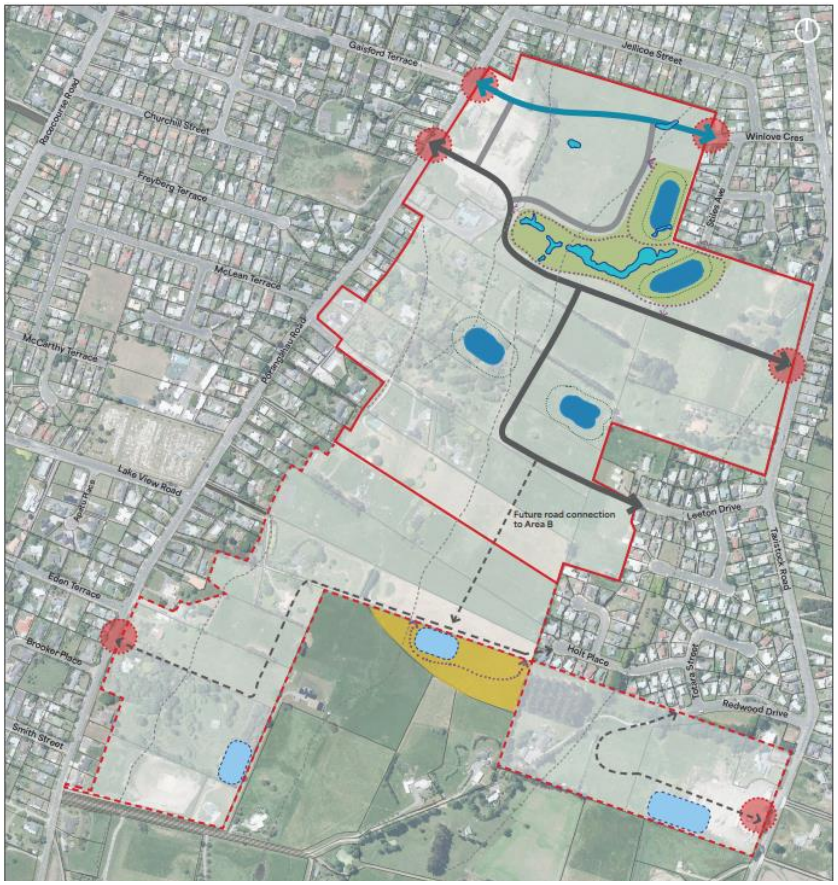
Central Hawke's Bay District Council

WAIPUKURAU SOUTH DEVELOPMENT AREA

INTEGRATED TRANSPORT ASSESSMENT

11 NOVEMBER 2025

CONFIDENTIAL



REPORT NUMBER U25/44

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INTEGRATED TRANSPORT ASSESSMENT

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REV	DATE	DETAILS
00	12/09/2022	First Issue
01	07/10/2022	Incorporate Client Comments
02	30/01/2025	Update report to reflect changes in structure plan
03	19/02/2025	Minor edits following client comments
04	11/11/2025	Update report to reflect changes in structure plan

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This report ('Report') has been prepared by WSP exclusively for Central Hawke's Bay District Council ('Client') in relation to the Integrated Transport Assessment ('Purpose') and in accordance with the Short Form Agreement with the Client dated 05/09/2024. The findings in this Report are based on and are subject to the assumptions specified in the Report. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

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GLOSSARY / ABBREVIATIONS

Collective Risk	Risk density measured as the number of fatal and serious casualties over a distance, e.g. deaths and serious injuries (DSI) per kilometre or within a set distance of an intersection.
Development Proposal	Any land use development proposed under the RMA and which triggers one of the ITA triggers.
Future Transport Network	The transport network representing the existing roading, public transport and walking and cycling network plus any proposed improvements to those networks by the relevant transport authorities.
SaAS	Safe and Appropriate Speed - Road speed that is appropriate with regards to the function, nature and use of the road, its environment, land use patterns, and whether the road is in an urban traffic area or a rural area.
Greenfields	Development of currently rural land on the outskirts of the existing urban area.

ITA	Integrated Transport Assessment
CHBDC	Central Hawke's Bay District Council
HDC	Hastings District Council
ECOP	Engineering Code of Practice
ITP	Integrated Transport Programme
LoS	Level of Service
LTP	Long Term Plan
NLTP	National Land Transport Programme
RCA	Road Controlling Authority
RMA	Resource Management Act 1991
TIA	Traffic Impact Assessment
AADT	Average Annual Daily Traffic
CBD	Central Business District
HCV	Heavy Commercial Vehicle
IRR	Infrastructure Risk Rating

EXECUTIVE SUMMARY

WSP was commissioned by Central Hawke's Bay District Council (CHBDC) to assess the transportation infrastructure required for the development of up to 950 residential dwellings located just south of Waipukurau town centre.

The full development is to be implemented in several phases although the transport assessment has been completed assuming the full development is operational to assess the worst-case scenario.

The indicative residential densities planned for each of the development phases have been used to predict the likely trip generation for the site. The final development has been assessed as generating 630 vehicles trips in the AM and PM peak hours. These trips have been distributed into the surrounding road network within the wider area.

The new internal roads will likely be a combination of 6.0 m and 5.5 m wide roads providing access for the site and connecting into the existing surrounding road network. The development phasing is such that each phase can be serviced by a fully operational intersection, as well as a secondary route.

There is no public transport provision within the area at present but walking and cycling provision is relatively good. The masterplan recognises the important role walking and cycling plays in the movement of people living in this area. The initial (and we expect final) development layout supports and encourages such modes of transport.

At this early masterplanning stage it has been assumed that the entire site will be allocated for residential use and no non-residential land-uses will be permitted.

The report supports any opportunity reduce vehicle speeds along Porangahau Road. The Jellicoe Street / Winlove Crescent intersection will require a minor kerb realignment to enable Winlove Crescent (which leads into the development) to become the major approach. A roundabout is recommended (but could also be a staggered intersection) where the development access road meets the Porangahau Road / Gaisford Terrace intersection for road safety reasons, even though it is not required from a capacity perspective. A list of both the required and recommended transport mitigations is provided in Table 1-1.

Several walking and cycling improvements have been proposed to help create walkable neighbourhoods and better/safer connectivity to nearby schools. This comprises a new shared path along Porangahau Road between Lake View Road and Ruataniwha Street. This path can provide future linkages to River Terrace, which is the starting point for several existing off-road paths, including the TukiTuki Trail and trail to Waipawa. Some minor improvements are also proposed along Tavistock Road to improve connectivity to Central Hawkes Bay College. These walking and cycling improvements are also included in Table 1-1.

An on-demand bus service is being proposed by Hawke's Bay Regional Council proposed to support local trips from both the development site and wider residential area to the town centre. This service will also provide a link to a proposed trunk service operating between Waipukurau, Waipawa, Ōtāne, Hastings and Napier.

Overall, these initial traffic investigations have not identified any barriers that should limit the development. Therefore, a residential village of the type and scale proposed can be supported in

this location from a transportation perspective, noting that some mitigation improvements will need to be validated, as above.

Table 1-1. Summary of Transport Mitigations

ITEM	INFRASTRUCTURE	REQUIREMENT	TRIGGER
1	Install a staggered intersection together with right turn bays for turning traffic along Porangahau Road. Section 3.4.4	Recommended	Linked to any development phase that provides New Road 1.
2	Right-turn bay to be installed at the Tavistock Road / Jellicoe Street. Right-turn bay required for traffic turning into Jellicoe Street (towards Winlove Crescent and the development. Section 3.4.4	Required	Triggered when the development connects to this intersection.
3	Adjust priority at Jellicoe Street / Winlove Crescent intersection to make Winlove Crescent the main road. Section 3.2.1	Required	Triggered when the development connects to Winlove Crescent.
4	Four new intersections (two along Porangahau Road, one each along Tavistock Road and Farm Road) to connect to the development. Section 3.2.1	Required	Triggered when the relevant parcels of land are developed.
5	Right-turn bays to be installed at the following intersections. — Tavistock Road / Leeton Drive. Right-turn bay required for traffic turning into Leeton Drive. — Tavistock Road / New Road (between Leeton Drive and Svenson Road). Right-turn bay required for traffic turning into the new road. Section 3.4.3	Required	Triggered if at least 100 new dwellings are built before they are connected to other parts of the development (internal road connections to Winlove Crescent and/or Porangahau Road).
		Recommended	Triggered when the development connects to their respective intersections.
6	Install a 3.5m wide shared path along Porangahau Road (from Ruataniwha Street to Gaisford Terrace). Section 3.2.2	Required	Triggered when the development connects to Porangahau Road at the Gaisford Terrace intersection.

ITEM	INFRASTRUCTURE	REQUIREMENT	TRIGGER
6a	Continue the 3.5m wide shared path along Porangahau Road (from Gaisford Terrace to Lake View Road), connecting to The Terrace School. Section 3.2.2	Recommended	Triggered when the shared path is built along Porangahau Road (Ruataniwha Street to Gaisford Terrace).
6b	Install pedestrian crossing facilities along Porangahau Road near the Petersen Place intersection. Section 3.2.2	Recommended	Triggered if the shared path is installed along Porangahau Road (between Gaisford Terrace and Lake View Road).
7	Consolidate the two pram crossings and buildouts along Tavistock Road (outside Central Hawke's Bay College) to a single pedestrian crossing. Section 3.2.2	Recommended	Triggered by either intersection improvements at the Tavistock Road / Jellicoe Street intersection, or the variable speed school zones.
8	Install a roundabout at the Porangahau Road / Gaisford Terrace / New Road 1 intersection. Section 3.5.3.3	Desirable	Triggered when the development connects to this intersection.
9	Install a 3.5m wide shared path along Herbert Street (between Ruataniwha Street and Russell Park / Tukituki River). Section 3.2.2	Desirable	No trigger for the development. Forms part of the wider connectivity to the local amenities. Could potentially form part of a wider community lead project.
10	Install or formalise the cycle lanes along Tavistock Road, Wellington Road and St Joseph Street (between Redwood Drive and Russell Park). Section 3.2.2	Desirable	Aspirations of the development to be less car dependant requires investment in walking and cycling facilities.
11	Install a centreline along Jellicoe Street	Desirable	No trigger for the development. Observation made during the site visit in 2022.

ITEM	INFRASTRUCTURE	REQUIREMENT	TRIGGER
12	All internal roads shown in the Waipukurau South Structure Plan are to comply with the HDC Engineering Code of Practice. — Minimum road reserve width of 15m — Minimum traffic lane width of 5.5m (two lanes) — All on-street parking to be indented — Footpaths on both sides of the road (minimum of 1.5m wide) — Ensure the new roads have the appropriate road markings installed (e.g. centreline). Section 3.3	Required	Triggered by each development land parcel.
13	Intersections within the development should avoid a cross-road arrangement (four or more approaches). Section 3.3	Recommended	Triggered for all roads within the development area.
14	All seven internal roads shown in the Waipukurau South Structure Plan to have a 3.5m wide shared path on one side of the road. Section 3.3	Recommended	Triggered by each development land parcel.
15	All ancillary roads (no-exit or loop roads not shown in the structure plan) to have a minimum road reserve of 15m, combined traffic lane of 5.5m (excluding on-street parking) and 1.5m wide footpath on at least one side (continuous). Section 3.3	Required	Triggered by each development land parcel.

1 INTRODUCTION

Central Hawke's Bay District Council (CHBDC) is preparing an amendment to the District Plan to include a new chapter to guide development within the Waipukurau South Development Area. The plan change will insert a structure plan and bespoke planning provisions to provide a framework for the integrated delivery of infrastructure and land use planning.

In October 2022 WSP prepared an Integrated Transport Assessment (ITA) for the area. However, the development of the structure plan has necessitated an update of the ITA. This report has therefore been updated in collaboration with technical stakeholders from CHBDC to support the plan change.

1.1 PURPOSE

CHBDC identified this development site as requiring investigation to develop appropriate infrastructure improvements that balance sustainable travel options with traffic operations whilst addressing road safety and deficiencies in the surrounding road network. These 'triggers' are discussed in Section 5 of this report. The options developed ensure that they meet the future needs of the district by improving network performance and safety.

The intention is that the ITA will:

- Establish the existing and desired future form and (movement and place) function of the surrounding roads;
- Investigate evidence that confirms and / or quantifies the potential opportunities and challenges identified;
- Identify and assess potential options that would assist in achieving the desired future function of the surrounding road network; and
- Develop conceptual designs establish the recommended improvements at strategic locations that CHBDC or developer could deliver.

The ITA provides a high-level assessment of the transport related effects of the potential structure plan for residential development. It assesses the potential impacts of the development on the safe and efficient operation of the transport network, with consideration given to:

- The expected trip generation and trip distribution resulting from development;
- The suitability of potential roading connections from the proposed growth area onto the existing transport network;
- The connectivity of identified growth areas for active modes and public transport;
- The impacts of the development on the wider transport network, giving consideration to its existing form and function;
- Compliance of the proposed development with the transport related requirements of the CHBDC District Plan and other relevant standards; and
- Compliance with the overarching aspirations of the Kainga Ora Sustainable Transport Outcomes dated March 2022.

1.2 WAIPUKURAU SOUTH DEVELOPMENT AREA

The area earmarked for development is the residential zoned land shown in Figure 1-1, comprising two development areas (Area A in the north and Area B in the south). A summary of the site area and potential dwelling yields used as a basis for the ITA are outlined in Table 1-1. It was assumed 25% of the area is not developable (required either for roads or stormwater ponds/wetlands) and the dwellings have an average land area of 550 m^2. It is noted the dwelling yields are a conservative estimate, with the final dwelling yield likely to be lower.

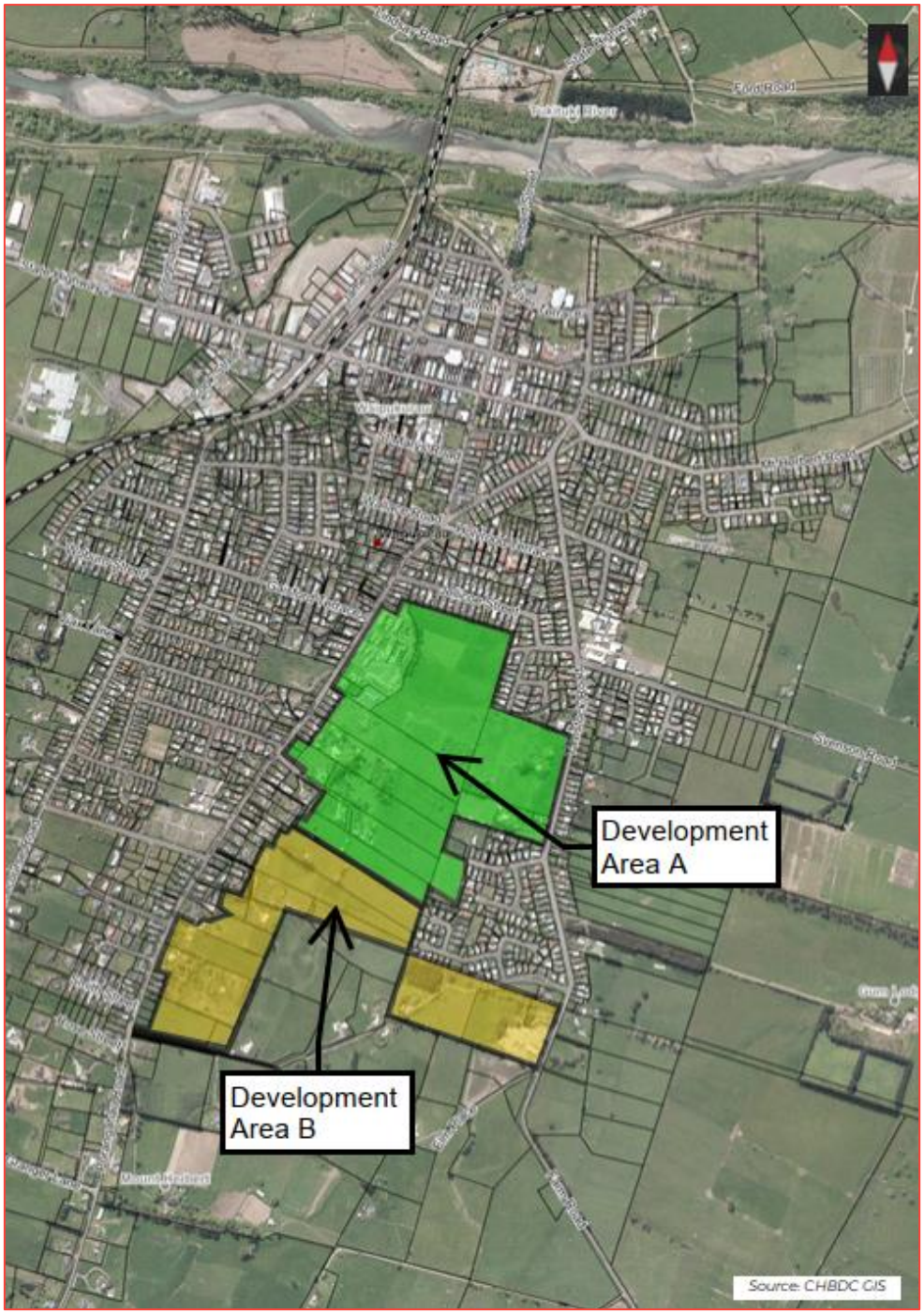


Figure 1-1. Study Area

Table 1-1. Development Areas

DESCRIPTION	TOTAL AREA (M^2)	DEVELOPABLE AREA (M^2)	DENSITY	YIELD (NO OF LOTS)
Area A	426,100	319,600	18 Lots per Ha (Ave lot size = 550m^2)	580
Area B	271,550	203,650		370
TOTAL	697,650	523,250		950

Given that the site has the potential to generate trips beyond just the site boundary the study area has been extended to include several surrounding intersections, namely:

- Porangahau Road / Gaisford Terrace
- Porangahau Road / Jellicoe Street
- Porangahau Road / Wellington Road
- Porangahau Road / Ruataniwha Street
- Wellington Road / Rautaniwha Street
- Wellington Road / Tavistock Road
- Tavistock Road / Holyrood Terrace
- Tavistock Road / Svenson Road.

Because the regional transport model was originally built for a road safety project, WSP was not confident that the model could accurately model the impact the development would have on the surrounding intersections. It was agreed with CHBDC that the intersection analysis for this development should be conducted using the traditional SIDRA approach. The analysis of these intersections and their performance is discussed in Section 3.5.3.

1.3 APPROACH

The assessment included the phases outlined in Figure 1-2 beginning with project initiation followed by problem confirmation, optioneering and analysis, which has informed the recommended infrastructure improvements.

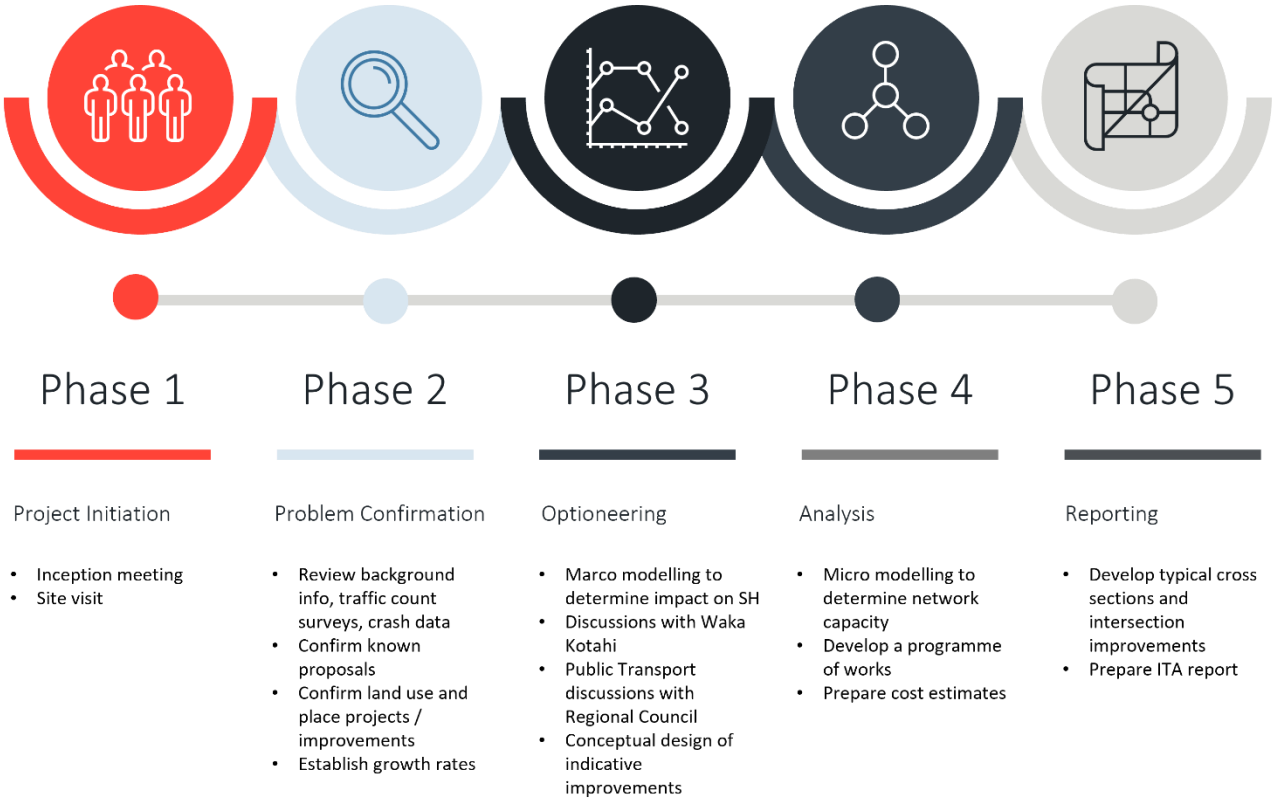


Figure 1-2. ITA Approach

Central to the development process was the intervention hierarchy shown in Figure 1-3. This hierarchy demonstrates the attractiveness of considering low-cost integrated planning, demand management measures and network optimisation to best utilise existing infrastructure to the extent possible before new infrastructure improvements are proposed.

