these land uses would require additional resource consents under the proposed zoning. Figure 11 indicates that for the predicted total GFA of approximately 36,000 m² an overall trip rate of approximately 0.82 is appropriate (an average of the last six

datapoints).

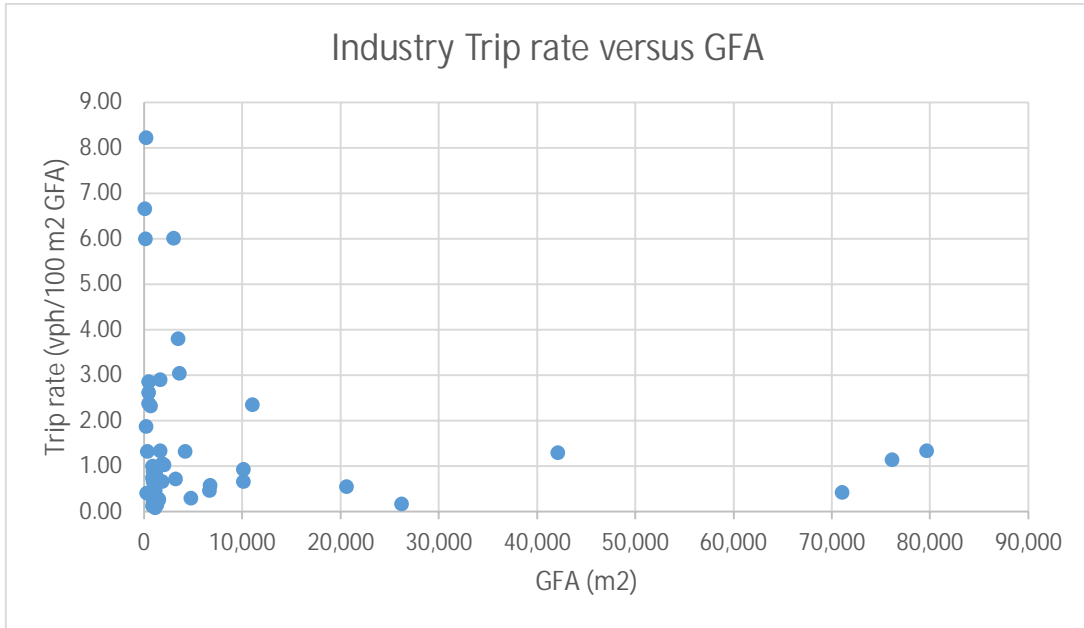


Figure 11: Industry trip generate rate versus GFA

101 Avenue Road North Intersection Flows

Full development of the site is expected to take between 5 and 10 years. A future 10-year assessment has therefore been undertaken.

The directional and in:out splits at the 101 Avenue Road North intersection for Stages 1 and 2 have been based on the pm site traffic count at the Avenue Road North/Keith Camp Place intersection. The directional split at the new road intersection is expected to be 25:75 to and from the north:south. The in:out split is expected to be 74:26 in the am peak period and the reverse in the pm. The directional and in:out splits result in a relatively high proportion of vehicles turning left into the site in the am peak period and right out of the site in the pm peak period.

The predicted movements for Stages 1 and 2 at the Avenue Road North intersection for the am and pm peak periods are shown in Figures 12 and 13. The calculations for these flow diagrams are provided in Appendix B. The critical movements are the right turn out in the pm peak (226 to 381 vph) and the right turn in, in the am peak (73 to 123 vph).

AM Flows
 Existing flows
 Movement split
 Consented flows 147 Using 0.7 1trip/100m2
 Subject site flows 256 Using 0.71 1trip/100m2
 Total flows on new road 403
 10 year flows (2031) 491

PM Flows
 Existing flows
 Movement split
 Consented flows 147 Using 0.7 1trip/100m2
 Site flows 256 Using 0.71 1trip/100m2
 Total flows 403
 10 year flows (2031) 491

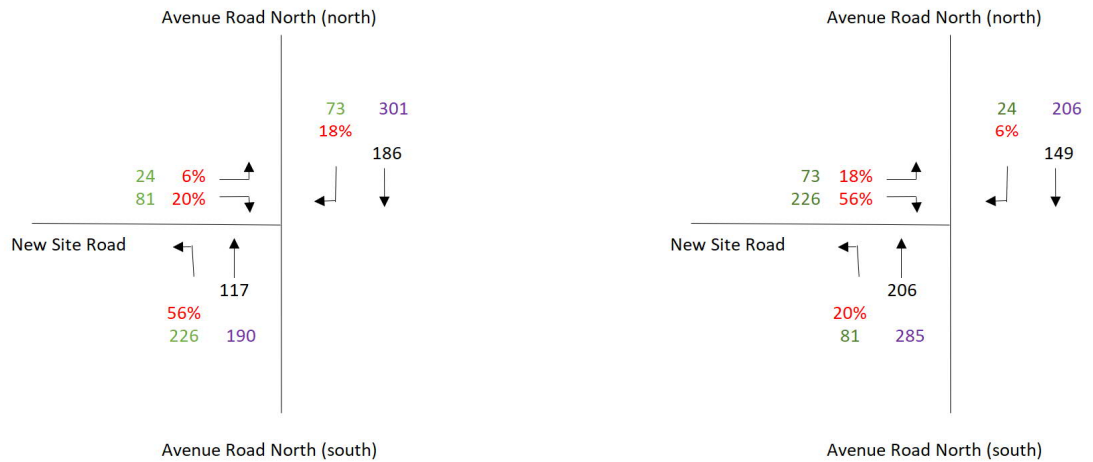


Figure 12: Site traffic flow diagrams using the predicted site trip generation rate of 0.71 trips/100 m² GFA.

AM Flows
 Existing flows
 Movement split
 Consented flows 147 Using 0.7 1trip/100m2
 Subject site flows 534 Using 1.48 1trip/100m2
 Total flows on new road 681
 10 year flows (2031) 491

PM Flows
 Existing flows
 Movement split
 Consented flows 147 Using 0.7 1trip/100m2
 Site flows 534 Using 1.48 1trip/100m2
 Total flows 681
 10 year flows (2031) 491

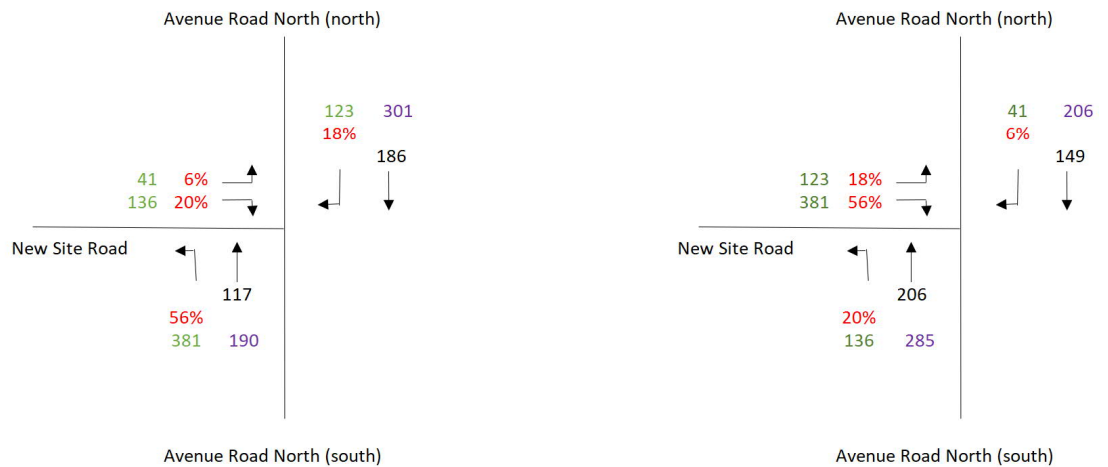


Figure 13: Site traffic flow diagrams using the maximum predicted site trip generation rate of 1.48 trips/100 m² GFA.

Construction Traffic

Peak hour earthwork and civil construction traffic volumes are expected to be approximately 25 vph, about 10% of the predicted site traffic volumes (256 vph), with a reversal of the in:out split and increased HCV volumes. No adverse traffic effects are expected as a result of these volumes. Earthworks and civil construction will occur over a relatively long period of time as the works will be staged.

Traffic associated with the construction of industrial buildings is not expected to have any noticeable effect on traffic flows other than a slight impact on the in:out traffic split. This is due to the relatively long period predicted for full development (five to ten years).

5.0 New Roads

The new roads associated with the proposed plan change are expected to be able to comply with the District Plan requirements as follows:

- A road reserve of 20 m,
- A 9 to 11 m wide carriageway (10 m proposed),
- A 1.5 m wide footpath/cycleway on one side,
- 4 to 6 m wide traffic lanes (5 m proposed),
- Parking of 2.5 m width on both sides of the road (informally provided by 10 m carriageway), and
- Street lighting is intended to be provided.

In addition, the following Regional Infrastructure Technical Specification requirements can be met:

- The new road intersection will have a minimum kerb radius of 13.5 m with corner splays of 6 m, and
- A turning head with a minimum radius of 15 m can be provided at the end of road cul-de-sacs.

It is expected that the new roads will function as local roads with a posted speed limit of 50 km/h.

The current design grades for the internal roads are shown in Figure 14. These range from 0.4% along the flat land in the centre and south of the site, to 8% on the roads at the north of the site. These grades meet the District Plan requirement of 10% or less for industrial local roads. Adverse crossfall issues on corners will be checked as part of the detailed design of this site. It is expected that any areas of concern will be addressed through localised flattening of grades at intersections and corners.

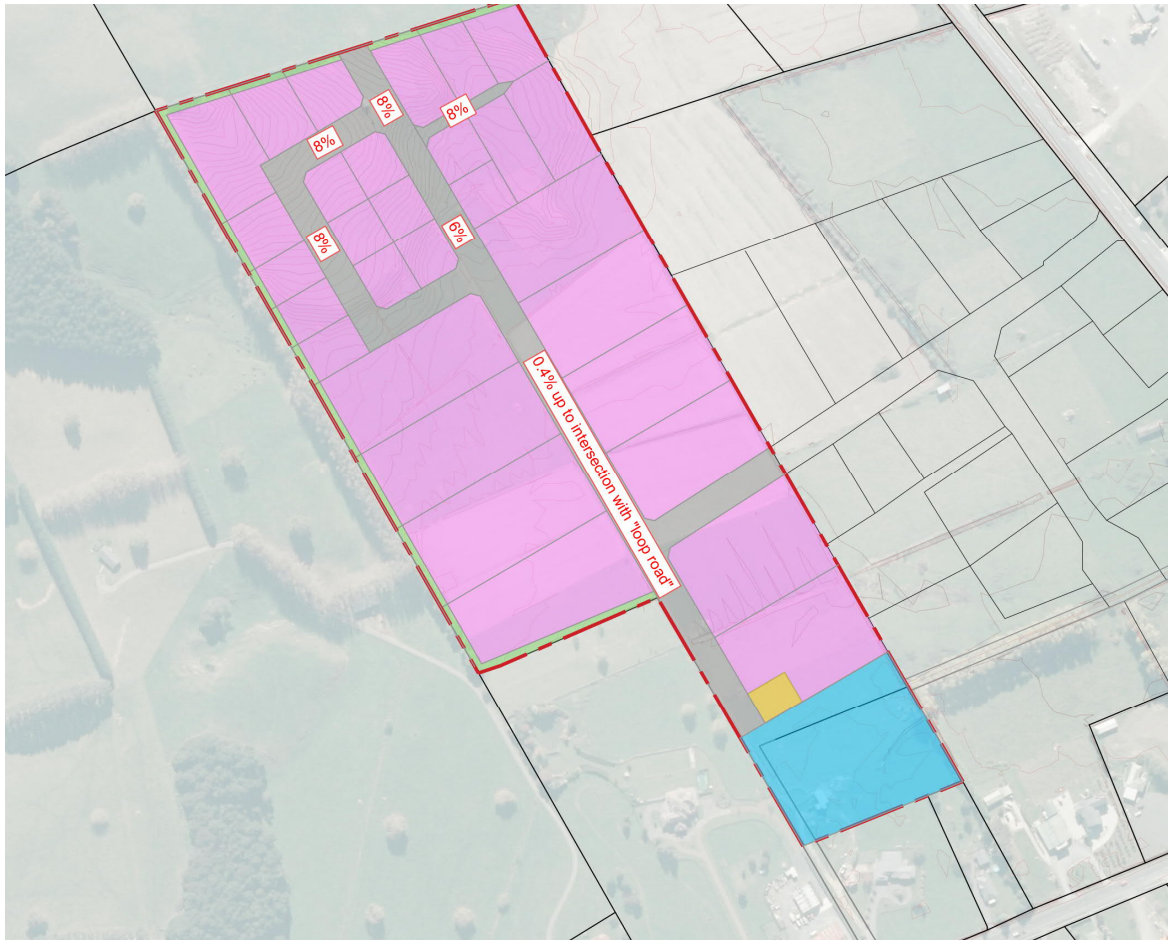


Figure 14: Industry trip generate rate versus GFA

It is noted that the concept layout of a crescent at the north end of the site could change in the design stage if issues arise with achieving grades and swept paths.

6.0 Avenue Road North/New Road Intersection

The construction of a new intersection on Avenue Road North has been approved by Council as part of the Stage 1 subdivision consent. The intersection location has sight distances in excess of 200 m, exceeding the District Plan requirement of 140 m for a 70 km/h environment. Sight distance photographs are provided in Figures 15 and 16.



Figure 15: Sight distance from the new intersection to the north



Figure 16: Sight distance from the new intersection to the south

The District Plan requires that intersections on the same side of the road be located 200 m apart in a 70 km/h environment. This criterion is met by the new road with State Highway 26 being the nearest intersection on the same side of Avenue North Road, approximately 450m south of the new road.

The District Plan requires intersections to be at least 30 m from adjacent accesses for either a 70 or 50 km/h speed environment. This requirement is not met as the proposed intersection location is only 9 m north of a dwelling at 114A Avenue Road North. Other accesses in the vicinity are Gibbons Engineering (37 m to the south) and Vowles Transport (58 m to the north).



Figure 17: Intersection location

The adverse effects of the intersection to access shortfall are considered to be adequately mitigated by the presence of the flush median, the right/left stagger of the access points, and the relatively low volume of traffic accessing the dwelling. This matter is discussed in detail in the Direction Traffic Design report "Industrial Subdivision, 101 Avenue Road North, Morrinsville" dated October 2021.

The intersection at 101 Avenue Road North will be constructed to a standard priority intersection with a right turn bay as part of the Stage 1 development. Engineering approval has recently been obtained from MPDC for the intersection design. The approved design layout is considered to be appropriate for the increased flows associated with the plan change land (Stage 2). A right turn bay is recommended by Austroads GTTM Part 6: 2020 Figure 3.25, provided in Figure 18 of this report. Austroads recommends that this intersection be channelised. However, channelisation is not recommended at this site as it would adversely affect adjacent accesses. A flag light will be provided at this intersection as part of the Stage 1 site works.

