Graham Block, Pokeno Plan Change

Integrated Transport Assessment

arrive
your transportation advisors

Graham Block, Pokeno
Plan Change
Integrated Transport Assessment

for

Pokeno Village Holdings Limited

Prepared for Pokeno Village Holdings Limited by

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N Z URBAN DESIGN PROTOCOL

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Glossary

Austroads	A group of Australian and New Zealand government transport authorities. Publishes guidelines.
CPTED	Crime Prevention Through Environmental Design. A design approach considering the safety of people and property through matters such as providing places that can be overlooked from areas where people are present
ITA	Integrated Transportation Assessment. A document following ITA guidelines published by NZ Transport Agency, Auckland Transport and others.
ITE	Institute of Transportation Engineers. Publishes survey data, guidelines and technical reports.
JTW	Journey to Work – a dataset from the Census about travel behaviour
LoS	Level of Service is a qualitative measure of traffic conditions and ranges from A to F. Level of Service A represents good free-flowing conditions with minimal delay. LoS E represents traffic flow at capacity, and LoS F represents an over-capacity situation with flow break-down and large delays. LoS D is often used as a design target in urban situations
modal split	The proportion of travel conducted by various transport modes
mode	Transport modes are different ways of travelling and include private car, walking, cycling, and public transport.
NIMT	North Island Main Trunk. The railway adjacent to this study area
NZTA	New Zealand Transport Agency. Government agency responsible for State Highways and funding of land transport.
PC24	Plan Change 24 to the Franklin District Plan – the plan change that introduced the Pokeno Structure Plan and rezoned large areas of Pokeno for residential and business activities.
PSP	Pokeno Structure Plan – a plan within the District Plan that controls development in Pokeno
PT	Public Transport
PVHL	Pokeno Village Holdings Limited – the proposers of this plan change
SH1, SH2	State Highways 1 and 2
veh/hr	Vehicles per hour, a unit of traffic flow rate
WDC	Waikato District Council
WRC	Waikato Regional Council
Austroads	A group of Australian and New Zealand government transport authorities. Publishes guidelines.
CPTED	Crime Prevention Through Environmental Design. A design approach considering the safety of people and property through matters such as providing places that can be overlooked from areas where people are present
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Executive Summary

This report describes the transport implications of the Plan Change.

Pokeno Village Holdings Limited [PVHL] is a joint venture between Dines Group and Fulton Hogan which was established for the purpose of jointly developing greenfield land at Pokeno.

In 2010 the Pokeno Landowners Consortium (a collection of landowners comprising Dines Group, Fulton Hogan, Hynds Pipe Systems and Winstone Aggregates) successfully obtained a change to the Franklin District Plan (Plan Change 24) in relation to approximately 400 hectares of land at Pokeno. The plan change introduced the Pokeno Structure Plan and new zoning provisions which provided for over 2000 residential sections and 80 hectares of industrial land.

PVHL anticipates that all residential land included within the PC 24 area will be developed by 2021. Demand for residential sections in Pokeno is high, and as a result, PVHL has identified additional land for development contiguous with the Structure Plan area.

The proposed extension to the Pokeno Structure Plan area is the balance of the Graham Block in the south west of the Structure Plan area. It is proposed to rezone that area from Rural to Residential 2 and Countryside Living. The plan change request will also seek the removal of a Large Lot Overlay to enable the development of an additional 51 units on land along Hitchen Road.

The net effect of the plan change is to allow an additional 140 dwellings to be provided in Pokeno. The additional traffic generated by those houses has been estimated and would result in an overall increase in traffic movements within Pokeno of around 2.3%, with a sizeable proportion of trips remaining within Pokeno. The increase in traffic volume on any of the State Highways is less than 1%.

The development of the Pokeno Structure Plan area will ultimately require new and upgraded roading infrastructure, including a new road bridge over the railway and widened intersections along Pokeno Road. Those changes would also provide adequate transport infrastructure to accommodate the additional houses in the Graham Block.

As a result, the transport impacts of the proposed plan change are considered to be minimal.

1 Introduction

1.1 Background

Arrive has been engaged by the Pokeno Village Holdings Limited [PVHL] to provide transportation advisory services in relation to the proposed Graham Block Plan Change in Pokeno.

The project proposes the rezoning of approximately 13 hectares from Rural to Residential 2, the rezoning of approximately 13 hectares from Rural to Countryside Living, and the removal of an area of Large Lot Overlay on Residential 2 land. The analysis supporting this Integrated Transport Assessment [ITA] are based on the Plan Change producing a net increase in the number of lots provided in south-western Pokeno.

Arrive was involved in providing an ITA for an earlier plan change, Plan Change 24 [PC24] that rezoned large parts of Pokeno in 2010 (Operative June 2011). The assessment of the current plan change is based heavily on the transport assessment work undertaken for PC24 in 2007-2008.

During the preparation of this report transport stakeholders including Waikato District Council [WDC or Council] and New Zealand Transport Agency [NZTA] have been consulted and their comments incorporated.

1.2 Report Structure

This report is structured to follow guidelines for preparation of an ITA:

- The relevant planning policy and guidance documents are summarised
- The receiving environment is described
- The transport characteristics of the proposal are summarised
- The assessment of the potential transport impacts of the Plan Change are described
- A summary of consultation is provided
- The report is summarised together with any recommendations.

2 Receiving Environment

2.1 Site Location

Pokeno is a township located near the intersection of State Highway 1 [SH1] and State Highway 2 [SH2] in the northern part of Waikato District.

The site is a block of land located at the end of Hitchen Road in Pokeno. The block of land is currently zoned Rural and adjoins land zoned Residential 2 and land zoned Light Industrial. The block is currently used for farming and viticulture.

Figure 1: Map showing location of Pokeno

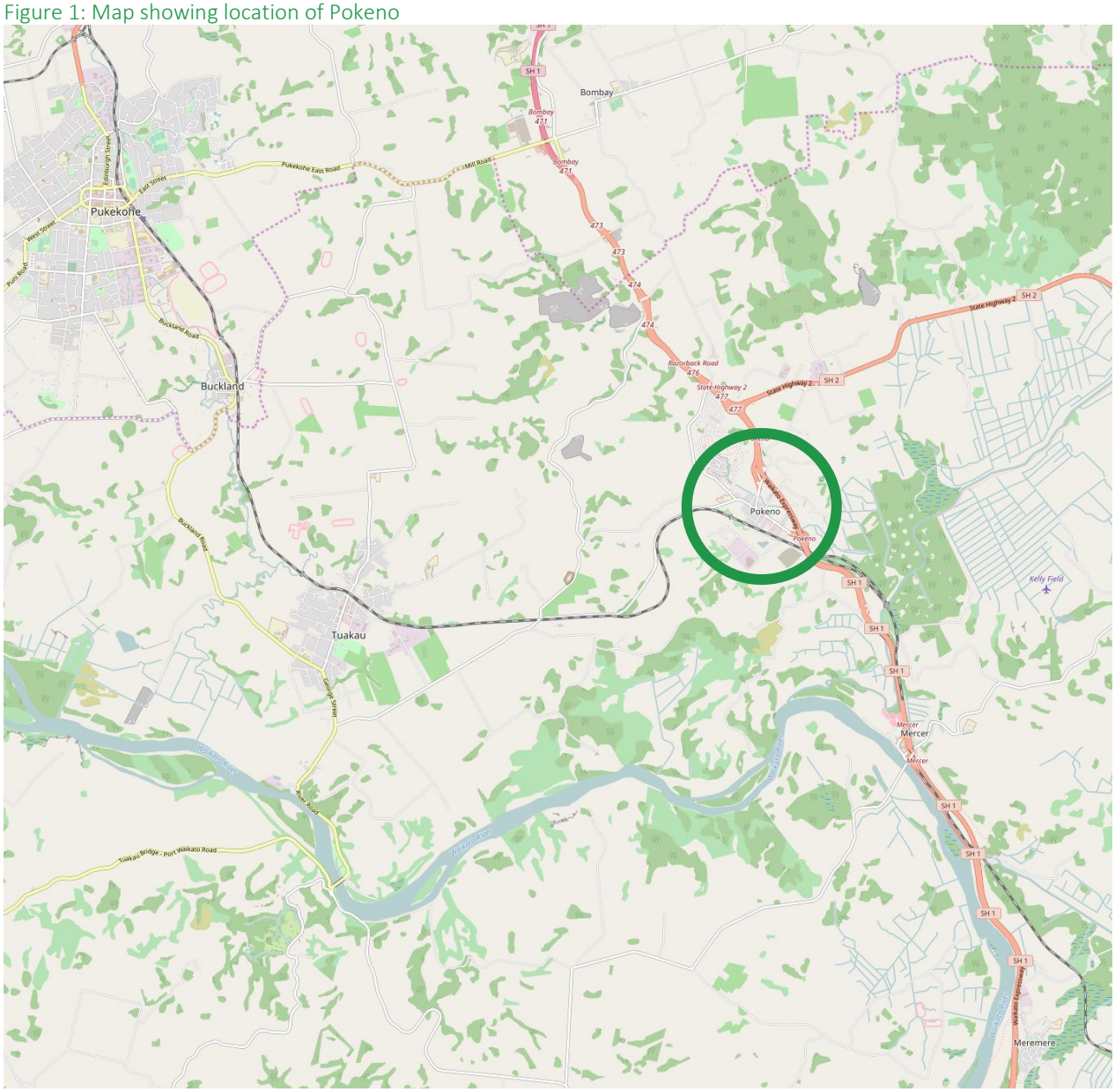


Figure 2: Map showing location of land to be rezoned

2.2 Road Network

The site is located at the western end of Hitchen Road, a low-volume two-lane rural road that is progressively being developed into a suburban form as development of the neighbouring Residential 2 area progresses.

The PSP provides for the section of road near the site to be a "Key Local Link Road", with the majority of Hitchen Road indicated to be a "Collector or Key Link Road".

At present the only road access for the area is via Gateway Park Drive and McDonald Road where a level crossing over the NIMT railway provides access to Great South Road.

It is intended that the western section of Hitchen Road will be connected to Pokeno via a new bridge over the North Island Main Trunk [NIMT] railway, supplementing a recently constructed level crossing at McDonald Road towards the south-east end of the town.

2.3 Traffic Volumes

The traffic volume on Pokeno Road is in the order of 3,000 vehicles per day at present, with around 1500 vehicles per day on Helenslee Road in 2015[1].

Traffic volumes on Hitchen Road have not been recently recorded; however, the future traffic volume is expected to be in the order of 4000-5000 vehicles per day when the development of the area is completed.

Peak-hour turning volumes were recorded at some key intersections in Pokeno by Beca on 23 November 2016[2], and these are summarised in the following tables. In these tables the volumes are all vehicles with heavy vehicles in brackets.

Table 1: Peak Hour Turning Movements at Pokeno / Helenslee

Approach	Movement	0745-0845	1645-1745
Pokeno SE	T	79 (17)	128 (10)
	R	30 (2)	51 (4)
Helenslee N	L	32 (5)	50 (1)
	R	21 (0)	17 (0)
Pokeno W	L	13 (0)	7 (1)
	T	99 (15)	135 (18)
Total		**274**	**388**

Table 2: Peak Hour Turning Movements at Pokeno / Gt South

Approach	Movement	0745-0845	1645-1745
Gt South SE	L	49 (7)	114 (6)
	T	98 (13)	116 (13)
Gt South NE	T	72 (5)	116 (7)
	R	6 (0)	16 (3)
Pokeno NW	L	9 (2)	16 (3)
	R	86 (11)	133 (10)
Total		**320**	**511**

[1] Volumes by Waikato District Council as reported in *Pokeno Intersection Assessment* report by Beca for WDC dated 3 Feb 2017.

[2] ibid

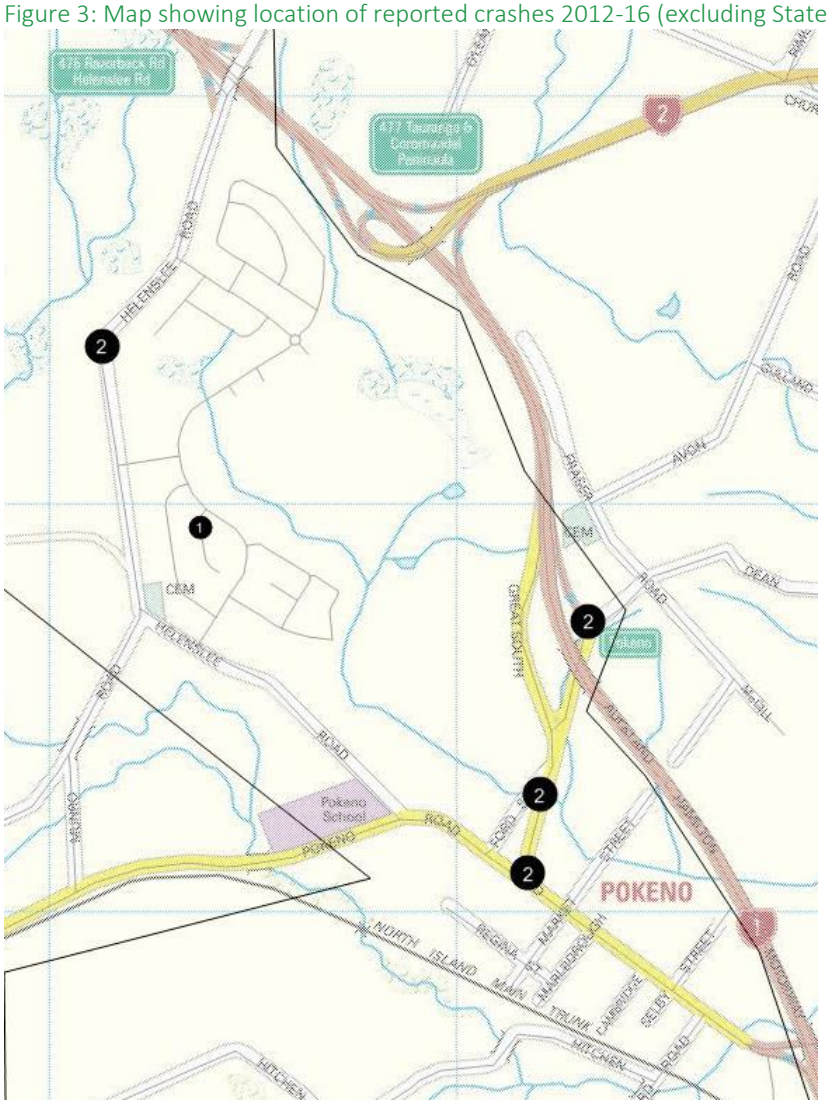
The turning movement survey at Pokeno / Gt South recorded little to no traffic exiting Pokeno Road, and this is thought to be due to some traffic using Ford Street to bypass the intersection.