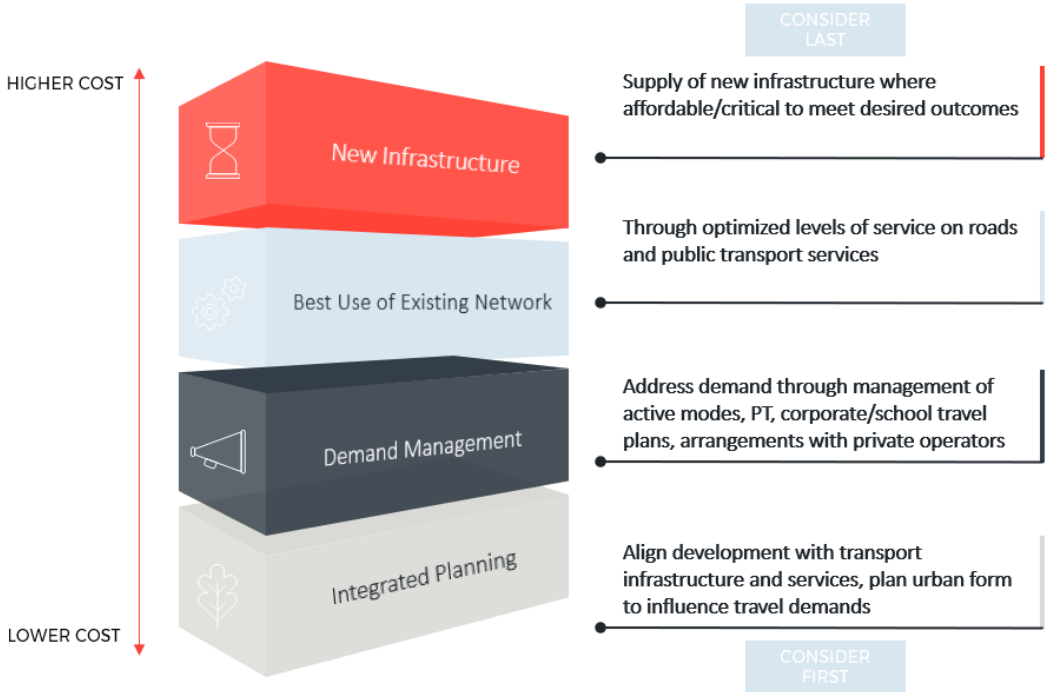


Figure 1-3 Intervention Hierarchy (WSP)

In summary, any new development should:

- Give preference to options that compliment safer intersection treatments;
- Provide solutions to specific problems as well as work cohesively;
- Allow people who walk and bike to have improved safety;
- Provide an opportunity to trial, test and grow and allow time for costly improvements to be reviewed later to ensure they are only implemented when and as needed; and
- Be in line with broader strategic thinking for the region.

1.4 STRUCTURE PLAN

In 2025 CHBDC provided an updated structure plan to include proposed roading connections in the development area and realigned roading connections in Area A. This is shown in Figure 1-4 and provides a useful reference when reading this report.

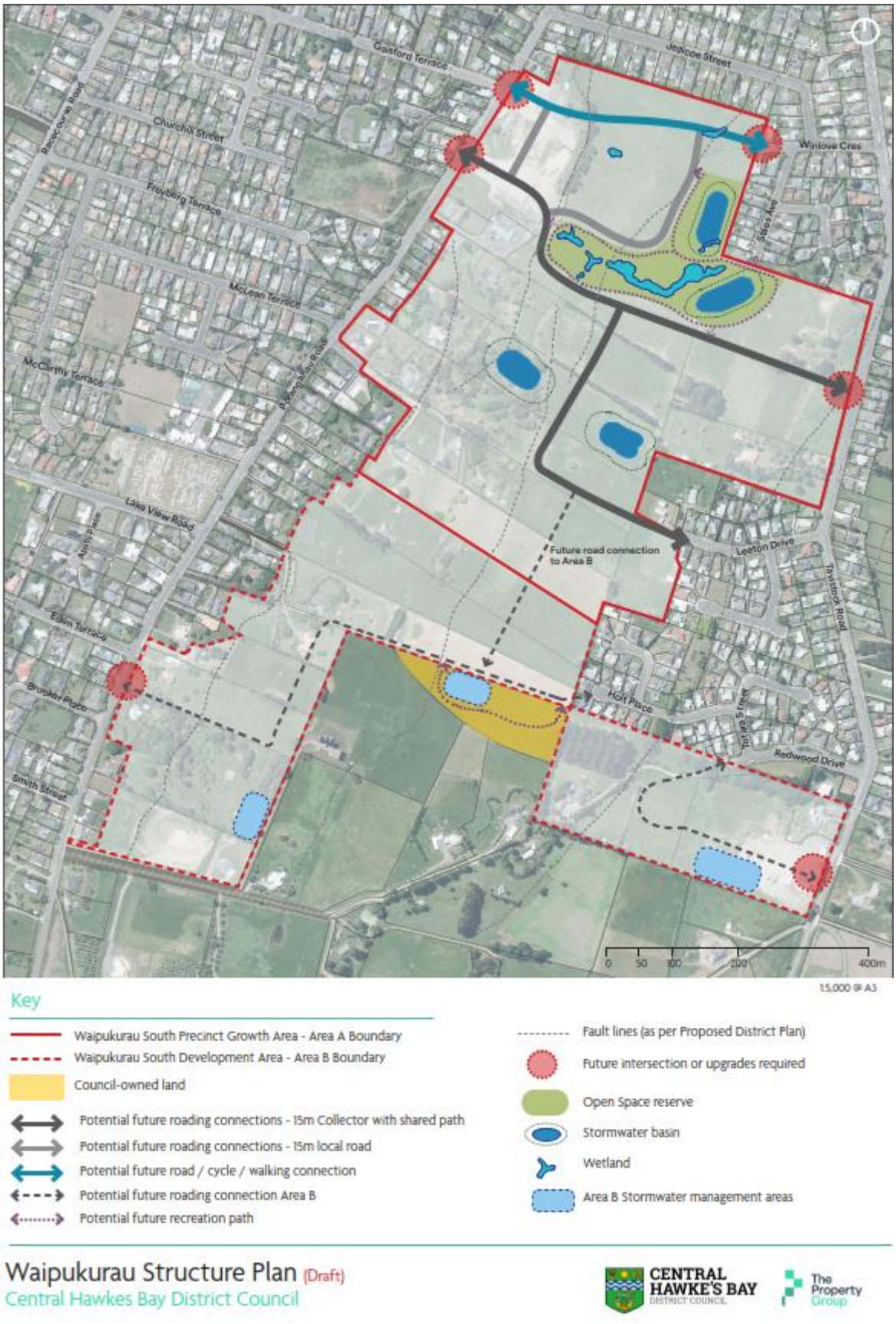


Figure 1-4: Waipukurau South Structure Plan

2 EXISTING CONDITIONS

This section of the report provides a description of the existing land-use and local transport environment, including a description of the existing road network, traffic demands, provisions for active modes and public transport, and a summary of the local road safety record.

2.1 LAND-USE ENVIRONMENT

Waipukurau is a rural town with a population of 4,698 in the 2023 New Zealand census. This is an increase of 282 (6.4%) since the 2018 census and 780 (19.9%) since the 2013 census

The existing residential pattern is low-medium density, with the residential area on the southern side of SH2 and the commercial district. Most of the residential area is bounded by Racecourse Road and Porangahau Road, with some low-density development along Tavistock Road and Mt Herbert Road. A small industrial area is located along SH2, west of the Palmerston North to Gisborne Rail Line.

There are four schools in Waipukurau with a summary provided in Table 2-1.

Table 2-1. Existing Schools within Waipukurau

SCHOOL	TYPE	DECILE	PRIMARY ACCESS	ROLL (2023)
The Terrace School	Primary	2	Porangahau Road	171
Central Hawke's Bay College	Secondary	4	Tavistock Road	548
Waipukurau School	Primary	5	Porangahau Road	330
St Joseph's School	Primary	6	Russell Street	102
TOTAL				1,151

Central Hawke's Bay College is the only secondary school in Central Hawke's Bay and has a role of over 500 students.

Waipukurau has two public domains, Russell Park and Central Park. Both domains are located on the northern side of Waipukurau, just south of the Tukutuki River. Russell Park has a large, grassed field, play area and indoor sports complex with an indoor pool. Russell Park is also the starting point for the Tukituki River Trail. Central Park also has a large, grassed field and an outdoor tennis complex.

2.2 TRANSPORT NETWORK

The roading hierarchy differentiates between roads by function. Roads at the top of the hierarchy are generally arterial routes that cater for through traffic and often have high traffic volumes. Roads at the lower end of the hierarchy (collector and local roads) generally have lower traffic volumes and provide an access function.

The existing road hierarchy within Waipukurau, as defined within the NZ Transport Agency One Network Road Classification (ONRC), is shown within Figure 2-1. The ONRC identifies the road hierarchy classifications for both state highways and local authority roads.

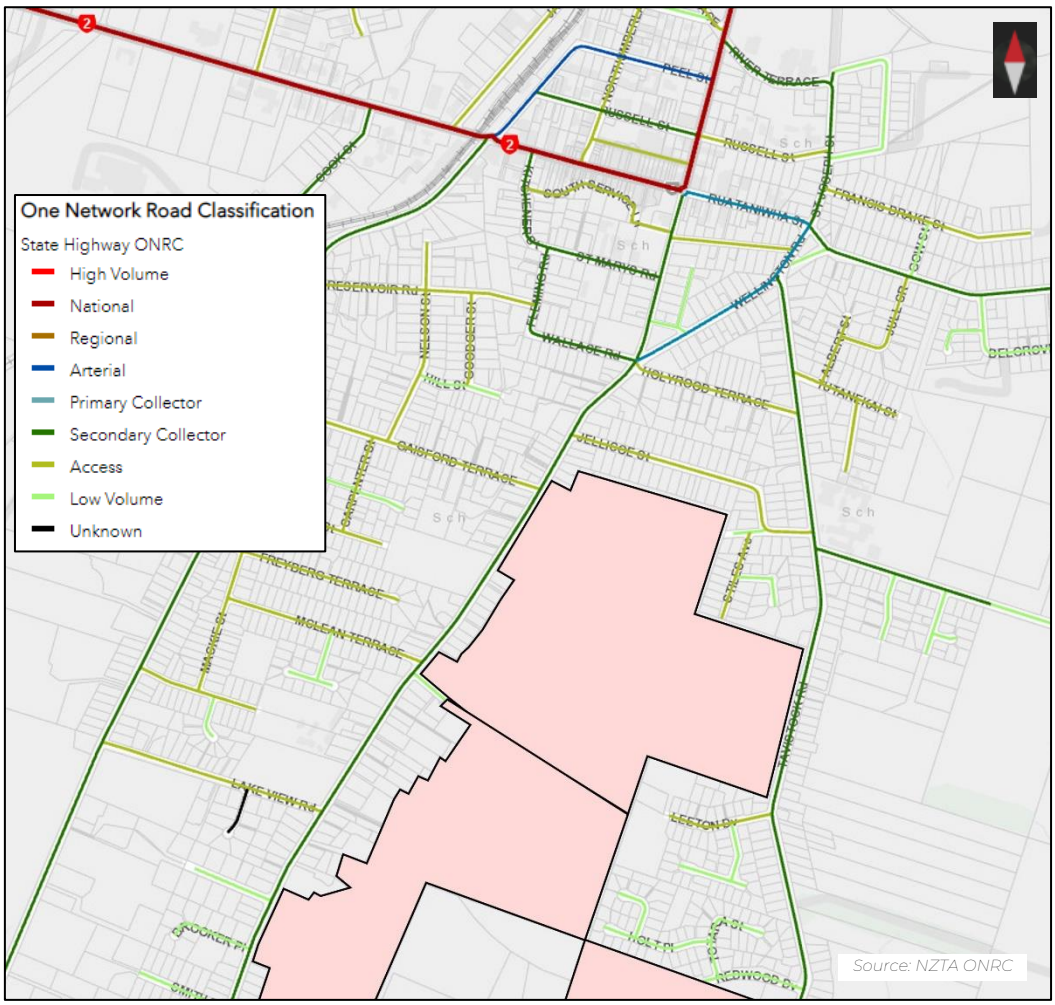


Figure 2-1. Existing Road Hierarchy

Although the ONRC has been superseded by the One Network Framework (ONF) there were serious concerns identified with the current ONF classifications in MegaMaps (particularly road classification inconsistencies along Porangahau Road). As a result, the ONF classifications have not been considered within the assessment.

For the purposes of this assessment, it has been assumed that the ONRC supersedes the district plan requirements for local roads and references to road standards.

2.2.1 ROAD NETWORK SUMMARY

A summary of the road network characteristics in the vicinity of the identified growth area are summarised in Table 2-2.

Table 2-2. Existing Road Characteristics

ROAD NAME	ONRC	LANES	ROAD WIDTH	ESTIMATED DAILY TRAFFIC (%HV)	SPEED LIMIT
Porangahau Road	Secondary Collector	2	6.1 m to 13.2 m	1,240 vpd to 4,435 vpd (6-10% HV's)	50 km/h

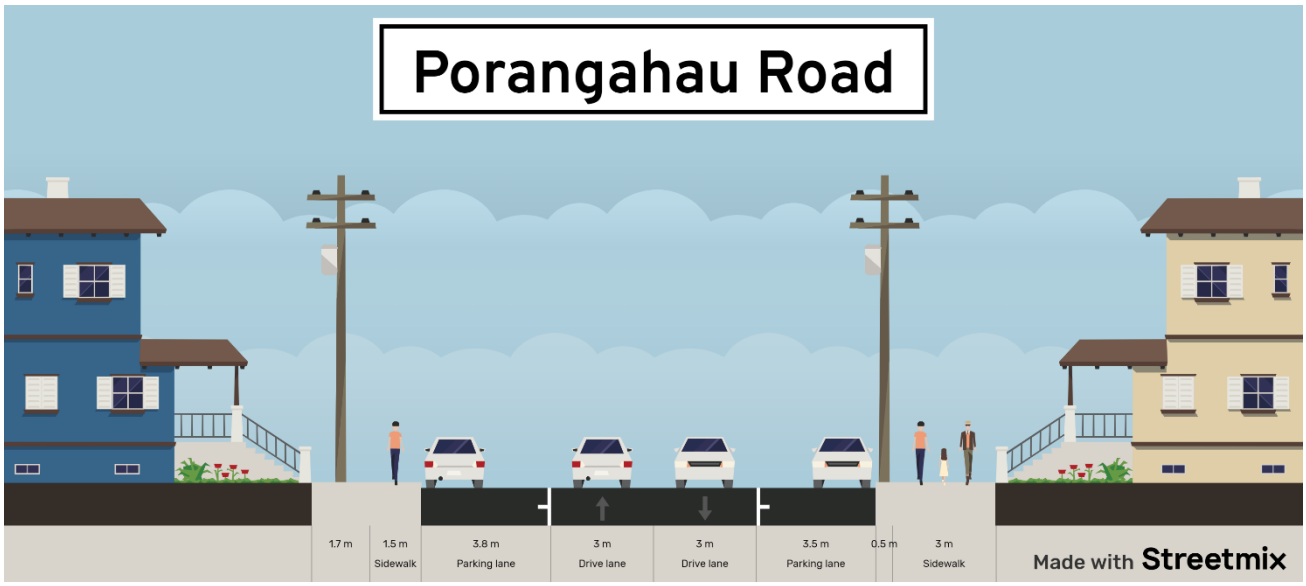
ROAD NAME	ONRC	LANES	ROAD WIDTH	ESTIMATED DAILY TRAFFIC (%HV)	SPEED LIMIT
Tavistock Road/Farm Road	Secondary Collector	2	6.0 m to 13.5 m	485 vpd to 2,755 vpd (5-20% HV's)	50 km/h
Jellicoe Street	Access Road	2	13.1 m	675 vpd (3% HV's)	50 km/h
Winlove Crescent	Access Road (Low Volume)	2	8.8 m	60 vpd (3% HV's)	50 km/h
Stiles Avenue	Access Road	2	7.6 m	260 vpd (3% HV's)	50 km/h
Willow Grove	Access Road (Low Volume)	2	7.6 m	50 vpd (3% HV's)	50 km/h
Holyrood Terrace	Access Road	2	13.7 m	645 vpd (3% HV's)	50 km/h
Wellington Road	Primary Collector	2	13.5 m	1,115 vpd to 4,050 vpd (4-8% HV's)	50 km/h
Ruataniwha Street	Primary Collector	2	13.6 m	4,405 vpd (6% HV's)	50 km/h
Gaisford Terrace	Access Road	2	11.9 m to 13.4 m	1,375 vpd (5% HV's)	50 km/h
Racecourse Road	Secondary Collector	2	7.2 m to 13.5 m	975 vpd to 3,340 vpd (11-16% HV's)	50 km/h
Petersen Place	Access Road (Low Volume)	2	9.6 m	70 vpd (3% HV's)	50 km/h
Lake View Road	Access Road	2	8.3 m	475 vpd (3% HV's)	50 km/h
Leeton Drive	Access Road	2	9.3 m	440 vpd (3% HV's)	50 km/h
Redwood Drive	Access Road	2	11.4 m	80 vpd (3% HV's)	50 km/h
SH2 (Herbert St)	National Arterial	2	14 m	11,256 vpd (18.8% HV's)	50 km/h
SH2 (Ruataniwha St)	National Arterial	2	13.2 m	11,256 vpd (18.8% HV's)	50 km/h
Holt Place	Access Road (Low Volume)	2	9.6 m	100 vpd (3% HV's)	50 km/h

2.2.2 LOCAL ROAD DESCRIPTION

A brief description of each local road of interest is outlined in further detail below.

Porangahau Road

Porangahau Road is identified as a Secondary Collector within the ONRC. The road carriageway is 11.8 m between SH2 and Wallace Road, increasing to 13.2 m between Wallace Road and Petersen Place (past the site). The carriageway width reduces to 9.8 m between Petersen Place and Smith Street, becoming 6.1 m south of Waipukurau. The carriageway is formed of two general traffic lanes with wide shoulders that double as cycle lanes. The road has an estimated AADT of 4,435 vehicles per day (vpd) with heavy vehicles comprising 10% of traffic, reducing to 2,760 vpd (6% heavy vehicles) south of Gaisford Terrace. South of Waipukurau, the traffic volume reduces to 1,240 vpd (9% heavy vehicles). The road has a posted speed limit of 50 km/h through Waipukurau, becoming 80 km/h south of Waipukurau.



Although the image above shows a 3 m footpath on the eastern side of Porangahau Road, this footpath contracts to 1.5 m north and south of the development.

Tavistock Road

Tavistock Road is identified as a Secondary Collector within the ONRC. The road carriageway is 13.2 m between Wellington Road and Svenson Road, increasing to 13.5 m between Svenson Road and Redwood Drive (past the site). The carriageway width reduces to 6.0 m south of Redwood Drive (south of Waipukurau), where Tavistock Road becomes Farm Road. The carriageway is formed of two general traffic lanes with wide shoulders that double as cycle lanes. The road has an estimated AADT of 2,755 vpd with heavy vehicles comprising 6% of traffic. This volume reduces to 1,995 vpd (8% heavy vehicles) south of Jellicoe Street, further reducing to 1,790 vpd (5% heavy vehicles) south of Leeton Drive and 655 vpd (20% heavy vehicles) south of Redwood Drive, whereupon Tavistock Road ends and Farm Road starts. The road has a posted speed limit of 50 km/h through Waipukurau, becoming unrestricted (100 km/h) south of Waipukurau.



Jellicoe Street

Jellicoe Street is identified as an Access Road within the ONRC. The road carriageway is 13.1 m along its length, formed of two general traffic lanes and wide shoulders. However, Jellicoe Street

only has linemarking on approach to the Tavistock Road and Porangahau Road intersections, along with the dogleg curve (near Tavistock Road). The road has an estimated AADT of 675 vpd, of which 3% are heavy vehicles. The road has a posted speed limit of 50 km/h.