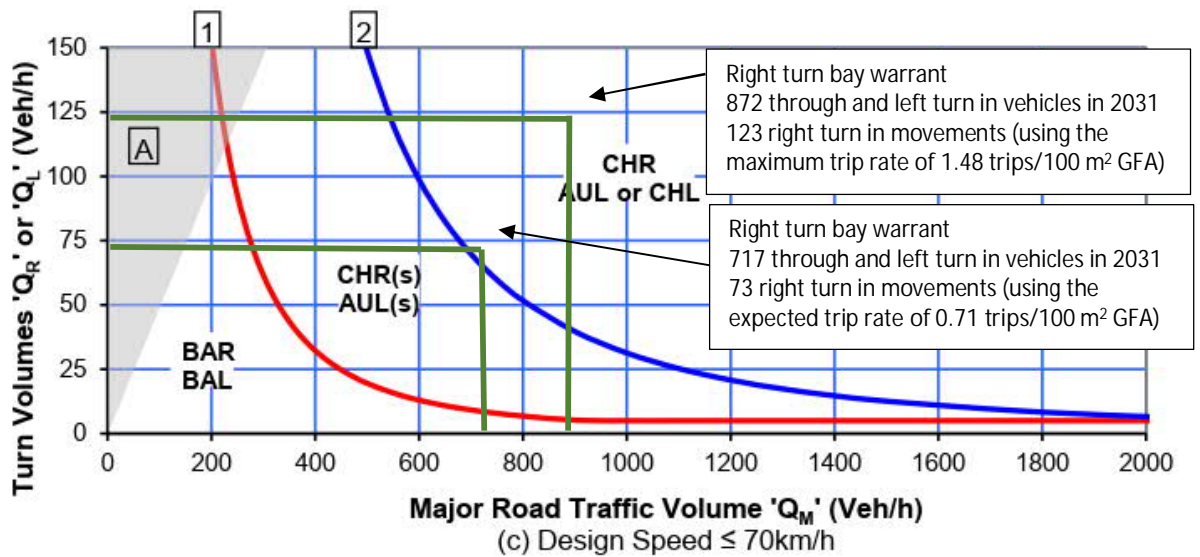


Figure 18: Austroads GTTM Part 6:2020 Figure 3.25 warrant for turn treatments

An assessment of capacity, delays and level of service for industrial use of the site has been undertaken using SIDRA Intersection 9 software for the 10-year design traffic flows. The assessment considers both the predicted trips and the likely maximum trips shown in the traffic flow diagrams in Figures 12 and 13. The results of this assessment are summarised in Table 2, with details provided in Appendix D. This assessment found that the new intersection would have a degree of saturation of no more than 0.347, average delays of 6.0 seconds, and a level of service A. These results indicate that there will be no capacity issues at this intersection and that queuing delays will be acceptable.

Table 2: SIDRA Summary for the Avenue Road North/new road intersection

Peak Period		Degree of Saturation (for worst movement)	Average Delay (for worst movement) (seconds)	LoS (for worst movement)
AM	Predicted trips (0.71 trips/100 m ² GFA)	0.247	5.9	A
	Maximum trips (1.48 trips/100 m ² GFA)	0.347	6.8	A
PM	Predicted trips (0.71 trips/100 m ² GFA)	0.209	5.9	A
	Maximum trips (1.48 trips/100 m ² GFA)	0.294	6.0	A

Inputs into the SIDRA assessment include the following:

- 14% HCVs on the new road (matching that found at Keith Camp Place).
- 5% HCVs on Avenue Road North (from traffic count data).
- A 10 m long short lane on the new road to account for the intersection flare.
- A 3 m wide right turn bay to the north and flush median exit lane to the south.

- Critical gaps in accordance with Austroads AGTTM Part 6 – right turn in critical gap of 4 seconds, headway gap of 2 seconds; right turn out critical gap of 3 seconds (crossing one lane only to the flush median) and headway gap of 3 seconds.

7.0 Avenue Road North

Kerb and channel will be installed on the west side of Avenue Road North along the site frontage as part of the Stage 1 site development. The existing sealed width of 10 m is considered appropriate for the predicted traffic flows following rezoning.

As part of the Stage 1 development a 1.5 m wide footpath and lighting will be constructed along the site frontage and along the north side of the internal road.

It is expected that the posted speed limit in the vicinity of the site will be reduced to 50 km/h by MPDC following development on the west side of Avenue Road North.

8.0 State Highway 26/Avenue Road Intersection

The proposed plan change is not expected to create any adverse traffic effects at the State Highway 26/Avenue Road intersection. The proposed upgrade of this intersection by Waka Kotahi/NZ Transport Agency will ensure that a safe layout is provided with increased capacity.

9.0 Vehicle Kilometres Travelled

Vehicle kilometres travelled (VKT) helps assess a site's impact on the environment as measured by factors such as emissions, impact on active and public transport travel modes, vehicle operating costs, road safety, amenity and travel times.

VKT by industrial sites are usually relatively high as goods are sourced and distributed. VKT are expected to be minimised at this site by the site location - close to Morrinsville and within an industrial area. Common destinations for industrial trips from this site include the surrounding industrial area, Morrinsville township, Hamilton, and nearby milk factories (Tatua and Waitoa). The site is well located to centrally service these areas.

10.0 Walking and Cycling Provision

Staff trips are expected to account for most walking and cycling trips at this site. Walking and cycling will be provided for by internal footpaths/cycleway along the new roads. Confident cyclists will also be able to cycle along the new road. This is appropriate given the new road's local road classification.

Ideally a pedestrian crossing facility, such as a refuge island, would be provided on Avenue Road North, linking the site to Morrinsville. However, such a facility cannot be provided at this site and still allow HCVs to fully enter the flush median ahead of intersections and

accesses. Pedestrians will be able to use the flush median when crossing to split this movement into two.

The concept plan allows for the future provision of a footpath/cycleway connection from the site onto State Highway 26. It is not intended to construct any pedestrian/cyclist facility in this location as part of the site development. Reasons for this are that there is expected to be limited pedestrian and cyclist demand from this direction, and safer access is provided via Avenue Road North. The construction of a pedestrian/cyclist link onto State Highway 26 would result in pedestrians and cyclists crossing State Highway 26 in a 70 km/h zone on a busy road. Ideally a crossing facility, such as a pedestrian refuge, would be constructed to provide for this movement. However, pedestrian refuge islands are not considered appropriate for 70 km/h posted speed areas. By allowing for a future connection this facility can be provided in the future if required and can be safety provided.

11.0 Consultation

Waka Kotahi will be consulted with regarding this proposal, and their feedback included in the final report provided with the Plan Change application.

12.0 Compliance with Policy and Other Frameworks

Government Policy Statement on Housing and Urban Development 2021

The Government Policy Statement on Housing and Urban Development directs local authorities to plan and enable a greater level of development. It encourages well-functioning, liveable urban environments, and requires councils to remove overly restrictive planning rules. The proposed plan change aligns with the objectives and policies of the Policy Statement, as the plan change area is located adjacent to an industrial area.

Government Policy Statement on Land Transport 2021

The 2021 Government Policy Statement on land transport sets out the government's priorities for spending from the National Land Transport Fund over the next 10 years. The GPS has four strategic priorities – safety, better travel options, improving freight connections, and climate change (Figure 19).

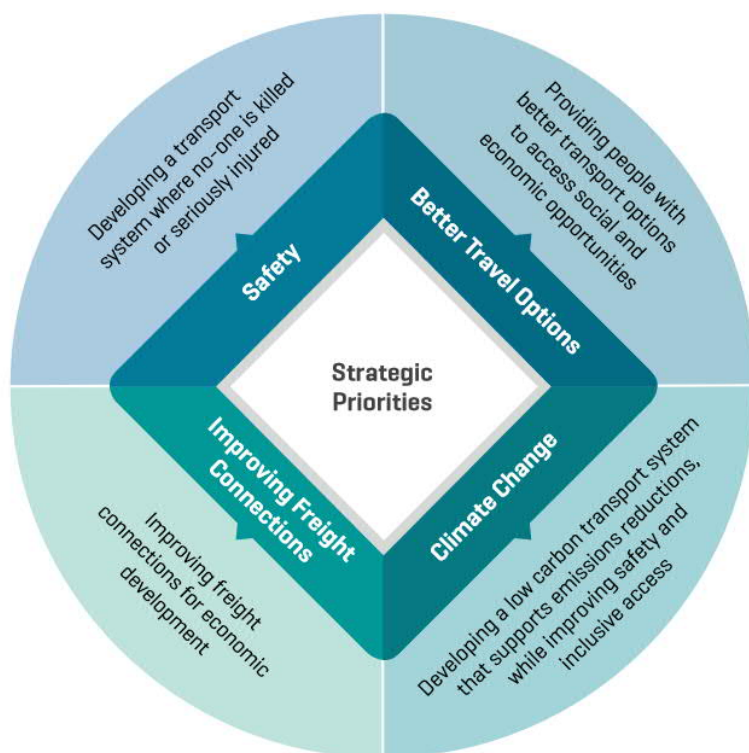


Figure 19: 2021 GPS Priorities

The proposed plan change is aligned with this policy statement for the following reasons:

- Safe access to the site will be provided.
- Good travel options to the site are available through the site's location within Morrinsville. Pedestrian and cycle access through the site will also be provided.
- Climate change effects will be minimised through reduced emissions resulting from the location of this site within Morrinsville. This location will allow staff from Morrinsville to use either active travel modes or to undertake short vehicle trips only compared to a site located distant to Morrinsville.

Safety Strategy 2020 – 2030 – Road to Zero

Waka Kotahi's "Road to Zero" safety strategy priorities human wellbeing, outlining a road safety system that supports road users to make good decisions, but accepts that all drivers can make mistakes. The vision of this strategy is "a New Zealand where no one is killed or seriously injured in road crashes. This means that no death or serious injury while travelling on our roads is acceptable".



Figure 20: Road to Zero focus areas

The proposed plan change complies with the vision of this strategy by providing a safe and well-designed site access.

District Plan Objectives and Policies

The Matamata-Piako District Plan has the following objectives:

- The strategic importance of significant transport infrastructure is recognised.
- A safe, efficient, integrated, and environmentally sustainable transport network that ensures our social, economic, and cultural wellbeing.
- The avoidance, remediation or mitigation of the adverse effects of transportation.
- To ensure that those activities that place demands on the roading network contribute fairly to any works considered necessary to meet those demands.
- To protect residential amenity from the effects of excessive traffic generation and on-street parking on residential streets.
- To maximise safety and convenience for pedestrians and vehicular traffic on all sites.
- Provision for parking and loading is adequate to ensure the safety and efficiency of the road network, without stifling development or leading to inefficient use of land.
- To encourage the provision of alternative transportation networks where it is clearly demonstrated that the provision of such networks will positively benefit and enhance the environment and community which they serve.

The proposed plan change site is considered to meet these objectives as the site ties in with adjacent industrial land, it will have efficient and safe access, and allows for the use of alternative transport modes.

District Plan Rules

Compliance with most District Plan rules cannot yet be demonstrated, as this site is currently at the concept stage only. However, it is anticipated that all District Plan and Development Manual requirements can be met at this site.

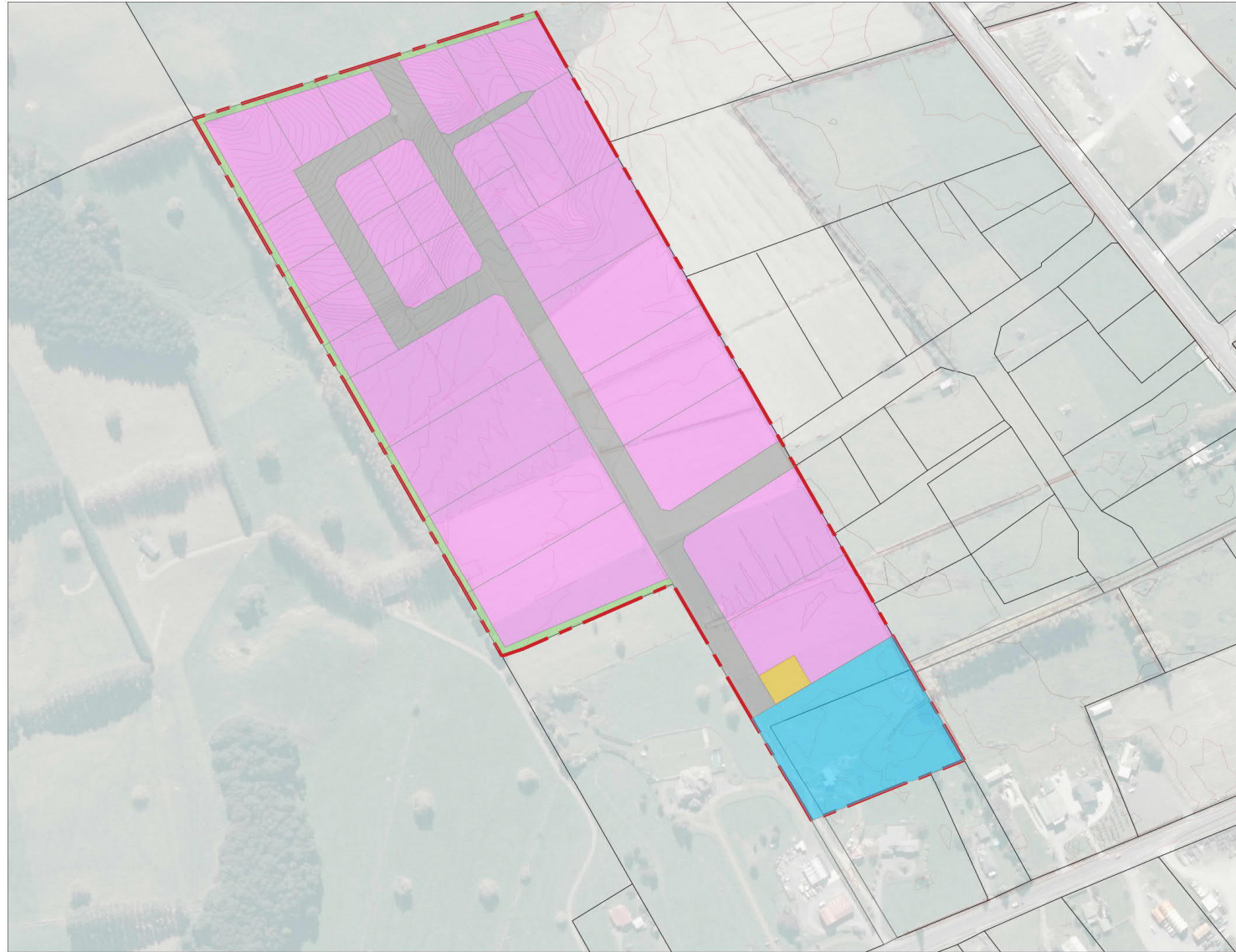
13.0 Conclusions

The proposed industrial plan change at Avenue Road North is not expected to result in any significant adverse traffic effects and is well suited to rezoning from rural to industrial from a transportation perspective.

The proposed plan change land will be serviced via a new road off Avenue North Road. The site is expected to generate between 256 and 534 vehicles in the peak hour. The increase in traffic flows at this intersection, over the consented Stage 1 industrial site traffic flows, will be accommodated by the proposed right turn bay and the existing flush median.

The new roads within the plan change site can be constructed to the District Plan and Regional Infrastructure Technical Specification requirements. The intended roading layout is considered to be appropriate, and will retain options for accessibility to adjacent land and to State Highway 26 in future should it be required. Pedestrians and cyclists can be appropriately provided for within the site.

