Bay of Plenty Regional Freight Flows Study

Prepared for UFTI and the Bay of Plenty Regional Council
Prepared by Beca, Richard Paling and Murray King

09 February 2020

Contents

Appendices

Revision History

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1	Krishan Singh, Richard Paling, Murray King	Draft	31 October 2019
2	Craig Richards, Richards Paling	Final Draft	28 November 2019
3	Craig Richards	Final	09 February 2020

Document Acceptance

Action	Name	Signed	Date
Prepared by	Krishan Singh, Richard Paling, Murray King		30 October 2019
Reviewed by	Craig Richards		31 October 2019
Approved by	Craig Richards		31 October 2019
on behalf of	Beca Limited		

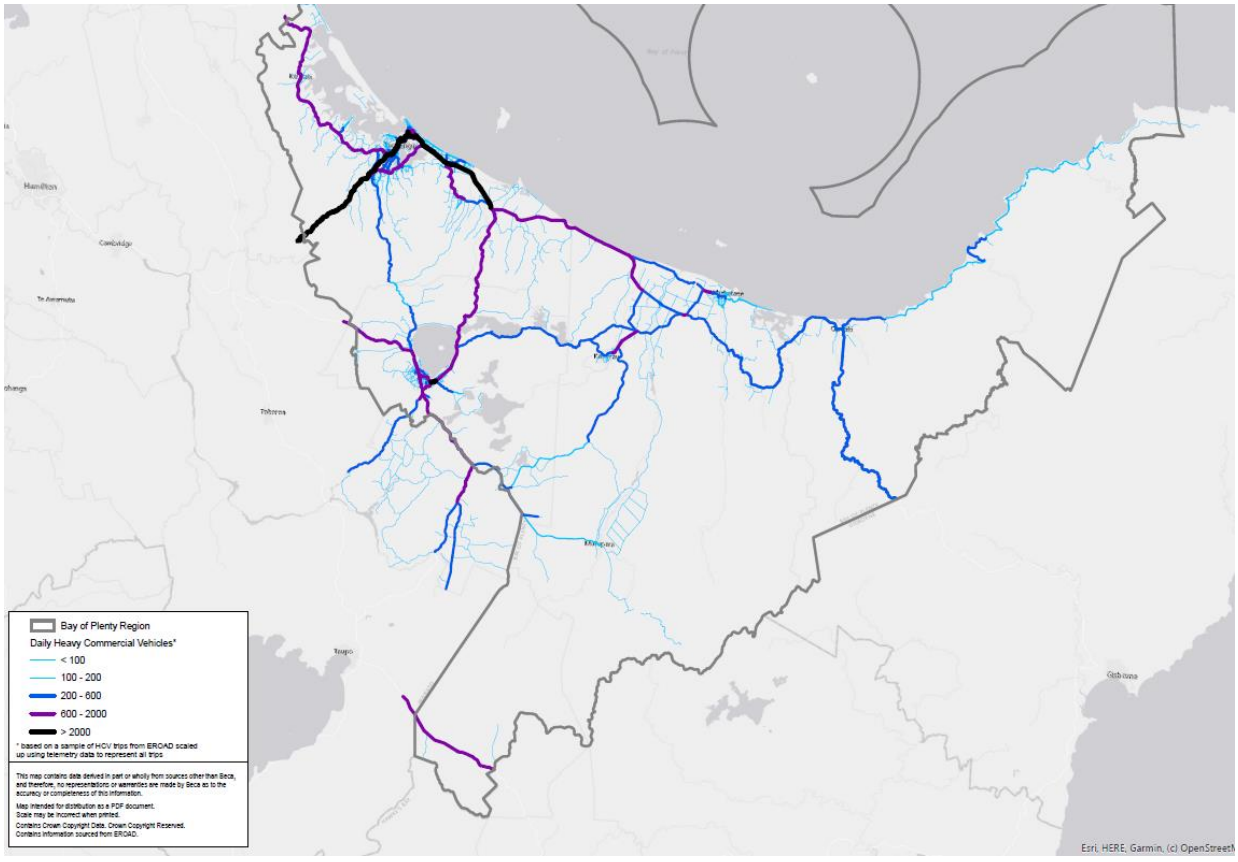
Executive Summary

This report has been prepared by Beca, Richard Paling Consulting and Murray King & Francis Small Consultancy to inform the Urban Form and Transport Initiative (UFTI) about volumes and movement of key freight commodities within the Western Bay of Plenty and wider Bay of Plenty region. The report also considers future scenarios to examine how freight movement could change in the region and what impact this could have on the transport system.

The specific scope of the study is to provide data on current and projected future freight flows (road and rail) to, from and through the Bay of Plenty and western Bay of Plenty sub-region (origins, destinations and magnitude). Answers to key questions were also sought to provide analytical insights to assist with the future modelling of scenarios in the Tauranga Transport Model (TTM).

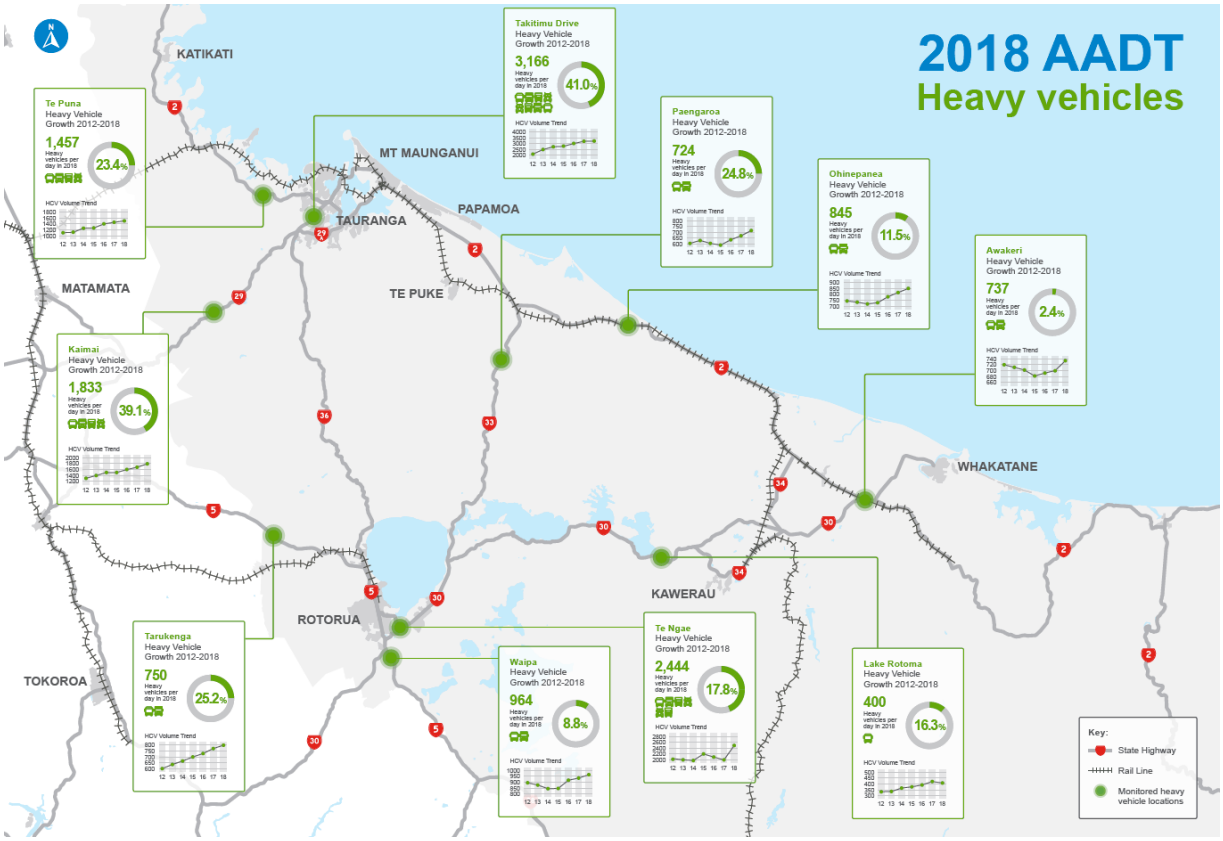
Existing Freight Movements

The Bay of Plenty State Highway network provides the key road connections for freight movement across the Bay of Plenty with much of the inter-regional freight movement focussed on the Port of Tauranga, reflecting the significant role that the Port has on the economic productivity of the wider region. The following heat map shows the key freight corridors by volume with thick black lines representing the highest freight volume corridors. All maps in this report are provided at A3 scale in **Appendix A**.



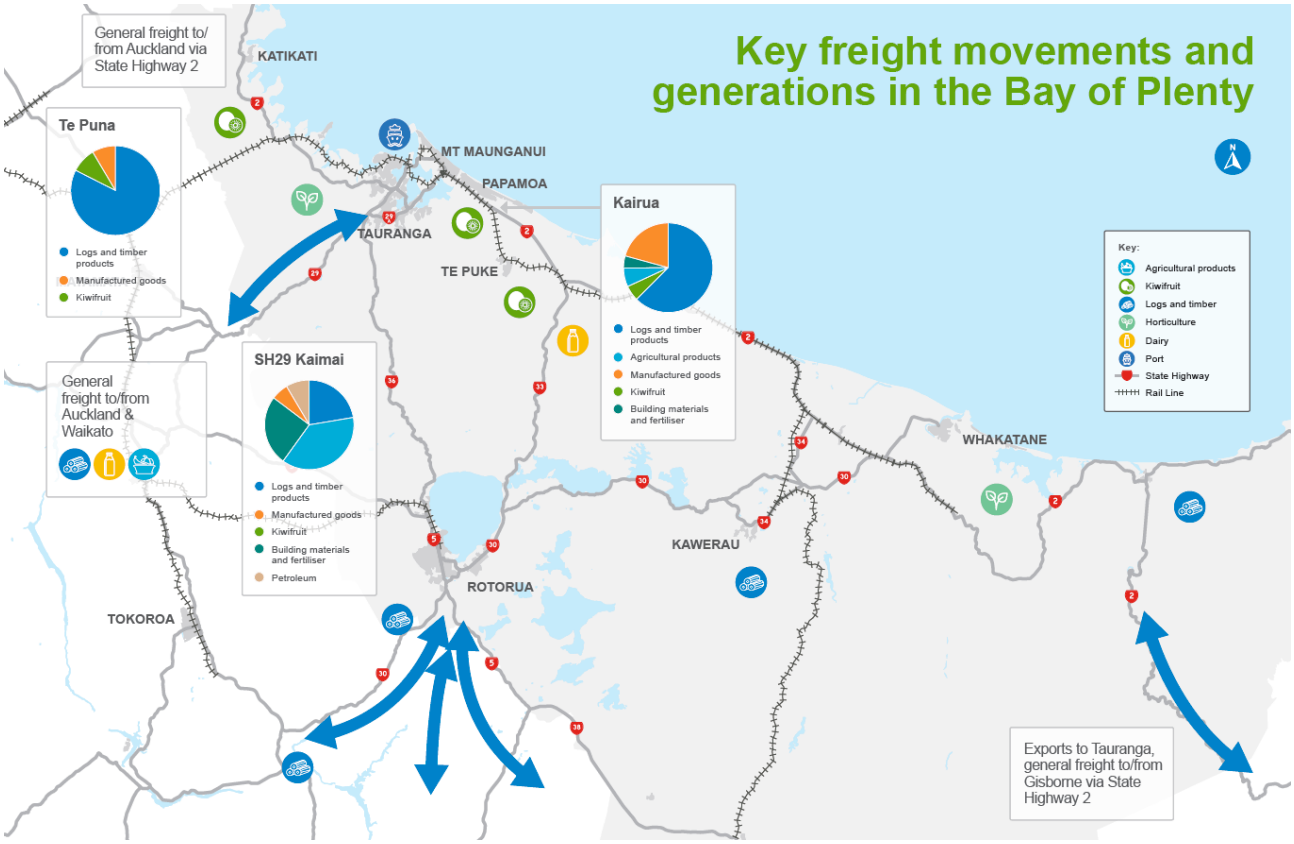
The following map shows the volume of heavy goods vehicles on the State Highway network and the growth at each location in the last five years. While all sites have experienced growth in goods vehicle movements the growth has been particularly high on the main routes into Tauranga (SH2 and SH29) and within

Tauranga where goods vehicle movements on Takitimu Drive[1] have grown by 41% in five years. This is likely to be influenced by the strong growth in the Tauriko Business Estate along with growth in movements to/from the Waikato and Rotorua.