Winlove Crescent

Winlove Crescent is identified as a Low Volume Access Road within the ONRC. The road carriageway is 8.8 m, enabling two-way traffic with narrow shoulders. The road has an estimated AADT of 60 vpd, of which 3% are heavy vehicles. The road has a posted speed limit of 50 km/h.

Stiles Avenue

Stiles Avenue is identified as an Access Road within the ONRC. The road carriageway is 7.6 m, enabling two-way traffic with narrow shoulders. The road has an estimated AADT of 260 vpd, of which 3% are heavy vehicles. The road has a posted speed limit of 50 km/h.

Holyrood Terrace

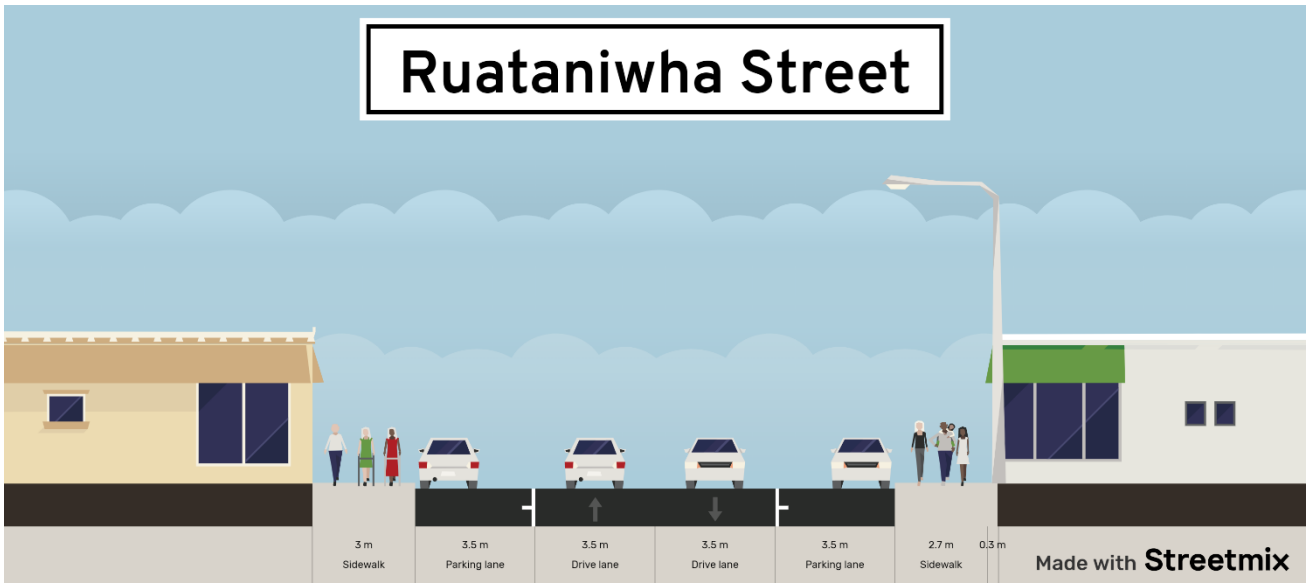
Holyrood Terrace is identified as an Access Road within the ONRC. The road carriageway is 13.7 m, enabling two-way traffic with wide shoulders allowing on-street parking. However, Holyrood Terrace has no linemarking except when approaching the intersections with Tavistock Road and Porangahau Road. The road has an estimated AADT of 645 vpd, of which 3% are heavy vehicles. The road has a posted speed of 50 km/h.

Wellington Road

Wellington Road is identified as a Primary Collector within the ONRC. The road carriageway is 13.5 m, enabling two-way traffic with wide shoulders between Porangahau Road and Tavistock Road, with a flush median between Tavistock Road and Ruataniwha Street. The section with a flush median does not allow on-street parking; however, there is a narrow shoulder with symbols indicating this shoulder could be used as a cycle lane. The road has an estimated AADT of 4,050 vpd between Ruataniwha Street and Tavistock Road, of which 8% are heavy vehicles. The AADT drops to 1,115 vpd between Tavistock Road and Porangahau Road, with the proportion of heavy vehicles also dropping to 4% of the AADT. The road has a posted speed of 50 km/h.

Ruataniwha Street (Between Wellington Road and Porangahau Road)

Ruataniwha Street is identified as a Primary Collector within the ONRC. The road carriageway is 13.6 m, enabling two-way traffic with wide shoulders. On-street (parallel) parking has been marked out in the wide shoulders along Ruataniwha Street. The road has an estimated AADT of 4,405 vpd, of which 6% are heavy vehicles. The road has a posted speed of 50 km/h.



Gaisford Terrace

Gaisford Terrace is identified as an Access Road within the ONRC. The road carriageway is 11.9 m between Porangahau Road and Nelson Street, widening to 13.4 m between Nelson Street and Racecourse Road. The road has a centreline along the entire section, with edgelines marked between Nelson Street and Racecourse Road. The road has an estimated AADT of 1,375 vpd, of which 5% are heavy vehicles. The road has a posted speed of 50 km/h.

Racecourse Road

Racecourse Road is identified as a Secondary Collector within the ONRC. The road carriageway is 11.8 m between State Highway 2 and Reservoir Road, increasing to 13.5 m between Reservoir Road and Lake View Road before reducing to 7.2 m south of Waipukurau. The road widths enable two-way traffic flow, with wide shoulders marked out, including cyclist symbols painted within the roadside shoulders. The road has an estimated AADT of 3,000 vpd between SH2 and Reservoir Road, of which 11% are heavy vehicles. This increases to 3,340 vpd (5% heavy vehicles) between Reservoir Road and Gaisford Terrace, before dropping to 2,650 vpd (13% heavy vehicles), dropping further to 1150 vpd (13% heavy vehicles) south of Churchill Street. The traffic volume experiences another decrease south of Lake View Road to 975 vpd with 16% heavy vehicles. The road has a posted speed limit of 50 km/h through Waipukurau.

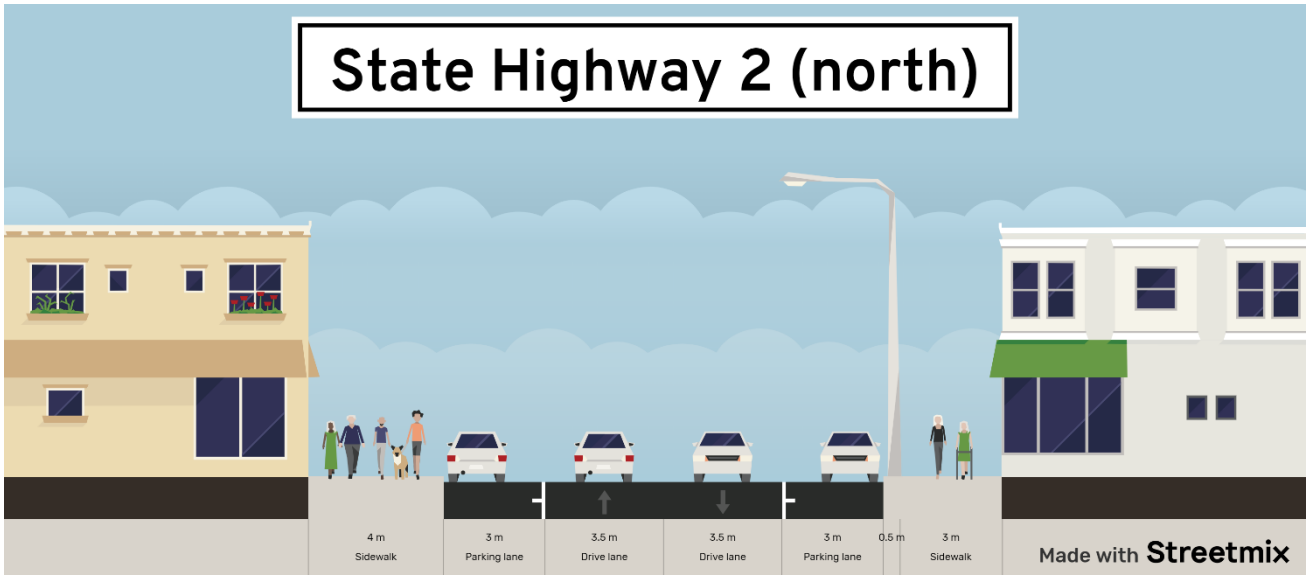
2.2.3 STATE HIGHWAY 2

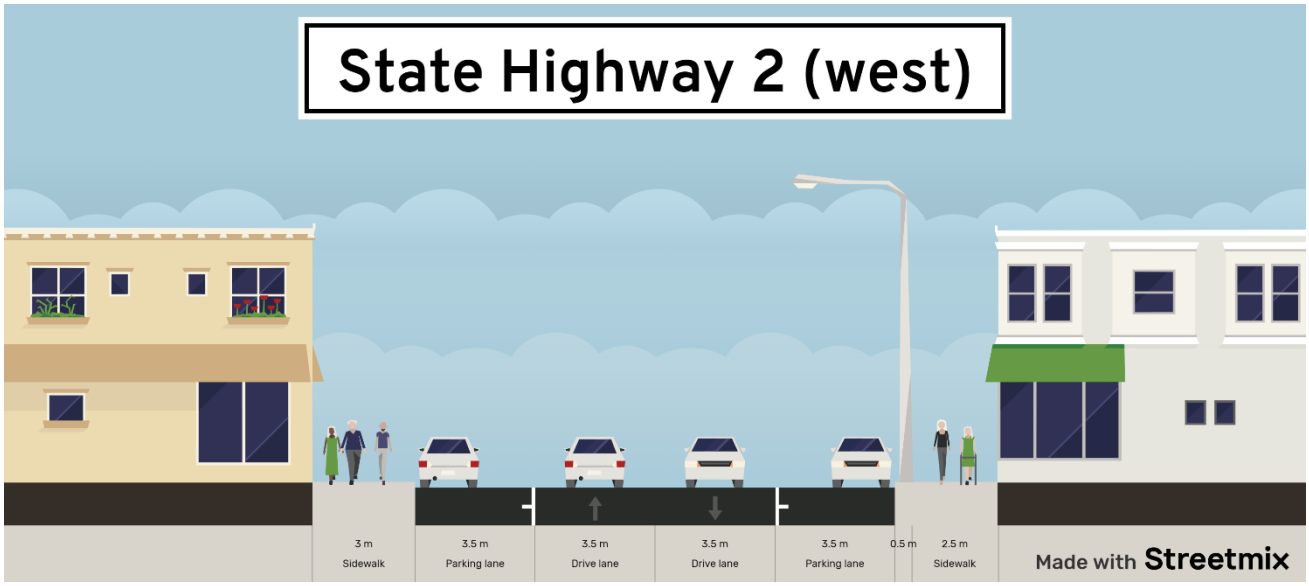
State Highway 2 (SH2) is identified as a National (State Highway) route within the ONRC. The road is the primary (and in some cases the only) route running along the East Coast of the North Island. At a local level, SH2 connects Waipukurau to Waipawa, Napier and Hastings in the north, and Dannevirke and Palmerston North in the south-west.

West of Waipukurau, SH2 is undivided with a carriageway width of 9.7 m, formed of two traffic lanes and moderate to wide roadside shoulders. Through the western fringe of Waipukurau, the carriageway width increases to 12.5 m, with a flush median between Coughlan Road and the Palmerston North to Gisborne Rail Line. SH2 then runs through the commercial shopping strip (between the rail line and Porangahau Road) with on-street parallel parking and three pedestrian crossings. The carriageway width along this section is 13.2 m. SH2 then turns north at the Porangahau/Ruataniwha roundabout, with a carriageway width of 11.8 m until the Tukituki River Bridge. North of the Tukituki River, SH2 is median divided between Waipukurau and Waipawa.

SH2 is posted at 50 km/h through Waipukurau and 100 km/h along both approaches to Waipukurau, with short transition sections posted at 70km/h (between Coughlan Road and Doughlas Road west of Waipukurau, and from the southern side of the Tukituki River Bridge to Ford Road north of Waipukurau).

The road has an AADT of 11,256 vpd through Waipukurau, of which 18.8% are heavy vehicles. West of Waipukurau, the traffic volume drops to 6,623 vpd (22% heavy vehicles). North of Waipukurau, the traffic volume reduces to 10,788 vpd (9.9% heavy vehicles) between Waipukurau and Waipawa before dropping to 8,678 vpd (10.2% heavy vehicles) north of Waipawa.





2.2.4 HISTORICAL GROWTH RATES

Waka Kotahi has one non-continuous loop count station (Station 00200720) on SH2 just north of the River Terrace intersection. A second non-continuous dual loop count station is located on SH2 some 8km west of the town centre. The counts indicate the traffic volumes have increased on average at 5% per annum over the previous 5-years, with 2023 being the highest. Annual growth rates vary between -8% in 2020 and 10% in 2021. Interestingly, the 2020 volumes fell below 2016 volumes, probably due to Covid travel restrictions.

Table 2-3. Historical AADT and Growth Rates

YEAR	COUNT STATION 00200720	GROWTH RATE	COUNT STATION 00200729	GROWTH RATE
2016	9,896	-	4,430	-
2017	10,095	2%	4,747	7%
2018	10,137	0%	4,768	0%
2019	10,772	6%	4,796	1%
2020	9,878	-8%	4,448	-7%
2021	10,875	10%	4,913	10%
2022	10,566	-3%	4,556	-7%
2023	11,256	7%	4,834	6%
7 Year Average Growth		2% 5% (if 2020/22 excluded)		1.4% 4.8% (if 2020/22 excluded)

In 2022, CHBDC published (Growth at a Glance 2022 Update) which provided updated population and economic indicators for Central Hawke's Bay and included the projected growth over the next 30 years (to 2051). Some key points highlighted include:

- Since 2013 the district has grown on average 2.1% per year.
- It is predicted an extra 4,500 people living in the district by 2031 and 1,700 more households over the next ten years.
- Local buyers looking for affordable housing will likely spread out into areas like Takapau.
- If the district was to grow 2.5% per year the population could double by 2051 (32,000+ people)

Based on the information above, it appears that Waipukurau is expected to continue seeing a population rise over the coming years. Therefore, we have assumed an annual traffic growth rate of 2.0%, which is in line with the district growth rate of 2.1% since 2013.

2.3 KNOWN FUTURE NETWORK CHANGES

2.3.1 RUATANIWHA STREET

CHBDC and Waka Kotahi have agreed that the 400 m long stretch of Ruataniwha Street between Bogle Brothers Esplanade and Poranahau Road will be revoked from Waka Kotahi to CHBDC as the new Road Controlling Authority. Conversely, a 540 m portion of Bogle Brothers Esplanade and Peel Street is to be revoked to Waka Kotahi to become part of the SH2 network.

Ruataniwha Street's classification will shift from a mobility (movement) function to an activity (place) function. To support this, CHBDC is likely to implement streetscape improvements,

promoting lower vehicle speeds and removing HCVs to create a pedestrian-friendly "High Street" environment. This change will also have a noticeable change in vehicle movements travelling through and within Waipukurau. However, given these network changes are still being considered, their impacts have not been captured within this ITA.

2.3.2 LIVINGSTON SUBDIVISION

It is understood that CHBDC have granted consent to an 88-lot subdivision on the eastern side of Waipukurau. This development proposes a new access along Mount Herbert Road, just west of Ennisclare Place. Given Mount Herbert Road is a no exit road, all traffic generated by this subdivision will need to pass through the Mount Herbert Road / Wellington Road / Ruataniwha Street intersection, which currently operates with priority controls (stop signs) along the Ruataniwha Street and Mount Herbert Road approaches. The impact this development has on this intersection has not been specifically included but has been accounted for within the background growth.

2.3.3 RACECOURSE ROAD SUBDIVISIONS

It is understood that CHBDC have received several applications for new subdivisions along Racecourse Road, some of which have been approved. These subdivisions are typically infill developments, with a combined total of approximately 92 lots. However, the new subdivisions along Racecourse Road are unlikely to impact the traffic on Porangahau Road, given that Racecourse Road provides direct access to the Waipukurau town centre and SH2. Possible exceptions to this could be school traffic (particularly to Central Hawke's Bay College) and the infrequent social visits.

2.4 ACTIVE MODE NETWORK

Active mode users have been provided for in Waipukurau, with most roads having a 1.2 m to 1.5 m footpath along both sides. There is less provision for cyclists, with cycle symbols painted in the roadside shoulders along several key roads (including Racecourse Road, Porangahau Road and Tavistock Road). However, the roadside shoulders are shared between on-street parking and cyclists, with no separation (e.g. painted cycle lanes) provided.

Waipukurau also connects to a several of the regional cycle trails, with a limestone path along both sides of the Tukituki River and a concrete shared path running along SH2 between Waipukurau and Waipawa.

2.5 PUBLIC TRANSPORT NETWORK

There are presently no public transport services operating in Waipukurau.

2.6 SAFETY RECORD

The NZTA Crash Analysis System (CAS) was searched to determine the pattern of crashes occurring around the site and along the main transport links to the Waipukurau town centre (i.e. Porangahau Rd, Wellington Rd and Ruataniwha St). The full 10-year period (2014 to 2024) was assessed. It was found that a total of 50 crashes have occurred in the study area over the last

10 years, of which one resulted in a fatal, three resulted in serious injuries and 15 resulted in minor injuries.

It appears there are an average 5 crashes recorded every year, with approx. 1.5 crashes per year (35%) resulting in injuries. A summary of the crash history for the entire study area is provided in Table 2-4 with the crash locations shown in Figure 2-2.

Table 2-4. Summary of CAS Data

Year	Crash Numbers				Casualty Numbers		
	Fatal	Serious Injury	Minor Injury	Non-Injury	Fatality	Serious Injury	Minor Injury
2014	1			3	1		
2015			1	2			1
2016			1	5			1
2017			2	3			2
2018			2	6			2
2019			2	4			2
2020			4	1			4
2021		1	1	3		1	1
2022		2		4		2	
2023			1				1
2024			1				1
Total	1	3	15	22	1	3	14
%	2.2%	6.7%	31.1%	48.9%	5.6%	16.7%	77.8%



Figure 2-2. Exisitng Crash Locations

A brief review of the crash history indicates that:

- 32 crashes occurred at intersections, with the following crash clusters:
  - SH2 / Ruataniwha St / Porangahau Rd (six crashes, one of which resulted in serious injuries and two resulted in minor injuries. All three injury crashes occurred since 2020);
  - Ruataniwha St / St Joseph St / Mount Herbert Rd / Wellington Rd (five crashes, three of which resulted in minor injuries);
  - Porangahau Rd / Wellington Rd / Holyrood Tce / Wallace Rd (five crashes, however, no injuries were reported); and
  - Porangahau Rd / Gaisford Tce (three crashes, two of which resulted in minor injuries).
- All three serious injury crashes happened during 2021-22, with half of all injury crashes occurring since 2020.
- Five crashes involved pedestrians, resulting in either minor or serious injuries. Two of these crashes occurred at the SH2 / Porangahau Rd roundabout, with a minor injury crash in 2020 and serious injury crash in 2021. The serious injury crash involved a truck and trailer travelling along SH2.

High-risk Intersections

- SH2 / Porangahau Rd / Ruataniwha Rd Roundabout

- Six crashes occurred at this intersection during the 10-year period. One resulted in serious injuries and two resulted in minor injuries. All three injury crashes occurred since 2020.
- The intersection was upgraded from a stop priority control to a roundabout between 2013 and 2015. From aerial imagery in Google Earth, there have not been any changes or improvements made to the intersection since the roundabout was installed.
- Two of the injury crashes, including the serious injury crash, involved pedestrians crossing the road. The serious injury crash involved a truck with trailer turning left along SH2 (into Herbert St) and striking a pedestrian crossing the road (travelling east). At present, the building on the corner limits the sightline for a pedestrian crossing the road (cannot see more than 1-2 m beyond the limit line of the western approach).

The crash analysis shows there are some existing safety issues along the road network. It is likely that the proposed development will increase the risk of crashes due to the increased trips generated and the size of the development without mitigation. Potential mitigation measures are discussed in Section 3.4.4 below.

2.7 TRAFFIC DATA

2.7.1 TRAFFIC SURVEY

A turning count traffic survey was conducted on Thursday 4th August 2022 at the following intersections:

- Porangahau Road / Gainsford Terrace
- Porangahau Road / Jellicoe Street
- Porangahau Road / Wallace Road / Wellington Road /. Holyrood Terrace
- Porangahau Road / SH2 / Ruataniwha Street
- Wellington Road / Ruataniwha Street / St Joseph Street / Mount Herbert Road
- Tavistock Road / Wellington Road
- Tavistock Road / Holyrood Terrace
- Tavistock Road / Svenson Road

The traffic survey was conducted during the morning and evening peak periods, as well as the midday inter-peak period. The survey was conducted to determine the following:

- The turning volumes / proportions at each intersection; and
- The AM and PM peak hour periods.

From the traffic survey, the AM peak hour was observed to occur at 8:00-9:00 and the PM peak hour occurred at 16:30-17:30. A summary of the two-way volumes near each intersection is provided in Table 2-5, showing the vehicles per hour (vph) on each of the road sections surveyed for both peak hour periods. The turning count volumes has been used as a basis for the traffic modelling in the Assessment of Effects (see Section 3).