2.4 Road Safety

A search of the official crash record for the most recent standard five-year reporting period (2012-16) produced a list of 9 crashes reported to Police. These included:

- 2 crashes where trucks exiting the motorway southbound rolled over when turning at the roundabout located at the end of the off-ramp (1 minor injury)
- 2 crashes where vehicles hit the rear-end of another vehicle waiting to turn right into Ford Street from Great South Road (1 minor injury)
- 2 crashes at the intersection of Great South Road and Pokeno Road. One involved a vehicle turning right out of Pokeno Road failing to give way (2 minor injuries). The other involved a vehicle driven by a foreigner travelling along the wrong side of the road hitting an approaching vehicle head-on (1 minor injury).
- 2 crashes where vehicles travelling north along Helenslee Road lost control on a tight bend in the dark (1 minor injury)
- 1 crash where a motorcyclist riding within an earthworks construction zone fell (1 serious injury).

Figure 3: Map showing location of reported crashes 2012-16 (excluding State Highways)



The number of reported crashes is considered to be moderate; however, the pattern of crashes indicates some locations where changes to the road network that were proposed during the PC24 process may result in a reduction in crashes.

The changes recommended for PC24 included changing the roundabout at the end of the southbound off-ramp to a Give Way control, closing Ford Street at the Gt South Road intersection, and installing traffic signals at the intersection of Gt South Road and Pokeno Road.

2.5 Public Transport

A public bus service provides Pokeno with connections to Pukekohe, Tuakau, Meremere, Te Kauwhata, Huntly, Ngaruawahia and Hamilton. From Pukekohe or Hamilton other public transport services are available.

The service currently runs on alternate Thursdays, passing through Pokeno northbound at around 11am and returning southbound at around 2:45pm.

2.6 Future Development

2.6.1 Pokeno

The PSP introduced through PC24 includes the existing township as well as formerly rural areas to the north of the township (the Helenslee block and the School block) and on the south-western side of the NIMT railway (the Hitchen Block).

The PSP provided for:

- Over 2000 residential sections
- 80 hectares of industrial land
- Parks and sports grounds

Development commenced in 2011 and to date has included a significant number of residential dwellings in the Helenslee area and development of that area is continuing at present. Some business development has also occurred in the southern part of the Hitchen Block, referred to as Gateway Business Park. The development of a new residential area is underway in the north-eastern part of the Hitchen block.

Development in other areas of the PSP area has not been significant to date, but is expected that some development or redevelopment of those areas may occur in the short to medium term and it is anticipated that development will be completed in 2021.

2.6.2 Tuakau

The PC24 transport analysis work included an allowance for traffic generated by Franklin Plan Change 22 that rezoned land for industrial activities in the Whangarata area east of Tuakau. Council has prepared the Tuakau Structure Plan and notified Waikato Plan Change 16 to implement Stage One of the Structure Plan.

The Plan Change as notified noted the following:

> Tuakau's population is anticipated to grow substantially from an approximate population of 4766 in 2016 to approximately 8666 in 2045. The pressure on Tuakau's growth is heavily influenced by its close proximity to Auckland and major transportation networks.
>
> Significant growth continues to occur in Pukekohe with an expected population of 50,000 in the year 2042 (double that which existed in 2014). Pukekohe is only 8 kilometres from Tuakau. Similarly, Pokeno which is only 10 kilometres from Tuakau, has experienced unprecedented growth which is also influenced by Auckland. The combination of these current trends has resulted in significant demands for an increased housing supply in Tuakau and well beyond what was predicted by the former Franklin District Growth Strategy in 2007.
>
> To sustainably manage the growth in Tuakau, Council resolved in December 2015 to address the immediate need for additional residential land and improve the provisions relating to the existing Whangarata Business Park through proposed Plan Change 16. This rezoning generally comprises Stage 1 of the TSP, leaving the remaining stages to be addressed with the upcoming comprehensive district plan review.
>
> Stage 1 seeks to provide short to medium term growth opportunities in the next decade for residential and industrial development that use well planned and integrated infrastructure to take advantage of Tuakau's strategic location in the northern part of the Waikato district and its close proximity to Auckland and major transportation networks.
>
> The rezoning for residential purposes in Stage 1 is expected to provide a conservative estimate of 1250 additional dwellings. Council will continue to monitor Tuakau's population growth and housing demand to ensure that there is a sufficient supply of residential land to comfortably meet existing and projected demands as contemplated by the draft National Policy Statement on Urban Development Capacity.

Submissions have been received and a hearing is expected to be conducted in early 2017. In response to submissions Council resolved to remove the industrial provisions from PC16.

An Integrated Transport Assessment for the Tuakau Structure Plan was prepared for Council. That document focusses primarily on the road connections required within Tuakau. The assessment does not calculate an expected level of trip generation, or consider the proportion of trips that may originate in, or pass through, Pokeno.

For those reasons this assessment calculates a likely level of traffic growth to allow for Plan Change 16 should that plan change be approved.

2.6.3 Drury

Since PC24 was proposed a Plan Change to the Auckland District Plan - Papakura Section has also been approved by Auckland Council. That plan change rezoned a large area of land for business purposes and the development of that land is expected to provide more employment opportunities for residents of Pokeno.

This change is not expected to make any significant change to travel patterns in Pokeno as a significant proportion of trips are already expected to travel north along SH1 for employment.

3 The Proposal

3.1 Description

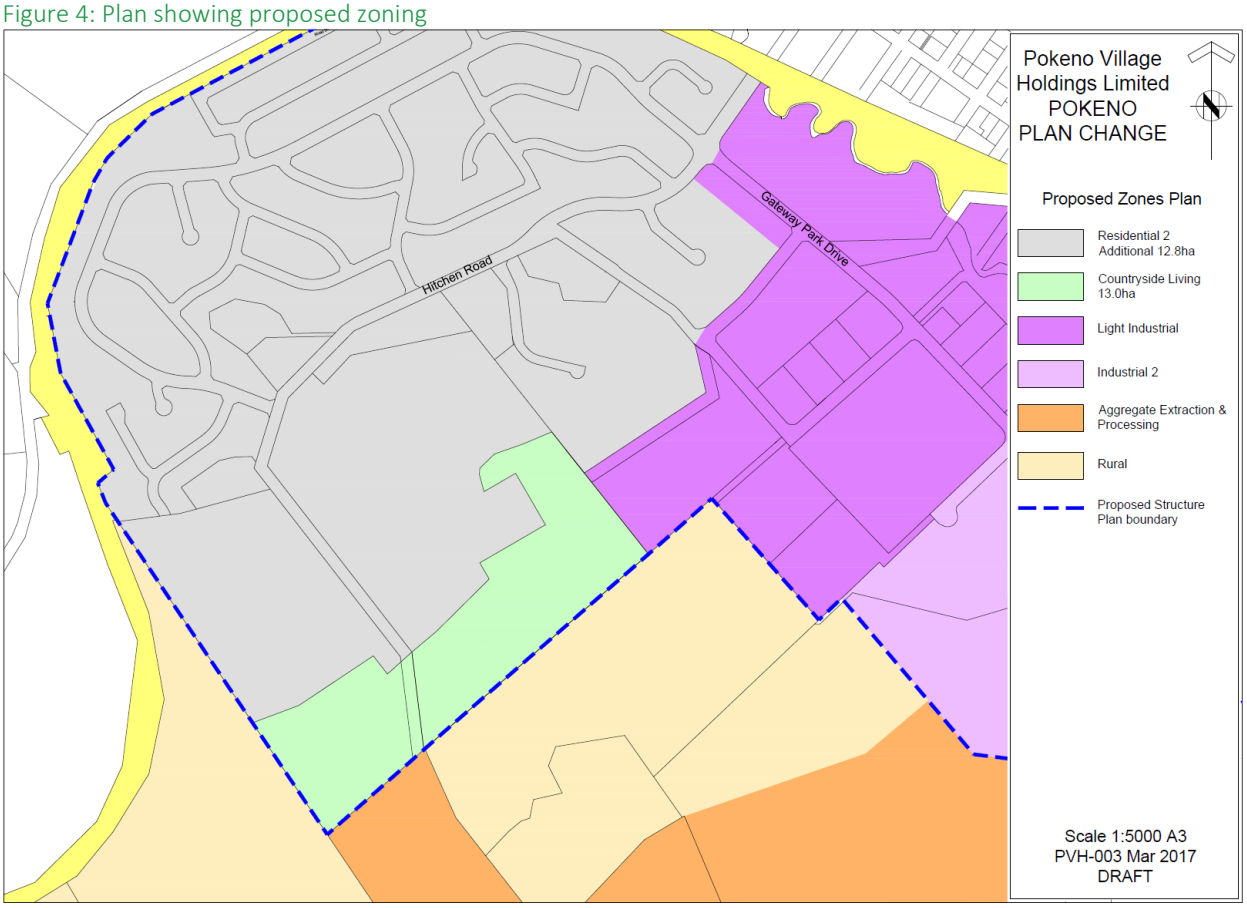
The proposed Plan Change involves rezoning the Graham Block from Rural to Residential 2. It also involves removing the Large Lot Overlay from another area of Residential 2 land in order to update the PSP to reflect changes in development patterns.

The PC24 Structure Plan documents envisaged the Hitchen Block (the land south-west of the NIMT railway) would provide around 780 residential lots. The 2008 ITA analysis was based on the Hitchen Block providing 800 dwellings.

It is intended that the Graham Block would be subdivided to provide somewhere in the order of 86 standard Residential 2 lots and somewhere in the order of 16 large lots (> 2000m2) for a net gain of 101 lots. The removal of the Large Lot Overlay produces a net gain of 51 lots. In addition, the actual yield within other parts of the Hitchen Block has provided 8 more residential lots than expected.

The overall effect of the proposed Plan Change is increasing the number of lots expected to be provided in the Hitchen Block to 940. This is 140 more lots than assumed in the earlier transport analysis and 160 more lots than the other PC24 documents expected.

Figure 4: Plan showing proposed zoning



3.2 Development Pattern

All of the new lots will be accessed by the road network that will be developed throughout the remainder of the Hitchen Block, chiefly Hitchen Road.

The development of the area will be governed by the District Plan and the Council Engineering Standards with the outcome expected to be similar to the areas of Pokeno that have been developed recently.

3.3 Promoting Walking and Cycling

Parts of the land have a relatively steep contour, with some sections of bush and waterways. These features provide significant constraints on the layout of streets and walkways. While the provision of walkways along direct routes may appear desirable from the layout plans, in reality the steep gradients would be a significant deterrent to walking on cycling on those routes. As a result, the more circuitous routes proposed are likely to provide the best outcome despite having a longer distance on a plan.

All streets in the Graham Block area are expected to be local streets with low traffic volumes and moderate speeds. These streets are expected to be suitable for walking and cycling.

3.4 Improvements to Influence Travel

All Integrated Transport Assessments are required to consider how improvements might be made to influence travel behaviour, focussing on the reduction of private low-occupancy vehicular trips.

To a significant extent, the Graham Block Plan Change is a small extension to the previous PC 24 Plan Change, and a number of measures to influence travel that were considered in PC24 are relevant to this plan change. The PC24 process considered the provision of public transport including setting out a possible bus route and making some provision for rail transport should that become economically viable in the future, probably as part of a Hamilton-Auckland commuter service.

The PC24 plan change was also focussed on providing a reasonably self-contained town with employment and residential activities both located within a reasonably cycling distance. It is acknowledged that a proportion of local residents would commute outside Pokeno for work, and that some employees of local business would likely live outside of Pokeno.

It is considered that the expansion of the PSP to include the Graham Block would increase the overall population and that would make the provision of local services, including public transport, more economically viable.

4 Transport Impacts

4.1 Plan Change 24 Transport Assessment

Plan Change 24 [PC24] to the Franklin District Plan rezoned large areas within and adjacent to Pokeno in 2008. The plan change with the associated Structure Plan was informed and supported by a suite of studies and reports.