Appendix A
Concept Plan



NOTES:

- LEGEND**
- EXISTING PROPERTY BOUNDARY
 - PROPOSED INDUSTRIAL ZONE
 - EXISTING / MAJOR CONTOUR (5m)
 - EXISTING / MINOR CONTOUR (0.5m)
 - PROPOSED INDUSTRIAL AREA
 - ROAD/ACCESS RESERVE
 - STORMWATER / MANAGEMENT RESERVE
 - LANDSCAPE BUFFER (5m)
 - UTILITY RESERVE

REVISION	DESCRIPTION	DATE
B	FOR DISCUSSION	DS 31.08.2022
A	FOR DISCUSSION	DS 28.07.2022
REVISION DETAILS:		BY: DATE:

TEKTUS
CONSULTANTS

CLIENT:
WARWICK AND MARION STEFFERT

SITE: AVENUE ROAD PLAN CHANGE

TITLE: CONCEPT LAYOUT PLAN

SUBTITLE:

DRAWN: DS	REVIEWED:	APPROVED:
NORTH:	SCALE AT A3: 1:2500	DATE: 31.08.2022
STATUS: FOR INFORMATION		
PROJECT NO: T21098	DRAWING NO: 100	REVISION: B

Appendix B

Traffic Count Data
Operating Speed Data

Location: 101 Avenue Road North
Client: Warwick & Marion Steffert
Job Number: 22069
Date: 29/07/2022
Time: 7:25 to 8:30 am and 4:30 to 5:30 pm
Weather: Showers

Time		Avenue Road North					
		North bound			South bound		
		Light	HCV	Total	Light	HCV	Total
7:30	7:35	12	2	14	24	1	25
7:35	7:40	5	1	6	15		15
7:40	7:45	4	1	5	15		15
7:45	7:50	5		5	17		17
7:50	7:55	13	2	15	12		12
7:55	8:00	4	2	6	18		18
8:00	8:05	17	1	18	14	1	15
8:05	8:10	14		14	15	2	17
8:10	8:15	9	1	10	11	3	14
8:15	8:20	9	1	10	13	1	14
8:20	8:25	9	1	10	18	1	19
8:25	8:30	16	1	17	14		14
Total				117			186
Directional split				39%			61%
4:30	4:35	13		13	11	3	14
4:35	4:40	13		13	12		12
4:40	4:45	24	1	25	20	1	21
4:45	4:50	14		14	8	1	9
4:50	4:55	14		14	15		15
4:55	5:00	13		13	13		13
5:00	5:05	11	1	12	14	2	16
5:05	5:10	33		33	9		9
5:10	5:15	12		12	10		10
5:15	5:20	20		20	8		8
5:20	5:25	14		14	12		12
5:25	5:30	23		23	10		10
Total				206			149
Directional split				58%			42%

Location: 101 Avenue Road North
Client: Avenue Industrial Park Ltd
Job Number: 21050
Date: 9/04/2021
Time: 8:35 to 9:00 am and 4:30 to 5:30 pm
Weather: Fine

Time		Avenue Road North		Keith Camp Place				Keith Camp Place			
		North bound	South bound	Left out	Right in	Right out	Left in	Left out	Right in	Right out	Left in
8:35	8:40	14	12	2	3						
8:40	8:45	11	10	3	2						
8:45	8:50	8	8	5	1		1				
8:50	8:55	11	12	2	2						
8:55	9:00	8	12	3		2					
8:55	9:00	5	9		1	1					
Total		57	63	15	9	3	1				
Hourly total		114	126	30	18	6	2				
Directional split		48%	53%	North	14%	South	86%				
In/out split				In	36%	Out	64%				
4:30	4:35	16	10	4	2	2				1	
4:35	4:40	17	21	2	1					2	
4:40	4:45	13	8	3	1		1			1	1
4:45	4:50	24	9	3	1					3	1
4:50	4:55	25	10	4	1	1				5	
4:55	5:00	21	7	4	2	3		1		3	
5:00	5:05	24	16		2	2				2	1
5:05	5:10	16	12	3	4	1					1
5:10	5:15	28	10	3		1	1			1	1
5:15	5:20	20	8	2						2	
5:20	5:25	17	6	1	1	1				4	1
5:25	5:30	19	13	5		3				2	1
Hourly total		240	130	34	15	14	2	1	26	2	7
Directional split		65%	35%	North	25%	South	75%	North	25%	South	75%
In/out split				In	26%	Out	74%	In	92%	Out	8%

Operating Speed Data

Location: 101 Avenue Road North
Client: Avenue Industrial Park Ltd
Job Number: 21050
Date: 9/04/2021
Time: 9:00 to 9:15 am
Weather: Fine

	Northbound	Southbound
	59	50
	62	64
	60	78
	58	71
	54	52
	55	60
	63	54
	73	62
	78	64
	50	57
	62	63
	67	72
	66	54
	69	50
	73	80
	59	66
	76	57
	68	70
	62	60
	60	72
	70	64
	66	61
		68
		62
85th Percentile	73	70

Appendix C

CAS Data

CODED CR	Crash road	Distance	Direc	Side road	ID	Date	Day of	Time	Description of events	Crash factors	Surface	Natural lig	Weather	Junction	Control	Casua	Casua	Casua
Avenue Road North																		
1314203	AVENUE R	78	S	SNELL STREET	2.022E+09	17/02/2022	Thu	13:53	Car/Wagon1 NDB on AVENUE ROAD NORTH hit rear of Ute2 NDB on AVENUE ROAD NORTH turning right from centre line	CAR/WAGON1, alcohol test below limit, attn diverted by scenery/persons outside vehicle UTE2, alcohol test below limit	Dry	Bright sun	Fine	Driveway	Nil	0	0	0
1234320	AVENUE R	234	N	ANDERSON STREET	2.02E+09	11/06/2020	Thu	11:59	Truck1 NDB on AVENUE ROAD NORTH hit Ute2 U-turning from same direction of travel	TRUCK1, alcohol test below limit UTE2, alcohol test below limit, did not check/notice another party behind, ENV: signs/signals ineffective or inadequate	Dry	Bright sun	Fine	Nil (Defau	Nil	0	0	2
1292465	AVENUE R	28	S	ANDERSON STREET	2.021E+09	16/07/2021	Fri	12:07	Car/Wagon1 NDB on AVENUE ROAD NORTH hit Ute2 U-turning from same direction of travel	UTE2, did not check/notice another party from other dirn	Dry	Bright sun	Fine	Nil (Defau	Nil	0	0	0
1263222	AVENUE R	47	N	THAMES STREET	2.02E+09	10/11/2020	Tue	10:30	Van1 SDB on Avenue Road North, Morrinsville hit turning Car/Wagon2	CAR/WAGON2, did not check/notice another party from other dirn, failed to give way entering roadway from driveway	Dry	Overcast	Fine	Driveway	Nil	0	0	0
State Highway 26																		
1202139	026-0017	616	W	AVENUE ROAD NORTH	201967158	17/09/2019	Tue	23:00	Ute1 EDB on SH 26, MORRINSVILLE, MATAMATA-PIAKO lost control; went off road to left, Ute1 hit other	UTE1, alcohol suspected, too far left	Dry	Dark	Fine	Nil (Defau	Unknown	0	0	1
1118655	SH 26	600	W	AVENUE ROAD NORTH	201732262	23/01/2017	Mon	16:00	Van1 SDB on SH 26 Morrinsville hit parked veh, Van1 hit non specific parked, non specific tree	VAN1, fatigue due to long day (working/recreation), fatigue due to lack of sleep, too far left	Dry	Overcast	Fine	Nil (Defau	Unknown	0	0	0
1189058	026-0017	591	W	AVENUE ROAD NORTH	201899030	4/11/2018	Sun	8:00	Car/Wagon1 EDB on SH 26 lost control; went off road to right, Car/Wagon1 hit drainage, fence, power pole,	CAR/WAGON1, alcohol test below limit, fatigue due to long day (working/recreation), too far right	Dry	Bright sun	Fine	Nil (Defau	Unknown	0	0	0
1168983	SH 26	430	W	AVENUE ROAD NORTH	201843276	5/07/2018	Thu	3:35	SUV1 EDB on SH 26, MORRINSVILLE, MATAMATA-PIAKO lost control; went off road to right, SUV1 hit non specific pole	SUV1, alcohol test below limit, other fatigue, too far right	Dry	Dark	Fine	Nil (Defau	Unknown	0	0	0
1192233	026-0017	420	W	AVENUE ROAD NORTH	2.018E+09	7/12/2018	Fri	17:57	Car/Wagon1 EDB on SH 26 changing lanes to left hit Car/Wagon2	CAR/WAGON1, alcohol test below limit, drugs suspected, speed on straight, sudden action CAR/WAGON2, alcohol test below limit	Dry	Bright sun	Fine	Nil (Defau	Unknown	0	0	0
1176532	SH 26	360	W	AVENUE ROAD NORTH	201850848	14/10/2018	Sun	17:30	Car/Wagon1 EDB on SH 26, MORRINSVILLE, MATAMATA-PIAKO hit rear of Car/Wagon2 EDB on SH 26, MORRINSVILLE, MATAMATA-PIAKO turning right from centre line	CAR/WAGON2, alcohol test below limit CAR/WAGON1, alcohol test below limit, failed to notice car slowing, stopping/stationary	Dry	Bright sun	Fine	Driveway	Nil	0	0	0
1305419	SH 26	224	W	AVENUE ROAD NORTH	2.022E+09	12/04/2022	Tue	8:30	Car/Wagon1 EDB on SH 26 hit rear end of Car/Wagon2 stop/slow for queue , Car/Wagon2 hit drainage	CAR/WAGON1, alcohol test below limit, fatigue due to lack of sleep, following too closely CAR/WAGON2, alcohol test below limit	Dry	Overcast	Fine	Nil (Defau	Nil	0	0	1
1201025	026-0017	191	W	AVENUE ROAD NORTH	201966049	30/04/2019	Tue	7:45	Car/Wagon1 EDB on SH 26 hit rear end of Car/Wagon2 stop/slow for queue	CAR/WAGON3, alcohol test below limit CAR/WAGON1, alcohol test below limit, failed to notice car slowing, stopping/stationary	Dry	Bright sun	Fine	Nil (Defau	Unknown	0	0	0
1201008	026-0017	150	W	AVENUE ROAD NORTH	201966032	30/04/2019	Tue	7:40	Car/Wagon1 EDB on SH 26, MORRINSVILLE, MATAMATA-PIAKO hit rear end of Car/Wagon2 stop/slow for queue	CAR/WAGON1, driver dazzled, failed to notice car slowing, stopping/stationary	Dry	Bright sun	Fine	Nil (Defau	Unknown	0	0	0

1242738	SH 26		118	W	AVENUE ROAD NORTH	2.02E+09	10/07/2020	Fri	18:20	Car/Wagon1 EDB on SH 26 hit rear end of Ute2 stop/slow for queue	UTE2, alcohol test below limit CAR/WAGON1, alcohol test below limit, failed to notice car slowing, stopping/stationary	Dry	Dark	Fine	Nil (Default)	Nil	0	0	0
State Highway 26/Avenue Road Intersection																			
1106758	AVENUE ROAD NORTH			I	SH 26	201711219	12/02/2017	Sun	16:38	Car/Wagon1 WDB on Thames Street hit Car/Wagon2 crossing at right angle from right, Car/Wagon1 hit non specific fence	CAR/WAGON2, failed to give way at priority traffic control, failed to notice control	Dry	Overcast	Fine	Crossroad	Give way	0	0	3
1108158	AVENUE ROAD NORTH			I	SH 26	201712631	9/04/2017	Sun	20:00	Car/Wagon1 WDB on State Highway 26 hit Car/Wagon2 crossing at right angle from right	CAR/WAGON2, failed to give way at priority traffic control	Dry	Dark	Fine	Crossroad	Give way	0	1	1
1177862	AVENUE ROAD NORTH			I	SH 26	201765019	14/01/2017	Sat	12:05	Car/Wagon1 SDB on AVENUE ROAD NORTH hit Car/Wagon2 crossing at right angle from right	CAR/WAGON1, failed to give way at priority traffic control	Dry	Bright sun	Fine	Crossroad	Give way	0	0	1
1172950	AVENUE ROAD NORTH			I	SH 26	201847257	20/08/2018	Mon	18:37	Car/Wagon1 WDB on Thames Street hit Car/Wagon2 crossing at right angle from right	CAR/WAGON2, alcohol test below limit, failed to give way at priority traffic control, fatigue due to lack of sleep CAR/WAGON1, alcohol test below limit, ENV: other signs or signals, street lighting failed	Wet	Dark	Fine	Crossroad	Stop	0	0	0
1192155	AVENUE ROAD NORTH			I	SH 26	2.018E+09	6/12/2018	Thu	15:20	Car/Wagon1 SDB on AVENUE ROAD NORTH hit Car/Wagon2 crossing at right angle from right	CAR/WAGON1, failed to give way at priority traffic control	Dry	Bright sun	Fine	Crossroad	Stop	0	0	0
1142313	AVENUE ROAD SOUTH			I	SH 26	201756234	8/12/2017	Fri	18:03	Car/Wagon1 WDB on Thames Street lost control turning left	CAR/WAGON1, alcohol test above limit or test refused, swung wide at intersection CAR/WAGON2, alcohol test below limit	Dry	Bright sun	Fine	Crossroad	Give way	0	0	0
1106936	SH 26			I	AVENUE ROAD NORTH	201711400	3/03/2017	Fri	20:28	SUV1 WDB on Thames Street hit Car/Wagon2 crossing at right angle from right	CAR/WAGON2, failed to give way at priority traffic control, failed to notice control	Dry	Dark	Fine	Crossroad	Give way	0	0	1
1249168	SH 26			I	AVENUE ROAD NORTH	2.02E+09	3/12/2020	Thu	5:23	Car/Wagon1 EDB on SH 26 hit Ute2 crossing at right angle from right, Car/Wagon1 hit traffic sign	CAR/WAGON1, speed approaching a traffic control, ENV: road surface uneven	Dry	Twilight	Fine	Roundabout	Give way	0	0	1
1152494	SH 26			I	AVENUE ROAD NORTH	201817859	13/09/2018	Thu	11:14	SUV1 EDB on CORNER SH 26 AND AVENUE ROAD NORTH, MORRINSVILLE 3300 hit Truck2 turning right onto AXROAD from the left	TRUCK2, alcohol test below limit, did not check/notice another party from other dirn, failed to give way at priority traffic control SUV1, alcohol test below limit	Dry	Overcast	Fine	Crossroad	Stop	0	0	1
1237560	SH 26			I	AVENUE ROAD NORTH	2.02E+09	2/06/2020	Tue	13:55	Truck1 EDB on SH 26 hit Ute2 turning right onto AXROAD from the left	UTE2, failed to give way at priority traffic control	Dry	Bright sun	Fine	Roundabout	Give way	0	0	0
1105643	SH 26			I	AVENUE ROAD NORTH	201700356	29/11/2017	Wed	10:20	Car/Wagon1 WDB on Thames Street hit Car/Wagon2 crossing at right angle from right	CAR/WAGON2, failed to give way at priority traffic control, failed to notice control, impaired ability due to old age, ENV: islands necessary, signs/signals necessary	Dry	Bright sun	Fine	Crossroad	Give way	1	0	2
1106089	SH 26			I	AVENUE ROAD NORTH	201710539	26/01/2017	Thu	15:00	Car/Wagon1 WDB on Thames Street hit Car/Wagon2 crossing at right angle from right, Car/Wagon1 hit non specific traffic sign	CAR/WAGON2, failed to give way at priority traffic control	Dry	Bright sun	Fine	Crossroad	Give way	0	0	2

1187462	SH 26		I	AVENUE ROAD NORTH	201897967	24/08/2018	Fri	17:30	Car/Wagon1 EDB on SH 26 lost control turning left; went off road to left	CAR/WAGON1, alcohol test below limit, lost control when turning, speed entering corner/curve	Wet	Overcast	Fine	Crossroad	Give way	0	0	0
1147100	SH 26		I	AVENUE ROAD NORTH	201812430	19/03/2018	Mon	18:00	Car/Wagon1 EDB on State Highway 26 hit Car/Wagon2 turning right onto AXROAD from the left	CAR/WAGON1, alcohol test below limit CAR/WAGON2, alcohol test below limit, did not check/notice another party from other dirn, failed to give way at priority traffic control	Dry	Bright sun	Fine	Crossroad	Give way	0	0	1
1298648	SH 26		I	AVENUE ROAD NORTH	2.021E+09	9/10/2021	Sat	22:43	Car/Wagon1 EDB on SH 26 hit Car/Wagon2 crossing at right angle from right	CAR/WAGON2, alcohol test below limit CAR/WAGON1, alcohol test below limit, failed to give way at priority traffic control	Dry	Dark	Fine	Roundabo	Give way	0	0	0