Table 2-5. Peak Hour Traffic Volumes Established from Surveys

ROAD NAME	ROAD SECTION	TRAFFIC VOLUMES (VPH)	
		AM PEAK (08:00-09:00 HRS)	PM PEAK (16:30-17:30 HRS)
State Highway 2	North along Herbert Street	826	691
	West along Ruataniwha Street	423	563
Porangahau Road	Between SH2 and Wellington Road	468	490
	Between Wellington Road and Jellicoe Street	458	525
	Between Jellicoe Street and Gaisford Terrace	478	514
	South of Gaisford Terrace	362	376
Ruataniwha Street	-	356	434
St Joseph Street	-	245	349
Mount Herbert Road	-	198	249
Wellington Road	Between Ruataniwha Street and Tavistock Road	399	518
	Between Tavistock Road and Porangahau Road	97	162
Wallace Road	-	109	54
Holyrood Terrace	-	94	60
Jellicoe Street	-	114	102
Gaisford Terrace	-	122	163
Tavistock Road	Between Wellington Road and Holyrood Terrace	332	364
	Between Holyrood Terrace and Svenson Road	264	356
	South of Svenson Road	201	218
Svenson Rd	-	77	142

3 ASSESSMENT OF EFFECTS

3.1 TRANSPORT ASSUMPTIONS

3.1.1 SITE YIELD ANALYSIS

We are advised that the site will yield about 950 extra dwellings.

3.1.2 TRIP GENERATION

Trip generation associated with residential activities has been determined on a per dwelling basis. The Roads and Traffic Authority (RTA) Guide to Traffic Generating Developments (2002) has been used to determine the trip generation for residential land-use.

The following trip generation rates have been used:

- Peak period trip generation rate of 0.85 vehicle trip per dwelling; and
- All-day trip generation rate of 9 vehicle trips per dwelling.

Note that not all trips are external trips and RTA guide recommends about 25% of trips are internal to the subdivision (resulting in 6.75 daily trips per dwelling), involving local shopping, schools and local social visits. This is comparable to the trip generation rates provided in NZTA Research Report 453 (Trips and Parking Related to Land Use), with a rate of 6.9 daily trips per dwelling and one peak-hour trip per dwelling. The intersection analysis is described in Section 3.5, noting that no reduction in the peak trip generation rate has been applied.

Therefore, when reviewing the impact of the traffic generated on sub-regional roads, some adjustment is necessary, depending on the location of shops, schools and recreational facilities.

Based on the trip generation assumptions outlined above, approximately 808 vehicle trips are expected to be generated during peak hours, with an all-day trip generation rate of approximately 8,550 vehicle trips.

3.1.3 TRIP DISTRIBUTION

The trip generation rates outlined within Section 2.7.1 are total two-way volumes, and it is recognised that residential activity generates a tidal distribution throughout the day.

The ITE Trip Generation Manual (Ninth Edition) has been used to determine the proportion of trips generated that are inbound and outbound with respect to peak periods and all-day traffic volumes generated by the site. For single-family detached housing, the ITE indicates a directional distribution of 20% inbound / 80% outbound for the AM peak and 65% inbound / 35% outbound for the PM peak (see Table 3-1).

Table 3-1. Trip Distribution for Waipukurau South Development Area

FACTOR	RATES	WAIPUKURAU SOUTH DEVELOPMENT AREA
Dwellings	Per Dwelling Unit	950
AM Peak Hour Trips	Total	630
	Trips In (20%)	126
	Trips Out (80%)	504
PM Peak Hour Trips	Total	630
	Trips In (65%)	410
	Trips Out (35%)	220
All Day Trip Generation	Total	8,550
	Trips In (50%)	4,275
	Trips Out (50%)	4,275

The trips generated by the Waipukurau South Development Area have been assigned to the network based on existing commuter travel patterns from the 2018 New Zealand Census for the 'Waipukurau East' and 'Waipukurau West' census areas. The primary destinations from Waipukurau are presented in Table 3-2.

Table 3-2. Assumed Distribution Splits for Traffic from Waipukurau South Development Area

DESTINATION	CENSUS TRIPS	ASSUMED SPLITS AND ASSIGNMENT
WAIPUKURAU	1,428 (71.3%)	
WORK FROM HOME	180 (9.0%)	Does not generate commuter trips
COMMUTER	1,248 (62.3%)	Travels into the Waipukurau Commercial Area
WITHIN CENTRAL HAWKE'S BAY	501 (25.0%)	
WAIPAWA (NORTH)	108 (5.4%)	Travel north along SH2
MANGAONUKU (NORTH-WEST)	12 (0.6%)	Travel west along SH2
MAKARETU (WEST)	291 (14.5%)	
TAUREKAITAI (SOUTH)	39 (1.9%)	Travel south along Tavistock Road / Porangahau Road
MANGARARA (SOUTH-EAST)	51 (2.5%)	
TRAVELLED OUT OF CENTRAL HAWKE'S BAY	75 (3.6%)	
NAPIER	9 (0.4%)	Travel north along SH2
TARADALE	12 (0.6%)	
HASTINGS	27 (1.3%)	
FLAXMERE	27 (1.3%)	

Using the trip generation rates and direction splits outlined in Table 3-1, the number of trips travelling to each destination from the site has been established. The assumed destination splits for outward trip movements from the site have been shown diagrammatically in Figure 3-1. It has

been assumed that inbound vehicles return along the same route as the outbound vehicles. This method of calculation resulted in an estimated future ADT and turning count estimation for each intersection.

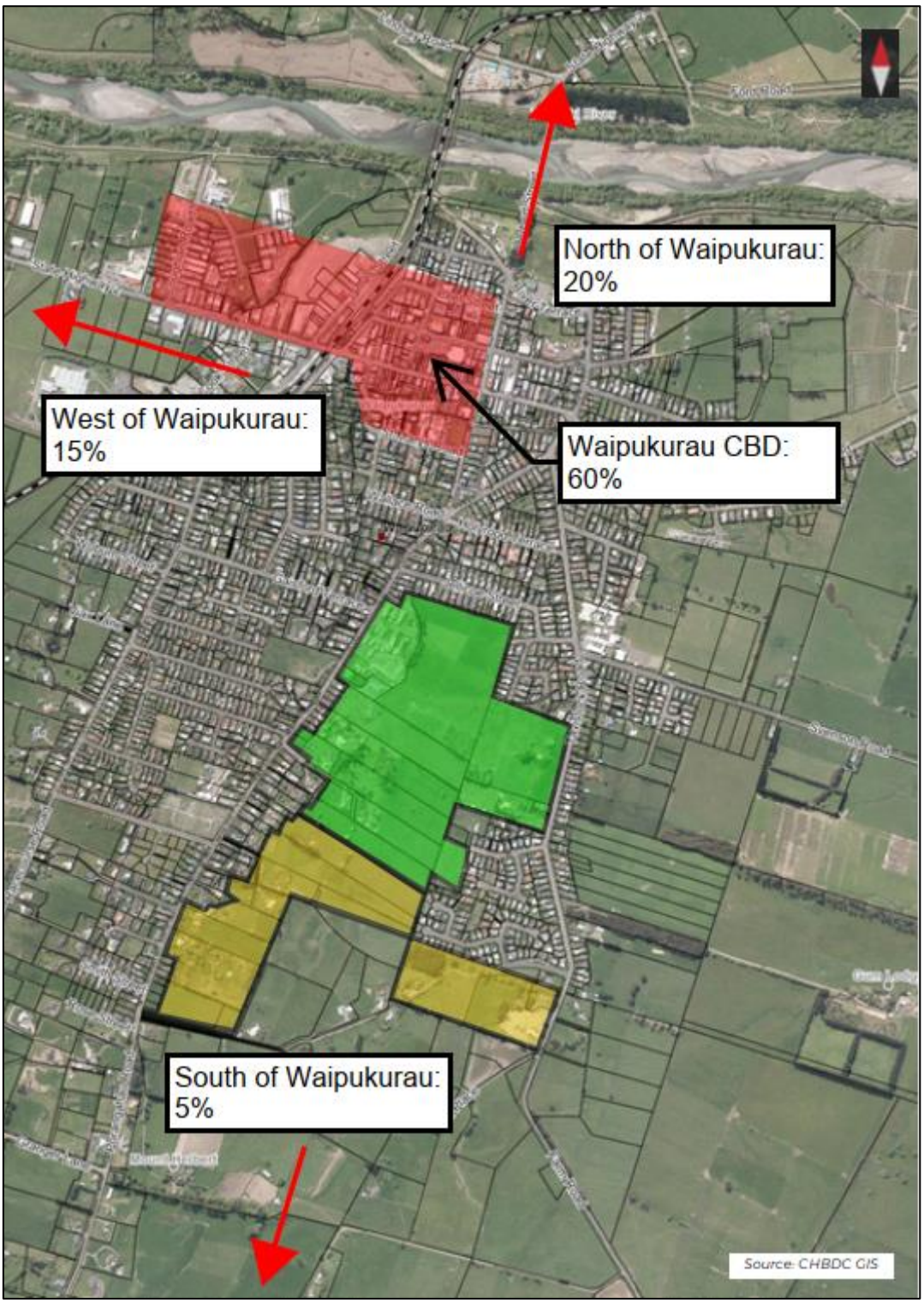


Figure 3-1. Trip Distribution Split

3.2 ACCESS STRATEGY

3.2.1 POTENTIAL ACCESS LOCATIONS

The suitability of potential connections from the Waipukurau South Development Area to the existing road network have been assessed with due consideration given to the ability to achieve the desired clear sightlines. The prospective access locations have been determined for the Waipukurau South Structure Plan (Figure 1-4) and shown in Figure 3-2 below and summarised in Table 3-3.

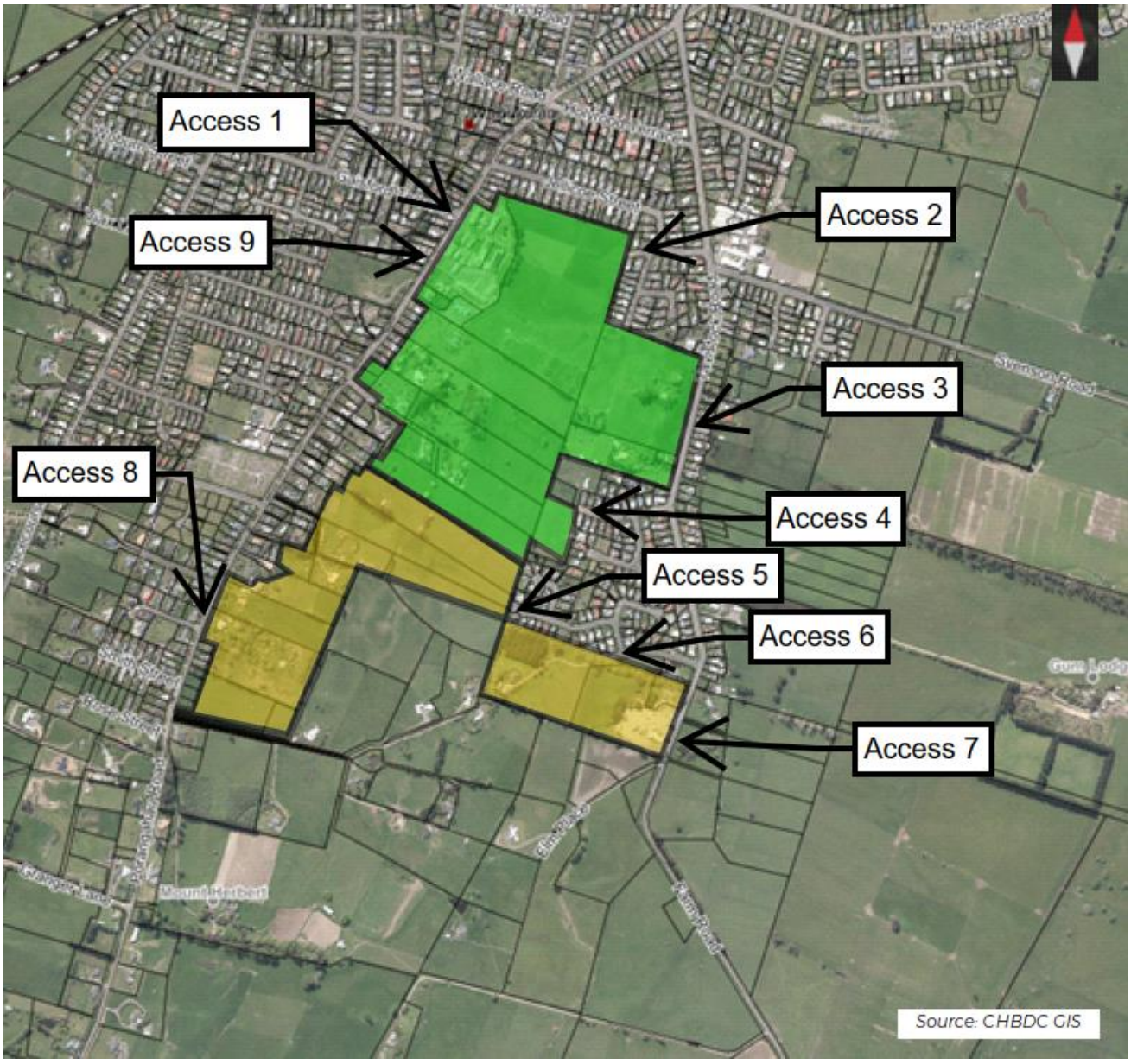


Figure 3-2. Proposed New Access Locations

Table 3-3. Access Summary

ACCESS NO.	LOCATION	DESCRIPTION	VIABLE LOCATION?
1	Porangahau Road / Gaisford Terrace Intersection	Based on the trip destinations determined in Section 3.1.3, an access at this location would likely attract most of the trips generated by the development. As such, three intersection layouts have been considered: • Priority-controlled cross-road (new road is directly opposite Gaisford Terrace); • Priority-controlled staggered T-junction intersection (new road would be 30 m south of Gaisford Terrace intersection); and • Roundabout at Gaisford Terrace intersection.	Yes
2	Winlove Crescent	Winlove Crescent is ideally located to provide a direct connection to Tavistock Road. The new access will mean that the existing Winlove Crescent / Jellicoe Street intersection will need to change to allow Winlove Crescent to be the major approach. It is recommended Winlove Crescent be renamed to Winlove Road as it will no longer function as a crescent. Furthermore, the portion of Jellicoe Street between Winlove Crescent and Tavistock Road should be renamed to Winlove Road.	Yes
3	Tavistock Road	Based on the size of the development, a new connection will be required along Tavistock Road (between Svenson Road and Leeton Drive). This access offers good sightlines and is far enough from Leeton Drive to avoid operational interference. It is noted that the entrance/exit for the Waipukurau Seventh Day Adventist Church exists directly opposite the proposed new development access. The church peak periods differ to typical weekday peak periods and in unlikely to cause conflicts. The exact location would need to be developed during the design stage.	Yes
4	Leeton Drive	This road can easily be extended to service the development.	Yes
5	Holt Place	Holt Place is suitably located to connect to the proposed road in Area B. The landowner at 26 Holt Place is reportedly willing to sell their property to allow its extension.	Yes
6	Redwood Drive	This road can easily be extended to service the development.	Yes
7	Farm Road	A new connection along Farm Road is unavoidable given the small development block along Farm Road is disconnected from the rest of the development. The only alternative to a new intersection along Farm Road is to connect a relatively small portion of the overall development to Redwood Drive. However, the Tavistock Road / Redwood Drive intersection is located on the inside of a bend with limitations in the available sight distance. While a connection to Redwood Drive is advisable, a new connection along Farm Road might still be beneficial to create some resilience in the road network in the event Redwood Drive becomes closed (approx. 60 properties currently reliant on Redwood Drive and the development will add up to 100 new properties).	Yes
8	Porangahau Road	An access south of Smith Street is potentially difficult to secure due to it requiring multiple landowner support. A new access is therefore proposed between Brooker Place and Eden Terrace, which is deemed the safest option based on initial analysis. Crossroads are generally avoided due to increased conflict points and higher costs for treatments like signals or roundabouts. Based on this location and traffic volumes, the new intersection would only require priority control. This access in intended to service the majority of Area B.	Yes
9	Porangahau Road	A new T-intersection is proposed along Porangahau Road, providing a viable access point. It has adequate sight distance in both directions and sufficient separation from the nearest intersection to avoid conflicts. The access will serve as a key connection for the development.	Yes

3.2.2 CONNECTIVITY FOR ACTIVE MODES

The internal road network is expected to provide pedestrian facilities on residential streets that adhere to the requirements of the CHBDC District Plan and Subdivision Engineering Standards (providing footpaths of an appropriate width and gradient on both sides of the road).

During consultation for the proposed District Plan changes in 2022, multiple submissions (submitted by Hawkes Bay Regional Council, Waka Kotahi, Kainga Ora and the Ministry of Education) were made advocating support for, or enhanced emphasis on, the provision for active travel modes.

Given the size of the development, dedicated cyclist facilities are recommended to be included within the internal road network, particularly along the proposed connection between Jellicoe Street and Gaisford Terrace. This blends in well with the Waipukurau Town Centre Masterplan prepared by Isthmus, which identifies Porganahau Road as having traffic calming and improved pedestrian connectivity (see Figure 3-3 below).



Figure 3-3. Extract from Town Centre Masterplan

Connections for active modes are proposed along both Porangahau Road and Tavistock Road to provide a suitable link between the development and the Waipukurau commercial area. This will involve the following:

- Constructing a shared path along the western side of Porangahau Road between Ruataniwha Street and Gaisford Terrace. However, it is recommended the shared path continues along Porangahau Road, terminating at Lake View Road. This will promote future active mode connections from the Development Area to Porangahau Road (such as at Petersen Place) as well as providing a safe connection to The Terrace School.

- Constructing a pedestrian crossing over Porangahau Road close to Petersen Place. This would provide a safe crossing point for active mode users between the development (through the alleyway proposed to connect to Petersen Place) and the shared path recommended along the western side of Porangahau Road.
- Consolidating the kerb build-outs along Tavistock Road (between Jellicoe Street and Holyrood Terrace) into a single pedestrian crossing servicing Central Hawke's Bay High School. The preferred location for the pedestrian crossing is approx. 40 m north of Jellicoe Street.

The proposed active mode connections along Porangahau Road can feed into / promote further connections / improvements including:

- Providing a shared path along SH2 between Ruataniwha Street and River Terrace. In conjunction with the shared path along Porangahau Road, the shared path along SH2 would connect the development (and southern Waipukurau) to both the Tukituki River Trail and the shared path connecting Waipukurau and Waipawa.
- Installing cycle lanes along Tavistock Road, Wellington Road and St Joseph Street to provide a cycling connection to Central Hawke's Bay High School and an alternative connection between the development and Russell Park (Tukituki River Trail and Waipawa-Waipukurau Shared Path).

3.2.3 CONNECTIVITY FOR PUBLIC TRANSPORT

There are currently no public transport services operating in Waipukurau. However, the Hawke's Bay Regional Council (HBRC) has recently completed its regional public transport plan, which now includes a proposal to trial a commuter bus between Waipukurau and Hastings by 2025/6. The service would involve two return services in the morning and evening on weekdays (Monday-Friday).

CHBDC produced a submission on the public transport plan, which supported the commuter bus trial. The submission also included results from a survey conducted in August 2022, highlighting the following:

- Over 80% of respondents indicated they would be either likely to or occasionally use the commuter bus service;
- 60% of respondents indicated that the frequency proposed in the trial would be sufficient;
- The preferred mode for the proposed commuter service is actually a passenger train, with over 85% of respondents in support compared to 57% for a bus service;
- The service would attract a variety of users, with only 30% using the service to travel to/from work (compared to nearly 50% using it for other reasons). It would also provide greater flexibility for students living in CHB but travel to Hastings for school;
- A commuter service with stops in Waipukurau, Waipawa and Otane would meet the needs of around 85% of the respondents; and
- Around half of respondents indicated their destination would be Hastings City Centre, with a further 30% requiring connections to Napier (EIT, Napier City Centre, Ahuriri/Napier Port).

As part of the initial investigations for the Waipukurau South Development Area, a local commuter shuttle was considered for operation within Waipukurau. An indicative route has been outlined

below (Figure 3-4), which assumes the full development has been completed. It is recommended that CHBDC discuss the potential of a local shuttle with HBRC. However, the final decision rests with HBRC and is ultimately driven by demand.