With respect to transport PC24 was informed by the following material:

- Integrated Transportation Assessment report (Parlane and Associates and Wes Edwards Consulting)
- Traffic Modelling Scoping Report (Beca)
- Micro-Simulation Modelling report (Beca)
- Rail Crossings Review of Options report (Wes Edwards Consulting)
- Quarry Traffic Options Assessment of Truck Routes report (Parlane and Associates)

A number of assumptions were made with respect to parameters such as trip generation rates, trip distribution over time and across the network, background traffic growth rates and the like.

The key assumptions were agreed with stakeholders including Franklin District Council and NZ Transport Agency, and were subjected to some scrutiny through the plan change process.

After reviewing the assumptions made the majority of the assumptions are still considered to be the most appropriate for use in this assessment. The key assumptions are discussed in more detail in the following sections.

4.2 Trip Generation

4.2.1 Graham Block

The trip generation rates adopted for this assessment are the same as used for PC24 and are summarised in the following table.

Table 3: Trip Generation Rates

Land Use	Trip Rates				Units
	AM In	AM Out	PM In	PM Out	
Residential	0.20	0.60	0.50	0.30	Household
Retail	1.00	0.25	2.00	2.00	100m^2
Food Retail	2.00	0.50	5.00	5.00	100m^2
School	0.19	0.15	0.00	0.00	Student
Commercial	1.60	0.40	0.40	1.60	100m^2
Mixed Use and Light Industry	0.80	0.20	0.20	0.80	100m^2

This plan change only involves residential activity. The residential trip generation rates for the peak hours are a little lower than used in some suburban locations as a proportion of residents

are expected to commute to other localities for work. A resident commuting to a workplace within Auckland is likely to leave relatively early in the morning and residents travelling within Pokeno or to locations with less congestion and travelling time are likely to leave later in the morning. Similar behaviour is expected in the afternoon peak period. The result is expected to be a more spread out traffic pattern during each of the peak periods.

This is also supported by NZTA research showing dwellings in outer areas have lower overall trip rates, presumably as a result of combining several activities such as work and shopping into a single vehicular trip.

Applying the adopted residential trip generation rate to the proposed increase in the number of dwellings is shown in the following table compared with the number of trips estimated to be generated by the other land uses in Pokeno using the same trip generation assumptions as PC24.

Table 4: Trip Generation Volumes

	Trip Generation					
	AM In	AM Out	AM Total	PM In	PM Out	PM Total
Graham Block	28	85	113	71	43	114
PC24 Hitchen Block	1607	805	2412	737	1683	2420
PC24 Pokeno Township	2541	1871	4412	1746	2727	4473
PC24 Entire Structure Plan	2642	2182	4824	2000	2877	4877

Of the approximately 4400 trips made in each peak hour by the PC24 activities, less than 40% are generated by the residential activities with the majority generated by the business activities. In the PC24 analysis the majority of the business activity trips are located in the Hitchen Block which is the land on the south-western side of the railway.

The additional Graham Block trips can be expressed as a percentage of the PC24 trips as shown in the following table.

Table 5: Trip Generation Increases

	Trip Generation					
	AM In	AM Out	AM Total	PM In	PM Out	PM Total
PC24 Hitchen Block	1.8%	10.6%	4.7%	9.7%	2.5%	4.7%
PC24 Pokeno Township	1.1%	4.6%	2.6%	4.1%	1.6%	2.5%
PC24 Entire Structure Plan	1.1%	3.9%	2.3%	3.5%	1.5%	2.3%

From this data, it can be seen that the new development area is predicted to result in an overall increase in trip generation of around 2.3% during peak hours.

4.2.2 Tuakau

The PC24 transport analysis made allowance for PC22 (Whangarata/ Tuakau Industrial) by adding 135 vehicles per hour on Pokeno Road during peak periods.

As noted earlier it is expected that PC16 would provide for an additional 1250 dwellings to be provided in Tuakau over the next 10 years. Using the same trip generation rates as Pokeno, those dwellings could generate an additional 1000 vehicle trips in each peak hour.

4.3 Traffic Distribution and Assignments

The hourly distribution of traffic is represented by the selection of peak-hour trip generation rates as described earlier. Throughout the PC24 modelling only the AM and PM peak periods were modelled as these are the busiest regular periods on the road network, aside from infrequent peak traffic flows experienced during holiday travel periods.

The spatial distribution of traffic is subject to a number of parameters, each of which is discussed below.

4.3.1 Internal Capture

This parameter is the proportion of generated trips that stay within Pokeno. These would include trips between home and school, local business, and local workplaces. This parameter is usually sourced from Census data collected from questions around the Journey to Work [JTW].

The following table summarises the population normally resident in each part of Pokeno for the census in 2006 and 2013.

Table 6: Census Population and Households

Meshblock	Population		Households	
	2006	2013	2006	2013
0842200 (Helenslee)	99	114	27	30
0842102 (Town Centre)	135	135	42	45
0842800 (South Hitchen)	135	135	45	42
0842700 (North Hitchen)	108	111	33	36

While the Census meshblock boundaries do not correspond with the PSP area it is clear that the 2013 population is well below the level expected when development of the PSP is completed. The PSP is based on an approximate 2850 households (including countryside living lots and surrounding areas) with a population in the order of 5900 people.

The conclusion drawn from this data is that the 2013 Census data is not appropriate for predicting the future transport behaviour of the town.

The PC24 analysis was informed by a number of sources including census data from Tuakau and Huntly, towns that are expected to have some similarities to a fully-developed Pokeno which will have a population between that of the other towns.

The PC24 analysis contained the following discussion:

> The employment population of Tuakau is approximately 30% of the resident population,
>
> Although the proportion of internal commuter vehicle trips is only 12% (Table 2.1). The JTW data in Table 2.1 indicates that 26% of Tuakau residents commute to Pukekohe, which suggests that Pukekohe's geographical proximity and greater size, reduces the opportunity for Tuakau to be a 'sustainable community'.
>
> By comparison, the employment population of Huntly is approximately 54% of the resident population. This is consistent with the proportion of internal commuter vehicle trips (55%), as identified in Table 2.2, suggesting there is a more 'sustainable community' in relation to employment opportunities.

> Given the aspiration for the proposed Pokeno development to be a 'sustainable community', it is anticipated that the proportion of internal commuter trips should be similar to the ratio of the employment to resident populations. In this respect, the anticipated ratio of employment (2,750) to resident (7,700) populations for the proposed Pokeno development is approximately 36%.
>
> Consequently, it is considered that the proportion of commuter vehicular trips, which could remain internal to the proposed Pokeno development, would be around 36%.

The PC24 value of 36% was based on larger employment and population projections that were used early in the PSP development, and were subsequently revised to employment of 1880 jobs and a population of 5900. The figure of 36% was retained.

In the absence of any better data, and the small scale of this plan change, the value used in the PC24 analysis is adopted for this assessment.

4.3.2 External Trips

The PC24 analysis also used Census JTW data from Tuakau to estimate the spatial distribution of trips external to Pokeno for four key directions as summarised in the following table. The same trip distribution is adopted for this assessment.

Table 7: Adopted Vehicular Trip Distribution

Destination	Proportion
Internal to Pokeno	36%
North (via SH1)	36%
East (via SH2)	5%
South (via SH1)	7%
West (via Pokeno Rd)	16%

The application of that distribution profile, taking into account likely trips to and from the local school, results in the trip volumes shown in the following table.

Table 8: Distributed Trip Volumes

	Trip Generation					
	AM In	AM Out	AM Total	PM In	PM Out	PM Total
School	5	6	11			
Other Pokeno	6	25	31	26	15	31
North	10	31	41	26	15	31
East	1	4	5	4	2	6
South	2	6	8	5	3	8
West	5	14	19	11	7	18

4.3.3 Trip Assignment

The trip assignment process involves assigning vehicular trips between various origins and destination to the various routes in the network.

For the PC24 analysis this assignment process was undertaken in a Micro-Simulation model developed by Beca using Paramics software. This model, which covered a sizeable area around Pokeno and represented each road link, was constructed and validated by Beca before being used to investigate the effects of PC24. The model was peer-reviewed by independent consultants during the PC24 assessment.

The current plan change process involves a relatively small amount of traffic and relatively few route choices, and this assessment is based on manual trip assignment from the Graham Block.

- School: Over new bridge, left into Pokeno Road
- Other Pokeno: Half via Gateway Park Drive to industrial area
  Half over new bridge, right into Pokeno Road, right into Gt South Rd
- North, East Over new bridge, right into Pokeno Rd, left into Gt South Rd
- South via Gateway Park Drive to McDonald Rd, right into Gt South Rd
- West Over new bridge, left into Pokeno Road

4.3.4 Tuakau Trips

As noted above the PC24 analysis referred to trip characteristics in Tuakau to inform the Pokeno analysis, noting that 38% of Tuakau trips were internal or to Pukekohe a short distance away.

As noted in the PC16 material the growth in Tuakau is anticipated to be largely a response to growth in population and employment in Pukekohe and Auckland. It is therefore expected that the majority of employment trips to and from Tuakau will be internal or to Pukekohe and other destinations to the north.

The 2013 Census data for the Journey to Work from Tuakau is shown in the following graphic

Table 9: 2013 Census Journey to Work - Tuakau - Commuting Destinations

It can be seen that very few residents of Tuakau currently make an employment trip to or through Pokeno. The 2013 Census results are summarised in the table below.

Table 10: 2013 Census Journey to Work - Tuakau - Travel Mode

Travel	Total
Worked at home/ Did not go to work	264
Drove a vehicle	1251
Passenger in a vehicle	81
Public transport	27
Pedestrian	51
Total	**1674**

Of the 1410 people that travelled to work, 1251 (89%) drove a vehicle and 81 (5.7%) were a passenger. This analysis assumes that no one travelling to Pokeno would use public transport or walk.

Table 11: 2013 Census Journey to Work - Tuakau - Commuting Type

Commuting Type	Totals
Live and work in Tuakau	252
Commute Out	1221
Commute In	51
Total	**1524**

The following table contains the approximate number of people travelling from or through Pokeno (The data is approximate as Census data is randomly rounded to multiples of 3 for confidentiality).

Table 12: 2013 Census Journey to Work - Tuakau – Origin / Destination

Commuting Type	Out of Tuakau	Into Tuakau
Pokeno	21	18
Mangatawhiri	6	9

If PC16 is approved, it is expected that around 1000 additional vehicular trips would be generated in Tuakau in each peak hour. Of those, it is expected that approximately 11 additional vehicles would travel from Tuakau to Pokeno and Mangatawhiri in the morning peak hour, with around 3 additional vehicles travelling towards Tuakau.

Additional employment trips travelling into Pokeno have already been accounted for in the PC24 trip generation for the employment activities in Pokeno, and that the additional employment trips travelling out of Pokeno have already been accounted for in the PC24 trip generation for the residential activities.

The additional traffic travelling between Tuakau and Mangatawhiri is also accounted for in the growth rates applied to the State Highway traffic, but not within Pokeno. The additional traffic travelling between Tuakau and Mangatawhiri (via Pokeno) is expected to be in the order of 4 or 5 vehicles per hour (two-way) when Tuakau Stage 1 is completed.

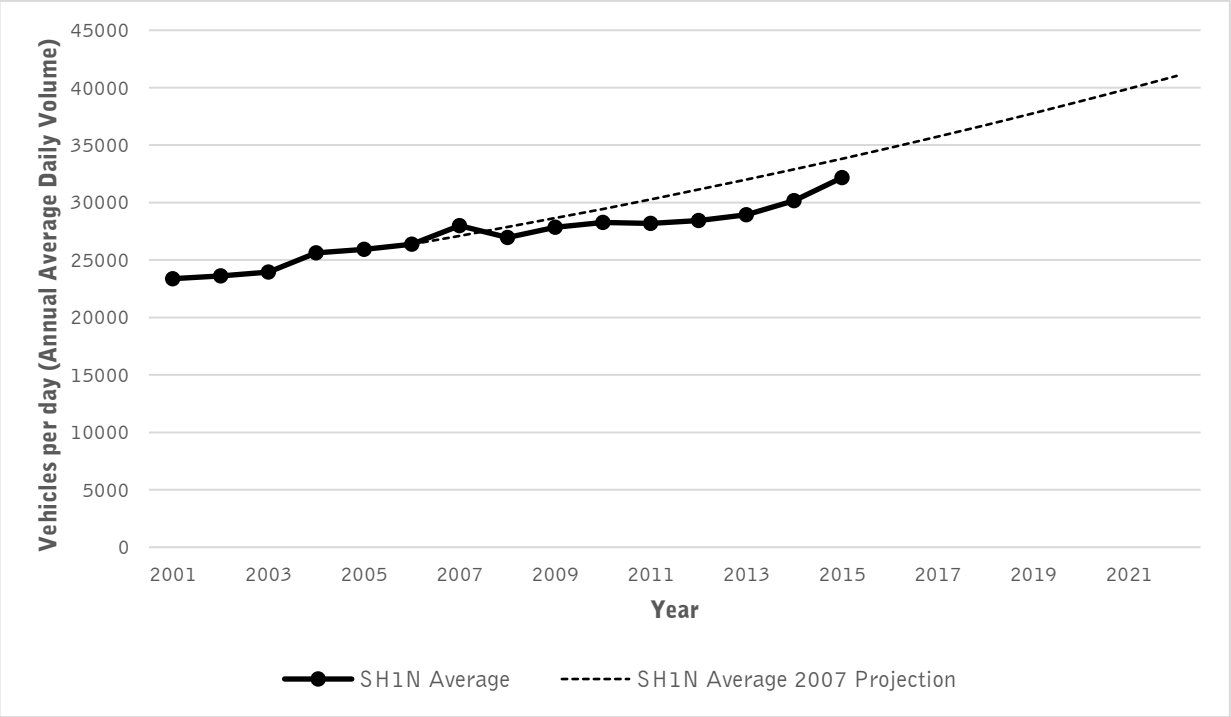
4.4 Assessment Scenarios

The PC24 assessment used a model derived from 2007 traffic data, with projected traffic growth added to produce a baseline assessment year of 2022.