Appendix D

SIDRA Assessment

MOVEMENT SUMMARY

Site: 101 [2032 AM 0.71 rate (Site Folder: General)]

101 Avenue Road Intersection
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV] %	[Total veh/h]	[HV] %	v/c	sec		[Veh. veh]	[Dist] m				km/h
South: Avenue Road - South														
1	L2	226	14.0	238	14.0	0.247	4.8	LOS A	0.0	0.0	0.00	0.29	0.00	47.7
2	T1	190	5.0	200	5.0	0.247	0.1	LOS A	0.0	0.0	0.00	0.29	0.00	48.3
Approach		416	9.9	438	9.9	0.247	2.6	NA	0.0	0.0	0.00	0.29	0.00	48.0
North: Avenue Road - North														
8	T1	301	14.0	317	14.0	0.178	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	73	5.0	77	5.0	0.050	5.9	LOS A	0.2	1.8	0.49	0.60	0.49	45.2
Approach		374	12.2	394	12.2	0.178	1.2	NA	0.2	1.8	0.10	0.12	0.10	48.9
West: Site access														
10	L2	24	14.0	25	14.0	0.020	5.4	LOS A	0.1	0.6	0.29	0.52	0.29	45.7
12	R2	81	14.0	85	14.0	0.064	5.4	LOS A	0.1	0.8	0.24	0.63	0.24	45.5
Approach		105	14.0	111	14.0	0.064	5.4	LOS A	0.1	0.8	0.25	0.61	0.25	45.5
All Vehicles		895	11.4	942	11.4	0.247	2.4	NA	0.2	1.8	0.07	0.26	0.07	48.1

MOVEMENT SUMMARY

Site: 101 [2032 PM 0.71 rate (Site Folder: General)]

101 Avenue Road Intersection
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV] %	[Total veh/h]	[HV] %	v/c	sec		[Veh. veh]	[Dist] m				km/h
South: Avenue Road - South														
1	L2	81	14.0	85	14.0	0.209	4.7	LOS A	0.0	0.0	0.00	0.12	0.00	48.6
2	T1	285	5.0	300	5.0	0.209	0.1	LOS A	0.0	0.0	0.00	0.12	0.00	49.3
Approach		366	7.0	385	7.0	0.209	1.1	NA	0.0	0.0	0.00	0.12	0.00	49.1
North: Avenue Road - North														
8	T1	206	14.0	217	14.0	0.122	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
9	R2	24	5.0	25	5.0	0.015	5.7	LOS A	0.1	0.6	0.45	0.55	0.45	45.3
Approach		230	13.1	242	13.1	0.122	0.6	NA	0.1	0.6	0.05	0.06	0.05	49.4
West: Site access														
10	L2	73	14.0	77	14.0	0.068	5.9	LOS A	0.3	2.1	0.38	0.58	0.38	45.5
12	R2	226	14.0	238	14.0	0.171	5.3	LOS A	0.3	2.3	0.23	0.63	0.23	45.5
Approach		299	14.0	315	14.0	0.171	5.4	LOS A	0.3	2.3	0.27	0.62	0.27	45.5
All Vehicles		895	10.9	942	10.9	0.209	2.4	NA	0.3	2.3	0.10	0.27	0.10	47.9

MOVEMENT SUMMARY

Site: 101 [2032 AM 1.48 rate (Site Folder: General)]

101 Avenue Road Intersection
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV] %	[Total veh/h]	[HV] %	v/c	sec		[Veh. veh]	[Dist] m				km/h
South: Avenue Road - South														
1	L2	381	14.0	401	14.0	0.343	4.8	LOS A	0.0	0.0	0.00	0.35	0.00	47.3
2	T1	190	5.0	200	5.0	0.343	0.1	LOS A	0.0	0.0	0.00	0.35	0.00	47.9
Approach		571	11.0	601	11.0	0.343	3.3	NA	0.0	0.0	0.00	0.35	0.00	47.5
North: Avenue Road - North														
8	T1	301	14.0	317	14.0	0.178	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	123	5.0	129	5.0	0.105	6.8	LOS A	0.5	3.7	0.59	0.71	0.59	45.0
Approach		424	11.4	446	11.4	0.178	2.0	NA	0.5	3.7	0.17	0.20	0.17	48.4
West: Site access														
10	L2	41	14.0	43	14.0	0.034	5.4	LOS A	0.1	1.0	0.30	0.53	0.30	45.7
12	R2	136	14.0	143	14.0	0.115	5.6	LOS A	0.2	1.6	0.28	0.67	0.28	45.4
Approach		177	14.0	186	14.0	0.115	5.5	LOS A	0.2	1.6	0.29	0.63	0.29	45.5
All Vehicles		1172	11.6	1234	11.6	0.343	3.2	NA	0.5	3.7	0.11	0.34	0.11	47.5

MOVEMENT SUMMARY

Site: 101 [2032 PM 1.48 rate (Site Folder: General)]

101 Avenue Road Intersection
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV] %	[Total veh/h]	[HV] %	v/c	sec		[Veh. veh]	[Dist] m				km/h
South: Avenue Road - South														
1	L2	136	14.0	143	14.0	0.244	4.8	LOS A	0.0	0.0	0.00	0.17	0.00	48.3
2	T1	285	5.0	300	5.0	0.244	0.1	LOS A	0.0	0.0	0.00	0.17	0.00	49.0
Approach		421	7.9	443	7.9	0.244	1.6	NA	0.0	0.0	0.00	0.17	0.00	48.7
North: Avenue Road - North														
8	T1	206	14.0	217	14.0	0.122	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
9	R2	41	5.0	43	5.0	0.028	5.9	LOS A	0.1	1.0	0.49	0.58	0.49	45.3
Approach		247	12.5	260	12.5	0.122	1.0	NA	0.1	1.0	0.08	0.10	0.08	49.1
West: Site access														
10	L2	123	14.0	129	14.0	0.114	6.0	LOS A	0.5	3.6	0.39	0.60	0.39	45.5
12	R2	381	14.0	401	14.0	0.294	5.5	LOS A	0.6	4.8	0.26	0.67	0.29	45.4
Approach		504	14.0	531	14.0	0.294	5.6	LOS A	0.6	4.8	0.30	0.65	0.31	45.4
All Vehicles		1172	11.5	1234	11.5	0.294	3.2	NA	0.6	4.8	0.14	0.36	0.15	47.3



2 Balfour Crescent, Riverlea, Hamilton
tara.hills@directiontd.co.nz

22nd December 2022

Matamata-Piako District Council

Dear Sir/Madam,

Plan Change 58: Avenue Business Park
Response to Council Traffic Feedback

This letter responds to a letter dated the 9th December 2022 from Matamata Piako District Council providing feedback and response on the Avenue Road Plan Change (PC58) draft application.

Section 6 of Council's letter discusses traffic matters. Council have advised that matters for discussion/action are as follows:

[6.1 Response to Gray Matter review](#)

[6.2 The future proofing of a link to SH26 needs consideration. The current plan change does not foreclose this option but is also does not establish any formal corridor or protection of the link. I consider we should at least require concept plans fore a future link and what any alignment will look like/how it will affect existing building/houses/boundaries.](#)

Responses to the Gray Matter review are provided in this letter, and the link to SH26 is discussed within this response. This letter should be read in conjunction with the Direction Traffic Design Integrated Transport Assessment for PC58, dated October 2022.

6.1 Response to Gray Matter Review

Gray Matter have set out comments on their review of the Direction Traffic Design Integrated Transportation Assessment for PC58 (the ITA) in a letter dated the 9th December 2022. The further information requested in the Gray Matter letter is listed and responded to below.

[1. Provide an assessment of safety and efficiency effects at the Snell Street/Avenue Road intersection as a result of the private plan change.](#)

The Snell Street/Avenue Road intersection is a 70 degree corner approximately 240m northwest of the Stage 1 Avenue Business Park intersection (the Stage 1 intersection) with Avenue Road North. It has a 55m radius, a speed advisory sign of 45 km/h and chevron boards directing traffic around the corner. Access is provided to an industrial site on the outside corner, and a flaglight is provided at this access.



Figure 1: Snell Street/Avenue Road North intersection

Peak hour traffic volumes on Avenue Road North/Snell Road are expected to increase by approximately 64 vehicles to a total of 588 vehicles per hour (vph) with the PC58 traffic and using a 25:75 north:south directional split. This represents an 11% increase in traffic at this corner above the Stage 1 flows. These figures are from Figure 12 of the ITA, and use 10-year future flows.

Safety Effects

The NZTA Crash Analysis System (CAS) has one crash in the vicinity of this corner in the last five years. This crash occurred 78m to the south of Snell Street and consisted of a rear end crash between two northbound vehicles, with the first vehicle turning right from the centreline. The crash details for this event are attached to this letter. As there have been no recent loss of control crashes on this corner it is considered that the site signage (doubled up curve advisory signs and chevronboards) is appropriately mitigating safety concerns associated with this out of context corner.

Crash rates on this corner are expected to increase with exposure (volume) only, with no change proposed to any traffic features at this corner.

Efficiency Effects

Efficiency effects are expected to be minimal on this corner. The predicted flow of 588 vph presents no efficiency concerns for two-lane two-way traffic flows. This flow equates to an average of one vehicle every six seconds. This flow allows for right turn out movements from adjacent accesses and intersections which typically require critical gaps of five seconds for light vehicles. While truck and trailer units will require longer gaps of approximately seven to ten seconds, these are expected to be accommodated by the predicted flows. Average delays for light vehicles are expected to be 2.7 seconds, with maximum delays of 15 seconds for a truck and trailer unit requiring a 10 second critical gap.

Adam's Formula

$$W = \frac{1}{\lambda e^{-\lambda t}} - \frac{1}{\lambda} - t$$

Flow (lambda)	588	588
Critical gap (t)	5	10
Delay (w)	2.7	15.2

2. Provide an updated layout of the consented intersection (Stage 1 Avenue Business Park) which ensures that there is sufficient space for heavy vehicle manouvering. The layout needs to ensure that swept paths and clearances for a semi-trailer can be accommodated at the intersection without encroaching kerbs or opposing traffic lanes. The pedestrian refuge island should be a minimum 2m wide to accommodate pedestrians safely.

The Stage 1 intersection layout will be amended to ensure that swept paths do not cross into opposing through lanes or go over the pedestrian refuge island. The pedestrian refuge island will be increased to a width of 2m if possible. It is noted that the current 1.8m width is the RITS minimum allowable.

3. Provide an assessment of effects of additional traffic using the right turn bay within the flush median on Avenue Road North. The assessment needs to consider effects on the vehicle crossings located on the opposite side of the road.

The District Plan requires accesses to be located 30m from an intersection. Adjacent accesses on Avenue Road North within 30m of the Stage 1 intersection consist of a residential access 7m to the south of this intersection.

Right turn out of residential access

The predicted 95% queue length in the right turn bay with PC58 traffic is a maximum of 1.8m in the am peak period, with average delays of 5.9 seconds (data from the ITA). While traffic turning right out of the residential access will occasionally need to wait for right turn in PC58 traffic, the predicted queue length and delay shows that queued traffic is expected to have a relatively minor impact on this movement. The right/left stagger of these crossing places puts the right turn out movements from both sites in conflict with each other.

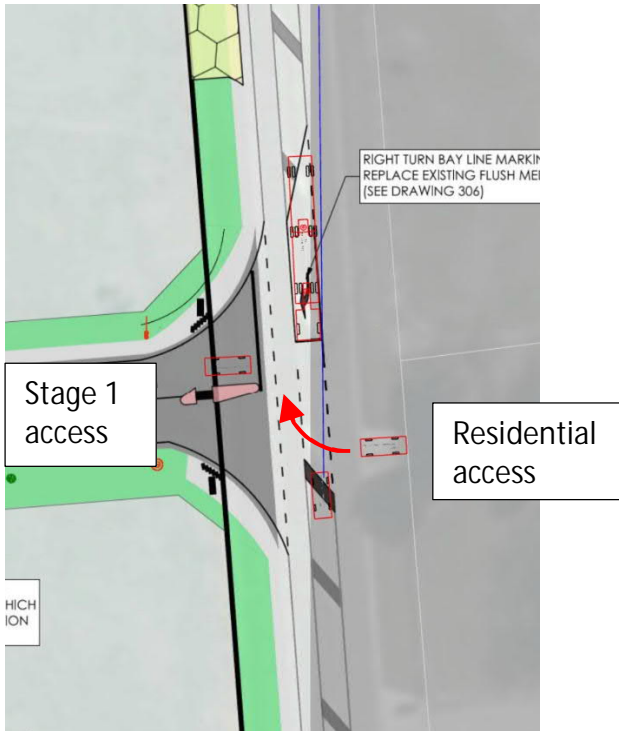


Figure 2: Stage 1 right turn bay effects

Left turn out of residential access

Traffic turning left out of the residential access are also potentially in conflict with traffic turning right out of the Stage 1 intersection.

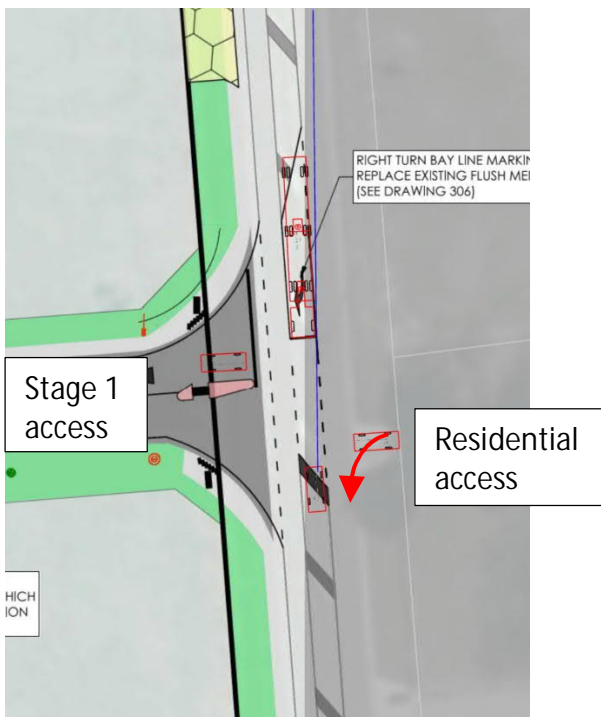


Figure 3: Stage 1 right turn bay effects

Right turn into residential access

Traffic turning right into the residential access have right of way over traffic turning right out of Stage 1, but the close proximity of these accesses creates conflict. Traffic turning right into the residential access may have reduced sight distances if trucks are waiting in the right turn bay.