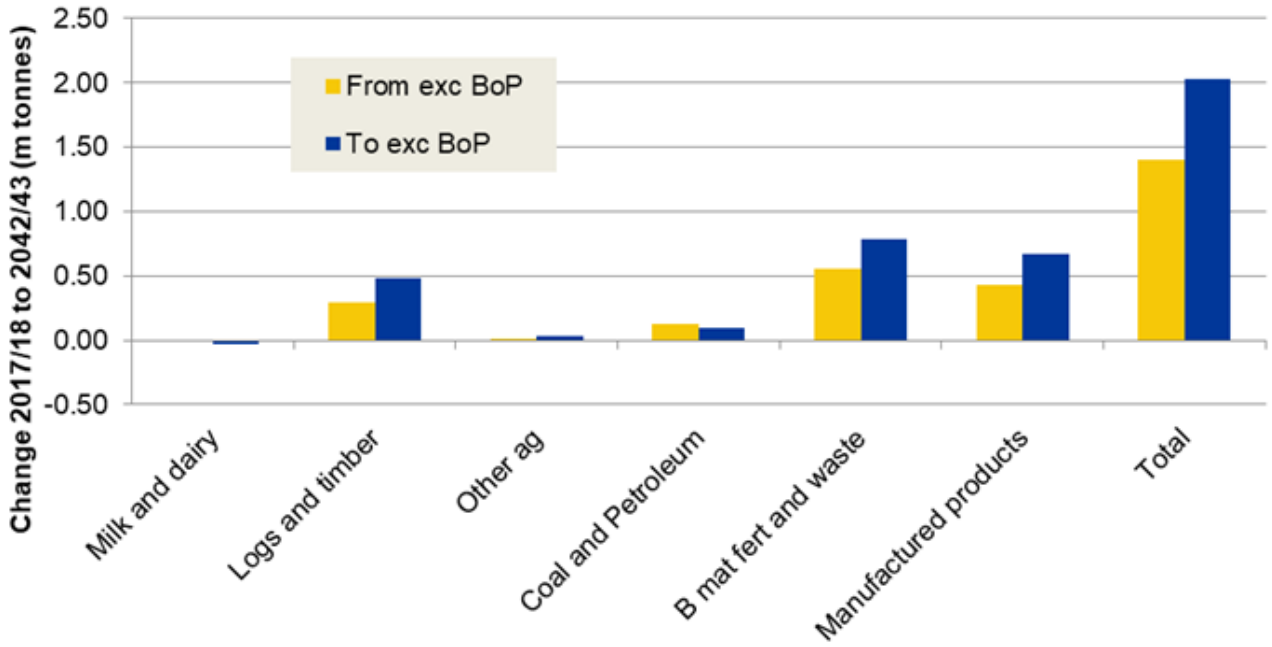
The next map shows the key commodities shifted by corridor in the region. Logs and timber products contribute significantly to freight movements on SH2 north and south of Tauranga. Other key commodities moved in the region include kiwifruit, manufactured goods, building materials and fertilizer.

[1] Recorded at the toll gantry

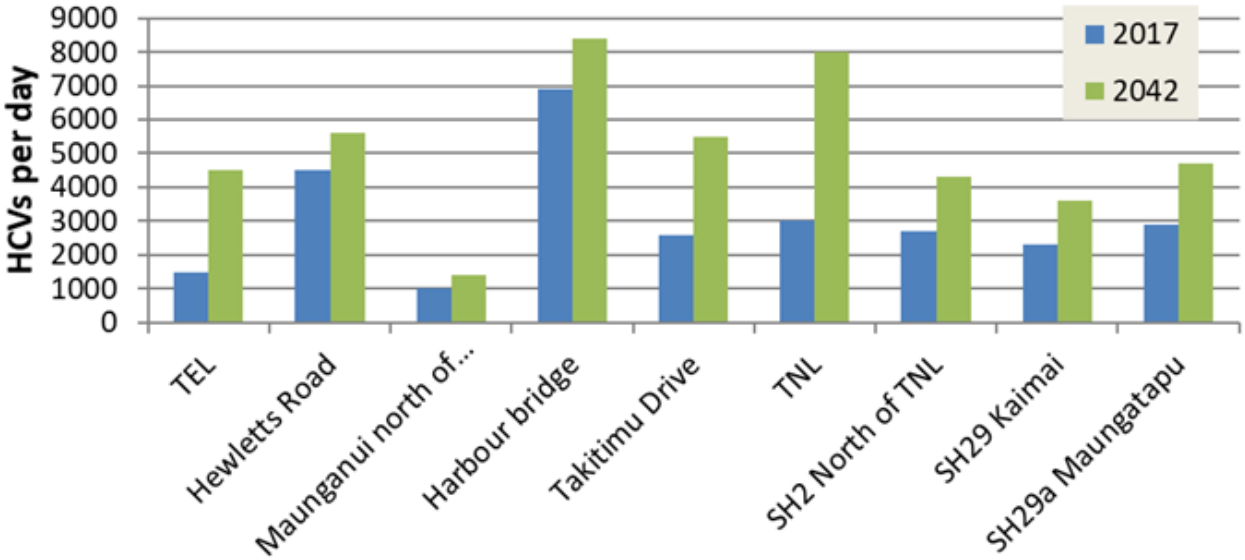


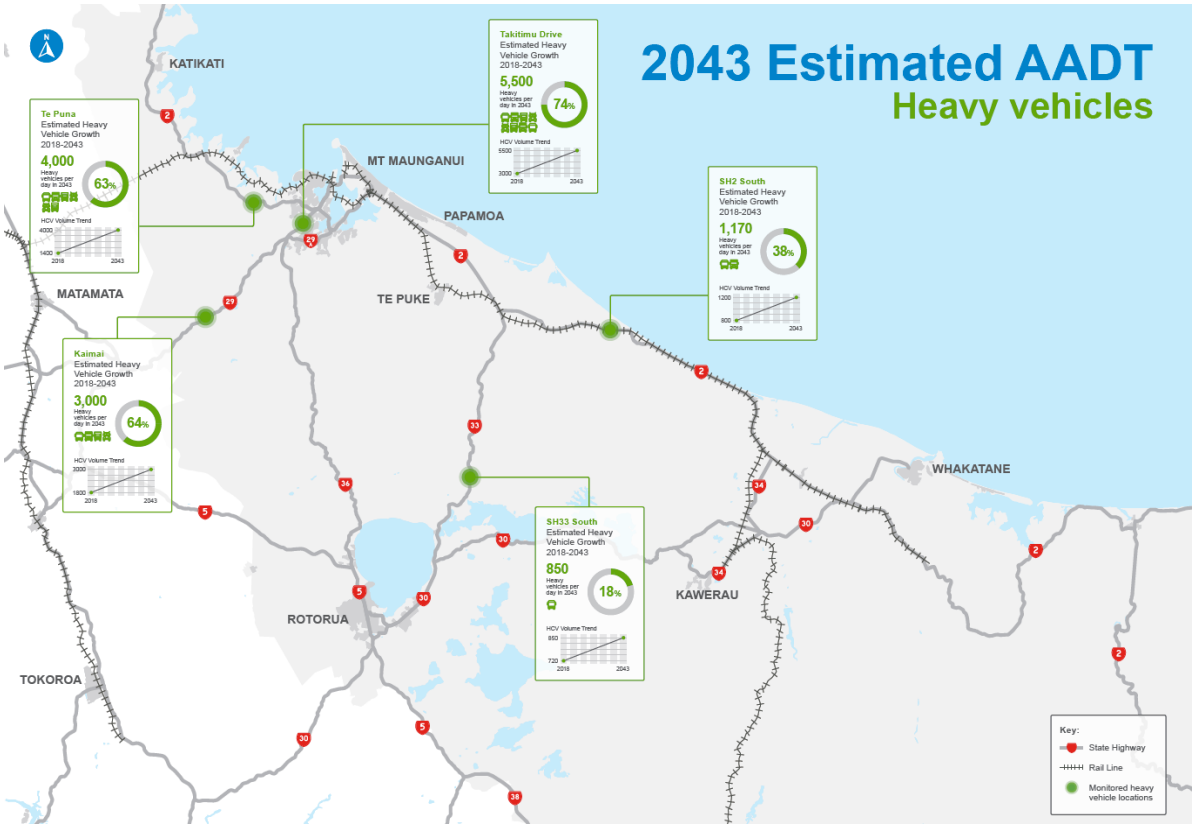
Predicted Change in Freight Movements

The following table shows the predicted change in major commodity flows to and from the Bay of Plenty between 2018 and 2043 (25 years). Raw data used to inform future freight projections is provided in **Appendix C**. In general, there is larger increases in logs and timber products, building materials and manufactured goods and reductions in dairy movements. It should be noted that this covers selected longer distance commodity flows only and these would be supplemented by shorter distance flows of other commodities and the effects of more complex supply chains.



Reflecting the traffic flows not included in the previous table, increases freight movement are more significant when freight generated within the Bay of Plenty are included in the volumes. The following graph and map show key commercial vehicle growth by corridor between 2017 and 2043.





Stakeholder interviews identified significant growth in kiwifruit production and movement with potential for a 50% increase in production over the next 10 years. This growth will be dispersed, and transport of kiwifruit is expected to remain largely by road given the varied location of orchards and packhouses in the region. Kiwifruit transport is not particularly time constrained, with a three day window typical for moving fruit to the port, but the limited availability of truck drivers with drivers not allowed or willing to work at night means the bulk of kiwifruit movements occur during the day.

Possible Disruptors to Business as Usual Freight Growth

Potential significant disruptors to freight movements considered in this study include[2]:

- The growth of aquaculture in Opotiki could increase truck movements on SH2 to the east by up to about 10 per day a relatively small increase on the total flows, although the way in which the product is to be processed and the location of any processing plant are yet to be determined.
- The proposed growth in high value horticulture would also have some impact on traffic flows but again the effects of this are likely to be small.
- Increase in water bottling plants in the eastern bay could increase truck movements particularly on SH2. The Otakiri Water Bottling plant proposes peak truck movements of up to 200 per day, however this application is still before the Environment Court.
- The Kawerau container terminal could result in a shift to rail reducing some truck movements into Tauranga from Kawerau and areas to the east. It may also attract some additional traffic from the Gisborne area.
- The Ruakura Inland Port and Matamata freight terminal could also result in some transfer from road to rail for freight to / from the Waikato and Auckland region.
- Relocation of Port of Auckland to Northland could lead to very significant increases in freight through the Port of Tauranga.
- The Rangiuru Business Park has potential to support rail freight, but is possibly too close to the Port of Tauranga to be a transfer option like Kawarau or Ruakura. Relocation of containerisation from the Tauranga Port site to Rangiuru could however potentially achieve mode shift and free up land in the Port of Tauranga area to allow it to support continuing growth in container traffic and other uses.
- Technology, in terms of a substantial shift to electric or hydrogen trucks is not expected to occur in the short or medium term. For electric this is due to the weight of batteries and systems to support electric trucks. Electric trucks could potentially increase truck volumes as trucks can carry less freight due to the weight of batteries. Hydrogen trucks may be more likely and ultra low emission diesel vehicles could be more quickly adopted by operators if economically appealing, or supported by Government.

Possible Transport Model Considerations

With a large port and potentially strong growth in export industries outside the region, there is potentially a case to estimate port HCV movements more specifically in the TTM. Growth in port volumes has surpassed population growth in Tauranga for the last five years for example (around 6% vs around 4%). This would however have only a relatively minor impact on total volumes considering the relatively low contribution of port traffic to total freight traffic in the region and the small proportion of freight in total traffic volumes (around 10%).

The scenarios that may warrant testing within the TTM arising from this study are:

- A scenario where freight movement between zones in the east (Te Puke area and external trips) and the Port of Tauranga Totara Street and Sulphur Point zones are increased to reflect increased growth in kiwifruit, aquaculture and water bottling. This would be a high freight growth scenario test rather than a forecast. The change in trips to and from the Port of Tauranga zone and the east could be in the order of 300 additional movements per day.
- A scenario where the number of trains per day using the rail network in Tauranga to access the port is increased by 10 trains per day (around 25%). This may need to be modelled using the Tauranga

[2] These disruptors are considered independently in this study, the likelihood is variable. However, a 'high growth in the east' scenario including growth in aquaculture, horticulture and water bottling combined is put forward as a potential transport model scenario test.