The projected traffic growth was calculated by factoring up 2007 traffic volumes using a linear growth rate of 2.8% pa over a period of 15 years, resulting in a 42% increase in traffic volume. The growth rate of 2.8% was obtained by inspecting ten years of traffic volume records on SH1 at Bombay and Mercer and using a flow-weighted average.

The following charts show the actual traffic volume on SH1 (average of Mercer and Bombay counts) over the past years together with the PC24 growth projection from 2007 to 2022.

Figure 5: Traffic Volumes on State Highway 1 near Pokeno



Volumes are average of volumes recorded at Bombay and Mercer

Traffic volumes decreased around 2007-08, presumably as a result of the economic downturn, but have recently returned to growth rates similar to those experienced prior to 2007. Growth over the past ten years has average 2.6% per annum.

It is useful to note that these traffic volumes include traffic growth as a result of the recent development in Pokeno and yet remain well below the PC24 forecast volumes without Pokeno traffic. As a result, the PC24 analysis has proven to be pessimistic.

For this assessment, a baseline assessment year of 2027 has been adopted, and the same annual linear growth rate used in the PC24 analysis has been adopted and added to the already-pessimistic PC24 2022 projected flows to provide for a robust pessimistic baseline.

For the purposes of this analysis it is assumed that the existing PSP area is fully developed. This assumption is also considered to be conservative (pessimistic) for three primary reasons.

Firstly, the original village of Pokeno has been developed for residential activity for many years and many sites are unlikely to be redeveloped to realise their full development potential for a substantially longer period.

Secondly, sizeable areas of business land have been developed for low-intensity activities such as storage of concrete products, resulting in fewer peak hour trips than allowed for in either assessment.

Finally, the development of greenfield areas in Pokeno, including the Graham Block, is projected to be completed around 2023.

4.5 Impact on External Road Network

The most recent traffic volume records on the external road network are shown in the following table, together with the expected peak hour contribution from the current plan change, and an estimate of the additional daily traffic volume from the current plan change

Table 13: Estimated Increase in Traffic Volume

Location	Existing Daily Volume	Graham Block Volume			Increase over Existing
		AM	PM	Daily	
SH1 at Bombay	45612	41	31	360	0.8%
SH1 at Mercer	24199	8	8	80	0.3%
SH2 at Mangatawhiri	15569	5	6	55	0.4%
Pokeno Road (near school)	2492	19	18	185	7.4%

As can be seen from this table the additional traffic generated by the Graham Block Plan Change is negligible compared with the traffic volume currently carried on those routes, and is less than 4 months' growth on those routes at historic average rates. By any measure the impact of the current plan change on the State Highway network is negligible.

The impact on Pokeno Road is more significant as that route currently carries a lower volume of traffic; however, the increase is significantly smaller when assessed against the likely future volume with the PSP fully developed.

The PC24 analysis did not identify any significant issues on Pokeno Road west of the township, even at the significantly higher initial population projections used in the first round of modelling. For these reasons the impact of the new plan change on this route is considered to be less than minor.

4.6 Impact on Internal Roading Network

The impact of the Graham Block proposal has been assessed through the use of software models for each of the key intersections developed using the Sidra Intersection software.

4.6.1 Turning Movements

From the above assumptions turning volumes at key intersections within Pokeno have been calculated. The volumes are the sum of the PC24 2022 volumes plus growth to 2027 plus the additional Graham Block trips. In the following diagrams the numbers for each movement show the total volume with the Plan Change, and the number in brackets is the change from the 2027 baseline scenario.

Figure 6: Turning Movements 2027 with Graham Block – AM Peak

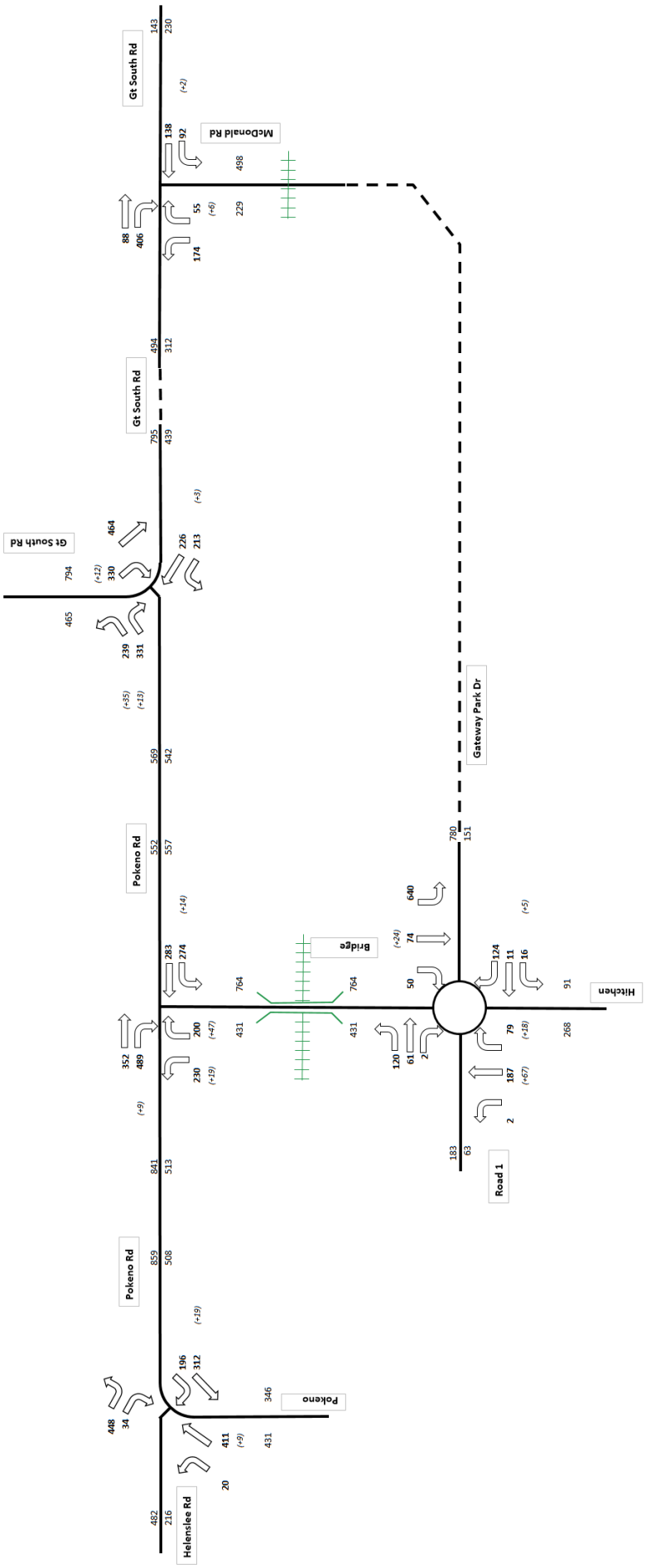
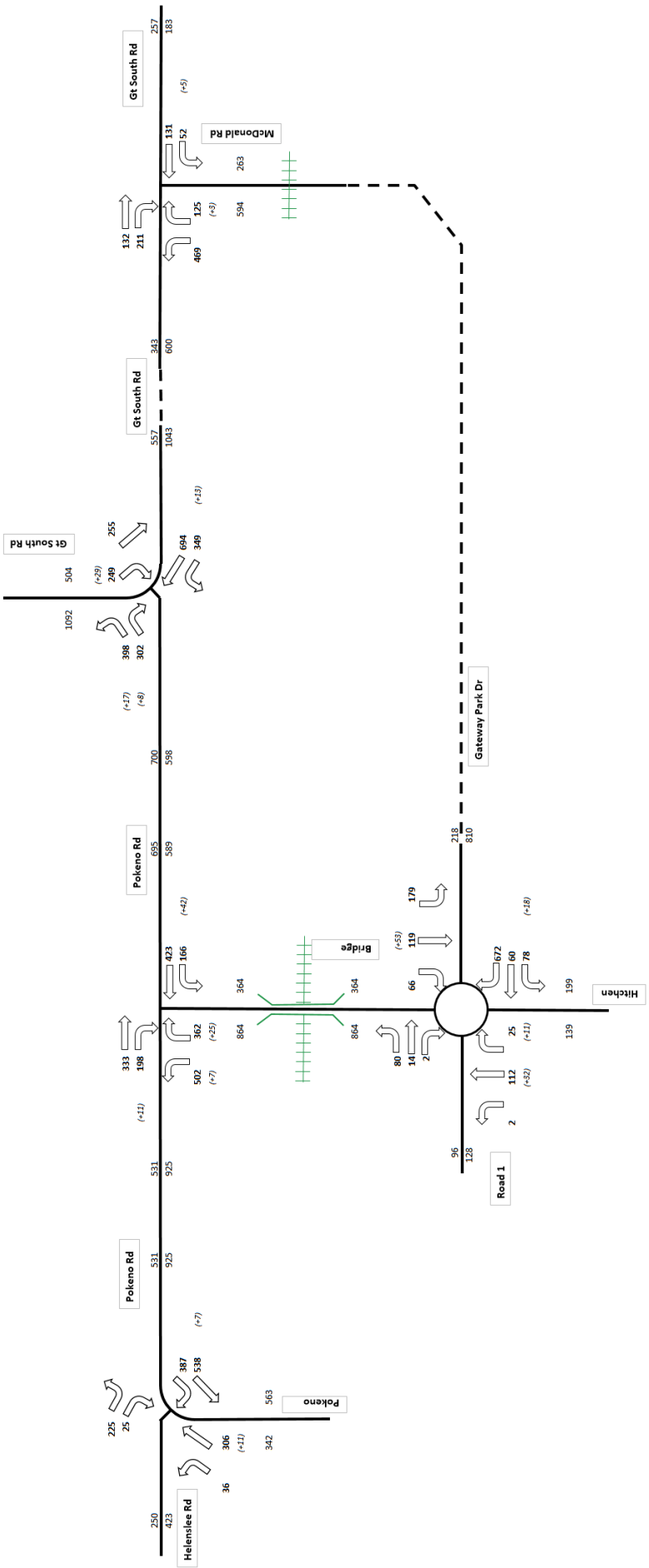


Figure 7: Turning Movements 2027 with Graham Block – PM Peak



4.6.2 Rail Crossings

During the development of the PC24 Structure Plan consultation with Kiwirail resulted in a limit of 10,000 vehicles per day using one level crossing in Pokeno with any additional traffic requiring the provision of a grade-separated crossing.

Through the PC24 process various locations for an overpass were evaluated with a location at the north-western end of the township identified. The construction of that overpass is expected to occur in the next few years.

The traffic assessment process is focussed on the AM peak hour and the PM peak hour and does not directly consider daily traffic volume on the road network. Estimating the daily traffic volumes from the peak-hour volumes indicates that the PC24 Hitchen Block is expected to generate somewhere in the order of 24,000 vehicles per day when fully developed, with around 59% using the overpass, leaving just under 10,000 vehicles per day using the level crossing.

With the addition of the Graham Block the total volume increases to somewhere in the order of 25,200 vehicles per day with around 61% expected to use the bridge, again leaving just under 10,000 vehicles per day using the level crossing.

4.6.3 McDonald Road / Gt South Road Intersection

This intersection is a recently-constructed replacement to the southern part of Hitchen Road and is currently the only route in and out of the Hitchen Block via the level crossing over the NIMT railway. The intersection with Gt South Road has priority control.

The traffic volumes used in the analysis are shown below.