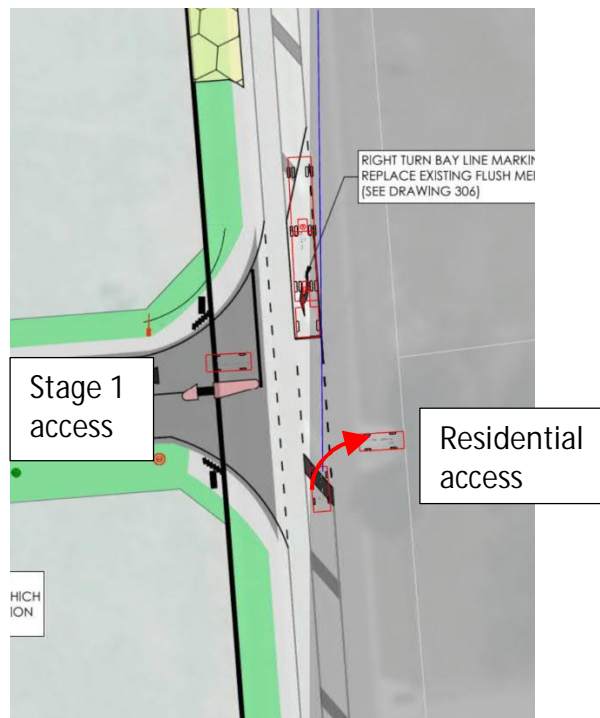


Figure 4: Stage 1 right turn bay effects

While the reduced separation distance to the residential access is less than desirable, it is considered to be acceptable given the relatively low volume of traffic accessing the dwelling, the presence of the flush median, and the right/left stagger of the accesses.

The presence of the flush median helps to mitigate the separation shortfall by providing right turn in vehicles a safe place to wait for approaching traffic. The right/left stagger of the access points ensures that waiting right turn in vehicles do not affect sight distances for vehicles exiting either Stage 1 or the residential access. The dwelling is expected to generate approximately 1.2 vph in the peak hour (NZ Transport Agency Research Report 453 Table 7.4), creating minimal conflicts with vehicles turning right out of the Stage 1 access (81 vph predicted with the PC58 traffic).

4. Provide a detailed assessment of effects at the SH26/Avenue Road roundabout which assesses the scale of change in safety and efficiency at the roundabout as a result of the proposed plan change. This should include proposed directional splits from the plan change at the SH26/Avenue Road North Intersection.

The SH26/Avenue Road roundabout is currently proposed for construction in the 23/24 season. The final design is not yet confirmed or made public as it is going through a detailed design safety audit. Waka Kotahi have advised that it will be a single-lane roundabout, with a similar configuration to what is currently on site. It is expected that intersection capacity

assessment work has been undertaken to confirm the design, however this work is not expected to be available until the design is made public.

As Waka Kotahi have raised no concerns with the capacity of this roundabout with the PC58 traffic, it is considered a reasonable assumption to make that the assessments show that there is adequate capacity for the PC58 traffic.

5. Provide an assessment of how direct access to SH26 could be provided in the future including consideration of appropriate intersection form on SH26.

A direct SH26 connection would reduce travel times for PC58 traffic wishing to travel to the west, and would improve integration with the state highway network. However, these benefits are not considered to outweigh the impact on state highway traffic associated with such a connection, particularly given that all PC58 traffic can be accommodated by the Avenue Road North intersection. A connection to SH26 would affect efficiency on the state highway, and would therefore be undesirable to NZTA unless there was good justification for such a connection. Justification for such a connection could be capacity issues at the Avenue Road roundabout, or to support further development which could not be accommodated via the Avenue Road North roundabout.

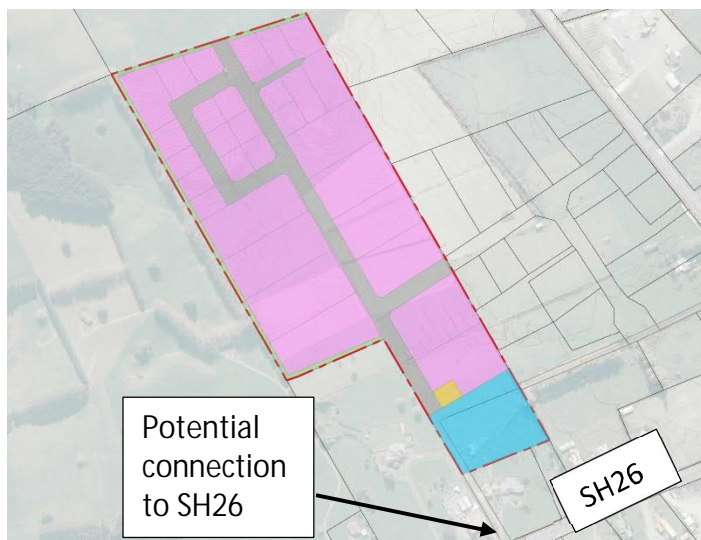


Figure 5: Stage 1 right turn bay effects

A new SH26 intersection is therefore only likely to be constructed in future if it is required to provide access to other land west or north of the PC58 site (subject to zoning changes) or if a roading connection is progressed by MPDC between SH26 and Hangawera Road.

A basic SIDRA assessment of a priority intersection at this location indicates that it would operate satisfactorily, with a Level of Service of C, maximum average delays of 15 seconds and a maximum degree of saturation of 47%. The inputs to this assessment are listed below, and the SIDRA movement summary sheet is attached to this letter.

- Traffic volumes have been extrapolated from the short traffic count on the 13 December 2022, with 10-year growth at 3%, with reversed flows for the PM assessment.
- The site in:out split is from the Keith Camp Place traffic count provided in the ITA.
- The directional split is assumed to be 75:25 to the west: east. Most traffic using this intersection are expected to be westbound, with eastbound traffic using the Avenue Road North intersection.
- The traffic volume is assumed to be all of the PC58 site of 256 vph (some PC58 traffic will use the Avenue Road North connection, but some Stage 1 traffic will use the SH26 connection).
- All SIDRA defaults have been used except for Austroads gaps of 4,2 for the right turn in and 5,3 for the right turn out.
- A 60m long right turn bay is used.
- A 10m left turn out lane is used.

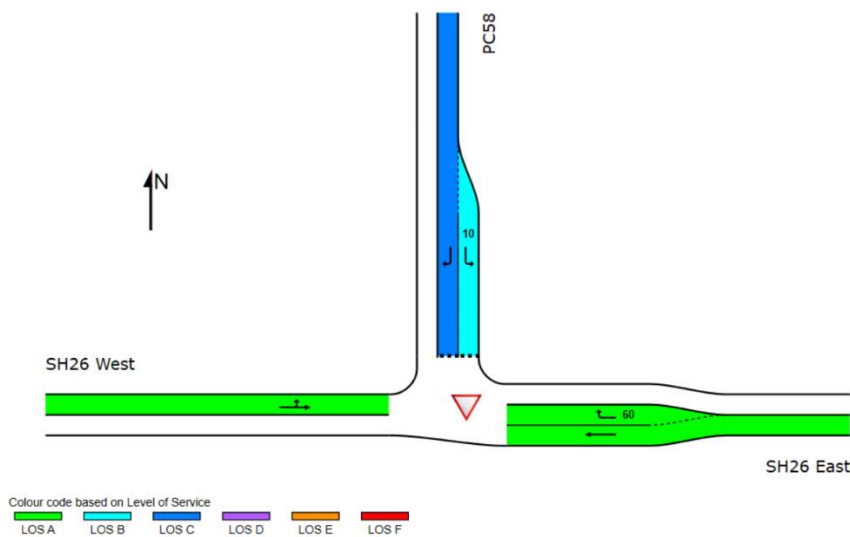


Figure 6: SH26 connection lane Level of Service

The use of turning restrictions at a SH26 connection could also be considered. Right turn out movements could be directed to the Avenue Road roundabout, approximately 470m east of the SH26 connection. This would significantly improve the capacity of such an intersection and reduce effects on the state highway.

Although the intersection is not required for access for PC58, there are no obvious transportation reasons why the intersection could not be provided if it is required in future. Amendments have been made to the Avenue Business Park Development Area Plan (ADAP) to identify a 'Potential Future Vehicle Connection to SH26' and to ensure that a future roading corridor is retained west of the stormwater management reserve (see response to point 9).

6. Provide a sensitivity assessment of the proposed trip distribution to capture future trips to and from the north once residential activities are further established (i.e. Lockerbie Plan Change).

The flow diagrams and capacity assessments in the ITA used a directional split of 25:75 to the north:south. This was based on flows from a nearby intersection (Keith Camp Place).

A sensitivity assessment has been undertaken in this letter for a directional split of 35:65 to the north:south at the Stage 1 intersection with Avenue Road North. This directional split is expected to appropriately account for traffic from the Lockerbie Plan Change and other residential developments to the north of the site. The SIDRA results for this assessment show that the intersection will operate satisfactorily with 35% of traffic travelling to/from the north. This scenario resulted in improved capacity compared with the 25:75 split, as the number of right turn out movements is decreased. The 35:65 split assessment has a maximum degree of saturation of 20%, maximum average delays of 5.9 seconds, and a Level of Service A. The 25:75 directional split has been used in the remainder of this letter, as the more conservative assessment.

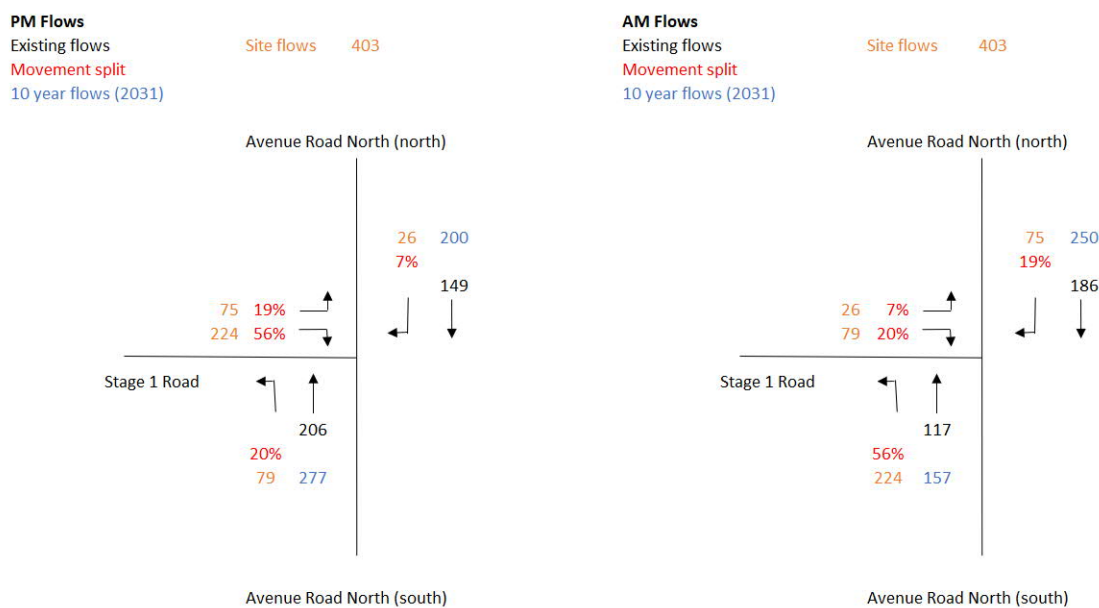


Figure 7: Flow diagrams for 25% of traffic to/from the north

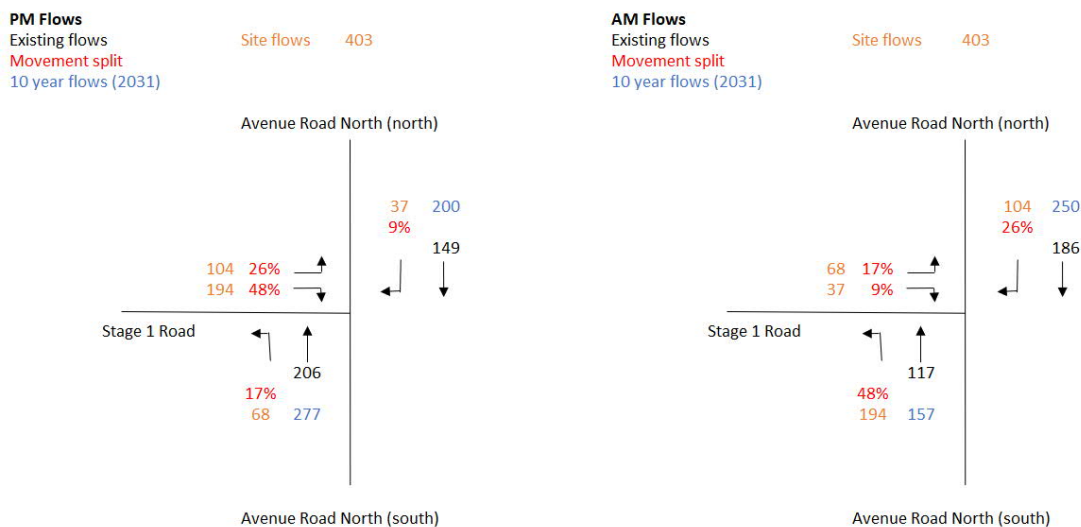


Figure 8: Flow diagrams for 35% of traffic to/from the north

Table 1: SIDRA Summary for 10-year flows – directional split sensitivity testing

	Directional Split	Degree of Saturation (for worst movement)	Average Delay (for worst movement) (seconds)	LoS (for worst movement)
AM	25:75 to the north:south	0.246	6.2	A
	35:65 to the north:south	0.204	5.9	A
PM	25:75 to the north:south	0.208	6.0	A
	35:65 to the north:south	0.197	5.9	A

The SIDRA inputs used in this assessment are the same as that used in the ITA, with the assessment undertaken for the predicted trip generation rate of 0.71 trips/100m² GFA). Assessment results for the 35% split to the north scenario are attached to this letter.

A more robust assessment has also been undertaken for this intersection in the am peak period with right turn out traffic not using the flush median to exit (critical and headway gaps of 5 and 3 seconds respectively). This assessment has a maximum degree of saturation of 25%, maximum average delays of 6.9 seconds, and a Level of Service A. The movement summary for this assessment is attached to this letter.

7. Provide a detailed assessment of the effects on the surrounding road network including but not limited to Avenue Road North, Snell Street, Snell Street/Studholme Street intersection. The assessment should identify any potential safety or efficiency effects including effects as a result of additional heavy traffic on the surrounding road network and if mitigation is required to ensure that the network operates safely.

Avenue Road North

Peak hour traffic volumes on Avenue Road North are expected to increase by approximately 192 vehicles to a total of 780 vehicles per hour (vph) with the PC58 traffic in the pm peak hour. This represents a 25% increase in traffic above the Stage 1 flows.

Safety Effects

The CAS database has four crashes on this road, an increase of one from the ITA. One crash is the rear end discussed in the Avenue Road/Snell corner section of this letter. One crash occurred to the south of the Stage one intersection, this was a minor injury crash resulting from a U-turning truck colliding with a northbound vehicle. One crash was just to the south of Anderson Street, this was a turning crash. The last crash was just north of the SH26 roundabout, and was a rear end crash.

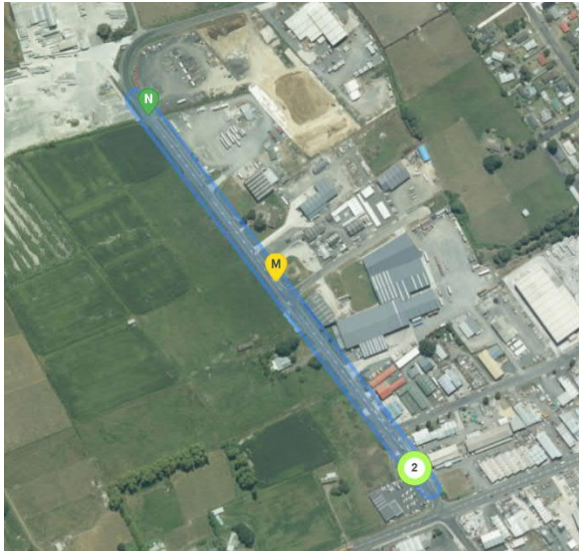


Figure 9: Crash locations on Avenue Road North

Crash rates on this road are expected to increase with exposure (volume) on this road, with a slight increase in severity due to the increased HCV percentage. The increased exposure and severity is expected to be no worse on this road compared to other roads.