Transport Hybrid Model (TTHM) to understand the impact of increased level crossing movements on road capacity at peak times.

Conclusions

Freight movements into the Bay of Plenty region are dominated by the movement of logs and timber products either for direct export or for processing within the region before export. There are also substantial flows of milk and dairy products inbound primarily for export and also outbound flows of other agricultural products mainly imported cattle feed. Manufactured goods flow in both directions reflecting the role of the Port of Tauranga in the supply chains for imports to and exports from Auckland.

In future it is expected that the growth in many of the bulk agricultural products which have driven much of the increase in port traffic will be limited, based on current trends, and this will tend to depress overall rates of growth in freight movements into the region. However, offsetting this, it is likely that increasing supply chain complexity and the growth of construction activities reflecting the relatively high population growth in the urban areas will continue to lead to higher growth rates in these areas. Production of high-quality horticulture and aquaculture developments will contribute to locally produced flows. Growth in commercial vehicle movements is anticipated to be higher around the Tauranga urban area and in particular on routes to and from the port.

There are several possible disruptors that could change the business as usual outcome. Of these higher growth in exports from the east by road and a high shift to rail (to examine the impact on level crossings in particular) are recommended for further TTM analysis.

1 Introduction

1.1 Purpose

Beca, Richard Paling and Murray King have collaborated on this project to inform the Urban Form and Transport Initiative (UFTI) with regard to existing freight flows in the Western Bay and wider Bay of Plenty region, and to consider how freight volumes, routes and mode may change in the future.

The purpose of the study is to inform UFTI and the Bay of Plenty Regional Council about the existing freight context and potential changes in freight movement that would need to be considered and planned for in future planning studies such as UFTI, the Regional Land Transport Plan and Tauranga Transport Model scenarios.

1.2 Study Aim and Methodology

The scope of the study is broadly in two key phases:

- Phase One: Provide data on current and projected future freight flows (road and rail) to, from and through the western Bay of Plenty sub-region (origins, destinations and magnitude) in a form that is compatible with the requirements of the TTM. An additional requirement will be delivering the findings from this data in a form that can be easily communicated and disseminated to key stakeholders and the general public. The scope of Phase One was expanded at the beginning of the project to also include reporting on existing and forecast freight flows across the wider Bay of Plenty region.
- Phase Two: Addressing the remaining key questions/actions to consider in the scoping document to provide analytical insights to assist with the future modelling of scenarios. This could include the framing of scenarios that should be tested in a subsequent modelling phase.

The key questions to answer posed in the brief are repeated in boxes within the report near the relevant text.

Information described in this report has been sourced from the following key sources:

- Commercial GPS data obtained via EROAD
- Interviews with representatives of local government, supply chain and large-scale producers
- The Tauranga Transport Strategic Model (TTSM)
- The National Freight Demand Study (NFDS) for 2017/18 recently published on the Ministry of Transport website with additional analysis provided by the consultants

This study does not attempt to account for the myriad of freight movements across the Bay of Plenty. To do so would include significant volumes of small general freight movements and highly variable movements that change from year to year, season to season and day to day. This study is aimed at identifying and describing the key freight movements on important transport system corridors and the change in volumes or commodities in the future that may warrant a response in planning considerations by UFTI or the partner organisations.

2 Stakeholder Interviews

Several interviews were conducted with organisations within the Bay of Plenty to obtain information on current freight movements and the type of opportunities and challenges that the region could be facing with regard to freight in future. Meeting notes from all stakeholder interviews are provided as **Appendix B**.

Population growth, the continued level of industry planning and development within the golden triangle (Auckland – Hamilton – Tauranga), and the recent funding investment through the PGF and related government programmes all signal continued growth in freight flows for the region. The key findings are summarised here and generally reflect the view of an increase in freight flows among key commodity groups that is also reflected in the freight data described further in this report.

For operators, businesses and Local Government, it was highlighted that contingency plans on the road network were limited and existing infrastructure capacity needs to be considered. The constraint in the region includes the unintended consequence of enabling economic and population growth where part of the access may not allow for this type of transportation use. The intensity around the golden triangle would continue to place pressure on both SH29 and rail capacity to support freight to and from the port and the wider region.

Within the context of the port the impact that larger vessels may have through supply chain activities was a common discussion point, noting that the shift towards larger vessels would create opportunities for how supply chain management may change in terms of both location, and from break bulk to containerisation. It was highlighted in several interviews that significant demand would need to be generated to see mode shift change from road to rail, however most interviews shared similar views on encouraging an integrated approach for road and rail at strategic locations where demand dictates. The location and role of possible new inland ports (Kawerau and Rangiuru in the Bay of Plenty and Ruakura in the Waikato) over time would become key to facilitating this change.

While the Provincial Growth Fund has been focussed into the Eastern Bay of Plenty, the nature of the investment will overtime contribute to increasing freight movements towards the Tauranga (and onwards to Hamilton and Auckland) or through to the port. Primarily forestry through the 1 Billion Trees programme, high-value horticulture and opportunities in aquaculture and water bottling will contribute to continued freight movements, however the scale of the latter remains unknown at this stage.

A more noticeable however marginal change will be the continued growth around movement of aggregate to support infrastructure and developments mainly in the Bay of Plenty. As population growth continues both general freight and waste management movements would increase.

Kiwifruit was identified by many stakeholders as a major growth commodity that will bring an increase in truck movements particularly during the harvest season. Export volumes are predicted to increase by 50% in the next 10 years. Available capacity on the state highway connections of Omokoroa to the port and TEL to the port is seen as a risk by the industry. Availability of seasonal workers including truck drivers is also a potential capacity constraint. Kiwifruit is largely moved during the day due to driver availability and limits on driving hours.

Those interviewed noted that the intensity around the Golden Triangle will amplify the known constraints with the Kaimai rail corridor and also roading corridors across SH29 and SH2.

3 Current Freight Flows

3.1.1 Introduction

In considering the patterns of flows of freight by road vehicles, two approaches have been used. The first considers the numbers of heavy vehicles recorded as using the road network and the second considers the estimated volumes of freight that are carried on the road and rail networks as a way of helping to understand these movements, the drivers behind them both now and in the future. Comprehensive information on the movement of freight flows is only available at a regional level and there is therefore a need to interpret this to help analyses flows at a more detailed spatial level for road and rail links within the region particularly the central areas in and around Tauranga.

The evidence indicates that while there is a reasonably close correspondence between the volumes of freight and the number of heavy goods vehicles at the regional boundaries remote from the main urban area, within the main economic centres the complexities of the supply chains and other activities not directly associated with the movement of freight mean that the linkage is less direct.

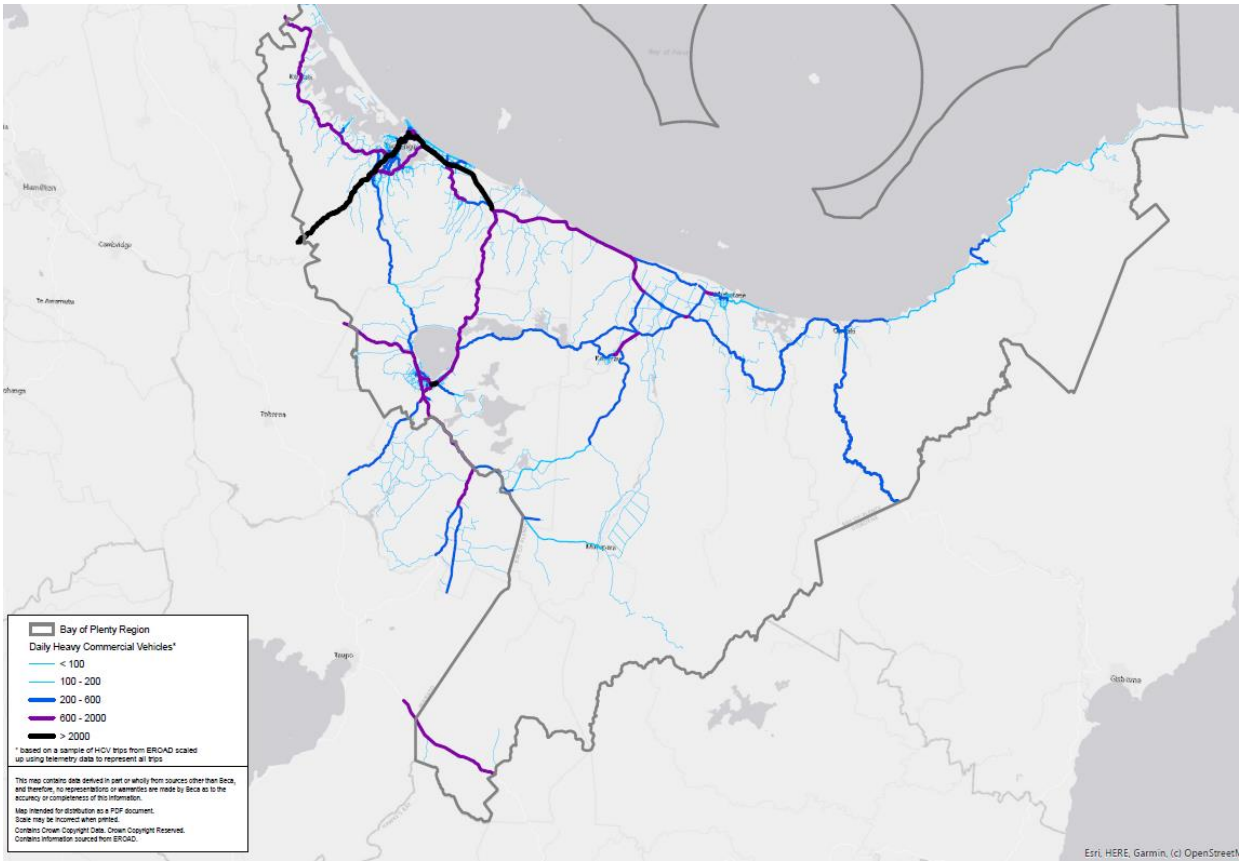
3.2 Freight Routes

What are the current freight flows in and out of the Western Bay of Plenty and Port of Tauranga for both road and rail including the original and destinations to the wider region?