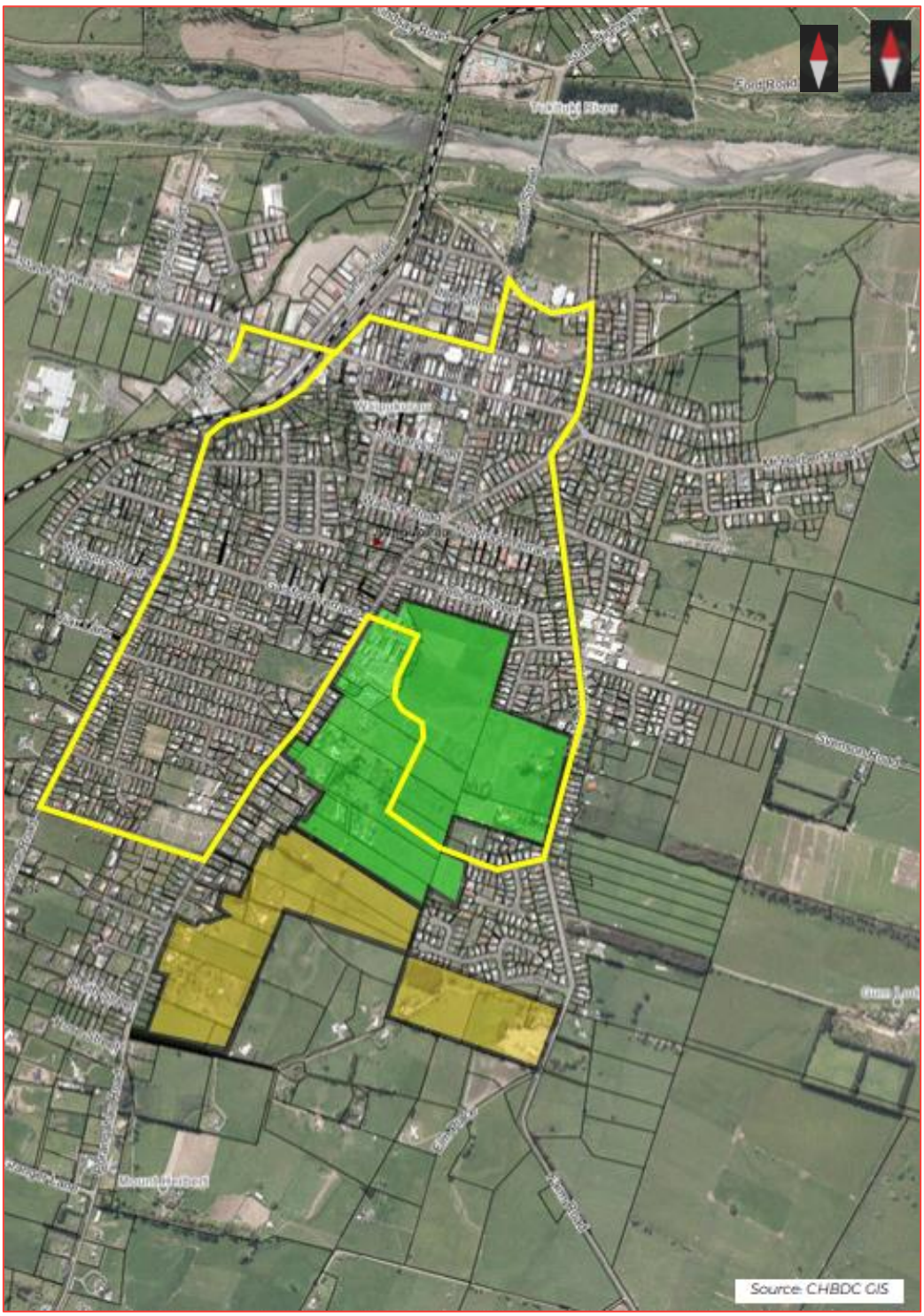


Figure 3-4. Indicative Bus Route Serving Waipukurau

3.3 INTERNAL ROAD NETWORK (MASTERPLAN)

CHBDC recently provided an updated draft structure plan for the development area (refer to Figure 1-4) which includes the road locations in Development Area A and a proposed road connection to Development Area B.

The proposed road network includes a combination of collector and local roads, described below:

- New Local Road connecting Porangahau Road (at the Gaisford Terrace intersection) to Winlove Crescent.
- New Collector Road connecting Porangahau Road with Tavistock Road and Leeton Drive, winding around the stormwater ponds and wetlands proposed in Development Area A.
- New Local Road connecting the realigned collector road with the cycle/walking connection, passing an open space reserve (with wetlands and stormwater ponds).

The updated structure plan proposes the following connections between Development Areas A and B:

- A potential new Local Road linking Area A and Area B
- A potential new Collector Road in Area B connecting Porangahau Road (mid-block access) to Holt Place
- A potential new Local Road linking Farm Road to Redwood Drive

The external intersections (where the roads in the development connect to the existing road network) are discussed in sections 3.4 and 3.5 below.

3.3.1 ROAD DESIGN REQUIREMENTS

Presently, the structure plan proposes that both the collector and local roads will have a 15m wide road reserve, with the collector roads having a 3m wide shared path along one side of the road.

The design requirements for the internal roads have been obtained from NZS4404:2010 and HDC's Engineering Code of Practice (ECOP) as referenced in CHBDC's District Plan.

These guidelines support the requirement for a 15m wide road reserve for both local and collector roads. Given the development is expected to create 950 dwellings across both development areas, with six connections between the development and the wider road network, it is unlikely any of the new roads will serve more than 200 dwellings. Therefore, the local road design requirements (15m wide road reserve) are appropriate for the internal road network in the development area. Some examples of road cross sections are provided in Figure 3-5 and Figure 3-6 below.

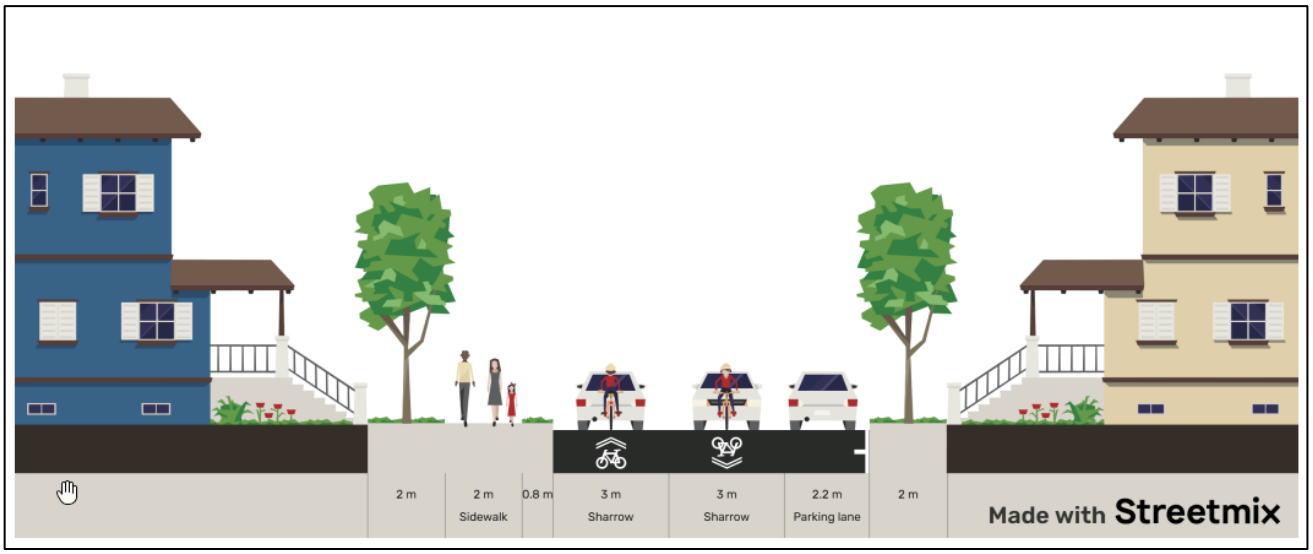


Figure 3-5: Example of Cross Section for Local Roads (15m Road Reserve)

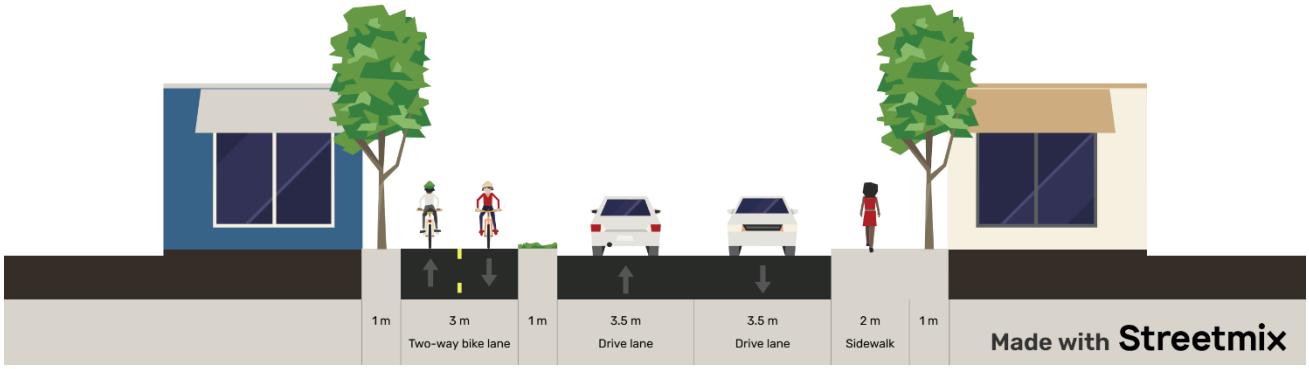


Figure 3-6: Example of Cross Section for Collector Road (15m Road Reserve)

While it is technically possible to have local roads narrower with a road reserve of only 9m (refer to NZS4404:2010) for roads serving up to 20 dwellings, it is recommended that the 15m road reserve be applied to ensure consistency. An allowance for short, no-exit roads (cul de sac's) and no-exit roads could be reduced to 9m but this should be at the discretion of the Council's roading engineer and site constraints.

A 3m wide shared path meets the requirements for a local road in NZS4404:2010. A shared path (or dedicated pedestrian and cyclist infrastructure) is considered essential to the development to promote active transport modes.

Finally, the intersections in the development should avoid cross-road layouts, with T-junction intersections preferred due to their improved safety (fewer conflict points for turning vehicles).

3.4 FORECAST TRAFFIC VALUES

3.4.1 NETWORK ASSIGNMENT

As outlined in Section 3.2.1, it is recommended that access to the development site is supported by four new intersections (two along Porangahau Road and two along Tavistock Road) utilising a further three existing driveways/intersections. Based on the recommended access strategy, the following assumptions were made when assigning trips to the network:

- The trip generation and distribution rates outlined in Sections 3.1.2 and 3.1.3 were used to determine the additional traffic volumes, trip destinations and directional splits (inbound and outbound movements);
- All vehicles entering Porangahau Road continued along Porangahau Road (e.g. vehicles that had a destination west of the rail line continued along Porangahau Road rather than cutting across to Racecourse Road via either Lake View Road or Gaisford Terrace);
- All vehicles entering Tavistock Road turned off at Ruataniwha Street rather than continuing along St Joseph Street (for those vehicles with destinations north of Waipukurau);
- All vehicles with destinations either north, west or within the commercial area of Waipukurau will pass through the SH2 / Ruatahiwha Street / Porangahau Road intersection.

Based on these assumptions, the all-day traffic volumes and peak period turning movements at each of the surveyed and new intersections are presented within Appendix A.

3.4.2 PEAK PERIOD LINK VOLUMES

At a network level, the traffic generated by the Waipukurau South Development Area is expected to have the most significant impact on network operations during the weekday morning and evening peak periods. The forecast two-way traffic flows generated by the Waipukurau South Development Area during peak periods have been added to the existing volumes (surveyed) to estimate the future forecast peak hour traffic flows along these key links (see Table 3-4).

Table 3-4. Forecast Peak Traffic Volumes along Select Links (with development)

ROAD SECTION	TRAFFIC VOLUMES – AM PEAK		TRAFFIC VOLUMES – PM PEAK	
	LINK FLOWS (VPH)	% CHANGE	LINK FLOWS (VPH)	% CHANGE
Porangahau Road (South of Gaisford Terrace)	459	+26.7%	473	+25.7%
Porangahau Rd (between Gaisford Terr and Wellington Rd)	833	+84.2%	908	+72.2%
Porangahau Rd (between Wellington Rd and Ruataniwha Str)	850	+81.1%	871	+77.7%
Tavistock Road (South of Leeton Dr)	316	+62.8%	338	+56.4%
Tavistock Road (between Leeton Dr and Jellicoe Str)	396	+96.9%	413	+89.3%
Tavistock Road (between Jellicoe Str and Wellington Rd)	529	+70.0%	582	+59.8%
Wellington Road (between Tavistock Rd and Ruataniwha Str)	617	+54.6%	736	+42.1%
Ruataniwha Street (between Wellington Rd and Porangahau Rd)	606	+56.1%	756	+40.5%

ROAD SECTION	TRAFFIC VOLUMES – AM PEAK		TRAFFIC VOLUMES – PM PEAK	
	LINK FLOWS (VPH)	% CHANGE	LINK FLOWS (VPH)	% CHANGE
SH2 (North of Porangahau Rd/Ruataniwha Str intersection)	814	+32.9%	901	+28.8%
SH2 (West of Porangahau Rd/Ruataniwha Str intersection)	830	+91.6%	980	+68.1%

As shown by the forecast traffic flows, there is expected to be ample link capacity on the network to support peak hour traffic volumes associated with the development.

3.4.3 INTERSECTION TURNING BAY REQUIREMENTS

Austroads Guide to Traffic Management: Part 6 (2020) provides guidance on the thresholds for turning bays at intersections. These thresholds are dependent on traffic volumes (vehicles per hour) and posted speed limits. The indicative volumes required for turn treatment requirements were obtained from Figure 3.25(c) as presented in Figure 3-7. The traffic volume parameters (Q_M, Q_L and Q_R) have been calculated using the parameters shown in Figure 3-8.

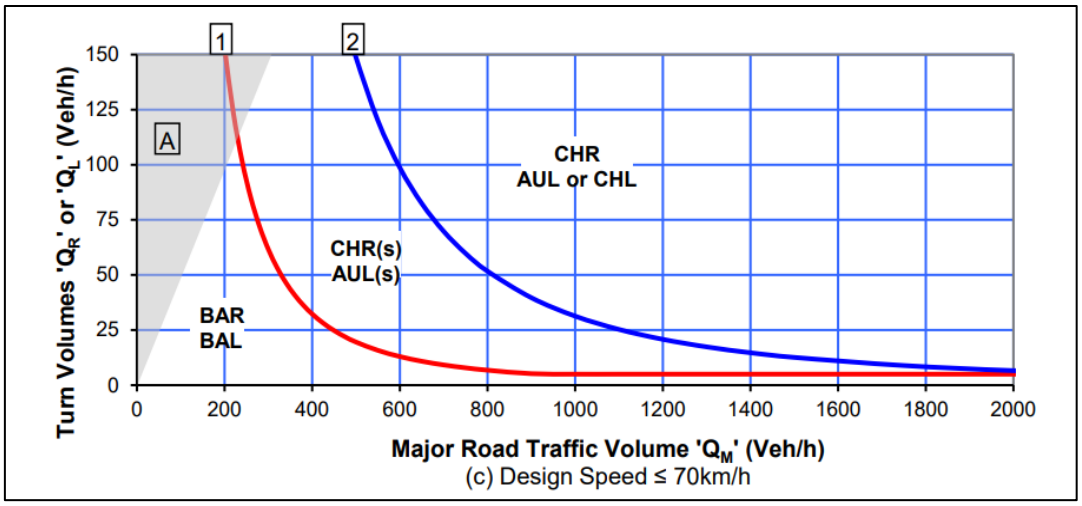
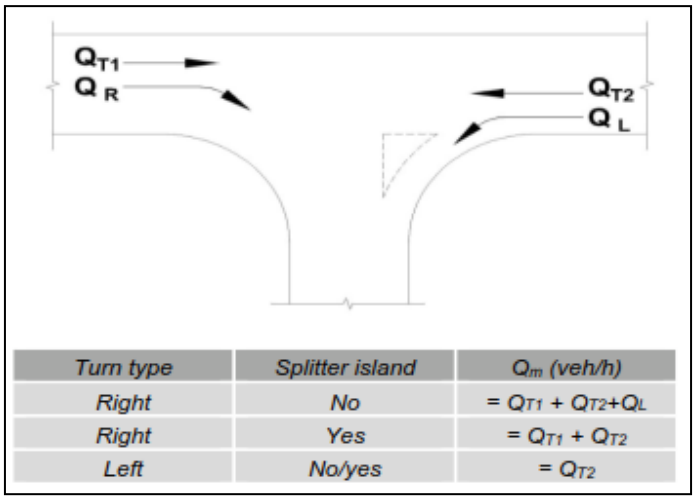


Figure 3-7. Warrants for Turn Treatments on Major Roads at Unsignalised Intersections (<70 km/h)

The types of turning treatments comprise either:

- BAR: Basic Right Turn (no treatment required).
- BAL: Basic Left Turn (no treatment required).
- CHR: Channelised Right Turn Lane, often referred to as a right turn bay. The (s) denotes a short turning bay may be implemented.
- AUL: Auxiliary Left Turn Lane. The (s) denotes a short turning bay may be implemented.
- CHL: Channelised Left Turn Lane, also called a left-turn bay. The (s) denotes a short turning bay may be implemented.



Turn type	Splitter island	Q_m (veh/h)
Right	No	= Q_{T1} + Q_{T2}+Q_L
Right	Yes	= Q_{T1} + Q_{T2}
Left	No/yes	= Q_{T2}

Figure 3-8. Calculation of the Major Road Traffic Volume Parameter, Q_M

All intersections shown in Figure 3-2 were reviewed against the turning bay requirements. It determined that the following intersections would need turning bays to accommodate the development:

- Porangahau Road / Gaisford Terrace;
- Porangahau Road / New Collector Road; and
- Tavistock Road / Jellicoe Street.

The other intersections along Porangahau Road which connect to the development area do not require turning bays as the majority of traffic is turning left-in and right-out (to/from the Waipukurau Town Centre and SH2). However, the reverse is true for the intersections along Tavistock Road which connect to the development area (particularly Leeton Drive and the new intersection proposed between Leeton Drive and Jellicoe Street). Therefore, these intersections were assessed to determine the level of approximate level of development allowable before a turning bay is warranted. The traffic volume thresholds are shown in Table 3-5 below.

Table 3-5. Scenarios for right-turn bays at intersections along Tavistock Road

		Tavistock Road / Leeton Drive	Tavistock Road / New Road
Existing (49 Dwellings off Leeton Drive)	Right Turn-in (Q_R)	26 vph	-
	Opposing Traffic (Q_M)	181 vph	209 vph
	Turn Bay Required	No	-
Baseline - Existing +33 Dwellings off Leeton Drive (consent in progress)	Right Turn-in (Q_R)	43 vph	-
	Opposing Traffic (Q_M)	182 vph	236 vph
	Turn Bay Required	No	-
Baseline + 100 Dwellings off Leeton Drive (Maximum of Development Area A accessing Leeton Drive only)	Right Turn-in (Q_R)	96 vph	-
	Opposing Traffic (Q_M)	185 vph	326
	Turn Bay Required	Yes	-
	Right Turn-in (Q_R)	43	52
	Opposing Traffic (Q_M)	182	247

		Tavistock Road / Leeton Drive	Tavistock Road / New Road
Baseline + 100 Dwellings off New Road (indication of access from New Road)	Turn Bay Required	No	No
Baseline + 100 Dwellings off Redwood Drive (Development Area B)	Right Turn-in (Q_R)	43	-
	Opposing Traffic (Q_M)	262	326
	Turn Bay Required	No	-
Baseline + 100 Dwellings off Leeton Drive + 100 Dwellings off New Road (partial development of Area A)	Right Turn-in (Q_R)	96	52
	Opposing Traffic (Q_M)	185	329
	Turn Bay Required	Yes	Yes
Baseline + 150 Dwellings off Leeton Drive + 250 Dwellings off New Road (Maximum of Development Area A without northern connections)	Right Turn-in (Q_R)	122	131
	Opposing Traffic (Q_M)	186	373
	Turn Bay Required	Yes	Yes

Broadly, the results from Table 3-5 show that right-turn bays will be needed at both intersections along Tavistock Road (Leeton Drive and the new road) assuming the following conditions are met:

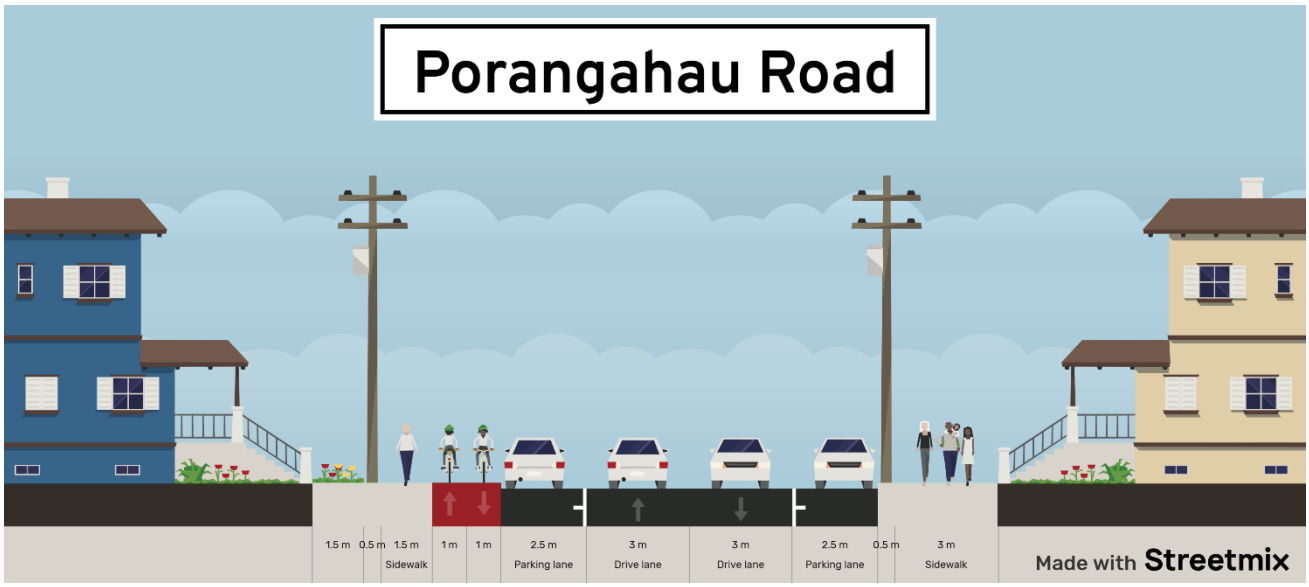
1. At least 100 new dwellings are proposed within Development Area A; and
2. These new dwellings will only be connected to Leeton Drive or the new road (no connections to Porangahau Road / Winlove Crescent in the north, or Porangahau Road in the south).