Figure 8: Turning movements at McDonald/ Gt South for AM and PM peak hours

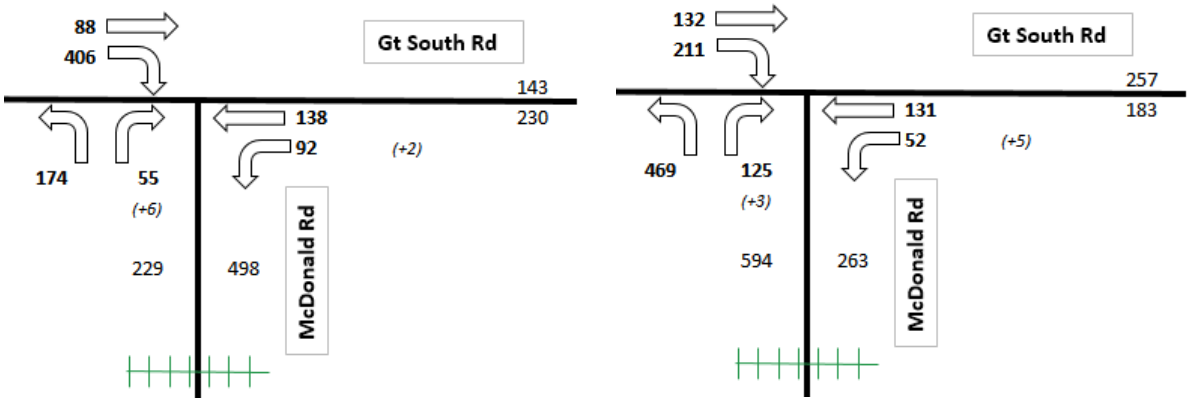
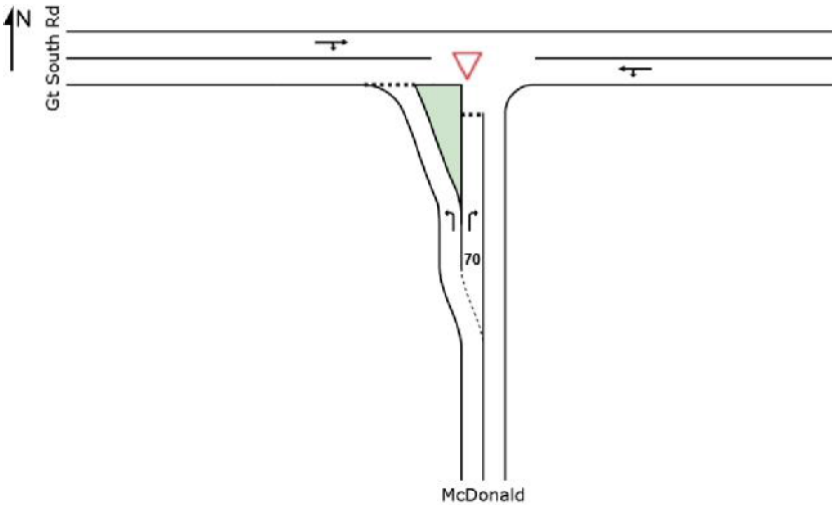


Figure 9: Model representation of McDonald/ Gt South intersection



Summaries of the model results are shown in the following tables, including the average delay and Level of Service [LOS]. The average delay (in seconds) is the average of the delay experienced by all vehicles making that moving during the hour under analysis. Level of Service is a qualitative measure of traffic performance ranging from A for ideal conditions through F for congested conditions. The LOS D is commonly used as a design target for urban peak-period conditions. The LOS thresholds are based on average delay and differ between priority-controlled, roundabout-controlled, and signal-controlled intersections.

Table 14 : Model Results Summary for McDonald/ Gt South – AM Peak

Approach	Movement	2027 Without Change		2027 With Change	
		Avg Delay	LoS	Avg Delay	LoS
McDonald	Left	5.6	A	5.6	A
	Right	12.2	B	12.3	B
Gt South Southeast	Left	4.7	A	4.7	A
	Through	0	A	0	A
Gt South Northwest	Through	2.5	A	2.5	A
	Right	7.2	A	7.3	A
Intersection		5.4		5.5	

Table 15 : Model Results Summary for McDonald/ Gt South – PM Peak

Approach	Movement	2027 Without Change		2027 With Change	
		Avg Delay	LoS	Avg Delay	LoS
McDonald	Left	6.5	A	6.5	A
	Right	9.5	A	9.6	A
Gt South Southeast	Left	4.7	A	4.7	A
	Through	0	A	0	A
Gt South Northwest	Through	1.1	A	1.1	A
	Right	5.9	A	5.9	A
Intersection		5.2		5.3	

These results show that the change in performance at this intersection is expected to be negligible and that the intersection would operate at good levels of service in the future.

4.6.4 Gateway Park Drive/ Hitchen Road/ Bridge Roundabout

This roundabout is the primary point through which the majority of the Hitchen Block residential traffic is expected to pass. For the purposes of this assessment all additional traffic from the Plan Change is assigned to Hitchen Road and passes through this roundabout.

Figure 10: Turning movements at Gateway Park / Hitchen for AM and PM peak hours

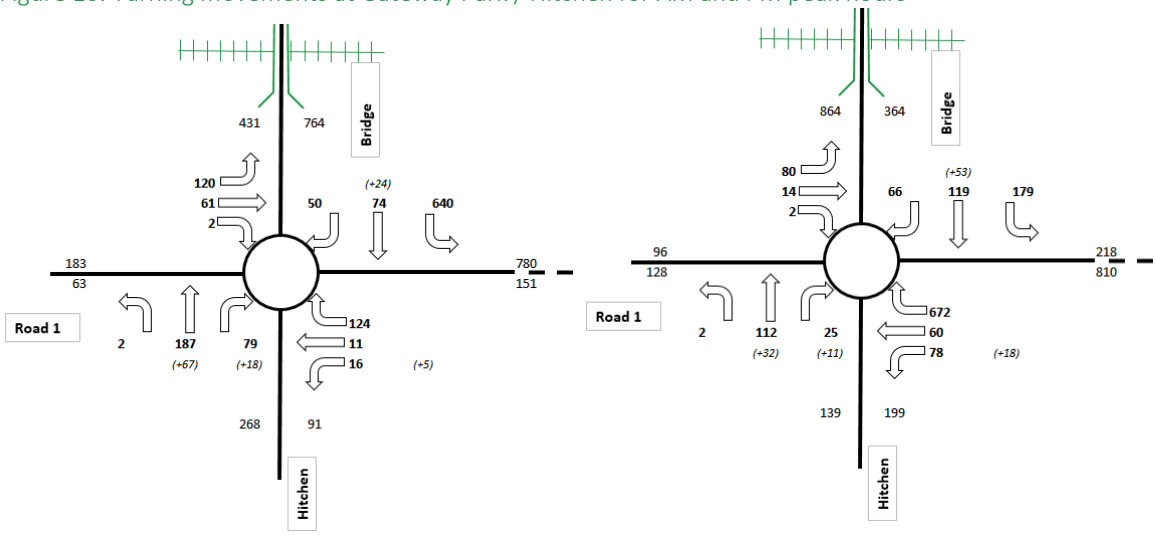


Figure 11: Model representation of Gateway Park / Hitchen intersection

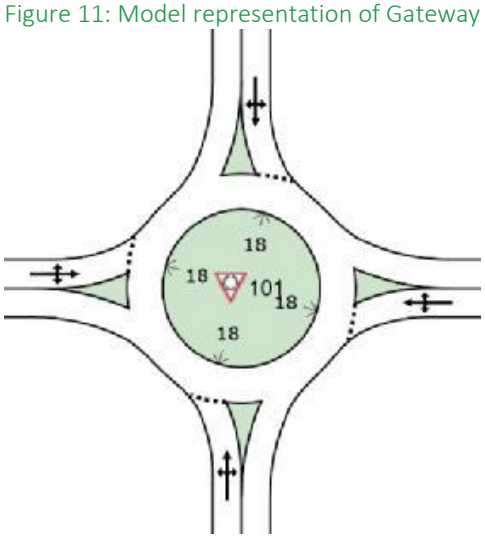


Table 16 : Model Results Summary for Gateway/ Hitchen – AM Peak

Approach	Movement	2027 Without Change		2027 With Change	
		Avg Delay	LoS	Avg Delay	LoS
Hitchen	Left	4.1	A	4.2	A
	Through	4.0	A	4.1	A
	Right	8.3	A	8.4	A
Gateway Park	Left	3.5	A	3.7	A
	Through	3.5	A	3.6	A
	Right	7.9	A	8.0	A
Bridge	Left	4.3	A	4.6	A
	Through	4.1	A	4.4	A
	Right	8.4	A	8.7	A
Road 1	Left	4.8	A	5.4	A
	Through	4.8	A	5.4	A
	Right	9.1	A	9.7	A
Intersection		5.1		5.3	

Table 17 : Model Results Summary for Gateway/ Hitchen – PM Peak

Approach	Movement	2027 Without Change		2027 With Change	
		Avg Delay	LoS	Avg Delay	LoS
Hitchen	Left	9.4	A	9.7	A
	Through	9.4	A	9.6	A
	Right	13.6	B	13.9	B
Gateway Park	Left	4.4	A	5.9	A
	Through	4.3	A	5.8	A
	Right	8.8	A	10.3	B
Bridge	Left	3.2	A	3.3	A
	Through	3.1	A	3.2	A
	Right	7.4	A	7.4	A
Road 1	Left	8.9	A	9.6	A
	Through	8.9	A	9.5	A
	Right	13.2	B	13.8	B
Intersection		7.4		8.2	

The model results show that this roundabout is expected to operate at good levels of service and that the addition of the Graham Block traffic would produce minimal increases in delay.

4.6.5 Pokeno Road/ Helenslee Road Intersection

This intersection currently operates under priority control and is expected to remain under priority control throughout the assessment period. The assessed road layout has a separate lane for traffic turning right into Helenslee Road and separate lanes for each turn exiting Helenslee Road.

Figure 12: Turning movements at Pokeno / Helenslee for AM and PM peak hours

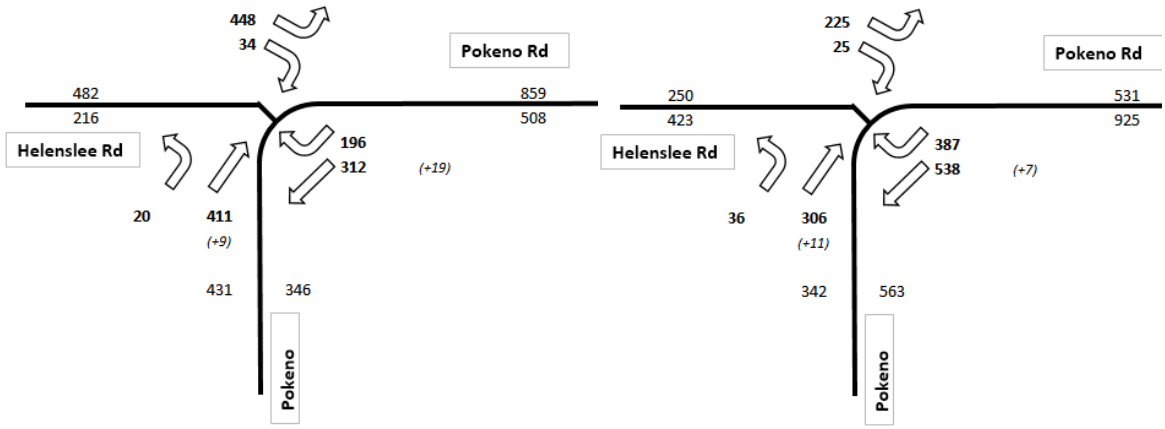


Figure 13: Model representation of Pokeno / Helenslee intersection

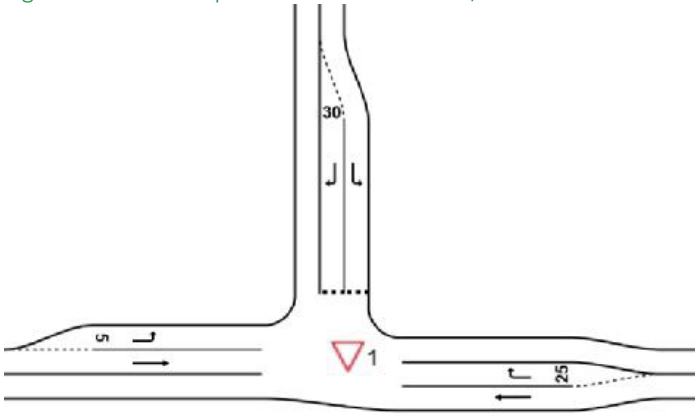


Figure 14: Proposed layout of Pokeno / Helenslee intersection

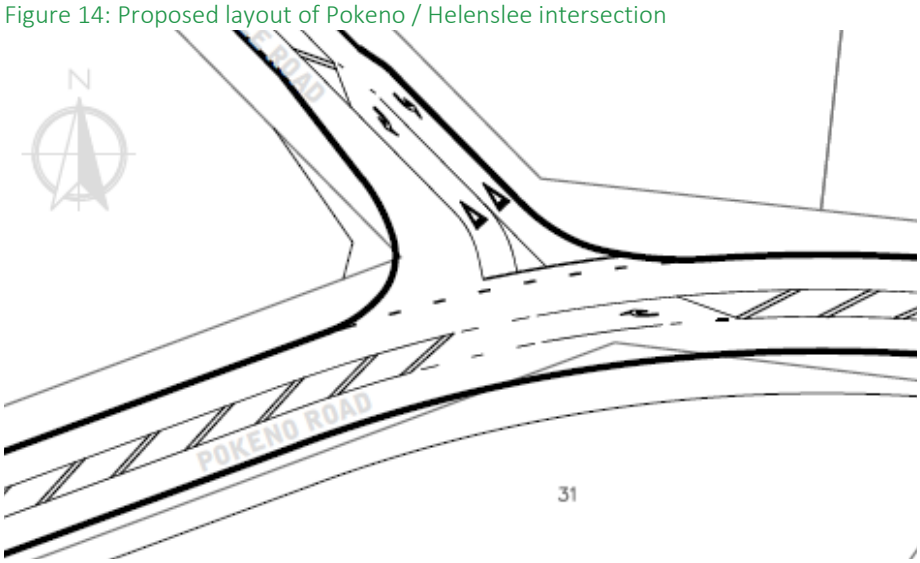


Table 18 : Model Results Summary for Pokeno/ Helenslee – AM Peak

Approach	Movement	2027 Without Change		2027 With Change	
		Avg Delay	LoS	Avg Delay	LoS
Pokeno Southeast	Through	0.0	A	0.0	A
	Right	7.2	A	7.3	A
Helenslee	Left	9.4	A	9.6	A
	Right	17.3	C	18.1	C
Pokeno Northwest	Left	4.6	A	4.6	A
	Through	0.0	A	0.0	A
Intersection		4.5		4.5	

Table 19 : Model Results Summary for Pokeno/ Helenslee – PM Peak

Approach	Movement	2027 Without Change		2027 With Change	
		Avg Delay	LoS	Avg Delay	LoS
Pokeno Southeast	Through	0.0	A	0.0	A
	Right	7.3	A	7.5	A
Helenslee	Left	6.3	A	6.4	A
	Right	31.7	D	33.0	D
Pokeno Northwest	Left	4.6	A	4.6	A
	Through	0.0	A	0.0	A
Intersection		3.5		3.5	

As with the majority of priority-controlled T-intersections the right turn out of the side road (Helenslee Road) experiences the highest delay, and in this case that movement experiences LOS D in the PM peak hour which is considered to be acceptable as the operation will be better at all other times of the day. The addition of the Graham Block traffic results in minimal increases in average delay.