3.2.1 Observed Heavy Commercial Vehicle flows

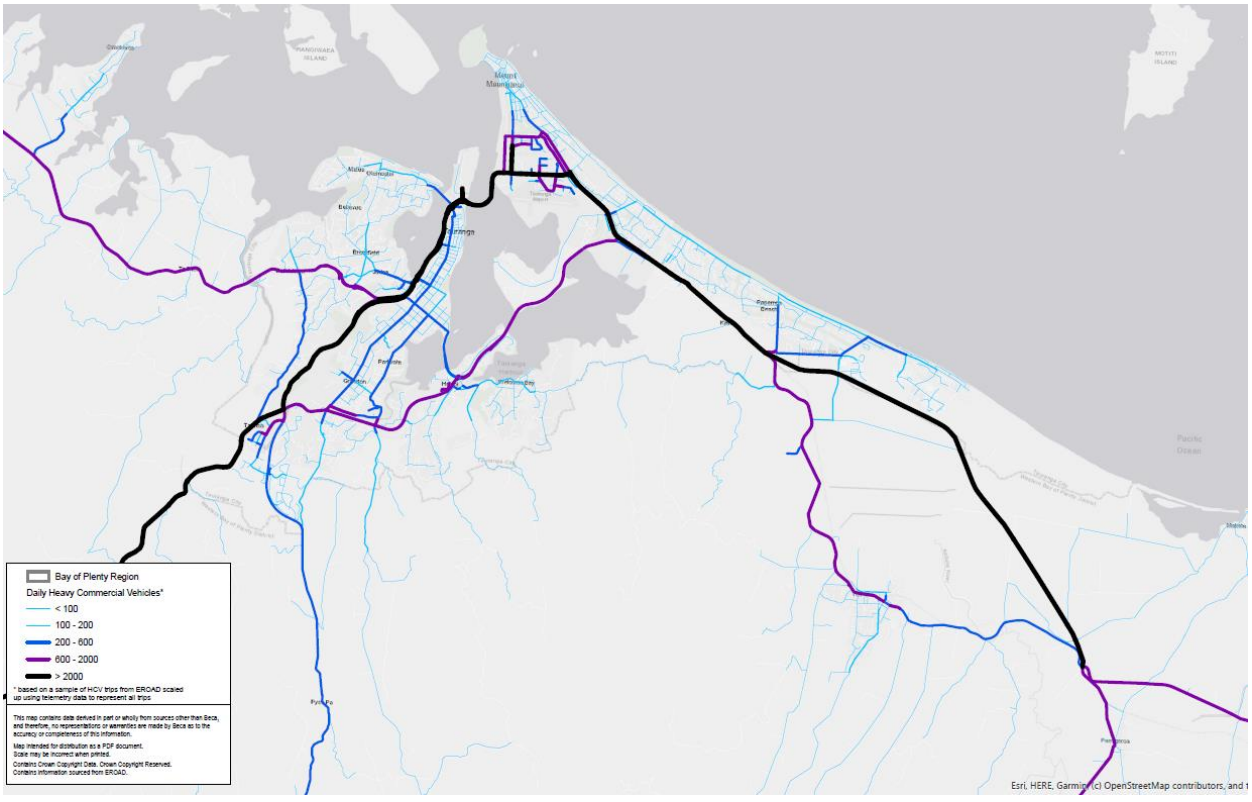
The Bay of Plenty State Highway network provides the key road connections for freight movement across the Bay of Plenty with much of the freight movement focussed on the Port of Tauranga, reflecting the significant role that the Port has on the economic productivity of the wider region. The following heat map shows the key freight corridors by volume with thick black lines representing the highest freight volume corridors. All maps in this report are provided at A3 scale in **Appendix A**.

Fig. 3.1 BoP Freight Heat Map



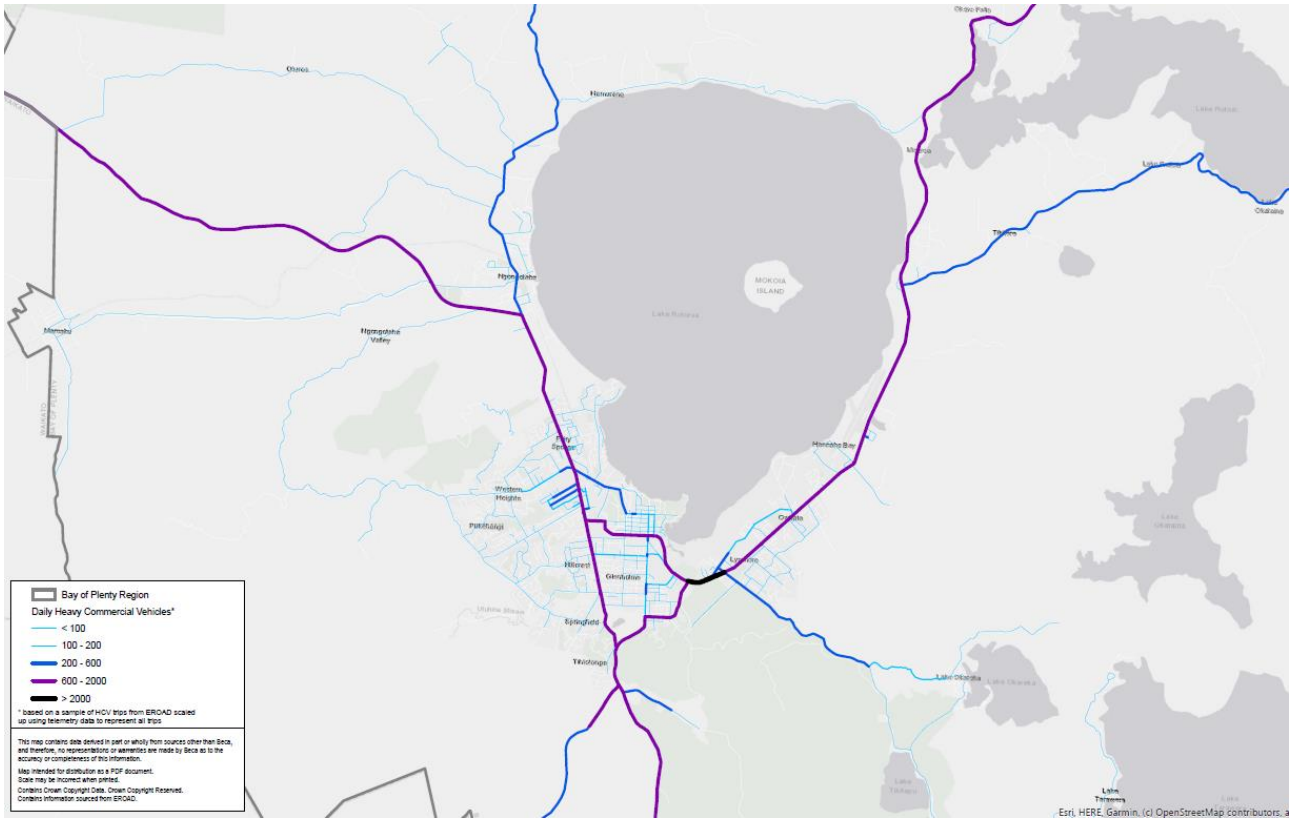
The following map provides a closer view of the key freight corridors in the Tauranga area.

Fig. 3.2 Tauranga Area Freight Heat Map



And the Rotorua area is expanded in the map below.

Fig 3.3 Rotorua Area Freight Heat Map



From the Tauranga Transport Model, the following figures show the location of key freight attractors and generators in the Tauranga area. The port zones attract high volumes of freight, other key attractors are the industrial areas in Maleme Street, Tauriko and Judea. The shopping centres at Bayfair, Tauranga Crossing, Papamoa Plaza, Fraser Cove and Bethlehem are all identifiable as goods vehicle movement producers and attractors.

Fig 3.4 TTM HCV Heat Map Attraction

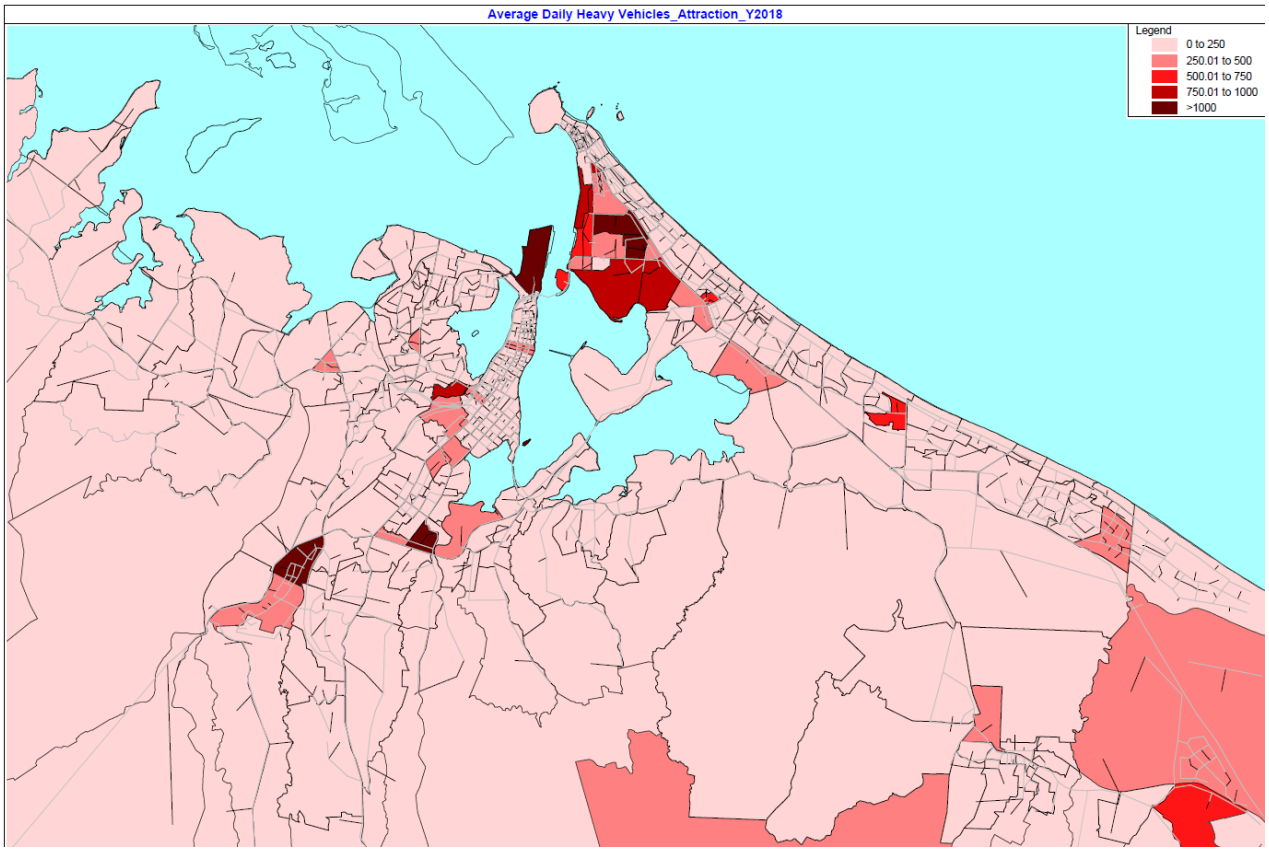
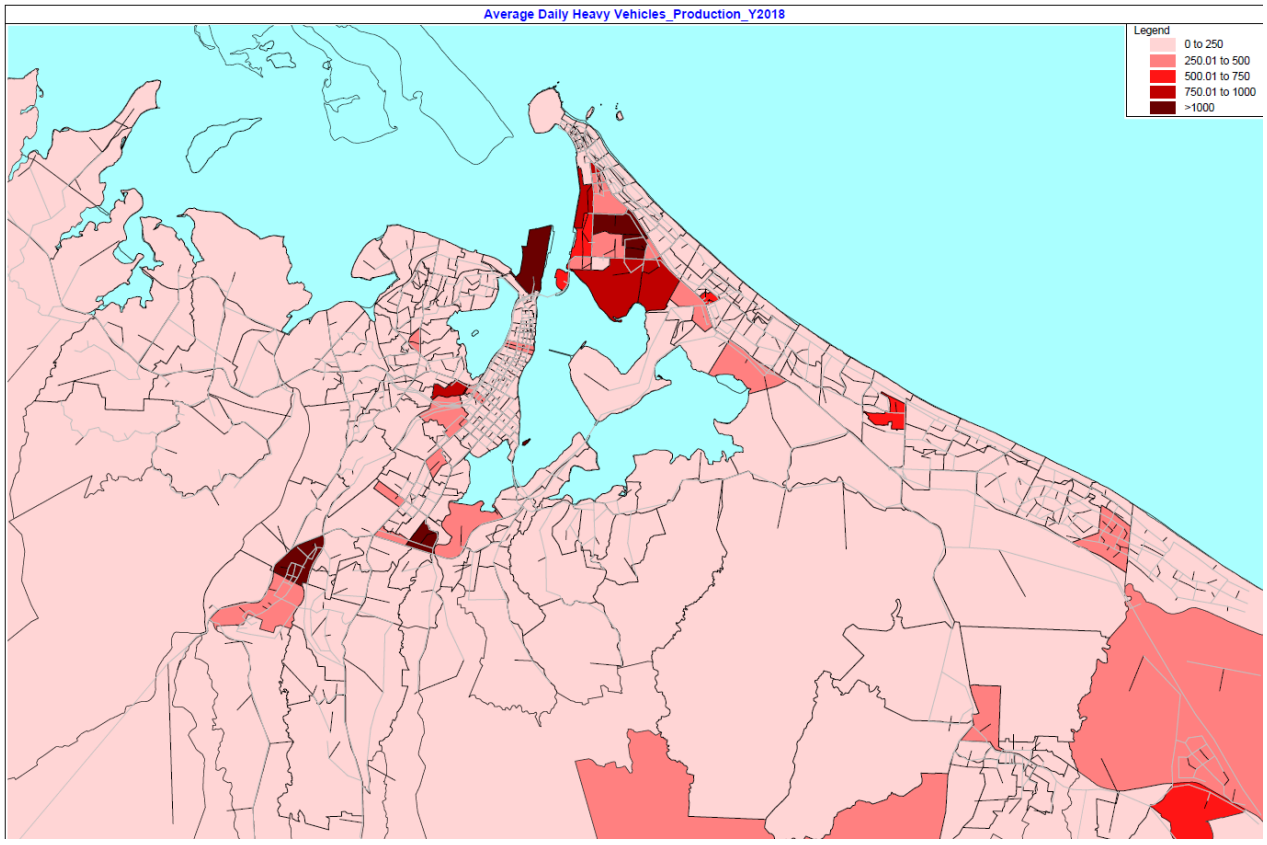
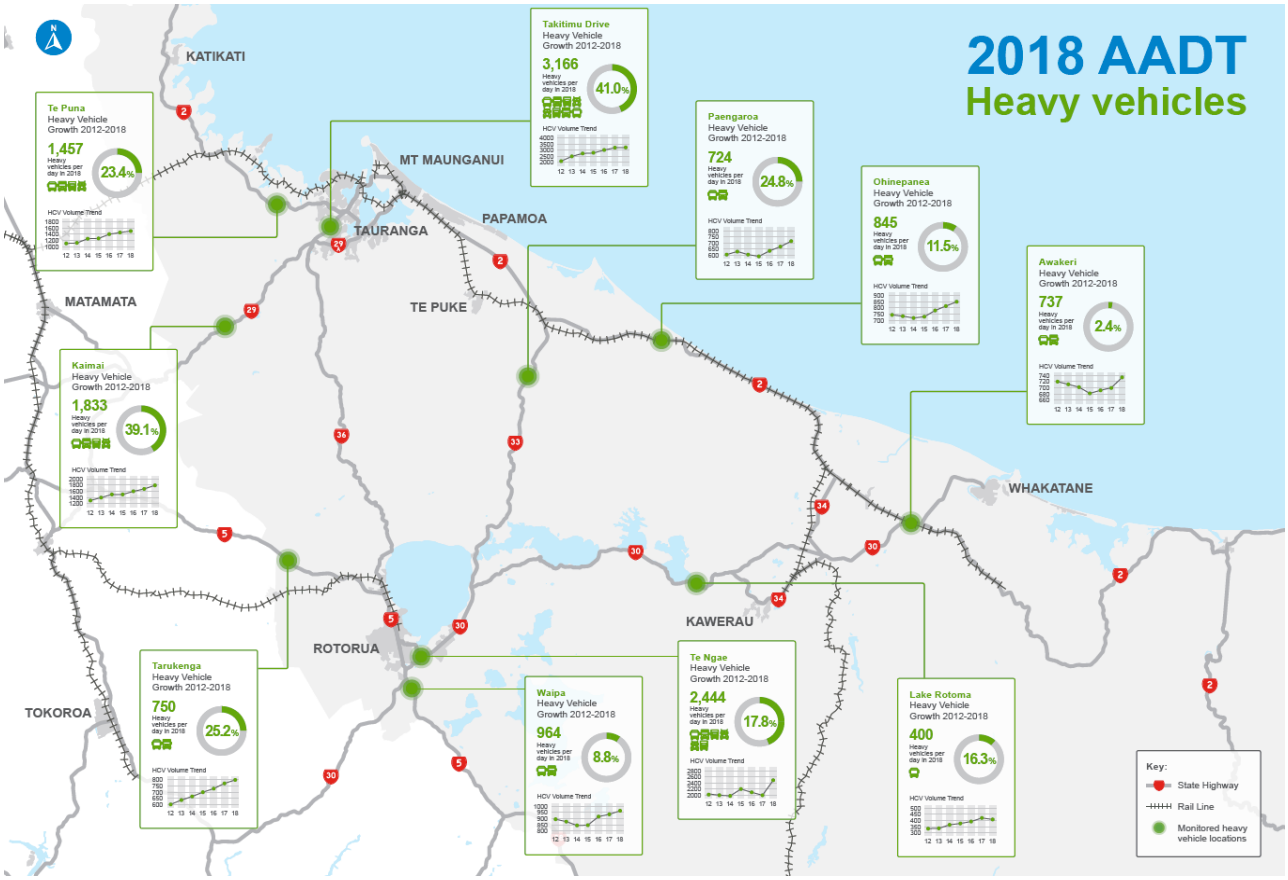