The increase in traffic on this road will make it more difficult for pedestrians and cyclists to cross, and could increase the severity of any crashes that occur. Locating this site away from a town would avoid this issue, but would increase the exposure of vehicles travelling further to access the site. The location of this site on the outskirts of Morrinsville is considered to limit both conflicts with pedestrians and travel distance.

Pedestrian crossing facilities will be provided where possible to mitigate safety concerns for pedestrians. The location of pedestrian crossing facilities is discussed in Item 13.

Efficiency Effects

Efficiency effects are expected to be minimal on this road. The predicted flow of 780 vph equates to an average of one vehicle every 4.6 seconds. Average delays for light vehicles turning right out of side accesses is expected to be 4 seconds, with maximum delays of 26 seconds for a truck and trailer unit requiring a 10 second critical gap.

Adam's Formula

$$W = \frac{1}{\lambda e^{-\lambda t}} - \frac{1}{\lambda} - t$$

Flow (lambda)	780	780
Critical gap (t)	5	10
Delay (w)	4.0	25.7

Snell Street

Peak hour traffic volumes on Snell Street are expected to increase from 366 vph (traffic count data attached to this letter) to 471 vph (an increase of 135 vph assuming a 35% split to the north). This represents an 18% increase in traffic for the PC58 flows only (85 vph).

Snell Street has parking provided on both sides. As there is limited parking demand on this street, the parking width also provides for cyclists. Footpaths are provided on both sides. No pedestrian crossing facilities are provided along this road.

Safety Effects

CAS shows that there have been four crashes on Snell Street in the last five years. Two crashes occurred at the Young Street Intersection, and two crashes occurred at the west end of this road. The two crashes at Young Street included one turning crash and once crash where a vehicle swerved to avoid a pedestrian. The two crashes at the west end of the site were both loss of control crashes, with one of the crashes resulting in a minor injury. The crash history indicates a pattern of loss of control crashes in the 70 km/h length of Snell Street. Making all of Avenue Road North and Snell Street 50 km/h would help address this matter. This change in the posted speed limit is a matter for Council to consider. The lack of pedestrian crossing facilities on Snell Street is also considered to be an existing matter to be considered by Council.

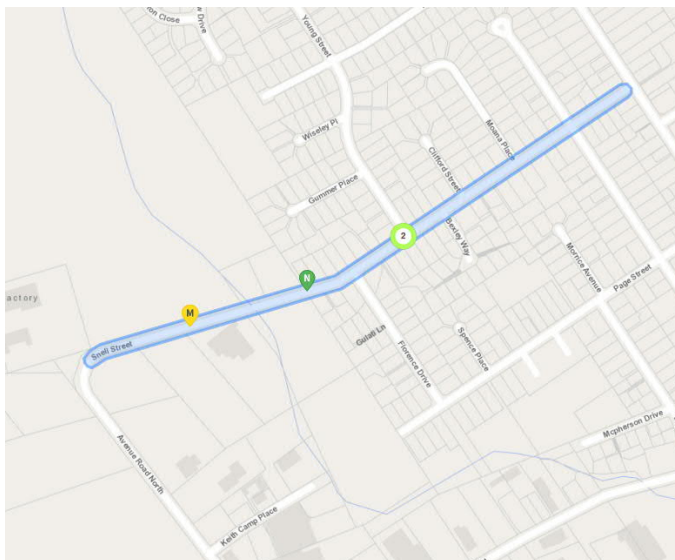


Figure 10: Crash locations on Snell Street

Efficiency Effects

Efficiency effects are expected to be minimal on this road. The predicted peak hour flow of 471 vph equates to an average of one vehicle every 7.6 seconds. Average delays for light vehicles turning right out of side accesses is expected to be 2.1 seconds.

Adam's Formula

$$W = \frac{1}{\lambda e^{-\lambda t}} - \frac{1}{\lambda} - t$$

Flow (lambda)	471
Critical gap (t)	5
Delay (w)	2.1

Snell Street/Studholme Street Intersection

This is a standard priority T-intersection with a right turn bay. No splitter island is provided on Snell Street. There is a sealed shoulder provided for cyclists and parking along Studholme

Street. 'No stopping' linemarking is provided opposite Snell Street, and a pedestrian refuge island is provided to the south of the intersection on Studholme Street.



Figure 11: Snell/Studholme Street intersection

Safety Effects

The CAS database shows that there have been three crashes at this intersection in the last five years. One crash involved a vehicle entering/leaving a driveway hitting a pedestrian on the footpath, resulting in two minor injuries. One involved a southbound vehicle colliding with a vehicle at a driveway. The last crash involved a southbound vehicle which lost control, resulting in one minor injury. None of these crash types are expected to be affected by the proposal traffic.

Truck and trailer units turning left out of Snell Street were observed to cross into the right turn bay on Studholme Street. Conflicts are expected to occasionally occur due to the relatively high volume of right turn traffic at this intersection.

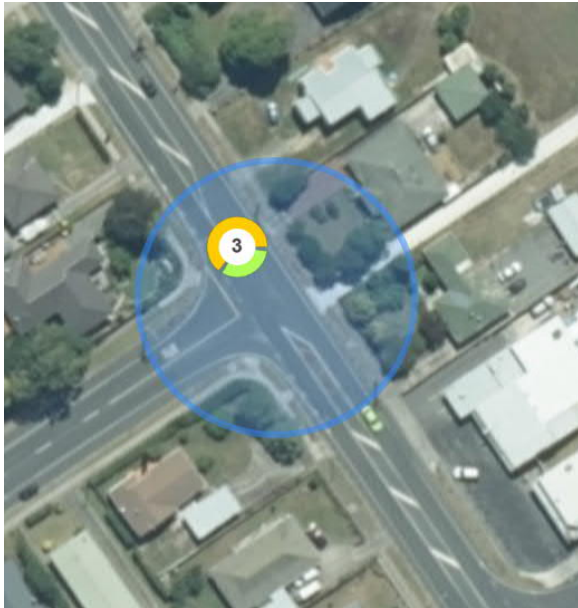


Figure 12 Crash locations at the Snell/Studholme Street intersection

Efficiency Effects

Traffic counts were undertaken at this intersection on the 13th December 2022 (data attached to this letter). A 10-year capacity assessment of these flows with 3% growth at 35% of site traffic travelling to the north has been undertaken. A 10m short turning bay was used on Snell Street, and a 60m right turn bay was used on Studholme Street. HCV percentages used were 10% on Snell Street and 3% on Studholme Street. Austroads critical gaps were used.

For the predicted traffic flows delays for the right turn out movement in the peak period is expected to be about 12.9 seconds, with a worst Level of Service of B, a maximum 95% back of queue of 6.3m and degree of saturation of 27%. This demonstrates that this intersection will operate well with the PC58 traffic. The movement summary for this assessment is attached to this letter.

8. Provided updated cross sections which include provisions for cyclists, pedestrians and safe turning facilities within the plan change area. The cross-sections should also be appropriate for the current and future form and function of the road.

The proposed cross-section for the PC58 roads matches the approved cross-section for the Stage 1 development. Cycling is provided for on-road, as is usual for a local road. A footpath is provided on one side of the road only due to stormwater constraints in this area.

The north/south road within the PC58 area will be constructed as a local road, with the same cross-section as the east/west road. A local road standard is all that is required to service the PC58 area. If Council intend for this road to be constructed to a collector standard, and for it to service a greater area, then this increase in standard could be accommodated at Council's cost.

9. Provide an updated Structure Plan that does not preclude access to the west and SH26 and shows walking and cycling facilities within the proposed PC58 area.

The Avenue Business Park Development Area Plan (ADAP) shown below has been updated to more clearly future proof the potential for a connection to SH26.

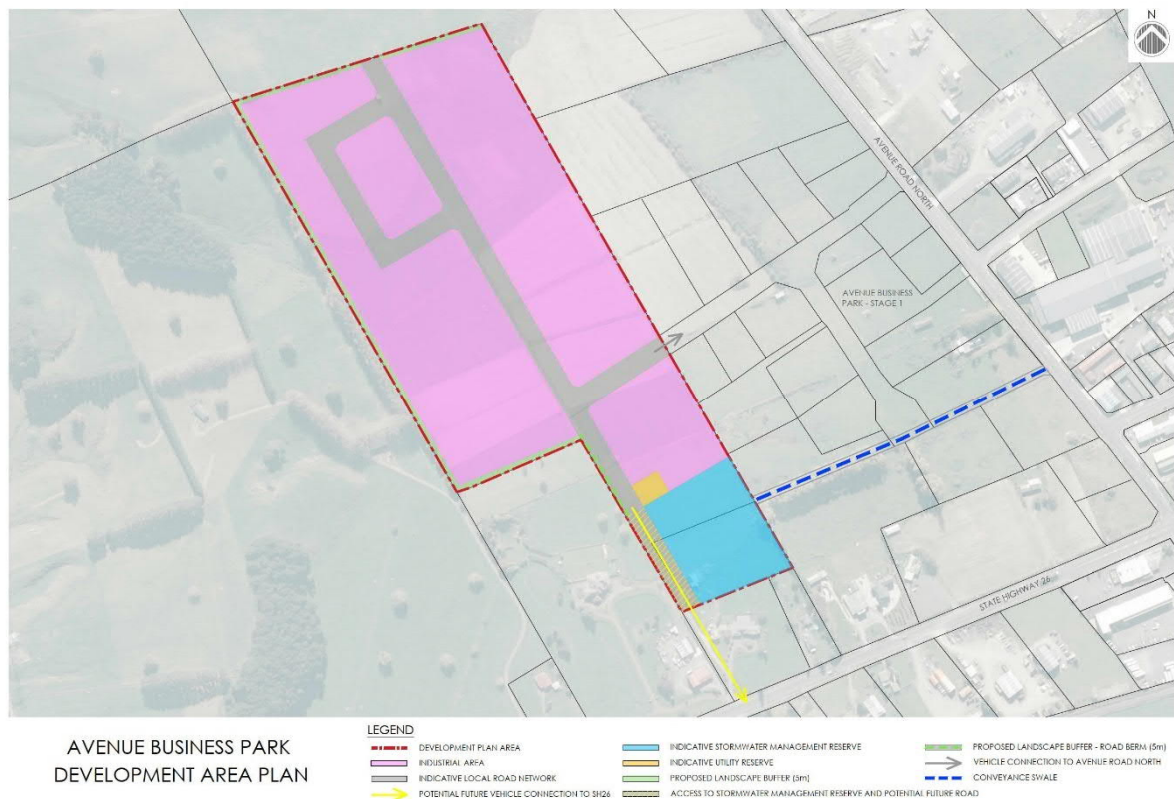


Figure 13: Updated Structure Plan

Cycling will be provided for on the road. This is considered to be appropriate given the local road classification and the expected volumes (peak hour flows of 256 vph at the connection to the Stage 1 site).

Footpaths will be provided on one side of all roads. On the extension of the Stage 1 road the footpath will continue on the north side of this road. For the Plan Change north/south road, the location of the footpath will be determined at the design stage, and is likely to be influenced by the stormwater design.

Access to the west is not precluded by the layout of the roads shown on the ADAP. The north-south road directly adjoins the boundary of an adjoining site to the west. This would enable an appropriate connection point as any potential future change in zoning/land use west of the PC58 site is most likely to occur near the SH26 frontage due to topographical constraints to the north-west (also see response to point 12).

10. Provide evidence of consultation with WRC related to PT access to the proposed development.

The Applicant met with Waikato Regional Council on the 11th November 2022. At this meeting WRC did not raise any concerns relating to public transport. Applicant planning notes from this meeting advise the following:

- Transport – WRC consider the site is well located to safely and efficiently connect and provide accessibility to existing networks. They encourage consideration of objectives and policies relating to climate change effects caused by transport emissions, although the plan has existing objectives and policies and this may be a wider transportation issue than just the GIZ. Ben agreed to consider.

As the site roads are local roads it is not anticipated that any public transport will enter the site, but that the site would be serviced by public transport along Avenue Road North (subject to public transport services being provided).

11. Provide an assessment of the development against the Waikato Regional Land Transport Plan and the Regional Policy Statement. Provide an assessment of the proposal against Regional Public Transport Plan.

Waikato Regional Land Transport Plan (2021-2051)

The Waikato Regional Land Transport Plan sets out the intent for developing the region’s land transport system. It includes a strategic approach for strategic corridors and economic development, road safety, and access and mobility. It has a vision for “an integrated, safe and resilient transport system that delivers on the well-beings of our diverse Waikato communities”.

Table 3: Waikato Regional Land Transport Plan Assessment

Objectives	Policies	Comments
An efficient and resilient land transport system that advances regional economic wellbeing, and facilitates the movement of people and freight on strategic corridors in the upper North Island	<ul style="list-style-type: none"> • Develop, maintain and protect the primary strategic freight corridor SH1/29 and NIMT/ECMT 	N/A
	<ul style="list-style-type: none"> • Protect efficiency of the strategic transport network, particularly the Waikato Expressway. 	The efficiency of SH26 is protected through site access to this route via the Avenue Road North roundabout.
	<ul style="list-style-type: none"> • Improve network resilience and route security on key strategic corridors. 	Network resilience is provided by the potential link to SH26.
	<ul style="list-style-type: none"> • Plan for and invest in rail for both interregional freight and passenger services. 	N/A
	<ul style="list-style-type: none"> • Support inter-regionally significant transport activities. 	N/A
	<ul style="list-style-type: none"> • Manage outcomes of national freight logistics and Port decisions. 	N/A
	<ul style="list-style-type: none"> • Develop and grow use of regional cycling trails and provide safe connections to regional tourist attractions. 	N/A

Objectives	Policies	Comments
A planned transport response that supports liveable urban areas and future growth areas.	<ul style="list-style-type: none"> • Develop multi-modal transport solutions that support agreed national, regional and spatial planning outcomes for housing and growth. • Ensure regionally significant transport corridors serve the future transport needs of the region. • Support key urban development projects that support Hamilton-Waikato metro spatial outcomes. 	<p>PC58 will provide for pedestrians and cyclists.</p> <p>PC58 allows for connections to surrounding land.</p> <p>N/A</p>
A safe, accessible transport system in the Waikato region, where no one is killed or seriously injured.	<ul style="list-style-type: none"> • Regional Road Safety Forum to oversee and deliver road safety in the region. • Safety programmes and interventions targeted to highest risk users. • Regionally consistent approach to speed management. • Address safety concerns that hinder use of active modes and public transport options. 	<p>N/A</p> <p>Pedestrians and cyclists are provided for in PC58.</p> <p>The proposed speed limit of 50 km/h is consistent with other industrial areas in Morrinsville.</p> <p>Pedestrians and cyclists are appropriately provided for.</p>
A transport system that provides an inclusive range of integrated, safe, accessible, quality travel choices for people to meet their social, economic and cultural needs.	<ul style="list-style-type: none"> • Provide an inclusive transport system, including: <ul style="list-style-type: none"> ○ Public transport in and between centres ○ Rapid and high frequency public transport on core corridors in greater Hamilton ○ Passenger rail between Hamilton and Auckland ○ Alternative delivery modes to improve rural access ○ Safe and accessible walking and cycling networks. • Promote initiatives that support travel behaviour change, mode shift and compact urban form. • Look for funding opportunities to advance access and mobility outcomes. • Uptake new technology to enhance transport outcomes. 	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>Provided at this site.</p> <p>The proximity of the site to Morrinsville township will encourage active modes of transport.</p> <p>N/A</p> <p>N/A</p>

Objectives	Policies	Comments
An environmentally sustainable, energy efficient and low-carbon transport system that delivers emissions reductions and enhances communities' long-term resilience to the effects of climate change.	<ul style="list-style-type: none"> • Embedding climate change and environmental sustainability considerations into our planning and decision-making, and giving effect to national priorities. • Encouraging urban form that supports low carbon and low emission transport options. • Reducing the adverse effects of transport on the environment, public health and communities. • Working collaboratively to address route security and climate change effects on transport. 	These policies are supported by the site location, on the edge of Morrinsville, which allows for either active modes of transport or short trips to reach the site.
Collaboration around spatial and place-based planning results in a safe and efficient transport system that supports thriving and healthy urban and rural communities and economic wellbeing.	<ul style="list-style-type: none"> • Supporting the region's strategic transport and land use pattern. • Collaborative advocacy for funding of the region's integrated land use and transport priorities. 	The location of the site, of the edge of Morrinsville, supports place-based planning. N/A

Waikato Regional Policy Statement

A detailed assessment of the WRPS is provided in the planning report for PC58.