4.6.6 Pokeno Road/ Bridge Intersection

At the time of writing the name of the road leading from Pokeno Road over the railway is unclear. Documents have various names for this road including Hitchen Road and McLean Street. It is expected that naming this road Hitchen Road would cause confusion with the southern part of Hitchen Road located between Gt South Road and the railway. As a result of the uncertainty this road is referred to as the bridge road in this assessment.

Figure 15: Turning movements at Pokeno / Bridge intersection for AM and PM peak hours

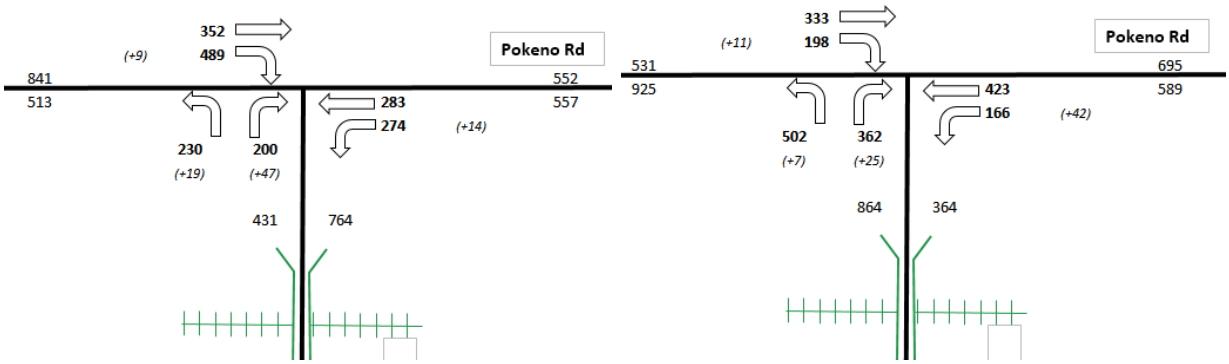


Figure 16: Model representation of Pokeno / Bridge intersection

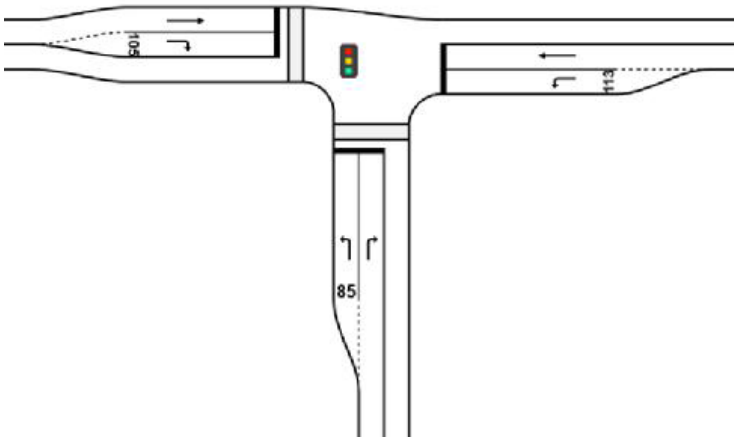


Figure 17: Proposed layout of Pokeno / Bridge intersection

Table 20 : Model Results Summary for Pokeno / Bridge – AM Peak

Approach	Movement	2027 Without Change		2027 With Change	
		Avg Delay	LoS	Avg Delay	LoS
Bridge	Left	10.1	B	10.1	B
	Right	31.6	C	33.8	C
Pokeno Southeast	Left	15.5	B	14.9	B
	Through	30.4	C	30.4	C
Pokeno Northwest	Through	4.4	A	4.9	A
	Right	27.1	C	34.6	C
Intersection		19.6	B	22.1	C
Signal Cycle Time		50s		50s	

Table 21 : Model Results Summary for Pokeno / Bridge – PM Peak

Approach	Movement	2027 Without Change		2027 With Change	
		Avg Delay	LoS	Avg Delay	LoS
Bridge	Left	15.1	B	20.5	C
	Right	37.0	D	48.0	D
Pokeno Southeast	Left	8.8	A	11.7	B
	Through	25.0	C	28.3	C
Pokeno Northwest	Through	7.1	A	7.9	A
	Right	31.7	C	38.6	D
Intersection		21.0	C	26.1	C
Signal Cycle Time		50s		88s	

This intersection will ultimately be controlled by traffic signals and is expected to carry the majority of residential traffic from the Hitchen Block and a sizeable proportion of the business traffic.

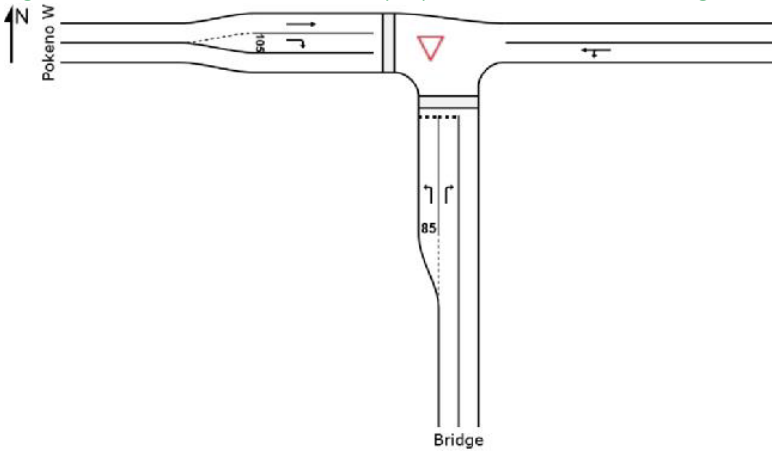
With the PC24 Structure Plan fully developed the intersection is expected to operate at good levels of service during the peak periods with LOS B in the AM peak hour and LOS C in the PM peak hour. The worst movement is the right turn into Pokeno Road in the PM peak hour which is just over the LOS C/ D threshold.

When the Graham Block traffic is added the intersection experiences relatively minor increases in average delay and the intersection operates at LOS C in both peak periods. The average delay for the right turn into Pokeno Road in the PM peak period increases to be well into the LOS D band; however, this performance is considered to be appropriate for a one-hour period.

In order to give some indication of when it would be necessary to provide traffic signal control of this intersection a simplistic analysis was undertaken. This simplistic analysis used the 2022 PSP turning volumes and scaled them down until the relevant Level of Service threshold was obtained. This scale is not directly comparable to the amount of land that could be developed as this simplistic methodology also scales any pre-development traffic, but as the post-development volumes are relatively large compared to the pre-development volumes the differences are unlikely to be significant.

The simplistic analysis shows that the Give Way intersection layout shown below would reach the LoS C/D threshold at flow scales of 90% in the AM peak and 84% in the PM peak. The intersection would reach the LoS D/E threshold at 96% in the AM peak and 88% in the PM peak. In each case the worst LoS was for the right turn out of the bridge road with all other movements operating at good levels of service.
This analysis indicates that conversion from priority control to traffic signals should be implemented prior to around 85% of the Helenslee block being developed.

Figure 18: Possible interim Give Way layout for the Pokeno / bridge road intersection



4.6.7 Pokeno Road/ Gt South Road Intersection

Figure 19: Turning movements at Pokeno/ Gt South for AM and PM peak hours

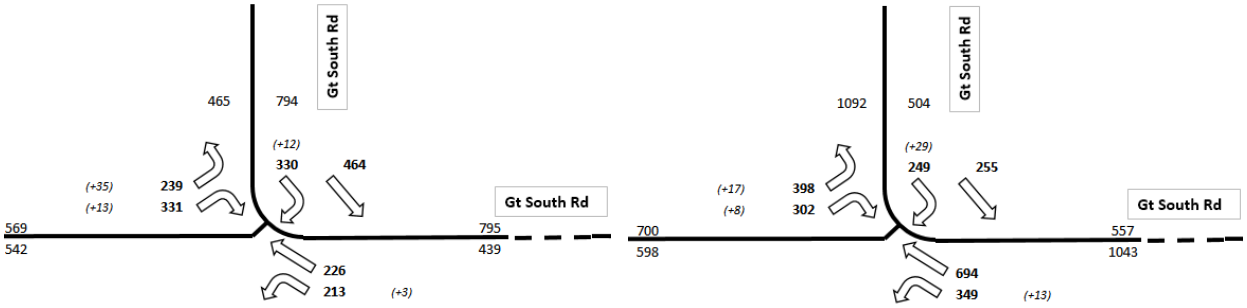


Figure 20: Model representation of Pokeno/ Gt South intersection (traffic signals)

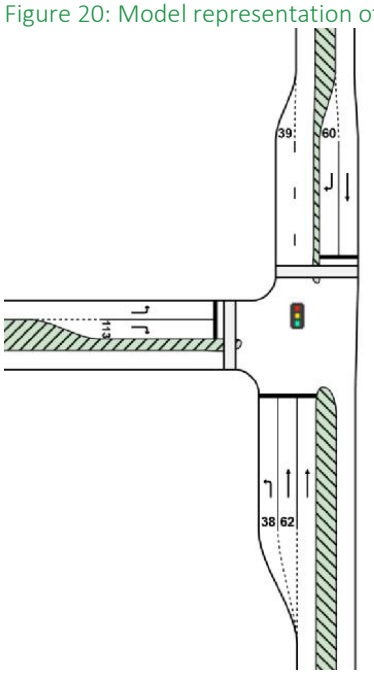


Figure 21: Proposed layout of Pokeno/ Gt South intersection (signals)

Table 22 : Model Results Summary for Pokeno/ Gt South – AM Peak

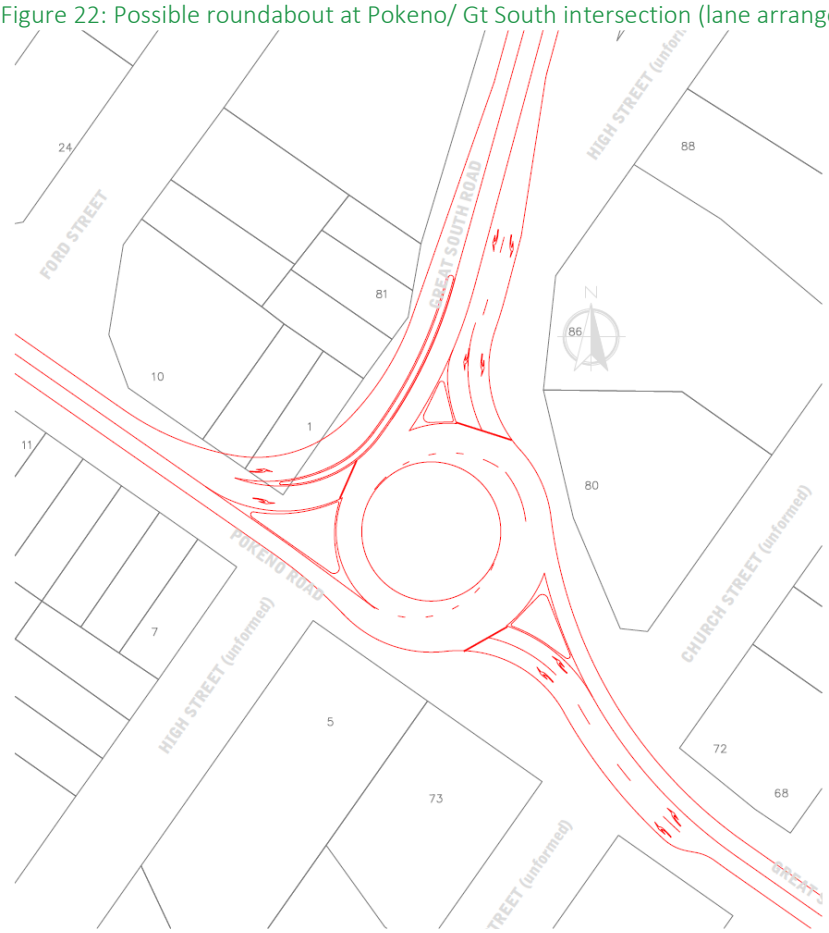
Approach	Movement	2027 Without Change		2027 With Change	
		Avg Delay	LoS	Avg Delay	LoS
Gt South Southeast	Left	11.8	B	11.8	B
	Through	24.5	C	24.5	C
Gt South Northwest	Through	9.2	A	9.2	A
	Right	19.0	B	19.3	B
Pokeno	Left	9.0	A	9.2	A
	Right	25.2	C	26.0	C
Intersection		16.2	B	16.4	B
Signal Cycle Time		50		50	

Table 23 : Model Results Summary for Pokeno/ Gt South – PM Peak

Approach	Movement	2027 Without Change		2027 With Change	
		Avg Delay	LoS	Avg Delay	LoS
Gt South Southeast	Left	9.5	A	9.6	A
	Through	27.0	C	27.0	C
Gt South Northwest	Through	6.0	A	6.0	A
	Right	25.5	C	27.0	C
Pokeno	Left	17.4	B	17.6	B
	Right	38.3	D	40.6	D
Intersection		21.6	C	22.1	C
Signal Cycle Time		60		60	

This intersection will also be controlled by traffic signals in future. While a moderately large roundabout could provide more efficient movement for vehicles it would provide a poor environment for pedestrians and cyclists, and would require a large land footprint. For that reason, traffic signal control was selected during the PC24 process and remains the recommended option for this intersection.