Fig. 3.5 TTM HCV Heat Map Production



The following map shows the volume of heavy goods vehicles on the State Highway network and the growth at each location in the last five years. While all sites have experienced growth in goods vehicle movements the growth has been particularly high on the main routes into Tauranga (SH2 and SH29) and within Tauranga where goods vehicle movements on Takitimu Drive[3] have grown by 41% in five years. This is likely to be influenced by the strong growth in the Tauriko Business Estate along with growth in movements to/from the Waikato and Rotorua.

Fig. 3.6 Key Freight Movements



3.2.2 Rail Movements

Typical rail volumes on the Western BoP rail network:

- To/from North to Sulphur Point = 15
- To/from North to Mt Maunganui = 13 (including 2 just between Sulphur Point and Mt Maunganui)
- To/from East to Mt Maunganui = 14

This gives a total rail volume of 42 movements per day of which 2 are between Sulphur Point and Mt Maunganui.

3.3 Key Commodity Movements

To support the data on heavy vehicle movements on the individual model links, we have analysed the patterns of commodity movements which would be carried by heavy vehicles and where appropriate by rail. Reflecting the data available, this has been undertaken at two levels, the first considering the flows into and

[3] Recorded at the Toll Gantry

out of the Bay of Plenty region for which estimates are available (inter-regional) and the second considering the position within the region and in particular on the main routes in the area covered by the Tauranga Traffic Model for which the available data only provides indications of some of the key flows (intra-regional).

3.3.1 Inter-Regional Movements

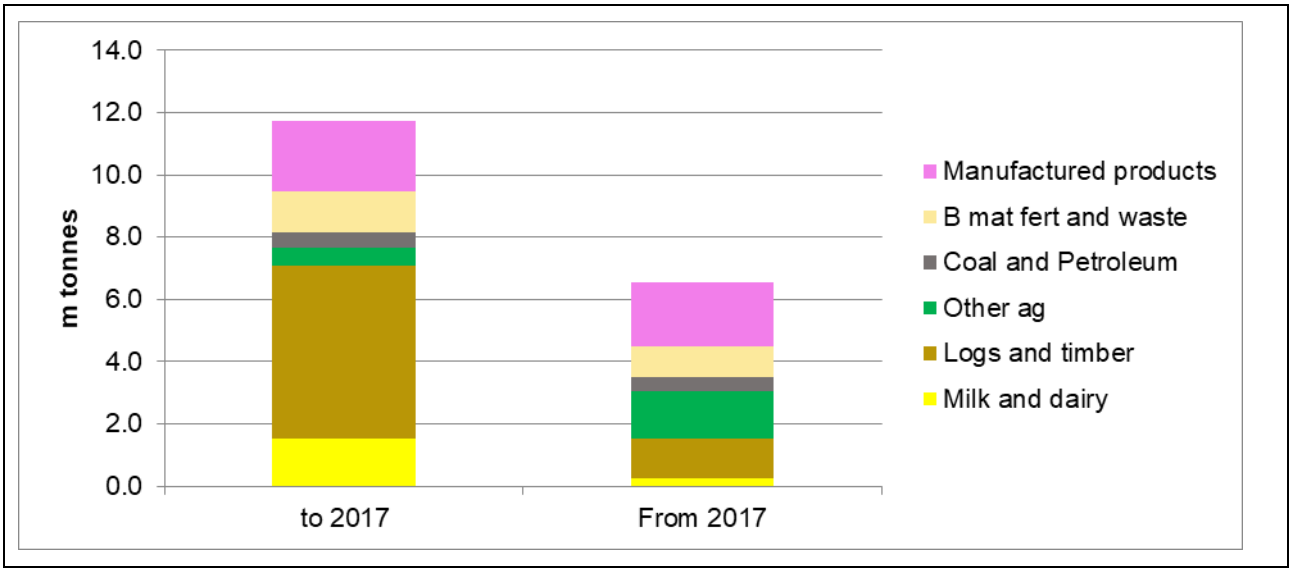
Estimates of the total flows of inter-regional freight into and out of the Bay of Plenty region by all modes are available from the updated National Freight Demand Study and the position for 2017/18 by broad commodity group is set out in Table 3.1. This shows the difference between inter-regional imports and exports.

Table 3.1

Total estimated inter-regional freight flows into and out of the Bay of Plenty Region 2017/2018 all modes (m tonnes)

Commodity	Milk and Dairy	Logs and Timber	Other Agriculture	Coal and Petroleum	Building Materials, Fertiliser and Waste	Manufactured Products	**Total**
Inbound movements	1.51	5.56	0.57	0.52	1.31	2.26	**11.73**
Outbound movements	0.30	1.30	1.50	0.50	1.00	2.00	**6.53**

Fig. 3.7 - Estimated inter-regional freight flows into and out of the Bay of Plenty 2017/2018 (m tonnes)



Movements into the Bay of Plenty region are dominated by the movements of logs and timber products either for direct export or for processing within the region before export. There are also substantial flows of milk and dairy products inbound primarily for export and also outbound flows of other agricultural products mainly imported cattle feed. Manufactured goods flow in both directions reflecting the role of the Port of Tauranga in the supply chains for imports to and exports from Auckland. It also demonstrates the importance of Auckland as a distribution hub supplying the Bay of Plenty region.

Table 3.2 and Figure 3.8 provide the breakdown of flows by commodity group across road and rail movement.

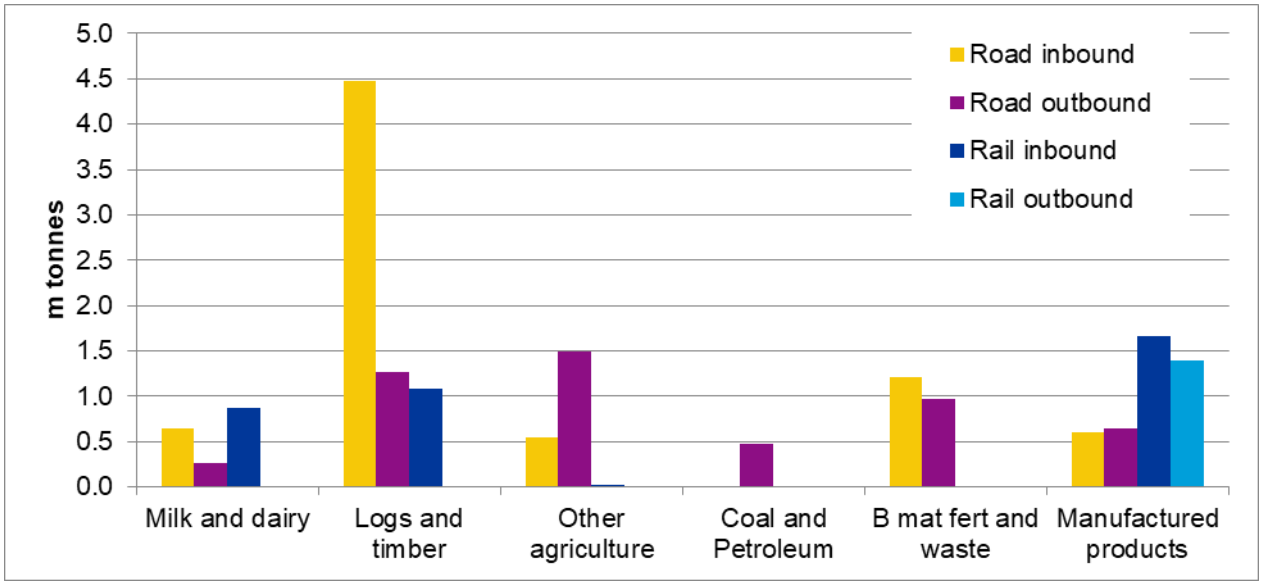
Table 3.2

Inter-regional flows by road and rail 2017/2018 (m tonnes)							
Commodity	Milk and Dairy	Logs and Timber	Other Agriculture	Coal and Petroleum	Building Materials, Fertiliser and Waste	Manufactured Products	**Total**
Movements by Rail							
Inbound Bay of Plenty	0.87	1.08	0.03	0.00	0.00	1.66	**3.64**
Outbound from Bay of Plenty	0.00	0.01	0.00	0.00	0.01	1.40	**1.42**
Movement by Road							
Inbound Bay of Plenty	0.64	4.48	0.54	0.00	1.21	0.60	**8.09**
Outbound from Bay of Plenty	0.27	1.26	1.49	0.48	0.97	0.64	**5.11**

Notes: This table excludes petroleum and cement delivered to the region by coastal shipping.