2022-2032 Regional Public Transport Plan

The regional public transport plan sets out the "priorities and needs of public transport services and infrastructure to be delivered in the Waikato". One focus of the plan is to service more rural communities.

Table 5: 2022-+2032 Regional Public Transport Plan

Relevant Plan Objectives	Comments
Objective 2: Deliver an integrated network of public transport services that enhances accessibility and wellbeing.	It is expected that any future local bus routes within Morrinsville will service the site via Avenue Road North, with a possible

Objective 5: Provide the infrastructure and services necessary for an accessible, effective, efficient and enjoyable public transport experience.

exception being if a link road through the site is developed.
Access to regional services is provided via bus stops on SH26, on either side of Avenue Road North.

12. Update plan provisions to include proposed cross-sections, future road connections (i.e. to the west).

It is intended that the road cross sections will match that approved for Stage 1. Specific cross sections are not considered to be necessary given the design of roads will need to be in accordance with the Regional Infrastructure Technical Specifications (RITS) or any other relevant standard applying at the time.

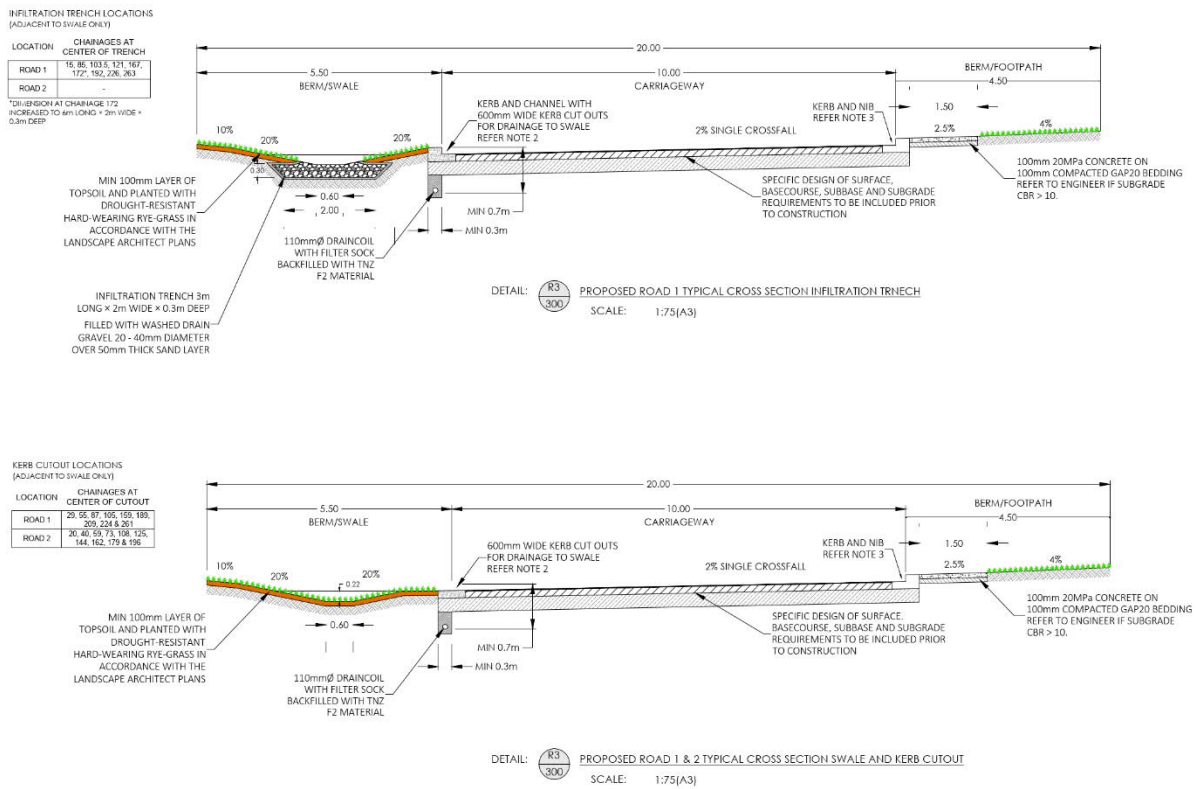


Figure 14: Stage 1 consented cross sections

No connection to the west via a continuation of the Stage 1 east/west road is proposed. As the ITA discusses:

- Should it occur, any development to the west of the site is expected to justify the construction of a direct connection to State Highway 26 to improve site accessibility;
- This connection would only service a relatively small area;
- A western connection via a continuation of the Stage 1 east/west road results in poor site utilisation with additional roading plus a narrow strip of unusable land to the south of any such connection; and

- A connection to land to the west is able to be provided along the southern end of the north/south road where it directly adjoins the land to the west.

13. Provide an assessment of where a safe pedestrian crossing could be provided on Avenue Road North including an assessment of the appropriate crossing facility at this location including what environmental changes are required to support a safe crossing facility i.e. safer posted speed (noting that changes to speed will need to be implemented by the RCA).

The provision of a pedestrian crossing on Avenue Road North is constrained by existing accesses along this road. A swept path assessment has been provided below to determine appropriate locations for crossing facilities. A standard 4.91m long 85th percentile car with 0.3m clearance has been used for residential and light accesses, an 8m medium rigid truck with 0.5m clearance has been used for medium sized lots, and a 19.8m B-train unit with 0.5m clearance has been used for existing heavy industrial accesses and larger industrial lots.

It is expected that pedestrian crossing facilities will be provided on all legs of the SH26/Avenue Road roundabout.

Possible locations for additional crossing facilities on Avenue Road North include:

1. 40m north of the Stage 1 intersection; and
2. 70m north of Anderson Street

These sites will be investigated further to see if crossings can be provided in these locations.

Swept path diagrams for the pedestrian assessment are provided in Figures 15 to 18. These figures run consecutively from north to south.

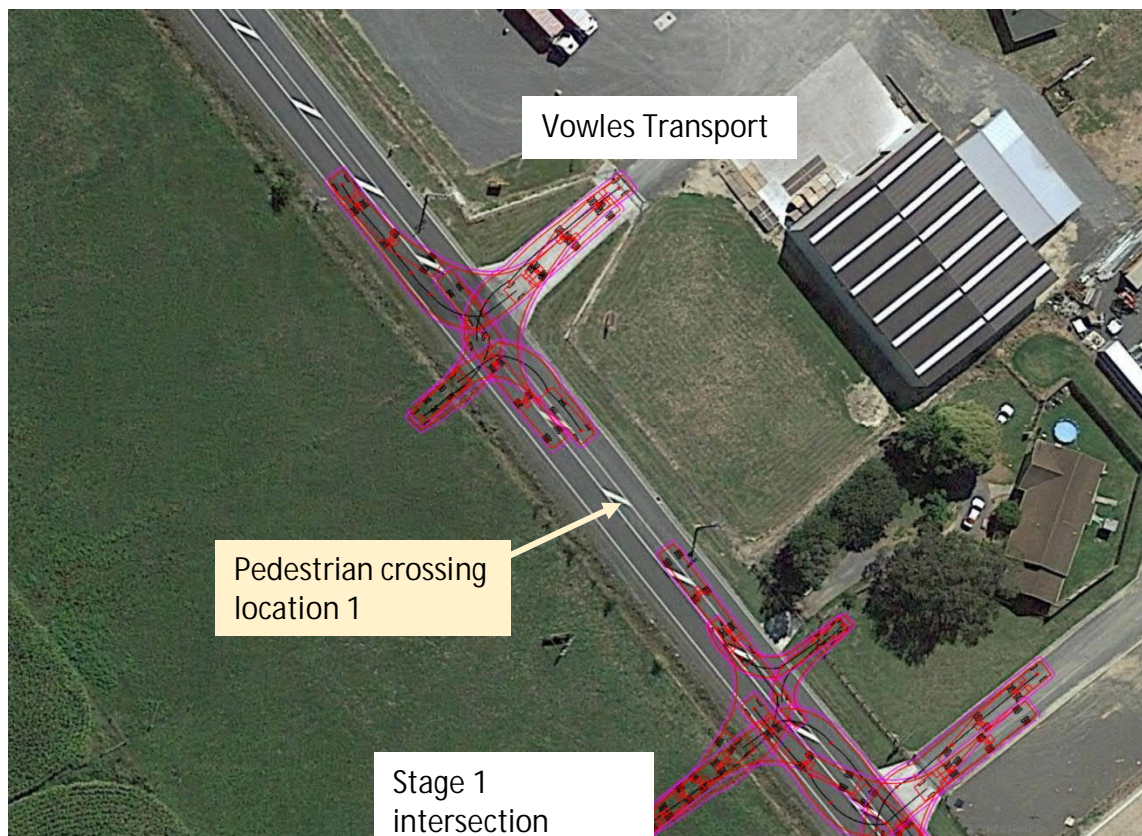


Figure 15: Avenue Road North pedestrian assessment – Vowles Transport to Stage 1 intersection



Figure 16: Avenue Road North pedestrian assessment –Stage 1 intersection to Keith Camp Place

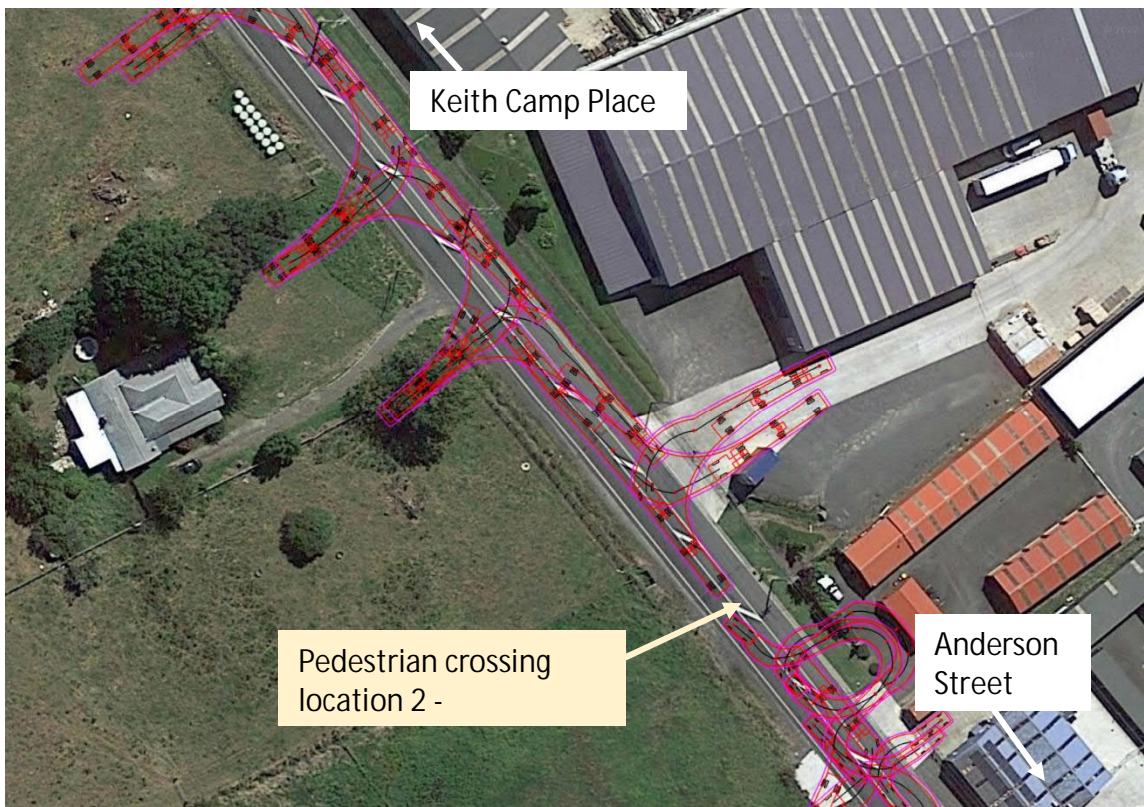


Figure 17: Avenue Road North pedestrian assessment – Keith Camp Place to Anderson Street



Figure 18: Avenue Road North pedestrian assessment – Anderson Street to SH26

The appropriate form for any pedestrian crossing facilities is a pedestrian refuge. This facility is a good compromise between improving pedestrian safety and minimising effects to traffic. The installation of a pedestrian crossing facility is only recommended in areas with a 50 km/h posted speed. Both recommended crossing locations are in 70 km/h areas, with the 50 km/h posted speed limit located just north of Anderson Street, extending to the south. It is therefore recommended that Council consider lowering the speed limit along all of Avenue Road North and Snell Street to 50 km/h prior to the construction of these crossing facilities. If the speed is reduced and if locations 1 and 2 are confirmed to be suitably clear of swept paths then it is expected that pedestrian refuges can be easily installed on the 2m wide flush median on Avenue Road North.

14. Provide clarity regarding the traffic count table at Appendix B of the ITA i.e. what there the two sets of data titled Keith Camp Place representing.

The second set of Keith Camp Place data is HCV volumes, which were only recorded in the PM traffic count.

15. Clarify the existing and planned footpath network in the wider area i.e. footpath along the east side of Avenue Road and at the SH26/Avenue Road roundabout.

The existing footpath network in the wider area is shown in Figure 19.



Figure 19: Existing footpath provision

The proposed Stage 1 footpath provision is indicated in Figure 20.



Figure 20: Stage 1 footpath network

16. Provide an assessment of the potential effects of the consent road cross-section to accommodate the additional trips generated by the PC58 and any mitigation required.

The expected trips along the Stage 1 east/west road will increase from 147 to 256 vph with the PC58 trips. The proposed cross section is considered to be appropriate for this total traffic flow, and meets the RITS requirements for an industrial road. The Stage 1 road has been designed to accommodate the PC58 traffic. No capacity or safety effects are expected along the Stage 1 road, or at the intersection of the east/west and north/south internal roads, as a result of this additional traffic.

6.2 Future Proofing of a Link to SH26

6.2 The future proofing of a link to SH26 needs consideration. The current plan change does not foreclose this option but is also does not establish any formal corridor or protection of the link. I consider we should at least require concept plans for a future link and what any alignment will look like/how it will affect existing building/houses/boundaries.

The future proofing of a link to SH26 has been addressed by updating the ADAP provided in Figure 14.

I trust that the responses provided address all requested information.