Figure 22: Possible roundabout at Pokeno/ Gt South intersection (lane arrangement from 2017 Beca report)

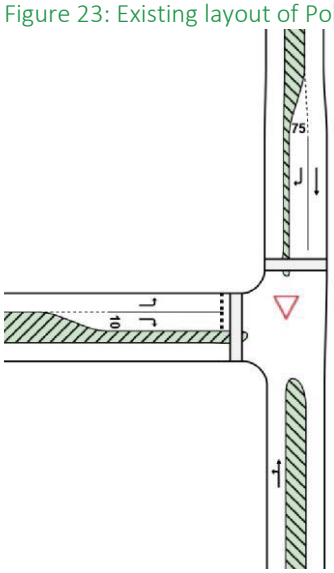


With the PC24 Structure Plan fully developed the intersection is expected to operate at good levels of service during the peak periods with LOS B in the AM peak and just over the threshold into LOS C in the PM peak. The worst movement is the right turn out of Pokeno Road.

When the Graham Block traffic is added the intersection experiences relatively minor increases in average delay and the intersection operates at the same LOS for each movement and the intersection overall. This performance is considered to be appropriate for a one-hour period.

As with the previous intersection a simplistic flow-scaling analysis was used to provide some idea of when conversion of this intersection to traffic signal control may be required. The priority-controlled intersection reaches the LoS C/D threshold at 80% of the 2022 PSP volumes in the AM peak and at 70% in the PM peak. The LoS D/E threshold is reached at 84% in the AM peak and 72% in the PM peak. As a result, it is recommended that this intersection be changed to the signal-controlled configuration above when the PSP is about 70% developed.

Figure 23: Existing layout of Pokeno / Gt South intersection



4.6.8 Impact on Road Safety

The change in traffic volumes as a result of this plan change would be negligible outside Pokeno and as a result the impact on road safety is also considered to be negligible.

Within Pokeno the additional plan change traffic would either be travelling along newly-constructed roads of a high standard with more than sufficient capacity, or travelling through intersections on Pokeno Road that are intended to be upgraded as development of the PC24 Structure Plan proceeds. As a result, the impact of the proposal on road safety within Pokeno is also considered to be negligible.

4.7 Mitigation Summary

The development of the approved Pokeno Structure Plan requires new road infrastructure to be provided including a new rail overbridge, and the provision of traffic signals at the intersection of the new bridge road and Pokeno Road and at the intersection of Pokeno Road and Gt South Rd as the PSP nears full-development.

No new improvements to the road network are required to provide for the development of the Graham Block. While delays and queues at the intersections would be slightly longer as a result of the additional development the intersections would still operate at good levels of service.

4.8 Assessment Against Policies and Plans

The expansion of Pokeno through the addition of the Graham Block will allow the infrastructure already present in Pokeno, together with the infrastructure planned to be provided, to be utilised more efficiently. As a result, the proposal is considered to be consistent with good practice and regional policy.

If rezoned the new area would be subject to the existing provisions in the District Plan and is consistent with those provisions as far as possible while including additional land.

5 Consultation and Implementation

5.1 Consultation

Consultation with Council and the Transport Agency is not yet complete. This section will be updated with the results of any consultation.

5.2 Implementation

From the analysis undertaken for this Plan Change, as outlined above, it has been determined that no new transport infrastructure will be required to accommodate development of the Graham Block.

6 Consistency with Strategy

A number of policy and guidance documents are relevant to this assessment, and these are discussed briefly in this section. A full assessment of the proposed Plan Change against these documents is contained in the Assessment of Environmental Effects [AEE] documentation.

6.1 Legislation

6.1.1 Resource Management Act

The Resource Management Act 1991 [RMA] governs the development of land and establishment of land use activities. The RMA requires authorities such as Waikato Regional Council [WRC] and Waikato District Council [WDC] to produce and update Regional and District Plans. The RMA also requires the Council to consider the impact of proposals including impacts on the transport environment.

This report is intended to assist the Council in considering the impacts of the proposal.

6.2 National Policy

6.2.1 Government Policy Statement on Land Transport

The Government Policy Statement on Land Transport [GPS] is a document produced by the Ministry of Transport that sets out the government's priorities for expenditure from the National Land Transport Fund over the next 10 years.

The current version of the document is the 2015/16 – 2024/25 edition, with the Draft 2018/19 – 2027/28 edition currently in preparation.

The proposal is not in conflict with the GPS.

6.2.2 NZ Transport Agency Documents

The NZ Transport Agency is responsible for producing the National Land Transport Programme. This documents contains all the land transport activities that the agency anticipates funding over the next three years. The current version is the 2015-18 edition with the 2018-2021 programme currently in development.

The agency is also responsible for the State Highway network and Roads of National Significance [RoNS] which includes the Waikato Expressway (SH1). The northern Longswamp section of the expressway is currently under construction and will result in improvements to SH1 south of Pokeno.

In this part of the Waikato region the other main focus is on some improvements on the SH2 route including four-laning at the western end of SH2.

The agency also produces a number of other documents in including the Integrated Planning Strategy which includes strategic objectives for a 10-year period with the current edition covering 2010-2020.

The proposal does not conflict with any NZTA strategy, plans or projects.

6.3 Regional Policy and Plans

6.3.1 Waikato Regional Policy Statement

The Waikato Regional Council [WRC] is responsible for producing the Regional Policy Statement [RPS]. This mandatory document provides an overview of the resource management issues in the region and the ways in which the Council intends to address them.

One of the issues identified in the document is managing the built environment and the pressures experienced from development. The policy seeks to use existing infrastructure efficiently.

The proposed Plan Change will utilise the existing infrastructure and new infrastructure planned to be delivered as the PSP is developed. No additional transport infrastructure will be required apart from new streets within the plan change area.

6.3.2 Waikato Regional Land Transport Documents

The WRC also produces a number of land transport documents including the Regional Land Transport Plan [RLTP], the Regional Public Transport Plan [RPTP], Regional Road Safety Strategy, and Regional Walking and Cycling Strategy.

The RLTP sets out how the WRC intends to develop the land transport system over the next 30 years, with the current edition covering 2015-2045. The RLTP includes the SH2 Pokeno to Mangatarata Safe System Demonstration project as the 7th-highest priority for the region.

The WRC is also involved with the NZ Transport Agency in several speed management demonstration projects which include Helenslee Road in Pokeno.

The proposal is not in conflict with these documents or projects, although the plan change would make a small contribution to growth in traffic volume along Helenslee Road. The additional traffic volume is not expected to materially change the outcome of the speed management project.

6.4 Local Policy and Plans

6.4.1 Franklin District Growth Strategy

Pokeno was once part of Franklin District and the Auckland Region and became part of Waikato District during Auckland local body amalgamation in 2010. As a result, planning for Pokeno was undertaken within the Franklin and Auckland frameworks and Pokeno is not included in the Waikato Future Proof Growth Strategy that was adopted in 2009.

The Franklin District Growth Strategy [DGS] sets the vision for Pokeno:

> Pokeno will attract a significant share of population growth and is likely to develop and function more like a town by 2051. Pokeno presents an opportunity for significant new residential, recreational, commercial and industrial activities, given its proximity to State Highways 1 and 2 and railway. Development of Pokeno is an opportunity to redesign in an integrated manner, combining all the necessary features for an attractive and functional village. It is expected that a comprehensive master plan for Pokeno will address features of a complete, self-contained town - work, live, play and the infrastructure required to support it.

When the DGS was prepared, prior to the implementation of PC24, Pokeno had a population of 585 people and was identified as being unsustainable. Significant growth for the town was planned.

With respect to transport the DGS included the following:

> Transport Planning
>
> Proximity to SH1 and thus access to Manukau and Auckland to the north and Hamilton to the south, is clearly a significant feature of the proposed development of Pokeno. SH1 has spare capacity at this point in the network. The well-documented capacity constraints which arise on SH1 during peak periods are located further north outside Franklin District at Drury and northwards. This level of accessibility is further supplemented by the proximity of SH2 which links to destinations such as the Bay of Plenty, the Coromandel Peninsula and the east Waikato.
>
> It is expected that the existing local road network will have the capacity to absorb the traffic increases associated with development of Pokeno. Given the proximity of the Waikato expressway, SH1, and the on and off-ramps, Pokeno can be planned and designed in a way that does not compromise the efficiency and safety of the State highway network.
>
> …
>
> The expanded village centre will require and benefit from an integrated urban design and traffic management scheme. This should be planned so that traffic management measures can be installed at an early stage. The main street of Pokeno will need traffic management measures introduced. These should include parking provisions and safety measures such as pedestrian facilities and speed control at key points. Within the village centre, traffic management could also be used to promote a sense of place in conjunction with streetscaping.
>
> A key element of Pokeno's development is potential to develop a rail-based public transport service between Pokeno and Pukekohe, Papakura, Manukau and south and central Auckland, which would be well aligned with the principles of sustainable transport.
>
> Principles:
>
> 23. Plan the network of local roads to distribute heavy traffic away from the main centre of the town and away from residential areas.

24. Design and integrate a local bus route, bus stops and station into the village plan.

24. [sic] Ensure good connectivity of local roads walking and cycling networks

25. Integrate features of public transport, particularly a new rail station into the planning and development of Pokeno.

26. Use traffic management principles in conjunction with quality urban design principles to create an attractive and functional town.

The additional population that would be enabled by the proposed Plan Change would assist in making local services within Pokeno more sustainable. This would include increasing the catchment for any public transport services.

The additional development can make use of the spare capacity on SH1 identified in the DGS.

The Graham Block Plan Change is largely neutral with respect to the transport principles as it has no effect on the structure of the road network for the rest of the town.

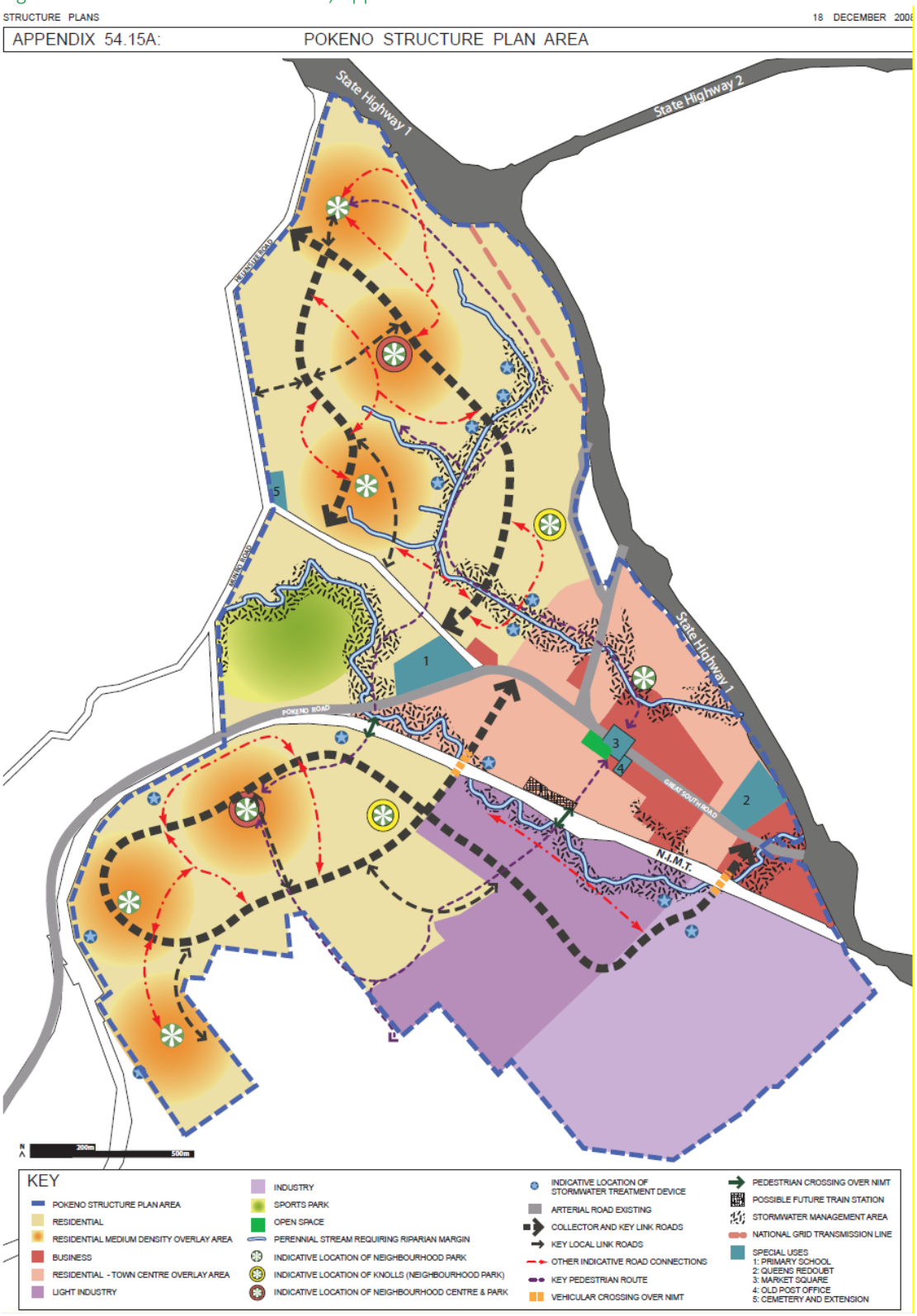
The connectivity of the local streets, particularly with respect to walking and cycling, is relatively poor; however, this is dictated by the terrain which includes steep-sided valleys. As a result, the street network with the Graham Block is not highly interconnected. As the development area is relatively small and the street pattern is not overly extended this is considered to be a minor issue in this case.