Source: National Freight Demand Study 2018

Figure 3.8 – Inter-regional flows by commodity by road and rail 2017/2018 (m tonnes)



3.3.2 Movements through the Port of Tauranga

The Port of Tauranga is a major freight generator and attractor in the region. Customs data shows that the international trade recorded through the port in 2017/18 amounted to about 18.5m tonnes, although these figures include some traffic from other New Zealand ports transhipped in Tauranga, estimated to amount to about 0.8 m tonnes in 2017/18. The port also handles domestic traffic including container traffic and also petroleum products from the refinery at Marsden Point and cement from Auckland and Whangarei. This is estimated to account for about a further 1m tonnes.

The view from several interviewees was that port activity would see an increase in vessel size coming to New Zealand and that overtime the phasing out of smaller vessels would occur, along with a shift into the future that there will be less of a requirement for breakbulk at the port. The use of larger vessels would impose challenges along the supply chain because of the need to handle the more peaked flows associated with these operations.

In addition to flows of traffic to and from New Zealand origins and/or destinations, the port also handles transhipments of purely international traffic not recorded in the statistics set out above. Although this traffic passes through the port and is included in the traffic statistics recorded by the port, it would not impact on the freight flows on the road and rail networks in the Bay of Plenty and so has not been considered further.

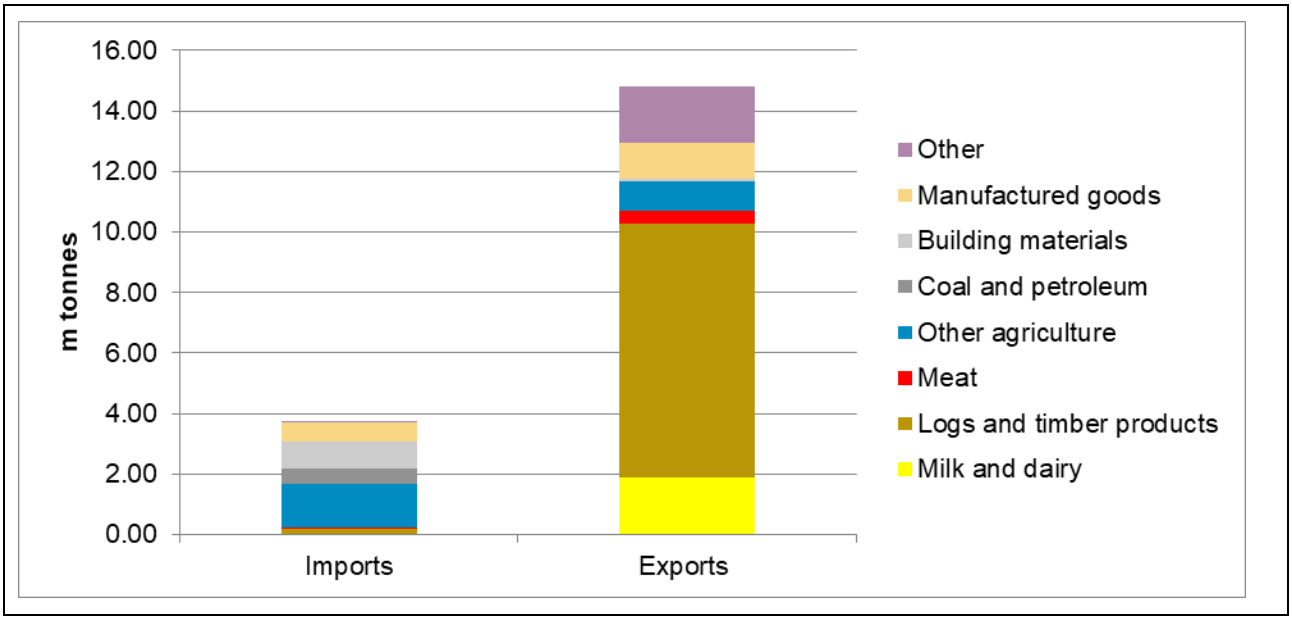
The breakdown of international trade through the port as recorded by Customs is set out in Table 3.3 and Figure 3.9.

Table 3.3

International traffic trade through Port of Tauranga 2018 (m tonnes)			
Commodity Group	Imports	Exports	**Total**
Milk and Dairy	0.04	1.88	**1.92**
Logs and Timber products	0.15	8.38	**8.53**
Meat products	0.05	0.45	**0.50**
Other Agriculture	1.44	0.96	**2.41**
Coal and Petroleum	0.52	0.00	**0.52**
Building Materials	0.85	0.10	**0.95**
Manufactured goods	0.66	1.19	**1.84**
Other	0.01	1.85	**1.86**
Total	**3.73**	**14.81**	**18.53**

Source: Statistics New Zealand

Fig. 3.9 – International freight through Port of Tauranga 2018 (m tonnes)



Traffic through the port is dominated by the exports of logs and timber products which account for almost half the goods imported or exported from Tauranga. Other important cargoes are dairy products, other agriculture (of which palm kernel and other animal foods represent a high proportion) and manufactured goods. In general, these products represent flows to or from locations outside the Tauranga area or even the Bay of Plenty region and this therefore represent substantial freight flows on the area's transport network by both road and rail.

International traffic through the port as recorded in Customs data has been increasing strongly, growing from about 14.8m tonnes in 2012 to 18.5 m tonnes in 2018, an increase of about 25 per cent. The details of this are set out in Table 3.4.

Table 3.4

International trade through Port of Tauranga (m tonnes)

Commodity Group	2012			2018		
	Imports	Exports	**Total**	Imports	Exports	**Total**
Milk and Dairy	0.05	1.38	**1.43**	0.04	1.88	**1.92**
Logs and Timber Products	0.19	7.04	**7.22**	0.15	8.38	**8.53**
Meat	0.06	0.47	**0.52**	0.05	0.45	**0.50**
Other Agriculture	1.19	0.95	**2.15**	1.44	0.96	**2.41**
Coal and Petroleum	0.34	0.00	**0.34**	0.52	0.00	**0.52**
Building Materials	0.78	0.15	**0.93**	0.85	0.10	**0.95**
Manufactured Goods	0.75	1.06	**1.81**	0.66	1.19	**1.84**

Other/Confidential	0.10	0.24	0.35	0.01	1.85	**1.86**
Total	**3.46**	**11.30**	**14.76**	**3.73**	**14.81**	**18.53**

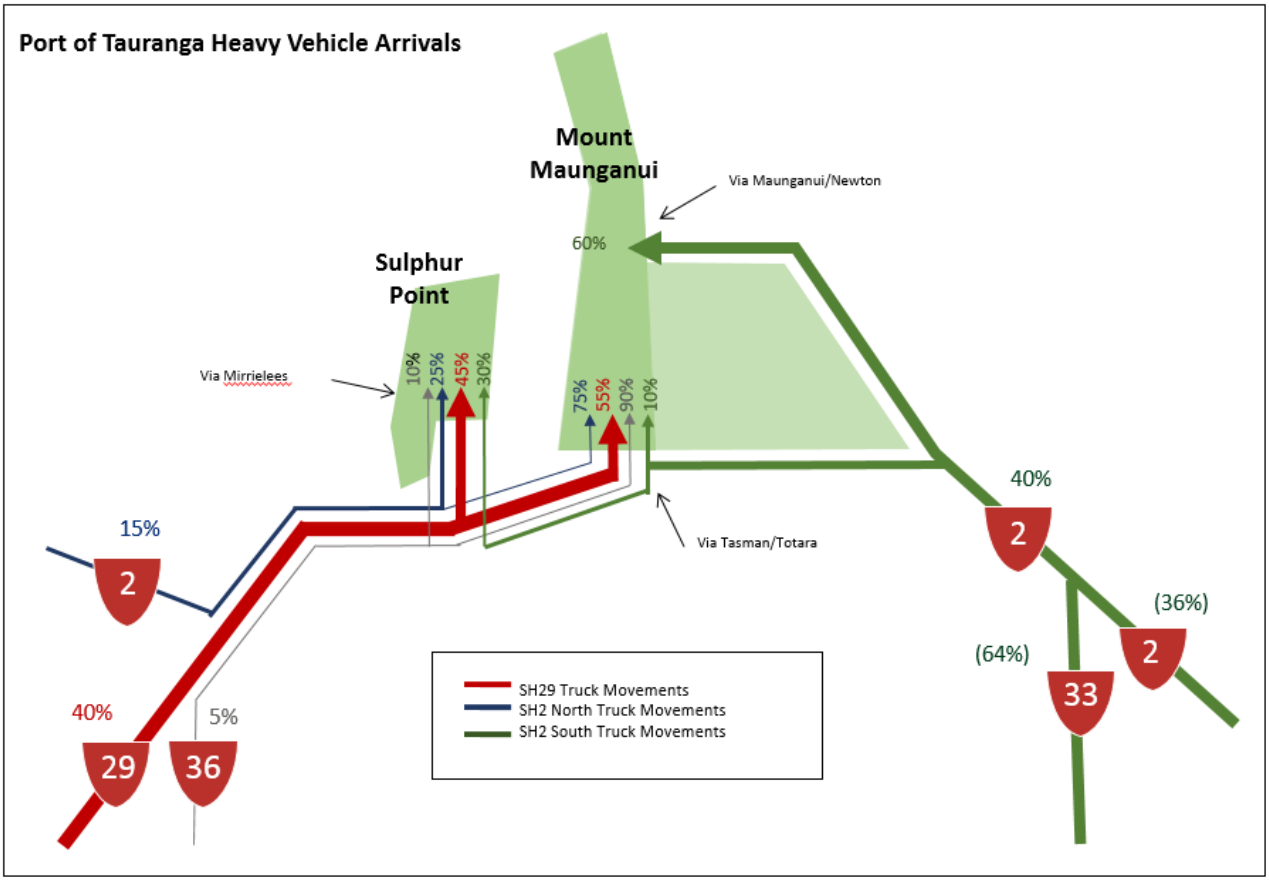
Source: Statistics New Zealand

Over the period imports have grown by about 0.3 m tonnes, 8 per cent, and exports by 3.5 m tonnes 31 per cent. Much of the growth in imports has arisen from movements of other agricultural products, primarily PKE and petroleum products. Growth in exports has been dominated by movements of logs and dairy products., with exports of kiwifruit through the port also growing by 0.2 m tonnes or 55 per cent.

In general in relation to movements on the Bay of Plenty transport network, the port can be considered to have two main functions, supporting local production in the region such as logs and timber products and kiwifruit and supporting longer distance supply chains as exemplified by the movements of dairy products from around the country and the movement of manufactured and retail goods to and from Auckland.

The patterns of movement of HCVs to the port are set out in Figure 3.10 (for rail distribution see table 3.7).

Fig. 3.10 - Heavy vehicle movements to the Port of Tauranga March 2017 (checked against 2018 data)



Map based on March 2017 data checked against August 2018 data

Source: EROAD

From Figure 3.10 the split of heavy vehicle road traffic by route and port area is summarised in Table 3.5.

Table 3.5

Breakdown of heavy vehicle traffic to the Port of Tauranga by route March 2017 (Percent of total to Port Area)			
	Total Port of Tauranga	Sulphur Point	Mount Maunganui
SH2 North	15%	11%	17%
SH29	40%	53%	33%
SH36	5%	1%	7%
SH2 East (Including SH33)	40%	35%	43%
Total	**100%**	**100%**	**100%**

The key routes into the port are SH2 from the east and SH29 with SH29 traffic primarily bound to Sulphur Point and SH2 East traffic primarily to Mount Maunganui. This reflects the types of commodities on these routes with SH29 providing the link for manufactured goods to and from Auckland which would use the container terminal at Sulphur Point and SH2 East supporting the movement of bulk products such as logs using Mount Maunganui. The split of traffic on State Highway from the north reflects in part the movements of kiwifruit which are predominantly exported via Mount Maunganui. While there is only one inter-regional rail connection into the Bay of Plenty, three main corridors have been defined for the movement by road:

- SH2 north and SH29 for movements from Northland, Auckland, Taranaki and northern Waikato
- SH2 south for movements to or from Gisborne
- SH5 and SH30 for all other movements

The estimated split by commodity on these routes is set out in Figure 3.11 and Figure 3.12.