3.4.4 RECOMMENDED ROAD IMPROVEMENTS

This section summarises the various infrastructure improvements to mitigate the effects of the development on the surrounding road network.

Porangahau Road

A 3.5 m wide concrete shared path is proposed along the western side of Porangahau Road between Ruataniwha Street and Lake View Road. The proposed new road cross section is shown below. It is noted that the proposed cross-section can be accommodated within the existing road reserve.

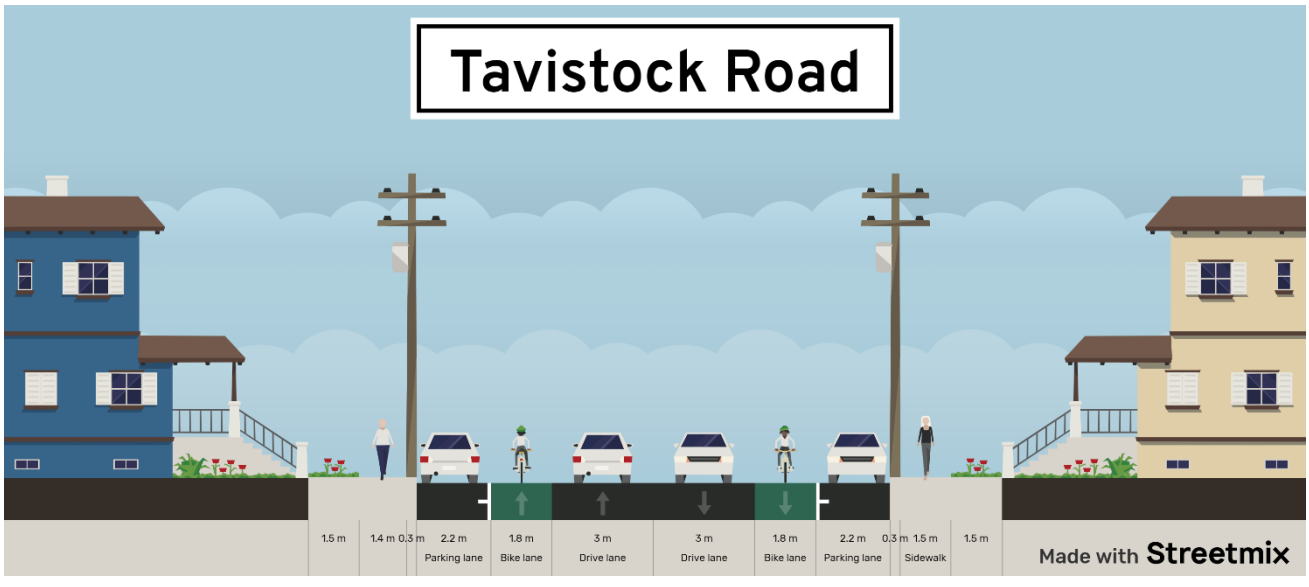


A new pedestrian crossing is also proposed near Petersen Place to aid pedestrians and cyclists crossing Porangahau Road and utilising the new shared path.

Tavistock Road

On road cycle lanes are proposed along Tavistock Road. It is also recommended that the existing kerb build-outs be removed and replaced with a raised speed platform. This will aid in reducing vehicle speeds close to Central Hawkes Bay College. The preferred location for the pedestrian crossing is approx. 40 m north of Jellicoe Street.

Under the new Setting of Speed Limits Rule (which came into effect on 30 October 2024), a 300 m section of road along the school frontage will now require a variable speed limit, operating during the school's busy periods (when students arrive and depart). Given the section of Tavistock Road alongside Central Hawke's Bay College is in an urban area, the variable speed limit will be set at 30 km/h. The speed limit rule also requires these variable speed limits to be implemented before 1 July 2025. However, CHBDC's timeframe to implement the variable speed limit along Tavistock Road is not known.



3.5 INTERSECTION MODELLING

3.5.1 MODELLING ASSUMPTIONS

The following input assumptions have been made within the SIDRA model:

- Peak Flow Factor: 95% on all models;
- Flow Scale (Constant): 100% on all models;
- Lane Utilisation Factors: Calculated by SIDRA;
- Gap Acceptance: As per SIDRA standard parameters for priority-controlled intersections;
- Approach Speeds: Approach and exit speeds based on existing posted speeds; and
- Lane Widths: Approach widths have been input as per existing arrangements

3.5.2 PERFORMANCE CRITERIA

The purpose of the modelling exercise is to identify the performance of intersections under future conditions and identify if/where mitigation maybe required. The following performance criteria has been used to assess if/when network deficiencies may occur within the network:

- Level of Service (LoS): Based on average delay for vehicles on the approach arm. LOS A-D indicates that intersections and links are performing with an acceptable level of service. LOS E indicates that intersection/links are performing at a poor level of service, and further investigation/modelling may be needed. LOS F indicates the intersections/links are over capacity.
- Degree of Saturation: Intersection reaches practical spare capacity (i.e. v/c ratio > 85%); and
- Maximum Queue Lengths: Consideration of whether queue lengths may impede on the performance of other intersections.

3.5.3 MODELLING RESULTS

The local road network was modelled in SIDRA using the AM and PM peak hour volumes from the trip distribution. Level of Service (LoS) diagrams for both peak hours are provided in Figure 3-9 and Figure 3-10 below.

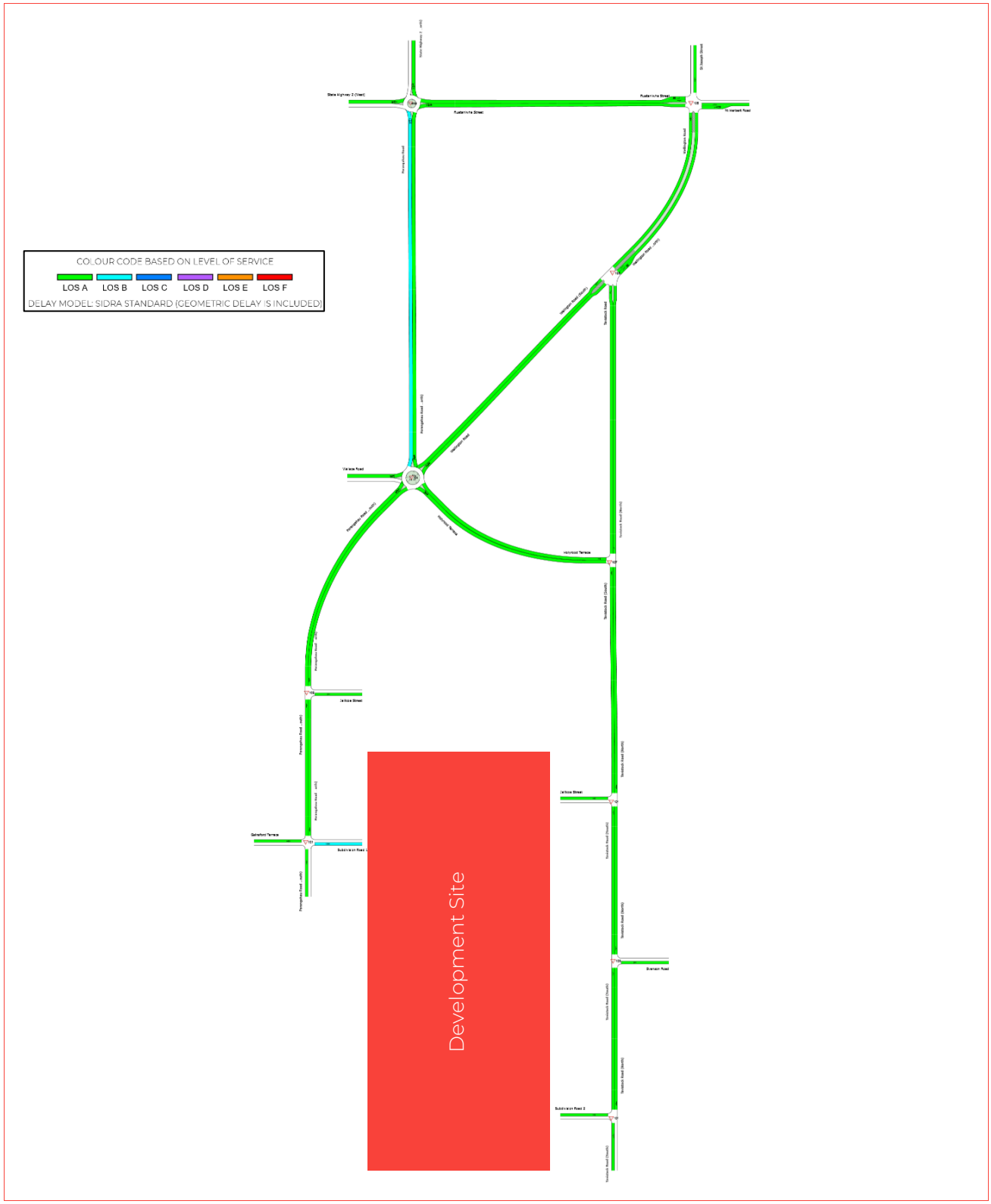


Figure 3-9. Network Level of Service (AM Peak)

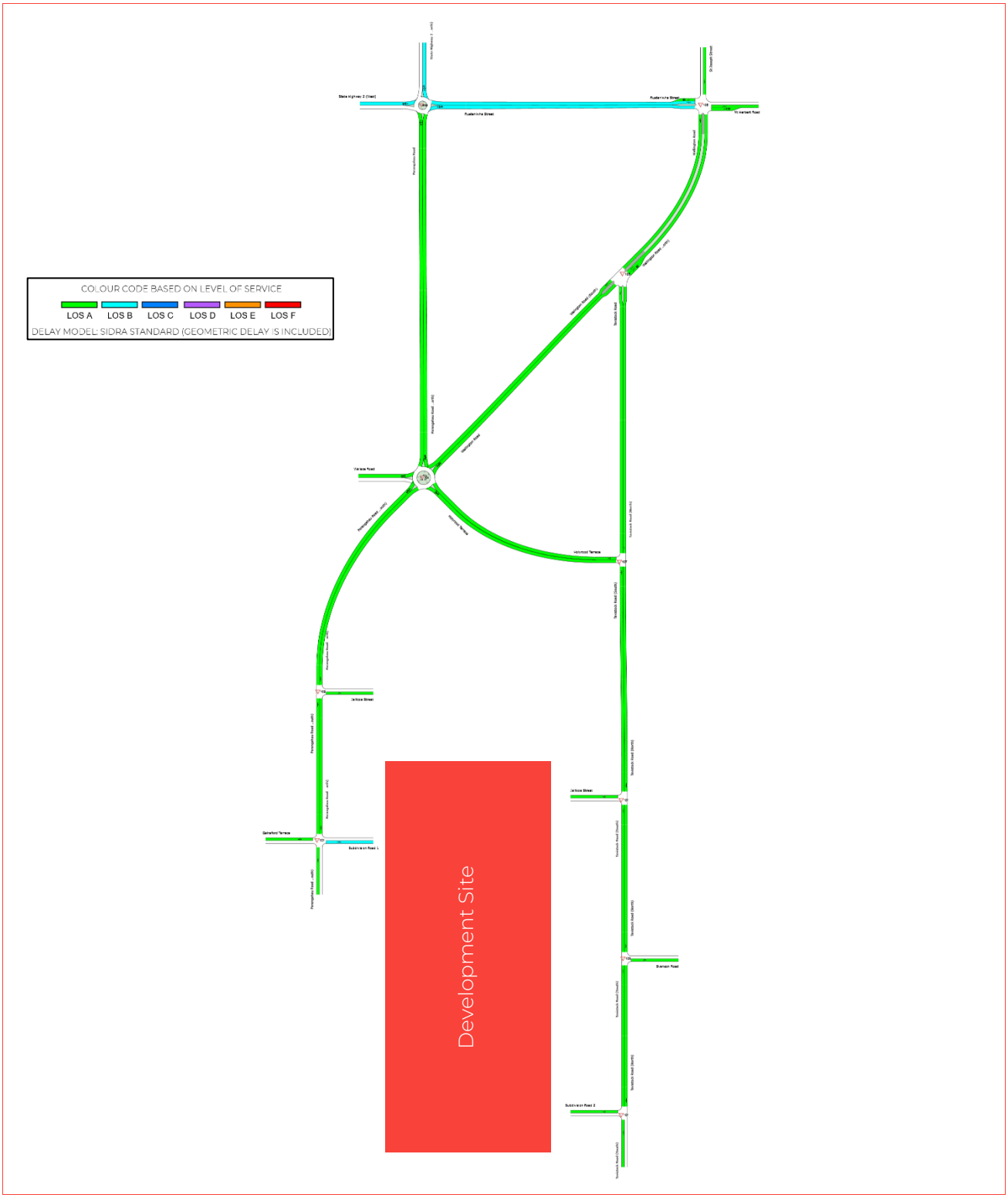


Figure 3-10. Network Level of Service (PM Peak)

It is clearly seen in the diagrams that the local road network in Waipukurau operates in an optimal condition, with all approaches operating at LoS A-C, even with the full development in place. The longest delay was observed along the new internal road approach at the Porangahau Road / Gaisford Road intersection, where vehicles turning right onto Porangahau Road will experience an average delay of 12.5 s in the AM peak and 12.0 s in the PM peak.

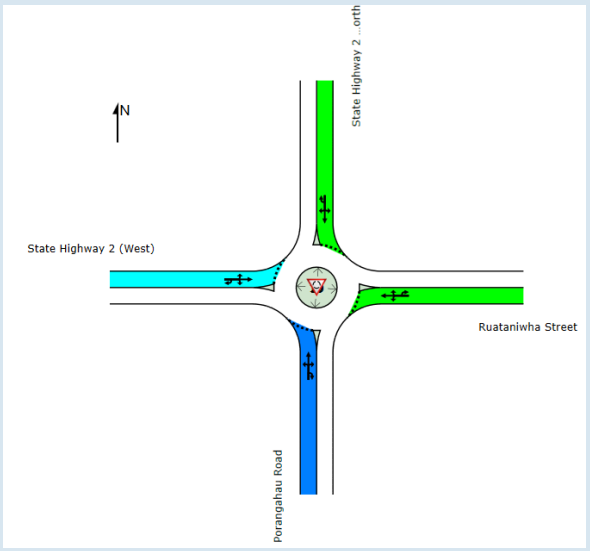
3.5.3.1 STATE HIGHWAY 2 / PORANGAHAU ROAD / RUATANIWHA STREET

The traffic modelling results for the SH2 / Porangahau Road / Ruataniwha Street intersection are summarised in Table 3-6 along with the Level of Service diagrams for the AM and PM peak periods.

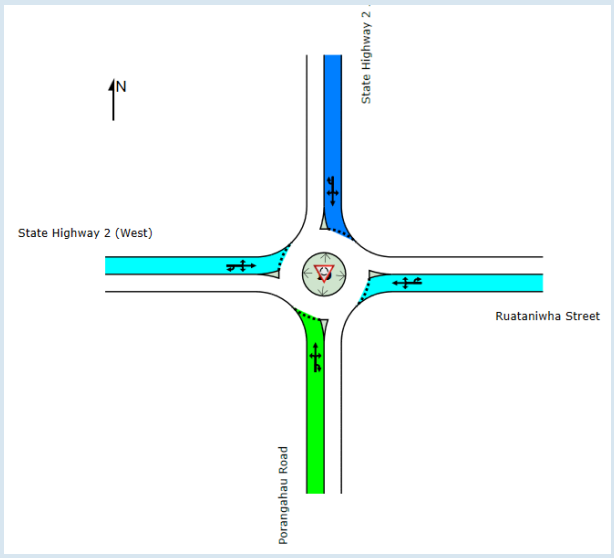
Table 3-6. SH2 / Porangahau Road / Ruataniwha Street intersection (Roundabout)

INTERSECTION APPROACH	AM PEAK HOUR			PM PEAK HOUR		
	V/C	AVERAGE DELAY (S)	95TH PERCENTILE QUEUE LENGTH (VEH)	V/C	AVERAGE DELAY (S)	95TH PERCENTILE QUEUE LENGTH (VEH)
SH2 (north)	0.298	7.3	1.9	0.808	20.6	11.4
Ruataniwha Street (east)	0.492	8.8	3.5	0.537	13.6	4.6
Porangahau Road (south)	0.868	21.3	15.2	0.495	9.0	3.8
SH2 (west)	0.431	10.6	3.1	0.781	15.6	10.9

LoS AM Peak Hour



LoS PM Peak Hour



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

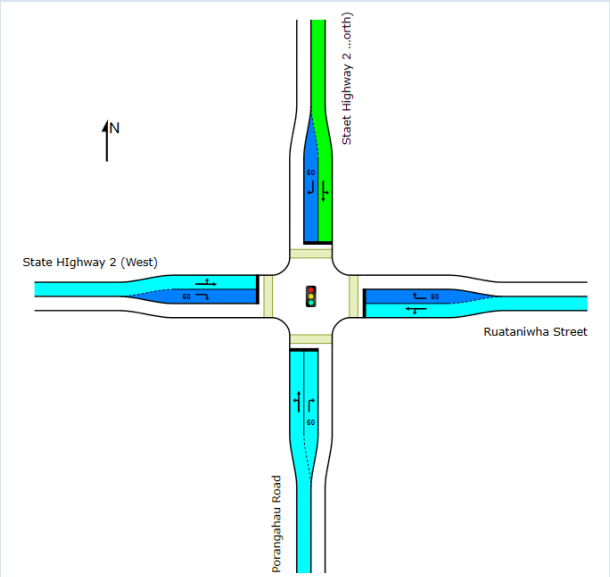
The average delays at the intersection were around 14.0 s, with the longest delays observed along the Porangahau Road approach during the AM peak period (21.3 s). Furthermore, several approaches appear to be nearing capacity with demand exceeding 70% of the capacity (Porangahau Road during the AM peak and both SH2 approaches during the PM peak).

Despite the delays and capacity concerns, all approaches are expected to operate between LoS A and LoS C during both peak periods. As such, no improvements are required from a capacity / operation perspective. However, there are existing safety concerns at this intersection, with a high crash rate (including several serious injury crashes). Therefore, a signalised intersection was also modelled, and the results shown in Table 3-7 below.

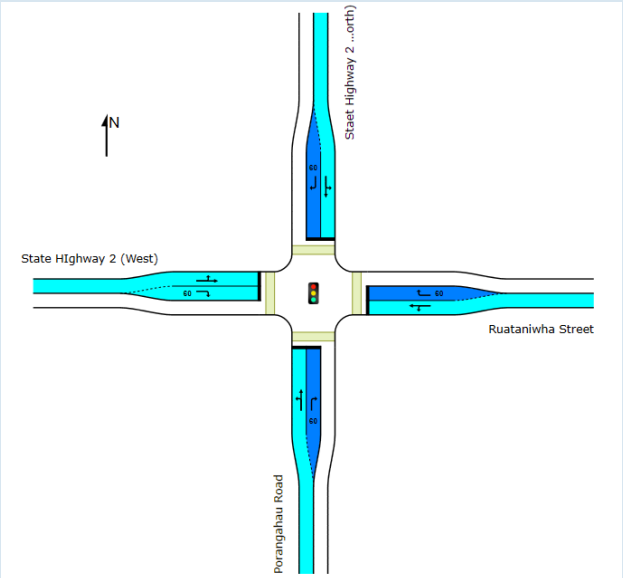
Table 3-7. SH2 / Porangahau Road / Ruataniwha Street Intersection (Signalised)

INTERSECTION APPROACH	AM PEAK HOUR			PM PEAK HOUR		
	V/C	AVERAGE DELAY (S)	95TH PERCENTILE QUEUE LENGTH (VEH)	V/C	AVERAGE DELAY (S)	95TH PERCENTILE QUEUE LENGTH (VEH)
SH2 (north)	0.318	13.3	2.7	0.632	15.5	7.3
Ruataniwha Street (east)	0.588	17.9	4.6	0.561	16.6	3.2
Porangahau Road (south)	0.803	17.4	13.4	0.557	14.5	6.1
SH2 (west)	0.378	17.5	3.3	0.595	15.7	6.6

LoS AM Peak Hour



LoS PM Peak Hour



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

The results confirm that the intersection will continue to operate within capacity with some movements deteriorating to LoS C. However, the traffic signals do provide significant safety benefits to pedestrians. The downside is that some 20 vehicles were observed U-turning, which could no longer occur with traffic signals. This would need further investigation to assess the wider impacts, and it would best undertake this investigation as part of a Ruataniwha Street project (e.g. SH2 revocation).