6.4.2 Waikato District Plan – Franklin Section

The primary policy document relevant to this Plan Change is the Operative District Plan. The District Plan contains a suite of provisions for the Residential 2 and Countryside Living zones that will govern development of the Graham Block.

These provisions include guidance on matters such as road cross-section, and of particular relevance to this plan change, contains the Pokeno Structure Plan [PSP].

Figure 24: The Pokeno Structure Plan, Appendix 54.15A of Waikato District Plan - Franklin Section



6.5 Summary

At the national level the identification of the Waikato Expressway as a Road of National Significance has led to the NZ Transport Agency continuing to progress the construction of the expressway south of Pokeno. That project will improve access between Pokeno and other locations to the south.

The NZ Transport Agency, partnering with the Waikato Regional Council, is continuing to improve the safety of the SH2 route, particularly at the Pokeno end of the highway. This project is expected to improve connections to the east of Pokeno.

The inclusion of Helenslee Road in the speed management trial being undertaken by NZTA and the Councils is expected to result in improved safety for Pokeno residents.

In general, the planning documents will result in improved road infrastructure in the Pokeno area which would help provide for the rezoning of the Graham Block.

7 Conclusion

Following extensive studies including transport assessment, traffic design, and traffic modelling, Plan Change 24 to the Franklin District Plan was approved, rezoning approximately 400 hectares of land at Pokeno.

The current proposal is to rezone an additional 13 hectares of land from Rural to Residential 2, an additional 13 hectares from Rural to Countryside Living, and to remove the Large Lot Overlay on some other areas of land. The net effect would be the addition of around 140 dwellings.

The assumptions and parameters used in the PC24 transport assessment were subject to review by Franklin District Council, Auckland Regional Transport Authority, NZTA, independent peer review and a public hearings process.

After recently reviewing the transport assessment work that was undertaken it has been determined that the majority of assumptions and parameters used are still appropriate for this current assessment. The assumptions that have proven to be incorrect are those around traffic growth, which have been over-stated to date.

In order to provide a robust assessment, the previous traffic growth rate has been adopted for this analysis. The period used for the assessment of transport effects has been changed from 2022 to 2027 to provide a 10-year assessment horizon.

From the analysis work carried out it has been determined that the proposed plan change would likely lead to the traffic volumes in Pokeno increasing by around 2.3%. When the additional traffic reaches the State Highway network the increase in volume on the highways is less than 1%.

As the newly zoned land is located south-west of the railway and there will be only two road access points to that area in future the effects of the change are more pronounced in that area with the total trip generation of that area increasing by less than 5%.

Traffic modelling and concept design of key intersections confirms that the changes to the road network expected to be provided as the PC24 Pokeno Structure Plan is developed further can also provide for the expected growth to 2027 with the proposed plan change.

In conclusion, the transport impacts of the proposed plan change are considered to be minimal. The effect of the additional traffic on the State Highway network would be negligible. Significant road improvements are required along Pokeno Road from Helenslee Road to Gt South Road, but these same improvements will also be required to accommodate the development of the PC24 Pokeno Structure Plan. The additional effects arising from this plan change are minimal.

arrive
your transportation advisors

100982

12 June 2017

Mr C Botica
Pokeno Village Holdings
by email

Graham Block Plan Change
Comments on Transportation Peer Review

Dear Colin

As requested, I have read through the Initial Transportation Review for the Graham Block Plan Change prepared for Waikato District Council by Gray Matter Ltd and contained in a letter dated 8 June.

The review finds that, in general, the traffic impacts from the additional development enabled by the plan change, and the fully-developed plan change area, would be negligible. A number of isolated concerns are noted as summarised below.

Level Crossing

Earlier discussion with Kiwirail indicated that the rail level crossing should not carry more than 10,000 vehicles per day. The review notes that *"following this proposal 9,800 veh/day are expected at the level crossing. The level crossing has been upgraded, but there are no specific rules limiting traffic to 10,000 veh/day."*

The comment that there are no District Plan rules linked to the provision of roading infrastructure is a common thread through the review, and is this is addressed below.

Ford Street

The review notes that signalisation of the Pokeno Road/ Great South Road intersection may *"result in rat-running as drivers seek to avoid delays introduced by the traffic signals. This has the potential to increase the risk of crashes at the Ford Street/ Great South Road intersection and the increase in traffic may adversely impact on the amenity of Ford St. The potential for adverse effects could be avoid by closing the Ford Street/ Great South Road intersection. Unclear if closure of Ford Street is included in the proposed intersection upgrade."*

The potential for rat-running was identified when the original Pokeno Plan Change was developed in 2007. For that reason, and due to a number of crashes at the intersection of Ford Street/ Great South Road, the intention at that time was that Ford Street would be closed at the Great South Road end. That remains the intention, and it is recommended that the closure is implemented prior to, or as part of, the signalisation of the Pokeno/ Gt South intersection.

Mitigation and District Plan Rules

The review notes *"While we agree that no additional infrastructure appears to be required due to the re-zoning, we are concerned there are no clear triggers or requirements for the identified improvements to be implemented at the affected intersections. For example, there are no rules in the District Plan or the Pokeno Structure Plan that specifically require the intersection upgrades at Pokeno Road/ Helenslee Road or Pokeno Road/ Great South Road."*

As noted in the review, no additional infrastructure is required by the Graham Block Plan Change. As a result, the absence of rules requiring specific mitigation measures is inherited from the former plan change and the Franklin Section of the District Plan.

The review notes that Council's Long-Term Plan 2015-2025 includes some upgrades of road infrastructure, and then goes on to say "*Unless developers are required to assess the effects and provide the necessary upgrades through other mechanisms in the District Plan or other agreements, it would be desirable to include specific triggers and thresholds for implementing these improvements"*

Developers are required to assess the effects of proposed developments at the subdivision consent stage, and at that stage Council has the ability to require that specific upgrades are funded and/ or provided at an appropriate time.

In the case of the development enabled by the previous plan change, the developer(s) have entered into a development agreement with Council that sets out the financial contributions required of each party with a list of projects and an expected timeframe for each upgrade. This mechanism has been used successfully by many other Councils in the past, has been used successfully to date in Pokeno, and is used for other subdivisions elsewhere in Waikato District.

The use of mechanisms outside the District Plan is preferred over the inclusion of rules in the District Plan for many reasons. As changes are likely to be required over the life of a large development programme such as Pokeno, changes to District Plan rules are expensive and cumbersome to effect. The terms of a development agreement can also be more focussed and flexible where required.

In summary, there is no need to include rules in the District Plan to provide triggers or thresholds for the provision of specific infrastructure items. A development agreement is already in place to provide the necessary infrastructure, and in addition Council has the ability to require additional or different mitigation through the subdivision consent process, albeit that no need to provide any additional or different mitigation has been identified for the Graham Block Plan Change.

Subdivision Layout

The review notes:
"A possible subdivision layout is included in Technical Report I: Stormwater Management Report (refer Figure 1 above). The ITA does not make any assessment of this layout."

"While this review is not an assessment of a subdivision application we have identified a number of aspects that are not consistent with the objectives and policies for the structure plan area. It is possible that future subdivision may not be able to meet the relevant objectives, policy and

design elements, resulting in the subdivision being declined. These issues are included as Appendix A".

The ITA made no assessment of the subdivision layout as it assessed the effects of rezoning land to provide for future subdivision. Assessment of a subdivision layout would be undertaken when a subdivision consent application is prepared.

Having said that, a response to some of the matters raised can be made at this point. The review notes the street layout will result in most lots being accessed off a cul-de-sac or an access lot, and notes that the layout should provide more connectivity.

The reviewer's comments mirror my own comments to the design team when I first sighted the subdivision plan, before the land contour was fully understood. The land in the area to be rezoned for the higher residential density includes some steep terrain and could be described as two bowl-shaped steep-sided valleys with dividing ridges that are similar to peninsulas.

The existing Hitchen Road alignment already provides a connection across the head of the two valleys to each peninsula and is a logical alignment to retain. Any connections across the eastern end of the valleys would have very steep grades which would be impractical for vehicular or pedestrian connections. While the connections along Hitchen Road have a longer travel distance the time and effort involved in using those connections would be less than for any alternative connections.

It may be possible to reduce the number of lots accessed by access ways by providing another street broadly following the contour parallel to Hitchen Road; however, this is may require significant earthworks benching the slope to provide a road with acceptable cross-falls. Those earthworks are likely to make lots steeper, make access to those lots difficult, significantly reduce the number of lots that could be provided, increase the cost of each lot, and have adverse environmental effects.

As a result, while the proposed layout does make use of several cul-de-sacs, this may be somewhat unavoidable if this land is to be developed at this sort of density, and the difficulties associated with providing a road along the slope mean that a number of lots will be rear lots.

These are matters that will be considered in more detail during the assessment of any subdivision consent.

Further Information

The review lists four items that require more information.

<u>Indicative Bus Route in Appendix 54.15B Design Element 1</u>

"Provide comment on whether the "Indicative Bus Route" identified in Appendix 54.15B Design Element 1 requires modification to achieve the desired outcome of providing a bus route within 400m walk of majority of households."

The Design Elements in Appendix 54.15B form part of the assessment criteria for evaluating subdivision proposals. Criterion 5 under Design Element 1 reads "*Road patterns should cater for a future bus route located within convenient walking distance of residents.".*

The explanation for that Criterion reads [emphasis added]:
*Regarding Criteria 5 and 6, the Pokeno Structure Plan Document identifies a suitable **indicative** route for a future bus route which would cater for almost all residents. A route **of this nature** should be allowed for in layout design and roading detailing, such that the bus route is located within a 400m walk of the majority of households. The positioning of the two Neighbourhood Centres, on that route, also aims to ensure that many residents are within either a 400m (5 minute) walking distance from local shops, or at most an 800m (10 minute) walk, as shown on the diagram on the previous page.*

In my view, the principal part of the assessment criteria is Criterion 5, against which any subdivision consent proposal will be evaluated. Given that criterion and the general wording of the explanation text, it is clear that a different bus route could be provided, or may be required, depending on the street patterns proposed and the location of the development.

As a result, it is considered that the District Plan already has sufficient control to ensure that a suitable bus route can be provided, and it is not essential that the Indicative Bus Route diagram is changed.

Road Treatment Diagram in Appendix 54.15B Design Element 3

"Review and, if necessary, provide an update to the "Road Treatment Diagram" at Appendix 54.15B Design Element 3 to include the roads necessary to serve the expanded structure plan area".

The Road Treatment Diagram only shows the more significant roads in the Structure Plan area. No minor roads are shown on that diagram, and as all roads within the Graham Block area would be minor roads, there is no need to change the diagram.

Consultation with NZ Transport Agency

"Provide summary of consultation with NZ Transport Agency".

NZTA have been made aware of the Plan Change and have provided some initial comments, generally questioning why the rezoning was not delayed until the District Plan review. Consultation with NZTA is ongoing; however, given the negligible impact of the Plan Change on the State Highway Network and the consistency with the remainder of the Structure Plan, there are unlikely to be an issues raised by NZTA that would require significant changes to the transport provisions of the Plan Change.

Additional Rules for Mitigation

"Provide commentary as to whether additional rules are required to trigger implementation of the identified intersection improvements."

As noted above, additional rules are not necessary.

Conclusion

The transport review of the Graham Block Plan Change has recognised that the Plan Change would have minimal effect on the transport environment and requests four items of information. Responses to these matters are set out above.

In conclusion, there is no need to make any significant change to the Plan Change, and I continue to recommend that the change be approved.

I trust this provides the required information. If I can be of any further assistance please do not hesitate to contact me.

Yours Sincerely

Wes Edwards
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Director | Transportation Advisor