Fig. 3.11 - Estimated flows inbound to Bay of Plenty region by commodity and corridor 2017/18 (m tonnes)

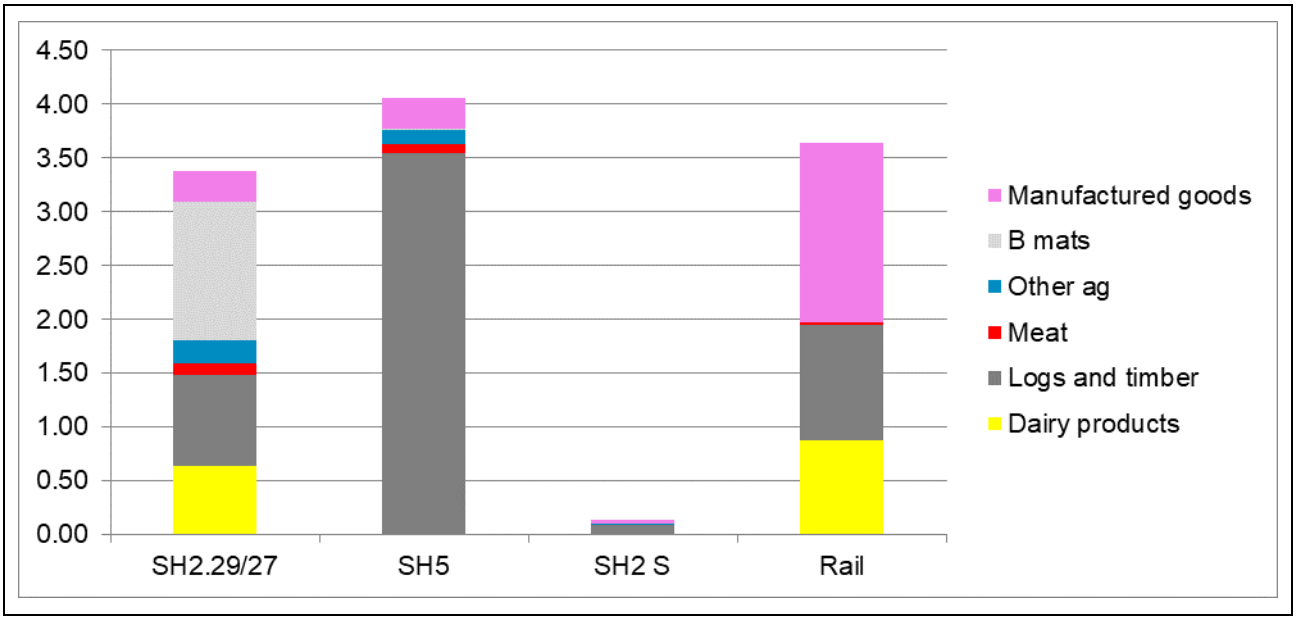
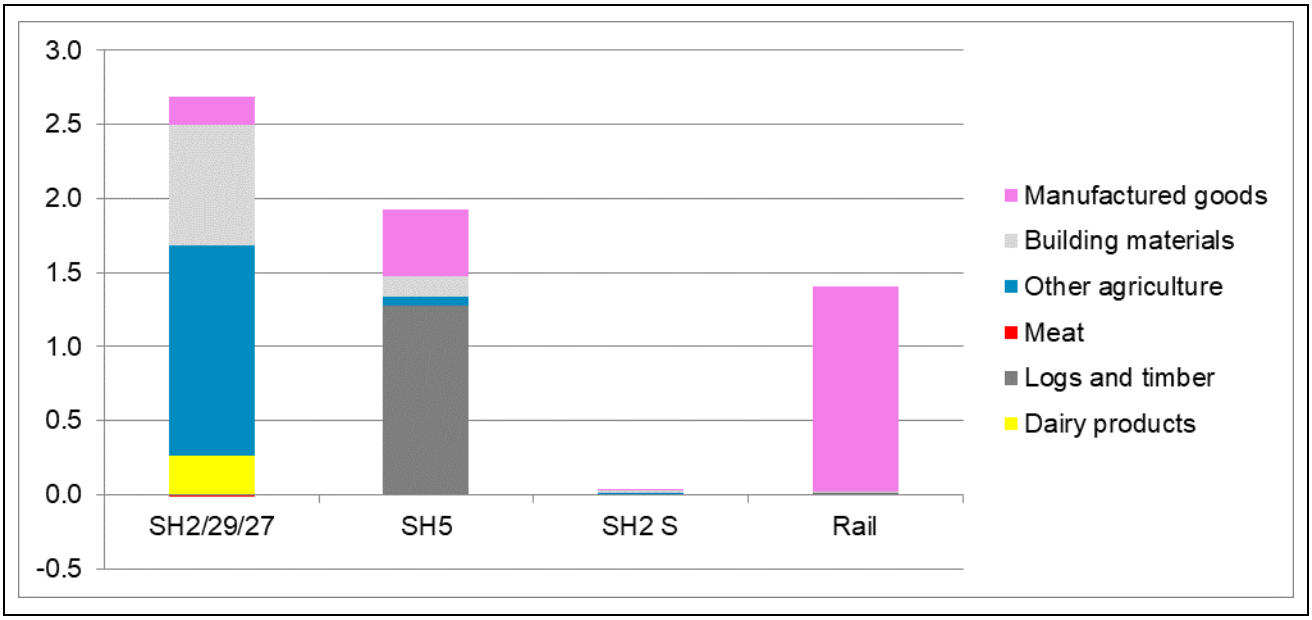


Fig. 3.12 - Estimated flows outbound from Bay of Plenty by commodity and corridor 2017/18 (m tonnes)



Because the traffic from Auckland is divided between SH2 and SH29 it is difficult to determine the split by commodity on the two routes. Data from traffic counts suggests that the traffic to and from Bay of Plenty region from the northern Waikato, Auckland and Northland appears to be split approximately 75 per cent via SH29 and 25 per cent via SH2. Almost all the rail traffic and a large part of the inter-regional road traffic are associated with movement through the port. However, there are also movements associated with manufacturing within the region particularly timber processing in Rotorua, Kawerau and Whakatane and with retail and distribution activities within the region with a focus within the more major urban areas of Tauranga and Rotorua.

3.3.3 Intra-regional flows

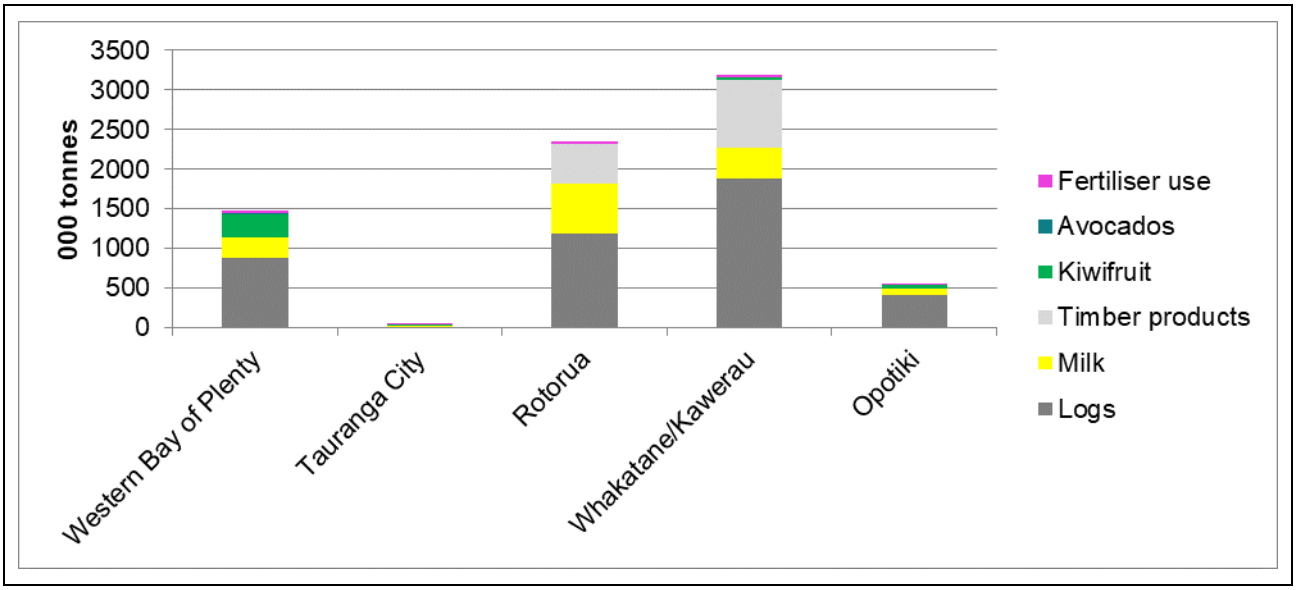
In addition to the inter-regional flows for which the updated NFDS provides estimates, there are substantial traffic generating activities within the region itself. Some of the more important of these for which information is available at a disaggregated level are set out in Table 3.6 and Figure 3.13.

Table 3.6

Production of selected commodities within Bay of Plenty Region 2018						
Area	Log Production (000 tonnes)	Liquid Milk Production (M litres)	Timber Processing (000 tonnes)	Kiwifruit Production (000 tonnes)	Avocado Production (000 tonnes)	Fertiliser Use (000 tonnes)
Western Bay of Plenty	882	252.9	-	297.9	18.5	31.2
Tauranga City	0	17.7	-	21.8	0.9	0.5
Rotorua	1,196	618.0	500	2.0	0	38.4

Whakatane /Kawerau	1,875	392.7	900	33.0	0.9	27.7
Opotiki	414	80.3	-	38.6	0.7	6.3
Total Bay of Plenty	**4,367**	**1,362**	**1,400**	**393.2**	**20.9**	**104.1**

Figure 3.13 - Production or use of selected commodities within Bay of Plenty Region 2018 (000 tonnes)



This highlights the high levels of primary production and processing particularly in the areas to the east of Tauranga served by SH2 and SH33 including:

- About 80 per cent of log production
- Almost all the timber processing (mainly in Rotorua/Kawerau and Whakatane).
- 80 per cent of milk production
- 70 per cent of fertiliser use.

Production of kiwifruit which is also substantial is mainly focussed in Western Bay of Plenty with particular concentrations around Te Puke and Te Puna. The flows of these would be mainly focussed on the routes to the port offered by SH2 to the north and east. There are also growing volumes produced further east in Whakatane and Opotiki and the flows of these also would also be focussed on SH2 to the east.

Freight movements within the Tauranga area would include both:

- The movements of these primary products many of which are exported or in the case of fertiliser imported through the port or manufactured in the urban area
- The movement and distribution of manufactured goods of different types either as part of import and export movements or associated with the production or retailing in the major population areas to the west of the region.

Reflecting these internal and external flows and the use of rail for movements within Bay of Plenty primarily for movements from Kawerau to Tauranga, the movements of a number of the major commodities making longer distance movements on key links of the road and rail network within the region are set out in Table 3.7. These figures would exclude a range of very local movements, including the movements of quarry

materials and also the localised distribution of manufactured and retail goods which within the urban area are likely to represent a large proportion of vehicle movements at various points on the road network in the area.