Although installing signals at the SH2/Porangahau Road/Ruataniwha Street intersection will offer a net improvement at the intersection, it is not required to accommodate the development.

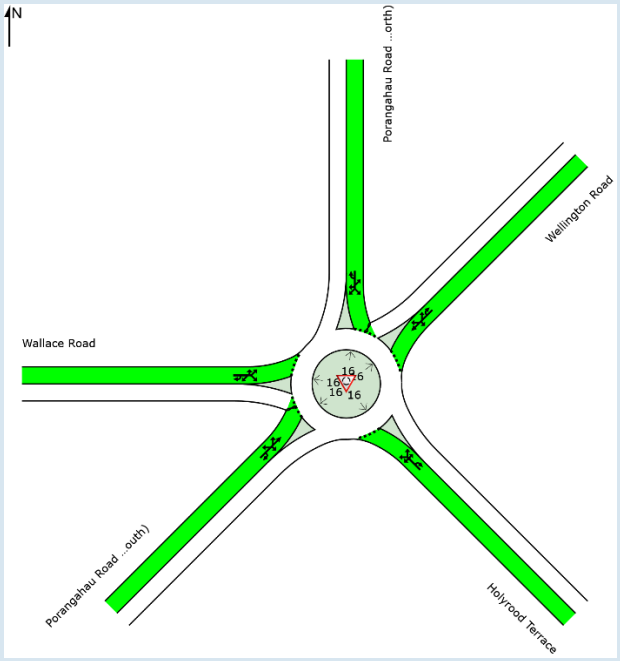
3.5.3.2 PORANGAHAU ROAD / WELLINGTON ROAD / HOLYROOD TERRACE / WALLACE ROAD

The traffic modelling results for the Porangahau Road / Wellington Road / Holyrood Terrace / Wallace Road intersection are summarised in Table 3-8 along with the Level of Service diagrams for the AM and PM peak periods.

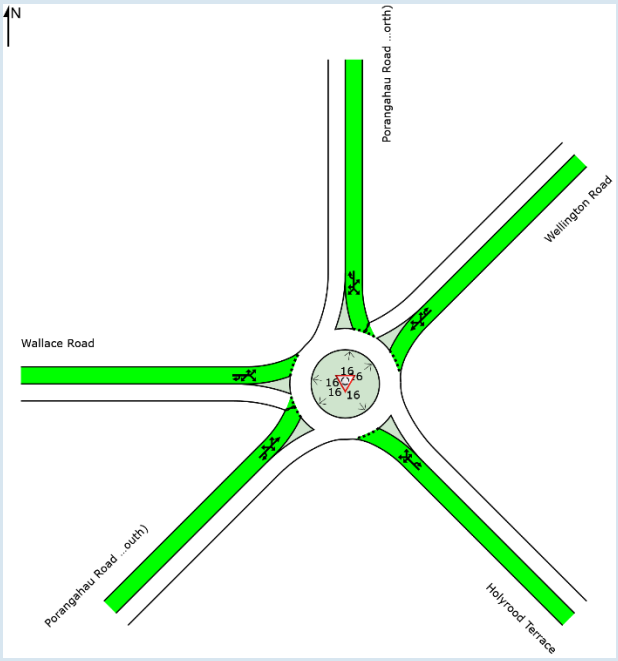
Table 3-8. Porangahau Road / Wellington Road / Holyrood Terrace / Wallace Road Intersection

INTERSECTION APPROACH	AM PEAK HOUR			PM PEAK HOUR		
	V/C	AVERAGE DELAY (S)	95TH PERCENTILE QUEUE LENGTH (VEH)	V/C	AVERAGE DELAY (S)	95TH PERCENTILE QUEUE LENGTH (VEH)
Porangahau Road (north)	0.189	7.6	1.0	0.421	8.0	2.9
Wellington Road (north-east)	0.041	7.4	0.2	0.091	8.0	0.5
Holyrood Terrace (east)	0.061	6.6	0.3	0.047	8.8	0.3
Porangahau Road (south)	0.481	4.6	3.8	0.279	4.3	1.8
Wallace Road (west)	0.050	9.5	0.3	0.040	9.5	0.2

LoS AM Peak Hour



LoS PM Peak Hour



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

The average delays at the intersection were around 6.0 s, with the longest delays observed along the Wallace Road approach during the PM peak period (9.5 s). The longest queue was observed along the southern approach of Porangahau Road during the AM peak hour, with a length of 3.8 vehicles. Capacity does not appear to be an issue with all approaches operating under a 0.5 v/c (volume to capacity) ratio, indicating the traffic demands do not exceed 50% of the capacity of the

road. The Level of Service along all approaches was found to be LoS A, showing there are no issues with the intersection.

Therefore, no changes are required to this intersection. Furthermore, given the number and angle of approaches, it is unlikely another form of intersection (e.g. traffic signals) would offer a suitable alternative.

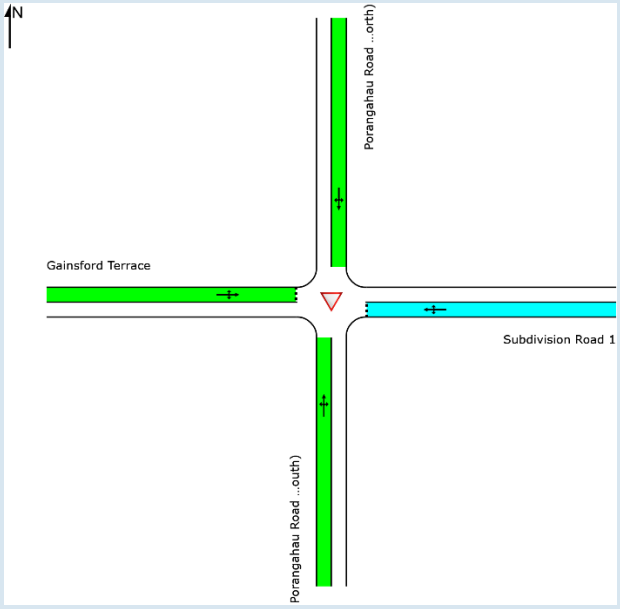
3.5.3.3 PORANGAHAU ROAD / GAISFORD TERRACE / NEW ROAD 1

The traffic modelling results for the Porangahau Road / Gaisford Terrace / New Road 1 intersection are summarised in Table 3-9 along with the Level of Service diagrams for the AM and PM peak periods.

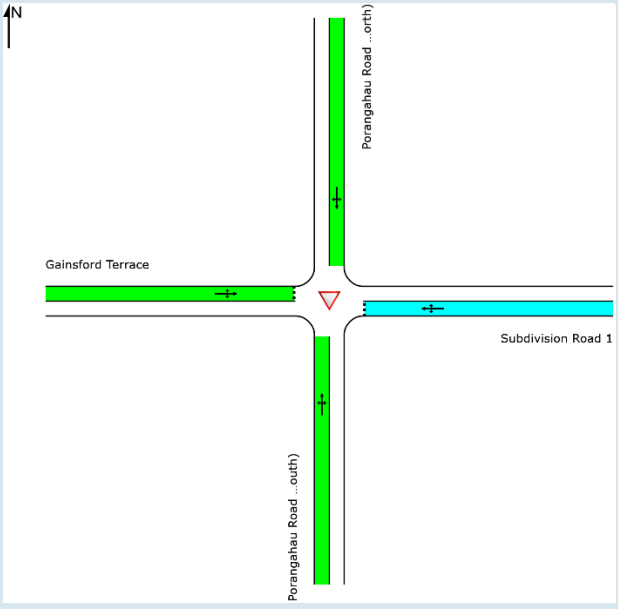
Table 3-9. Porangahau Road / Gaisford Terrace / New Road 1 Intersection

INTERSECTION APPROACH	AM PEAK HOUR			PM PEAK HOUR		
	V/C	AVERAGE DELAY (S)	95TH PERCENTILE QUEUE LENGTH (VEH)	V/C	AVERAGE DELAY (S)	95TH PERCENTILE QUEUE LENGTH (VEH)
Porangahau Road (north)	0.152	2.4	0.4	0.309	3.0	0.8
New Road 1 (east)	0.461	12.5	2.2	0..233	12.0	0.8
Porangahau Road (south)	0.168	0.1	0.0	0.113	0.2	0.0
Gaisford Terrace (west)	0.084	6.8	0.3	0.086	6.6	0.3

LoS AM Peak Hour



LoS PM Peak Hour



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

The average delay at the intersection was around 4 s, with the longest delays observed along New Road 1 during the AM peak period (12.5 s). The longest queue was also observed along New Road 1 during the AM peak hour, with a length of 2.2 vehicles. Interestingly, queues and delays were

observed along the northern approach of Porangahau Road. This suggests there is some difficulty in turning right into Gaisford Terrace during both peak periods, although these delays are relatively minor (6.6s for this movement). Capacity does not appear to be an issue with all approaches operating at under 0.5 v/c (volume to capacity) ratio, indicating the traffic demands do not exceed 50% of the capacity of the road. The Level of Service along most approaches was found to be LoS A, with New Road 1 operating at LoS B during both peak periods.

However, priority-controlled and uncontrolled cross-road intersections have a very high crash risk due to the number of conflict points (where different vehicle turning paths intersect) and the use of passive intersection controls (signs). Current design guidance discourages designing / constructing new cross-road intersections. Furthermore, cross-road intersections are fairly uncommon in Waipukurau, with almost all of them either located along low-volume residential roads (<500vpd) or within the commercial zone (with slower average vehicle speeds). This section of Porangahau Road is inconsistent with these factors (located in a residential area with a traffic volume of around 4,000vpd and mean speed of 50km/h). Therefore, a cross-road intersection is not recommended at this location.

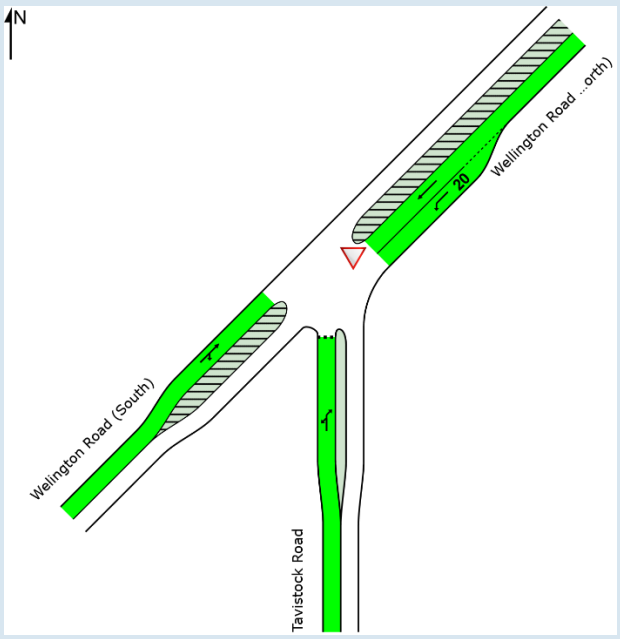
Table 3-3 identifies two alternative intersection layouts: a staggered T-junction (two T-intersections about 20-30 apart) or a roundabout. Of these, the roundabout is preferred due to the significant safety benefits (fewer conflict points and lower speeds). There is also a precedent in Waipukurau, with roundabouts installed at two other intersections along Porangahau Road (at Ruataniwha Street and Wellington Road intersections). Therefore, the recommendation is to install a roundabout at the Porangahau Road / Gaisford Terrace / New Road 1 intersection but noting that a staggered intersection would also suffice.

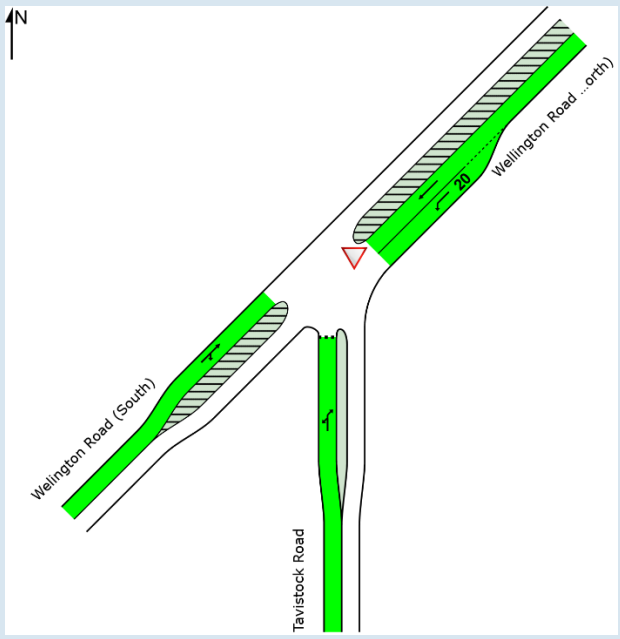
3.5.3.4 WELLINGTON ROAD / TAVISTOCK ROAD

The traffic modelling results for the Wellington Road / Tavistock Road intersection are summarised in Table 3-10 along with the Level of Service diagrams for the AM and PM peak periods.

Table 3-10. Wellington Road / Tavistock Road Intersection

INTERSECTION APPROACH	AM PEAK HOUR			PM PEAK HOUR		
	V/C	AVERAGE DELAY (S)	95TH PERCENTILE QUEUE LENGTH (VEH)	V/C	AVERAGE DELAY (S)	95TH PERCENTILE QUEUE LENGTH (VEH)
Wellington Road (north)	0.106	4.3	0.0	0.198	4.2	0.0
Tavistock Road (south)	0.413	6.3	2.3	0.331	7.7	1.7
Wellington Road (south-west)	0.037	1.3	0.1	0.056	1.1	0.1





Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Delay Model: SIDRA Standard (Geometric Delay is included).

Given all approaches to the intersection operate at LoS A during both peak periods, no improvements are required at this intersection.

3.6 REGIONAL MODEL

Stantec has developed and maintain the CHB regional transport model. This is a CUBE model and covers the wider CHB district. The model was originally developed as part of a road safety assessment project and as such has not been built from observed travel pattern data. Instead, it uses first-principle trip rates and traffic counts to synthesize travel. The model has been adapted for the purpose of identifying the impact the development will have on the SH2. Some caution is needed when interpreting the results. Nevertheless, the model is deemed to be the most accurate tool available.

The model was adapted from AADT to AM and PM peak volumes. The following scenarios were tested:

- 2020 (baseline year)
- 2031 (without development)
- 2031 (with development)

A summary of the key roads surrounding the site are provided in Table 3-11 below. Appendix B includes the technical memo produced by Stantec along with additional diagrams.

Table 3-11. Regional Model Outputs

ROAD	AM			PM		
	No Dev	With Dev	Diff	No Dev	With Dev	Diff
SH2 (North)	921	1033	112	1096	1225	129
SH2 (West)	695	751	56	859	926	67
Porangahau Rd (North)	342	762	420	406	830	424
Porangahau (South)	130	145	15	136	151	15
Tavistock (North)	227	401	174	257	461	204
Tavistock (South)	144	157	13	159	177	18
Total Development Trips			**622**			**661**

The results indicate that the model is broadly in line with the trip generation outlines in Section 3.1.2. It should be mentioned that the model is based on older traffic counts and some differences in the total predicted trips along each road will differ.

4 CONCLUSION

4.1 SUMMARY OF FINDINGS

This transport investigation has analysed the traffic issues and risks associated with developing a residential village comprising some 950 dwellings within Waipukurau. The site is on land that is currently zoned for residential.

The full impact of the development has been considered (all 950 dwellings built), although this will likely take at least 10 years to be realised.

Generic trip generation rates have been used, with a 20% reduction factor applied to accommodate people working from home and internal trips within the development. A further 3% reduction has been applied to account for the development's proximity to the town centre, schools and surrounding amenities. Several walking and cycling infrastructure improvements are proposed to support walking and cycling as a means to reduce private vehicle trips. Furthermore, a 2% reduction has been applied assuming an uptake in local public transport use.

This assessment has highlighted the need for the following infrastructure improvements:

- The intersection of the new development road, Porangahau Road and Gaisford Terrace be either a staggered intersection or ideally a roundabout to accommodate the traffic from the new development;
- New connections along Porangahau Road and Tavistock Road be provided at several locations to improve connectivity throughout the development site and the wider network. The intersection improvements will offer localised safety improvements;
- New walking and cycling facilities along Porangahau Road to best serve the site and integrate with the surrounding network; and
- Upgraded walking and cycling facilities along Tavistock Road to best serve the site and integrate it with the surrounding network.

It is further noted that the development has the potential to be staged, with conditions attached allowing additional stages subject to the improvements of critical roads/intersections to appropriate standards.

Recommended actions going forward at the appropriate time within the project:

- As the site masterplan is developed, consider short term and long-term roading layout and connections;
- Conduct a design review to make sure that likely mitigations/infrastructure provision can be delivered within the site or road corridor;
- The Integrated Transportation Assessment (ITA) will need to be updated once the masterplan has been fixed to ensure that all internal roads and connections are fit for purpose.

Overall, these initial traffic investigations have not identified any 'showstoppers' limiting the development. Therefore, a residential village of the type and scale proposed can be supported in this location from a transportation perspective, noting that some mitigation improvements will need to be validated, as above.

5 RECOMMENDED MITIGATIONS

Table 5-1 provide a summary of both the required and recommended transport mitigation measures for the Waipukurau South Development Area. All infrastructure proposed must comply with the CHB District Plan and HDC ECOP.

Table 5-1. Summary of Transport Mitigations

ITEM	INFRASTRUCTURE	REQUIREMENT	TRIGGER
1	Install a staggered intersection together with right turn bays for turning traffic along Porangahau Road. Section 3.4.4	Recommended	Linked to any development phase that provides New Road 1.
2	Right-turn bay to be installed at the Tavistock Road / Jellicoe Street. Right-turn bay required for traffic turning into Jellicoe Street (towards Winlove Crescent and the development. Section 3.4.4	Required	Triggered when the development connects to this intersection.
3	Adjust priority at Jellicoe Street / Winlove Crescent intersection to make Winlove Crescent the main road. Section 3.2.1	Required	Triggered when the development connects to Winlove Crescent.
4	Four new intersections (two along Porangahau Road, one each along Tavistock Road and Farm Road) to connect to the development. Section 3.2.1	Required	Triggered when the relevant parcels of land are developed.
5	Right-turn bays to be installed at the following intersections. — Tavistock Road / Leeton Drive. Right-turn bay required for traffic turning into Leeton Drive. — Tavistock Road / New Road (between Leeton Drive and Svenson Road). Right-turn bay required for traffic turning into the new road. Section 3.4.3	Required	Triggered if at least 100 new dwellings are built before they are connected to other parts of the development (internal road connections to Winlove Crescent and/or Porangahau Road).
		Recommended	Triggered when the development connects to their respective intersections.
6	Install a 3.5m wide shared path along Porangahau Road (from Ruataniwha Street to Gaisford Terrace). Section 3.2.2	Required	Triggered when the development connects to Porangahau Road at the Gaisford Terrace intersection.

ITEM	INFRASTRUCTURE	REQUIREMENT	TRIGGER
6a	Continue the 3.5m wide shared path along Porangahau Road (from Gaisford Terrace to Lake View Road), connecting to The Terrace School. Section 3.2.2	Recommended	Triggered when the shared path is built along Porangahau Road (Ruataniwha Street to Gaisford Terrace).
6b	Install pedestrian crossing facilities along Porangahau Road near the Petersen Place intersection. Section 3.2.2	Recommended	Triggered if the shared path is installed along Porangahau Road (between Gaisford Terrace and Lake View Road).
7	Consolidate the two pram crossings and buildouts along Tavistock Road (outside Central Hawke's Bay College) to a single pedestrian crossing. Section 3.2.2	Recommended	Triggered by either intersection improvements at the Tavistock Road / Jellicoe Street intersection, or the variable speed school zones.
8	Install a roundabout at the Porangahau Road / Gaisford Terrace / New Road 1 intersection. Section 3.5.3.3	Desirable	Triggered when the development connects to this intersection.
9	Install a 3.5m wide shared path along Herbert Street (between Ruataniwha Street and Russell Park / Tukituki River). Section 3.2.2	Desirable	No trigger for the development. Forms part of the wider connectivity to the local amenities. Could potentially form part of a wider community lead project.
10	Install or formalise the cycle lanes along Tavistock Road, Wellington Road and St Joseph Street (between Redwood Drive and Russell Park). Section 3.2.2	Desirable	Aspirations of the development to be less car dependant requires investment in walking and cycling facilities.
11	Install a centreline along Jellicoe Street	Desirable	No trigger for the development. Observation made during the site visit in 2022.