Yours sincerely



Tara Hills
Senior Traffic Engineer
MSc, CMEngNZ, CPEng

Attachments:

- CAS data
- Traffic count data
- SIDRA assessment results

CAS Data

CODED CR	Crash road	FEATURE	Distance	Direction	Side road	Date	Day of week	Time	Description of events	Crash factors	Surface cond	Natural light	Weather	Junction	Control	Cas	Cas	Casualties
Avenue Road Crashes																		
1314203	AVENUE ROAD NORTH	SNELL ST	78	S		17/02/2022	Thu	13:53	Car/Wagon1 NDB on AVENUE ROAD NORTH hit rear of Ute2 NDB on AVENUE ROAD NORTH turning right from centre line	CAR/WAGON1, alcohol test below limit, atn diverted by scenery/persons outside vehicle UTE2, alcohol test below limit	Dry	Bright sun	Fine	Driveway	Nil	0	0	0
1292465	AVENUE ROAD NORTH		28	S	ANDERSON	16/07/2021	Fri	12:07	Car/Wagon1 NDB on AVENUE ROAD NORTH hit Ute2 U-turning from same direction of travel	UTE2, did not check/notice another party from other dirn	Dry	Bright sun	Fine	Nil (Default)	Nil	0	0	0
1234320	AVENUE ROAD NORTH		234	N	ANDERSON	11/06/2020	Thu	11:59	Truck1 NDB on AVENUE ROAD NORTH hit Ute2 U-turning from same direction of travel	TRUCK1, alcohol test below limit UTE2, alcohol test below limit, did not check/notice another party behind, ENV: signs/signals ineffective or inadequate	Dry	Bright sun	Fine	Nil (Default)	Nil	0	0	2
1263222	AVENUE ROAD NORTH		47	N	THAMES ST	10/11/2020	Tue	10:30	Van1 SDB on Avenue Road North, Morrinsville hit turning Car/Wagon2	CAR/WAGON2, did not check/notice another party from other dirn, failed to give way entering roadway from driveway	Dry	Overcast	Fine	Driveway	Nil	0	0	0
Snell Road Crashes																		
1267477	SNELL STREET	AVENUE ROAD	185	N		26/06/2021	Sat	6:35	Car/Wagon1 EDB on SNELL STREET lost control; went off road to left, Car/Wagon1 hit power pole, drainage	CAR/WAGON1, alcohol test below limit, too far left	Wet	Dark	Fine	Nil (Default)	Nil	0	0	1
1308481	SNELL STREET		82	S	FLORENCE	5/01/2022	Wed	6:30	Car/Wagon1 WDB on SNELL STREET lost control; went off road to right, Car/Wagon1 hit fence, transformer	CAR/WAGON1, alcohol test below limit, other attention diverted, too far right	Dry	Bright sun	Fine	Nil (Default)	Nil	0	0	0
1316428	SNELL STREET			I	YOUNG ST	7/02/2022	Mon	15:00	Car/Wagon1 SDB on YOUNG STREET hit parked veh, Car/Wagon1 hit parked (unattended)	CAR/WAGON1, swerved to avoid pedestrian	Null	Unknown	Null	T Junction	Nil	0	0	0
1311169	YOUNG STREET			I	SNELL STREET	27/11/2021	Sat	17:15	Left scene1 SDB on YOUNG STREET turning right hit SUV2 turning right into AXROAD	LEFT SCENE1, did not check/notice another party from other dirn, failed to give way at priority traffic control	Null	Unknown	Null	T Junction	Give way	0	0	0
Snell/Studholme Street Intersection Crashes																		
1154063	STUDHOLME STREET		10	N	SNELL ST	2/11/2018	Fri	5:45	Car/Wagon1 entering/leaving driveway hit Pedestrian2 (Age 17) walking on footpath	CAR/WAGON1, other inattentive	Dry	Bright sun	Fine	Driveway	Nil	0	0	2
1159017	STUDHOLME STREET			I	SNELL ST	23/02/2018	Fri	9:00	Cycle1 SDB on STUDHOLME ST hit Car/Wagon2 doing driveway manoeuvre	CAR/WAGON2, alcohol test below limit, did not check/notice another party from other dirn, ENV: visibility limited by hedge or fence	Dry	Bright sun	Fine	Driveway	Nil	0	0	0
1194283	STUDHOLME STREET			I	SNELL STREET	19/07/2019	Fri	1:30	Car/Wagon1 SDB on STUDHOLME STREET lost control; went off road to right, Car/Wagon1 hit light pole, substantial vegetation (causing vehicle damage or stopping the vehicle)	CAR/WAGON1, alcohol test below limit, other fatigue, too far right	Dry	Dark	Fine	T Junction	Give way	0	0	1

Location: Studholme Road
Client: Avenue Industrial Park Ltd
Job Number: 21050
Date: 13/12/2022
Time: 7:30 to 8:30 am
Weather: Overcast

Time		Studholme Street		Snell Street			
		North bound	South bound	Left out	Right in	Right out	Left in
7:30	7:35	19	19	8	6	9	7
7:35	7:40	19	19	9	14	8	7
7:40	7:45	30	30	5	9	5	7
7:45	7:50	17	17	3	9	6	3
7:50	7:55	28	28	7	16	4	2
7:55	8:00	32	32	9	14	6	2
8:00	8:05	21	21	13	3	6	2
8:05	8:10	19	19	4	9	12	3
8:10	8:15	25	25	8	5	9	3
8:15	8:20	28	28	6	9	3	4
8:20	8:25	28	28	9	12	10	2
8:25	8:30	33	33	7	8	10	4
Hourly total		299	299	88	114	88	46
Directional split		50%	50%	South	40%	North	60%
In/out split				In	48%	Out	52%
10 year flows 3%		402	402	118	153	118	62
Stage 1 flows - 13 eastbound, 38 westbound				8	8	15	15
PC58 flows - 21 eastbound, 64 westbound				13	13	26	26
Consented total				96	122	103	61
Total with PC58				108	134	129	87

SH26/Avenue Road Roundabout SIDRA assessment

SH26 Connection SIDRA assessment

MOVEMENT SUMMARY

Site: 101 [75:25 to west directional split (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist]				
East: SH26 East															
5	T1	All MCs	441	12.0	441	12.0	0.244	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	All MCs	18	14.0	18	14.0	0.025	9.4	LOS A	0.1	0.8	0.67	0.74	0.67	43.1
Approach			459	12.1	459	12.1	0.244	0.4	NA	0.1	0.8	0.03	0.03	0.03	49.6
North: PC58															
7	L2	All MCs	49	14.0	49	14.0	0.100	10.9	LOS B	0.3	2.5	0.68	0.85	0.68	42.5
9	R2	All MCs	149	14.0	149	14.0	0.374	15.0	LOS C	1.3	10.4	0.82	1.00	1.06	40.3
Approach			199	14.0	199	14.0	0.374	14.0	LOS B	1.3	10.4	0.79	0.96	0.96	40.8
West: SH26 West															
10	L2	All MCs	53	14.0	53	14.0	0.468	4.9	LOS A	0.0	0.0	0.00	0.03	0.00	48.1
11	T1	All MCs	789	12.0	789	12.0	0.468	0.2	LOS A	0.0	0.0	0.00	0.03	0.00	49.5
Approach			842	12.1	842	12.1	0.468	0.5	NA	0.0	0.0	0.00	0.03	0.00	49.4
All Vehicles			1500	12.4	1500	12.4	0.468	2.3	NA	1.3	10.4	0.11	0.16	0.14	48.1

Stage 1 Intersection

AM with 25% of traffic to the north

MOVEMENT SUMMARY

Site: 101 [AM 25:75 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

New Site

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist]				
South: Avenue Road North (South)															
1	L2	All MCs	236	14.0	236	14.0	0.246	4.8	LOS A	0.0	0.0	0.00	0.29	0.00	47.0
2	T1	All MCs	200	5.0	200	5.0	0.246	0.1	LOS A	0.0	0.0	0.00	0.29	0.00	48.3
Approach			436	9.9	436	9.9	0.246	2.6	NA	0.0	0.0	0.00	0.29	0.00	47.6
North: Avenue Road North (north)															
8	T1	All MCs	263	5.0	263	5.0	0.139	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	All MCs	79	14.0	79	14.0	0.056	6.2	LOS A	0.3	2.1	0.51	0.61	0.51	44.6
Approach			342	7.1	342	7.1	0.139	1.5	NA	0.3	2.1	0.12	0.14	0.12	48.6
West: Stage 1															
10	L2	All MCs	27	14.0	27	14.0	0.022	5.4	LOS A	0.1	0.7	0.29	0.52	0.29	45.1
12	R2	All MCs	83	14.0	83	14.0	0.061	5.3	LOS A	0.1	0.8	0.23	0.62	0.23	45.1
Approach			111	14.0	111	14.0	0.061	5.3	LOS A	0.1	0.8	0.24	0.60	0.24	45.1
All Vehicles			888	9.3	888	9.3	0.246	2.5	NA	0.3	2.1	0.08	0.27	0.08	47.6

PM with 25% of traffic to the north

MOVEMENT SUMMARY

Site: 101 [PM 25:75 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Avenue Road North (South)															
1	L2	All MCs	83	14.0	83	14.0	0.204	4.7	LOS A	0.0	0.0	0.00	0.12	0.00	47.9
2	T1	All MCs	292	5.0	292	5.0	0.204	0.1	LOS A	0.0	0.0	0.00	0.12	0.00	49.3
Approach			375	7.0	375	7.0	0.204	1.1	NA	0.0	0.0	0.00	0.12	0.00	49.0
North: Avenue Road North (north)															
8	T1	All MCs	211	5.0	211	5.0	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
9	R2	All MCs	27	14.0	27	14.0	0.018	5.9	LOS A	0.1	0.7	0.46	0.55	0.46	44.7
Approach			238	6.0	238	6.0	0.111	0.7	NA	0.1	0.7	0.05	0.06	0.05	49.3
West: Stage 1															
10	L2	All MCs	79	14.0	79	14.0	0.070	5.9	LOS A	0.3	2.1	0.38	0.58	0.38	44.9
12	R2	All MCs	236	14.0	236	14.0	0.168	5.3	LOS A	0.3	2.3	0.22	0.63	0.22	45.1
Approach			315	14.0	315	14.0	0.168	5.4	LOS A	0.3	2.3	0.26	0.62	0.26	45.0
All Vehicles			927	9.1	927	9.1	0.204	2.5	NA	0.3	2.3	0.10	0.27	0.10	47.6

AM with 35% of traffic to the north

MOVEMENT SUMMARY

Site: 101 [AM 35:65 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Avenue Road North (South)															
1	L2	All MCs	204	14.0	204	14.0	0.208	4.7	LOS A	0.0	0.0	0.00	0.30	0.00	47.0
2	T1	All MCs	165	5.0	165	5.0	0.208	0.1	LOS A	0.0	0.0	0.00	0.30	0.00	48.3
Approach			369	10.0	369	10.0	0.208	2.7	NA	0.0	0.0	0.00	0.30	0.00	47.6
North: Avenue Road North (north)															
8	T1	All MCs	263	5.0	263	5.0	0.139	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	All MCs	109	14.0	109	14.0	0.071	6.0	LOS A	0.4	2.8	0.47	0.59	0.47	44.6
Approach			373	7.6	373	7.6	0.139	1.8	NA	0.4	2.8	0.14	0.17	0.14	48.3
West: Stage 1															
10	L2	All MCs	72	14.0	72	14.0	0.055	5.3	LOS A	0.2	1.7	0.27	0.52	0.27	45.1
12	R2	All MCs	39	14.0	39	14.0	0.028	5.2	LOS A	0.0	0.4	0.22	0.60	0.22	45.1
Approach			111	14.0	111	14.0	0.055	5.3	LOS A	0.2	1.7	0.25	0.55	0.25	45.1
All Vehicles			853	9.5	853	9.5	0.208	2.6	NA	0.4	2.8	0.09	0.28	0.09	47.5

PM with 35% of traffic to the north

MOVEMENT SUMMARY

Site: 101 [PM 35:65 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Avenue Road North (South)															
1	L2	All MCs	72	14.0	72	14.0	0.197	4.7	LOS A	0.0	0.0	0.00	0.11	0.00	47.9
2	T1	All MCs	292	5.0	292	5.0	0.197	0.1	LOS A	0.0	0.0	0.00	0.11	0.00	49.4
Approach			363	6.8	363	6.8	0.197	1.0	NA	0.0	0.0	0.00	0.11	0.00	49.1
North: Avenue Road North (north)															
8	T1	All MCs	211	5.0	211	5.0	0.111	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
9	R2	All MCs	39	14.0	39	14.0	0.025	5.8	LOS A	0.1	1.0	0.45	0.55	0.45	44.7
Approach			249	6.4	249	6.4	0.111	0.9	NA	0.1	1.0	0.07	0.09	0.07	49.1
West: Stage 1															
10	L2	All MCs	109	14.0	109	14.0	0.097	5.9	LOS A	0.4	3.0	0.38	0.59	0.38	44.9
12	R2	All MCs	204	14.0	204	14.0	0.145	5.2	LOS A	0.2	1.9	0.22	0.63	0.22	45.1
Approach			314	14.0	314	14.0	0.145	5.5	LOS A	0.4	3.0	0.28	0.61	0.28	45.0
All Vehicles			926	9.1	926	9.1	0.197	2.5	NA	0.4	3.0	0.11	0.27	0.11	47.6

AM with 25% of traffic to the north, right turn out movement into opposite lane

MOVEMENT SUMMARY

Site: 101 [AM 25:75 - right turn out into opposite lane (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Avenue Road North (South)															
1	L2	All MCs	236	14.0	236	14.0	0.246	4.8	LOS A	0.0	0.0	0.00	0.29	0.00	47.0
2	T1	All MCs	200	5.0	200	5.0	0.246	0.1	LOS A	0.0	0.0	0.00	0.29	0.00	48.3
Approach			436	9.9	436	9.9	0.246	2.6	NA	0.0	0.0	0.00	0.29	0.00	47.6
North: Avenue Road North (north)															
8	T1	All MCs	263	5.0	263	5.0	0.139	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	All MCs	79	14.0	79	14.0	0.056	6.2	LOS A	0.3	2.1	0.51	0.61	0.51	44.6
Approach			342	7.1	342	7.1	0.139	1.5	NA	0.3	2.1	0.12	0.14	0.12	48.6
West: Stage 1															
10	L2	All MCs	27	14.0	27	14.0	0.022	5.4	LOS A	0.1	0.7	0.29	0.52	0.29	45.1
12	R2	All MCs	83	14.0	83	14.0	0.087	6.9	LOS A	0.3	2.3	0.49	0.70	0.49	44.4
Approach			111	14.0	111	14.0	0.087	6.5	LOS A	0.3	2.3	0.44	0.66	0.44	44.6
All Vehicles			888	9.3	888	9.3	0.246	2.7	NA	0.3	2.3	0.10	0.28	0.10	47.6

Snell/Studholme AM assessment

MOVEMENT SUMMARY

Site: 101 [Site1 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

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

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Studholme (south)															
1	L2	All MCs	92	3.0	92	3.0	0.272	4.7	LOS A	0.0	0.0	0.00	0.10	0.00	48.1
2	T1	All MCs	423	3.0	423	3.0	0.272	0.1	LOS A	0.0	0.0	0.00	0.10	0.00	49.3
Approach			515	3.0	515	3.0	0.272	0.9	NA	0.0	0.0	0.00	0.10	0.00	49.1
North: Studholme (north)															
8	T1	All MCs	423	3.0	423	3.0	0.221	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	All MCs	141	10.0	141	10.0	0.105	6.5	LOS A	0.5	3.9	0.55	0.66	0.55	44.5
Approach			564	4.8	564	4.8	0.221	1.7	NA	0.5	3.9	0.14	0.17	0.14	48.4
West: Snell Street															
10	L2	All MCs	114	10.0	114	10.0	0.137	10.4	LOS B	0.5	4.0	0.50	0.94	0.50	43.4
12	R2	All MCs	136	3.0	136	3.0	0.241	12.9	LOS B	0.9	6.3	0.69	1.02	0.76	42.0
Approach			249	6.2	249	6.2	0.241	11.7	LOS B	0.9	6.3	0.60	0.98	0.64	42.7
All Vehicles			1328	4.3	1328	4.3	0.272	3.3	NA	0.9	6.3	0.17	0.29	0.18	47.5