ITEM	INFRASTRUCTURE	REQUIREMENT	TRIGGER
12	All internal roads shown in the Waipukurau South Structure Plan are to comply with the HDC Engineering Code of Practice. — Minimum road reserve width of 15m — Minimum traffic lane width of 5.5m (two lanes) — All on-street parking to be indented — Footpaths on both sides of the road (minimum of 1.5m wide) — Ensure the new roads have the appropriate road markings installed (e.g. centreline). Section 3.3	Required	Triggered by each development land parcel.
13	Intersections within the development should avoid a cross-road arrangement (four or more approaches). Section 3.3	Recommended	Triggered for all roads within the development area.
14	All seven internal roads shown in the Waipukurau South Structure Plan to have a 3.5m wide shared path on one side of the road. Section 3.3	Recommended	Triggered by each development land parcel.
15	All ancillary roads (no-exit or loop roads not shown in the structure plan) to have a minimum road reserve of 15m, combined traffic lane of 5.5m (excluding on-street parking) and 1.5m wide footpath on at least one side (continuous). Section 3.3	Required	Triggered by each development land parcel.

REFERENCES

- Movement and Place Classification High Level Concepts April 2020 https://www.nzta.govt.nz/assets/Road-Efficiency-Group/docs/ONF-draft-movement-and-place-classification-high-level-concepts.pdf
- Waka Kotahi NZTA (2021) *HPMV Routes – Internal*, https://nzta.maps.arcgis.com/apps/webappviewer/index.html?id=e00b3ac6ab524cb19a369fc5c2b4e6fa
- Google Earth. (2021). Waipukurau.
- Growth at a glance 2022 update, https://www.chbdc.govt.nz/assets/Document-Library/Reports/Growth-Assumptions/Growth-at-a-Glance-2022-Update-Snapshot.pdf

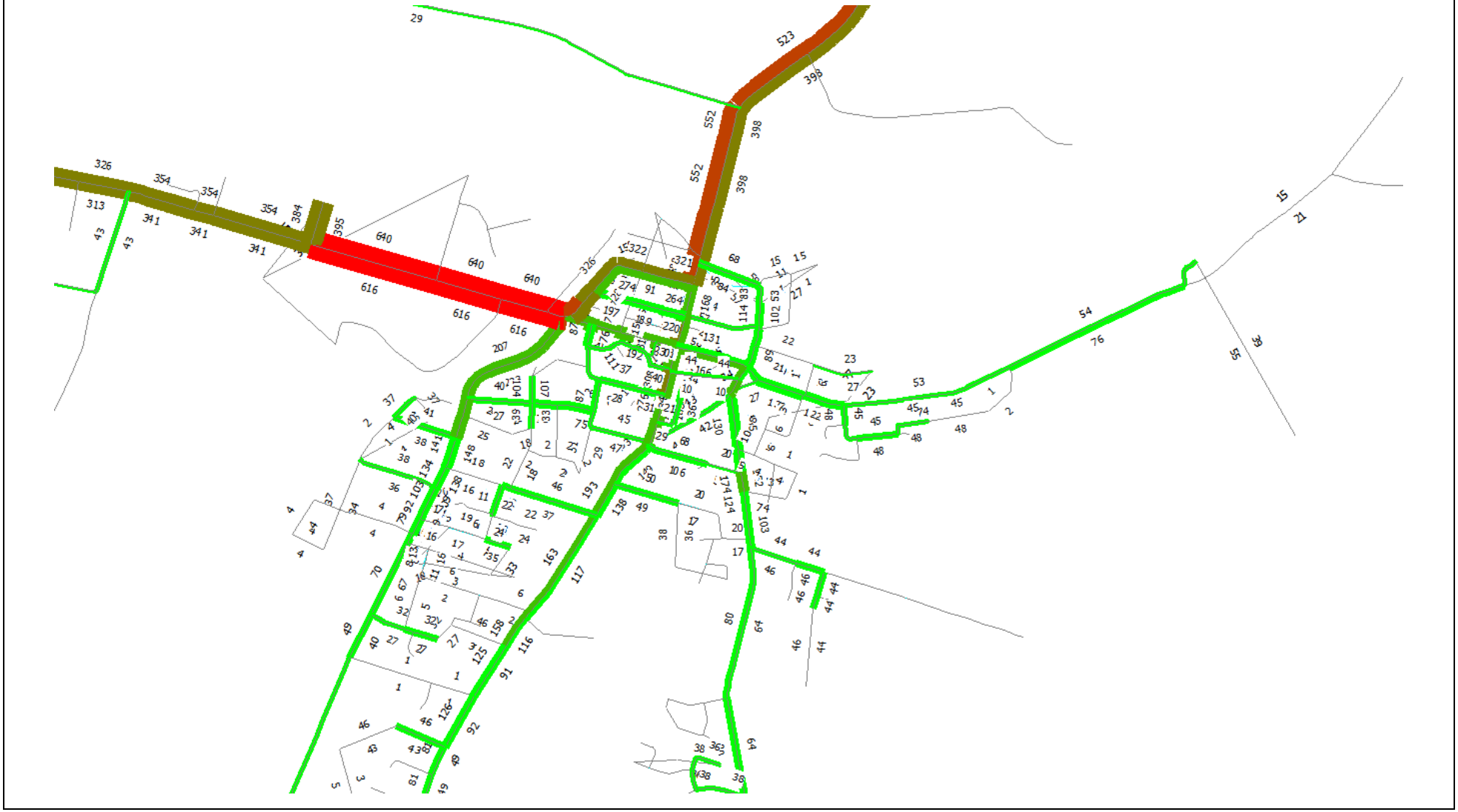
APPENDIX A – TRAFFIC COUNT VOLUMES

Attached as an excel spreadsheet

APPENDIX B – STANTEC REGIONAL MODEL OUTPUTS

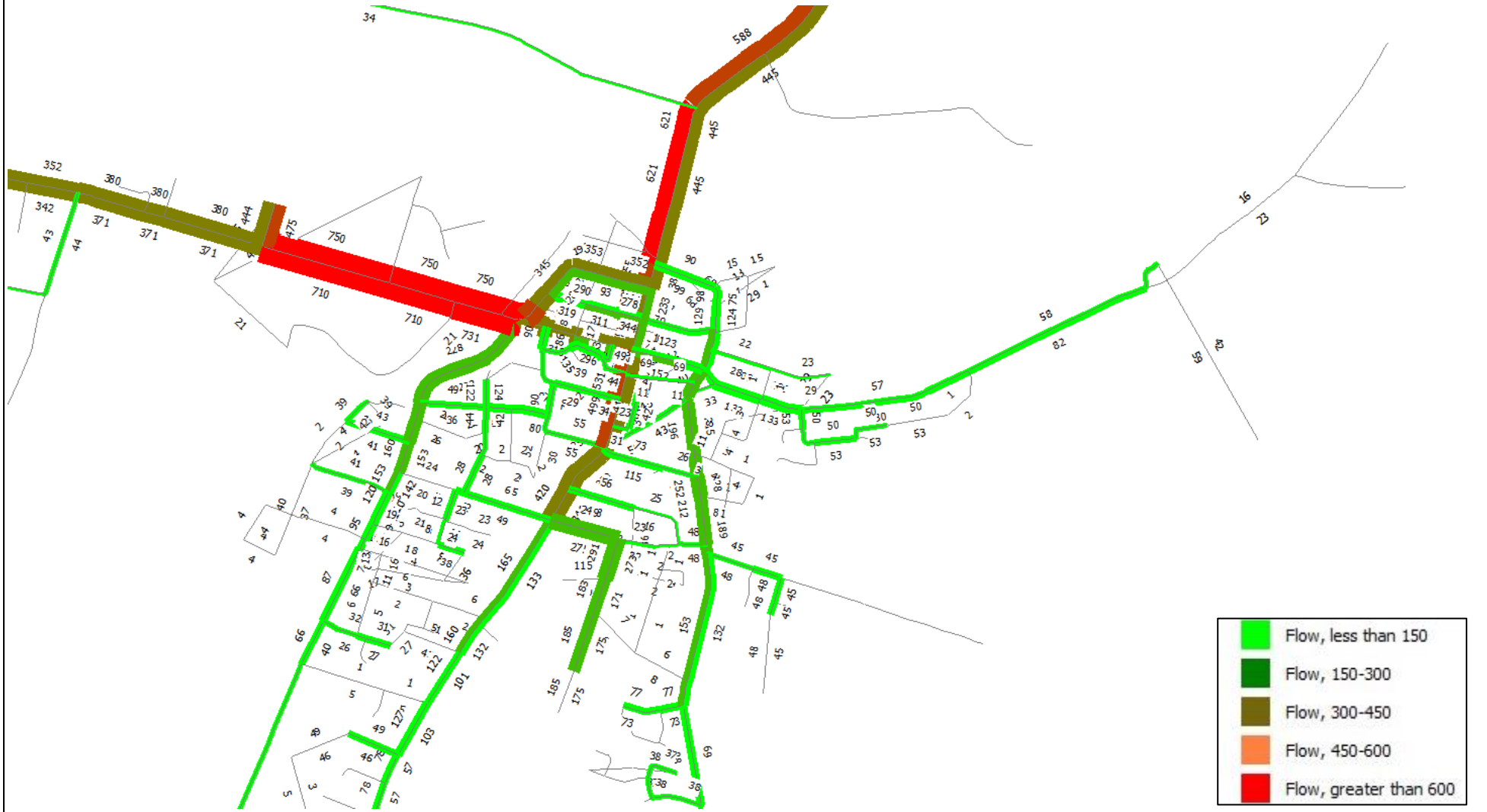
AM Peak

2031 No Development



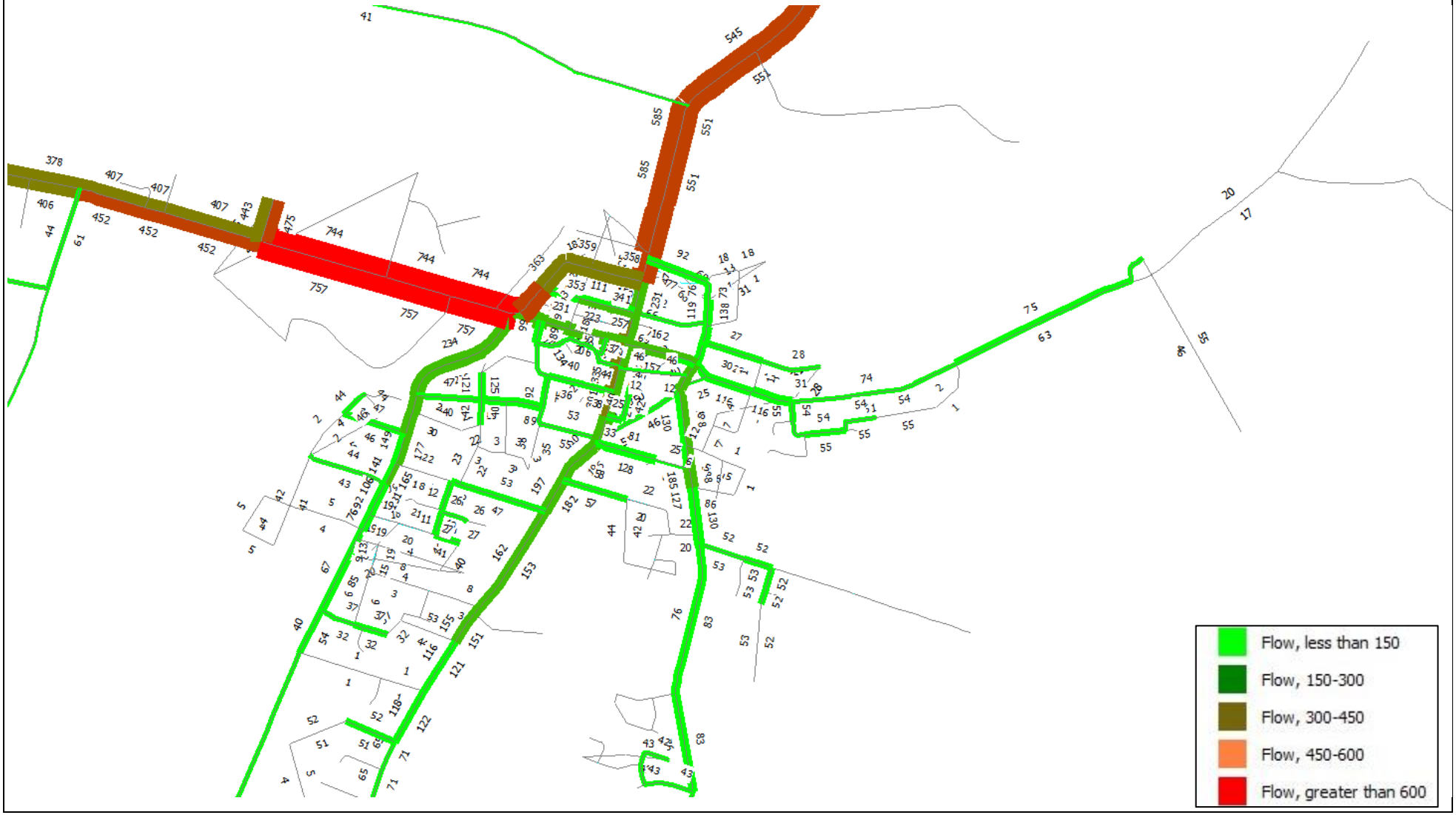
AM Peak

2031 With Development



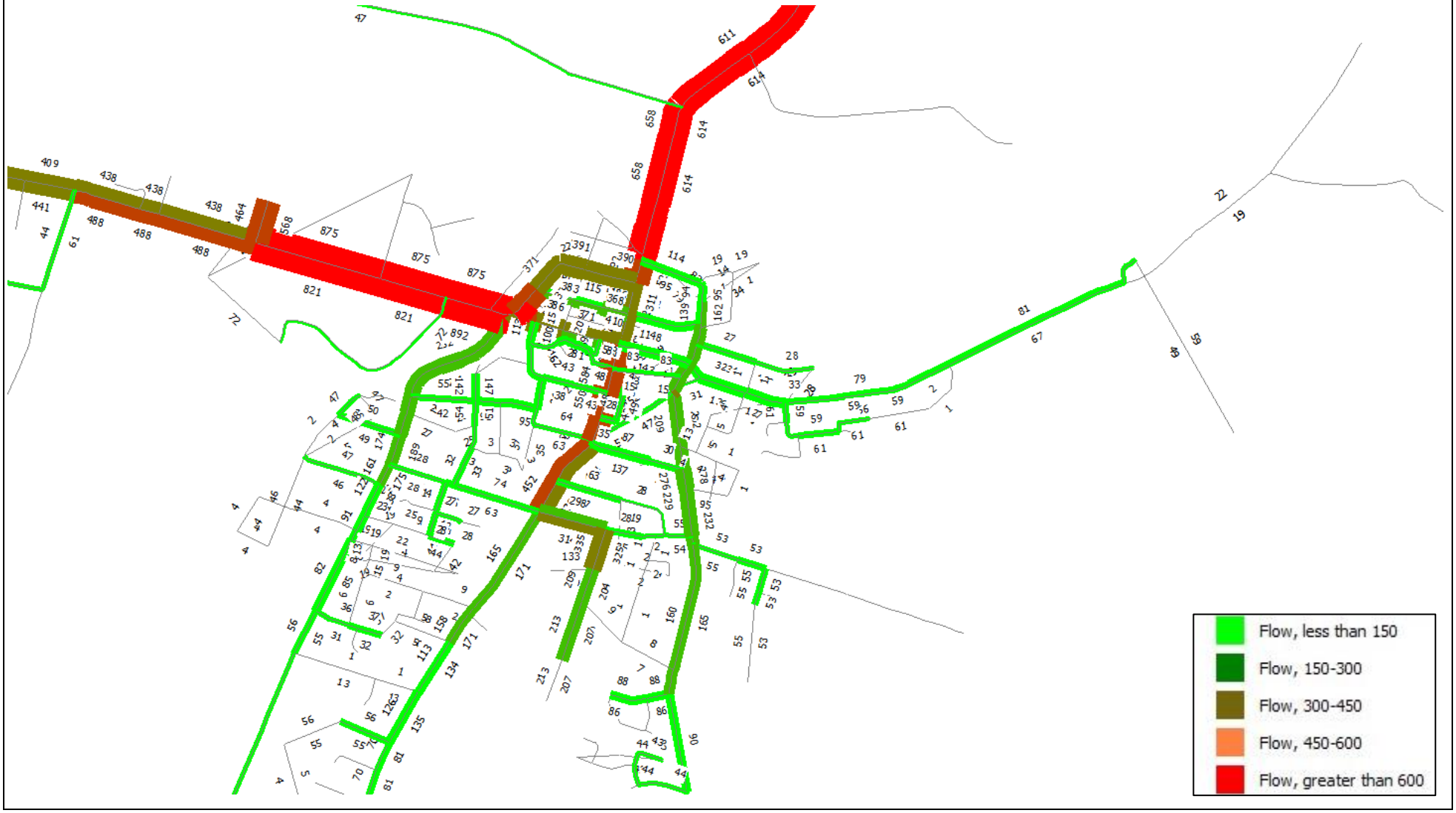
PM Peak

2031 No Development



PM Peak

2031 With Development



AM Peak – 2031 With Development

SH2 West



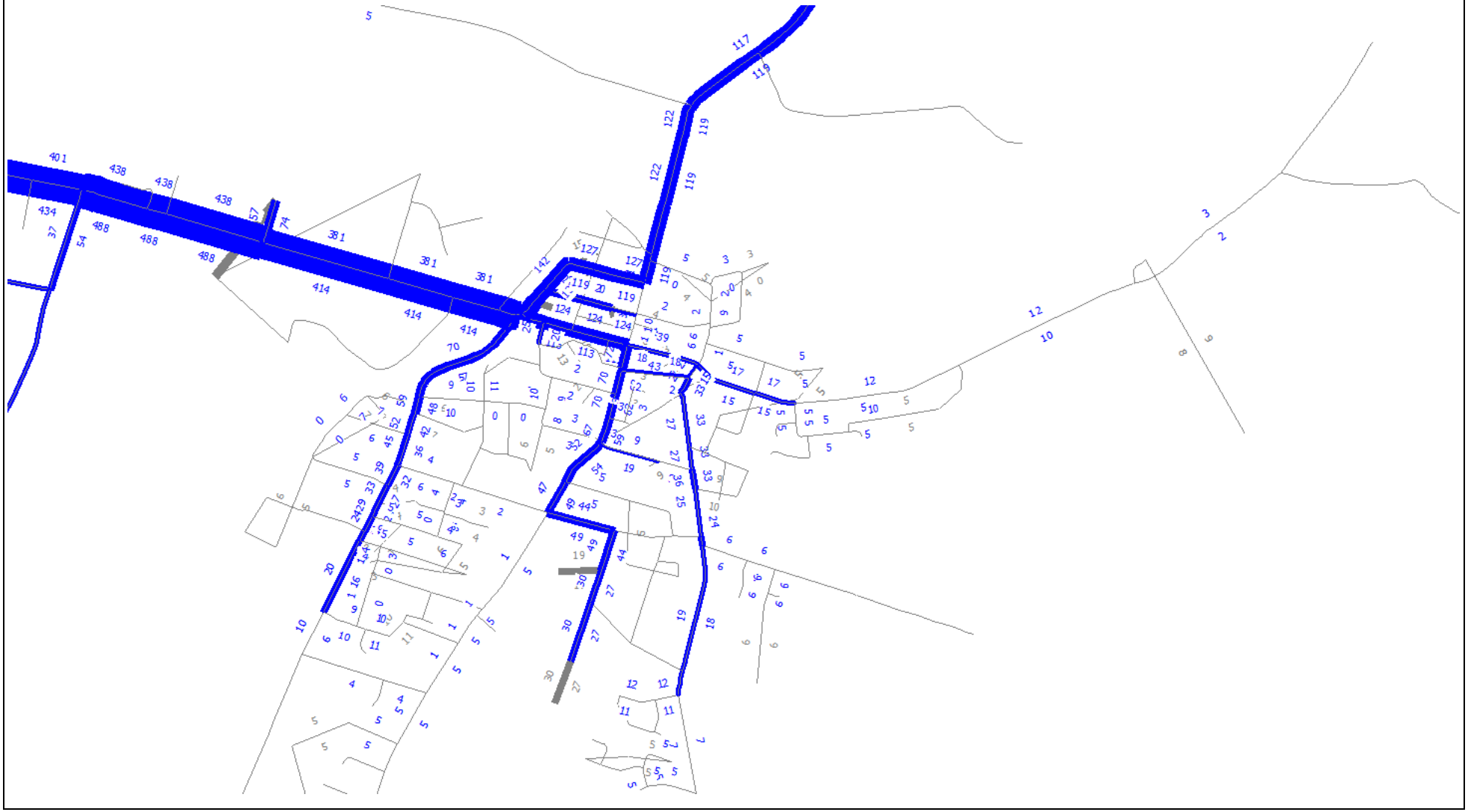
AM Peak – 2031 With Development

SH2 North



PM Peak – 2031 With Development

SH2 West



PM Peak – 2031 With Development

SH2 North