Table 3.7

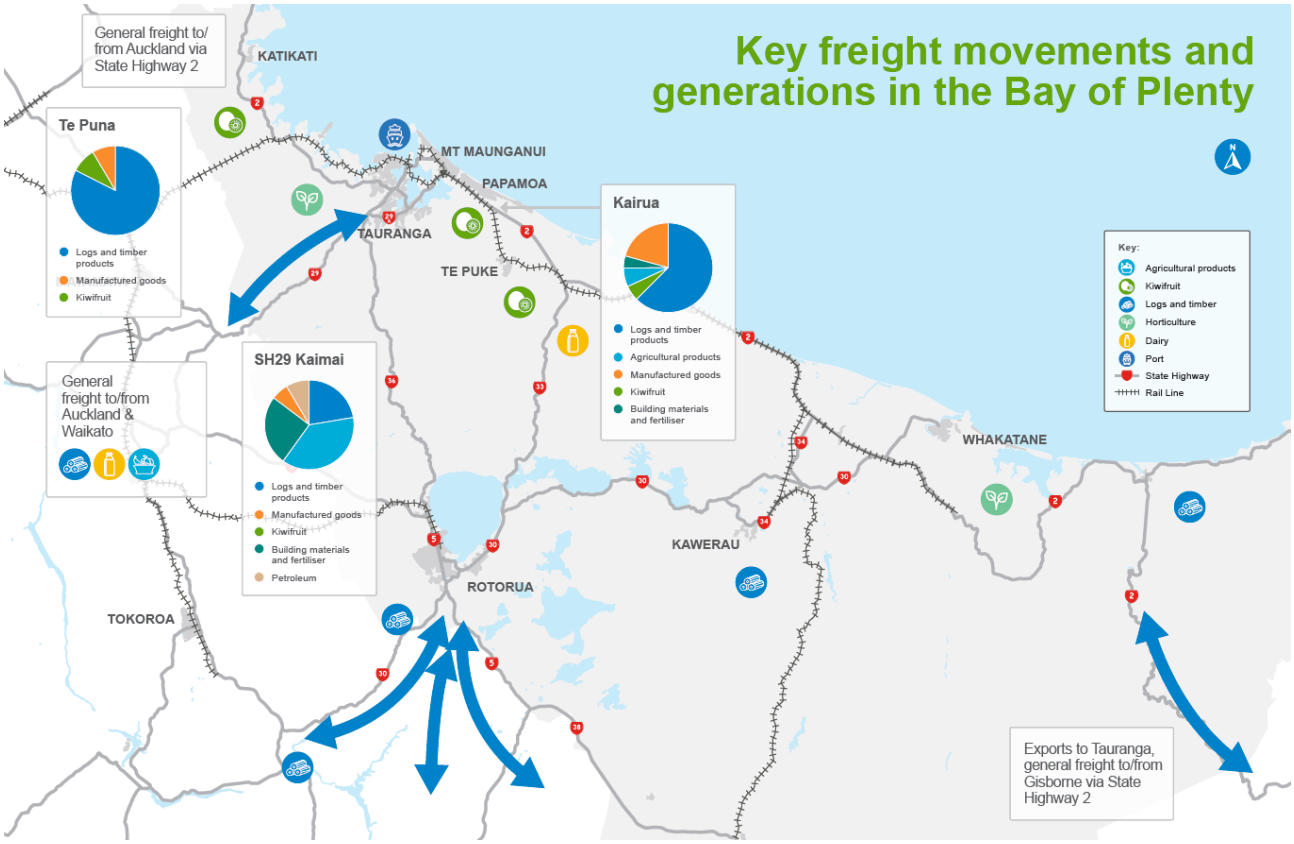
Major commodity flows at selected locations on the Tauranga road and rail network 2017/18 (m tonnes)

Total Flows	SH2 East	SH29	SH2 North	Rail from north	Rail from east
Points	Kairua	Kaimai	Te Puna		
Logs and Timber Products	2.93	1.23	0.77	1.08	2.23
Kiwifruit	0.28	0.00	0.10	0.00	
Agricultural Products	0.30	1.74	0.00	0.90	
Building Materials and Fertiliser	0.17	1.52	0.59	0.01	
Manufactured Goods	0.80	0.36	0.09	3.05	
Petroleum	0.02	0.46	0.00	0.00	
Total	**4.51**	**5.31**	**1.56**	**5.04**	**2.23**

These figures for road transport have been compared with an alternative estimate of the movement of goods at Kairua based on information from the weight in motion (WIM) site at this location for 2017. This gives an estimate of about 6.5-7m tonnes suggesting that the identified major commodity movements probably represent about 70 per cent of the total flows. The balance would represent either bulk products moved over short distances within the region such as aggregates and other building materials or the more local distribution of manufactured and retail products again within the region.

Drawing this information together gives a picture of the key freight movements and generations within the region as set out in Figure 3.14.

Figure 3.14 – Key Freight Generators and Movements for Bay of Plenty Region



What proportions and types of goods/products are time restricted e.g. have no option but to travel and access the port during peak times?

The extent to which freight is required to travel in peak times reflects two basic considerations:

- The extent to which goods are time sensitive requiring their movement at specific times, particularly to fit in with customer requirements
- The extent to which the volumes of goods to be transported are so large that their transport requires movements at peak as well as off peak times to ensure that the total freight task is achieved in the time available.

For goods exported there will generally be a requirement for these to be in position to be loaded when the vessel arrives. This would be particularly the case for shipping via routes which run to a fixed timetable as would normally be the case for containerised traffic. In addition, because containerised goods are typically of relatively high value there would be pressure to keep the supply chains to as short a time as possible again possibly constraining the times when goods might be delivered to the port. The stakeholder interviews indicated that this would also apply to exports of products like kiwifruit, where although not all transported in containers, the extent of the traffic in peak months would necessarily require deliveries over extended hours over the peak season.

The increasing use of bigger ships with larger container transfers would also accentuate the problems. The need to assemble and dispatch larger cargoes would potentially increase the demands at peak periods and would require higher land-side flows over extended periods.

While careful planning and scheduling of journeys can help reduce the extent to which journeys are made in peak hours, the requirements of customers to receive or despatch goods at particular times will inevitably tend to put some pressure on peak periods. This position will be accentuated by the need to make efficient use of drivers and vehicles over the day and avoid periods when these are not being used. Count data from Metroport, the Port of Tauranga inland Port in Auckland, suggests that about 15-20 per cent of all truck movements over the 12 hour period from 6:30 to 18:30 occur in the morning peak period, and about 10-15 per cent in the evening peak.

For the bulk cargoes, particularly logs, again some of the same considerations apply in that the volumes to be transported and the need to use transport assets efficiently mean that movements will have to take place throughout the working day including the peak periods.

While it is difficult to be definitive about this, there is probably only limited cargo that has to arrive in or depart from the port in the peak periods, the pressure of efficiently managing supply chains and the assets used for transport goods mean that there are inevitably flows that will impinge on the peak periods. This position will be intensified with the increase in the numbers of large vessels which will put increased pressure on the movements of goods both inbound to and outbound from the port to relieve the pressure on its operational space. Although conditions in Auckland would be different to those in Tauranga and with longer supply chains there may be more opportunity to time journeys to avoid the peak periods, the evidence suggests that the peak flows could amount to up to about 15-20 per cent of total movements through the Port.

4 Possible Future Freight Flows in BAU Scenario

What are the future freight flows in and out of the Western Bay of Plenty and Port of Tauranga for both road and rail including the original and destinations to the wider region?

The forecasts of future freight flows impacting on the Bay of Plenty region in a BAU scenario have in part been derived from the updated NFDS which provides forecasts for a range of supply driven, mainly agricultural commodities and in part from the use of the MoT Freight Futures Model updated to reflect revised estimates of flows by commodity in 2017/18. In predicting the future patterns of flows these to a large extent assume similar patterns of flows through ports and do not incorporate any significant changes in the supply chains for international trade.

As well as considering inter-regional movements we have also reviewed the drivers of freight movements within the Bay of Plenty region, especially for key links in and around the Tauranga area.

4.1 Linkages between GDP and freight growth

Will future freight flows continue to grow ahead of GDP?

In order to provide some background to the forecasts the traffic growth over the period from 2012 to 2018 has been compared with GDP growth. The key points from this include:

- Using the estimates of regional GDP published by Statistics NZ the growth in real GDP of the Bay of Plenty between 2012 and 2018 amounted to about 29 per cent
- Traffic growth through the Port of Tauranga as measured by Customs data amounted to
    - Exports 31 per cent mainly driven by logs and timber and dairying
    - Imports 8 per cent mainly driven by increases in PKE
    - Total 26 per cent

- Rail freight growth - total to or from Bay of Plenty
    - Total 2012 6,4 m tonnes
    - Total 2017/18 7.3 m tonnes
    - Growth 14 per cent
- Rail freight growth - total to or from Auckland
    - 2012 2.1 m tonnes
    - 2017/18 3.0 m tonnes
    - Growth 41 per cent
- Total road traffic growth: The changes in HCV flows over time at selected locations across the region are set out in Figure 4.1 and Figure 4.2.

Fig 4.1

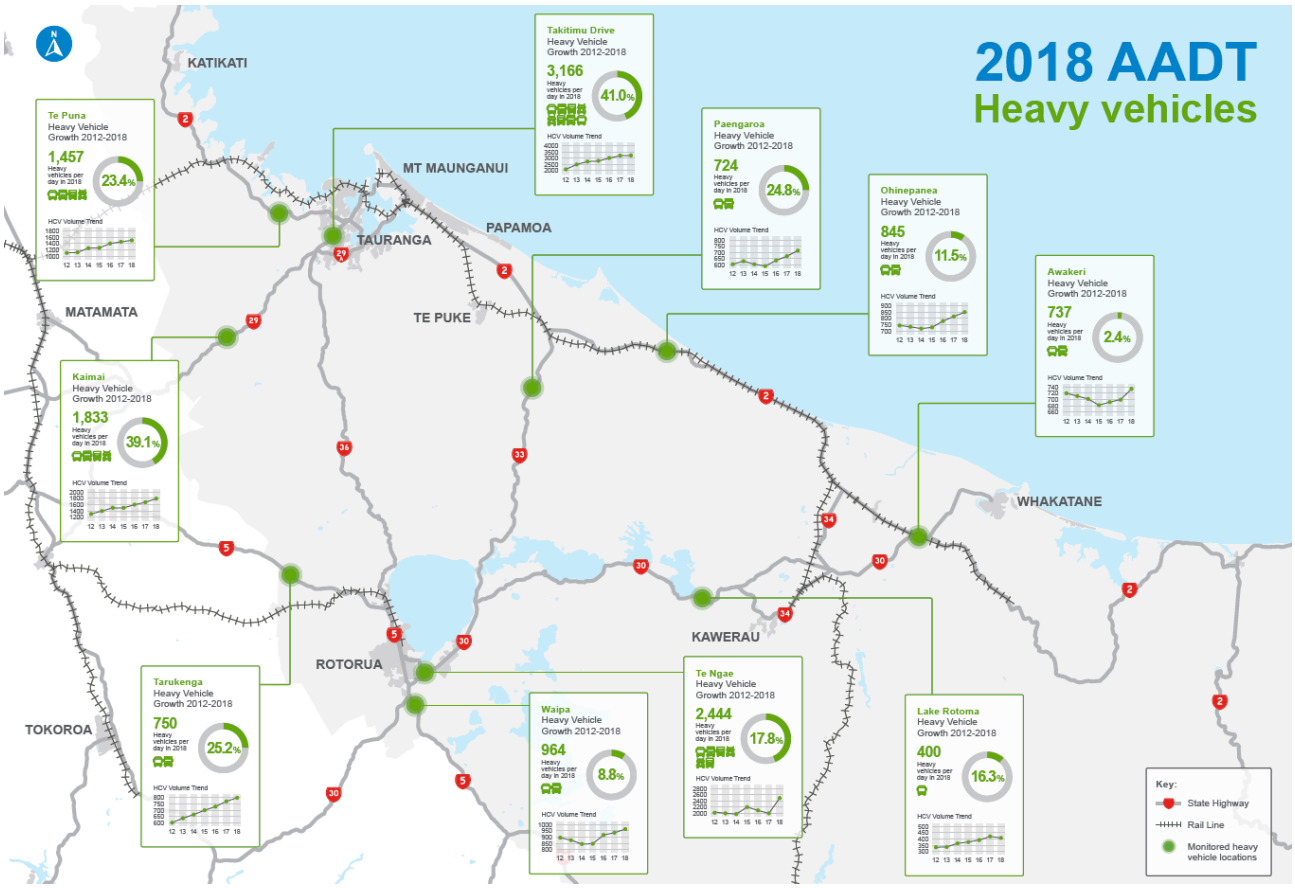
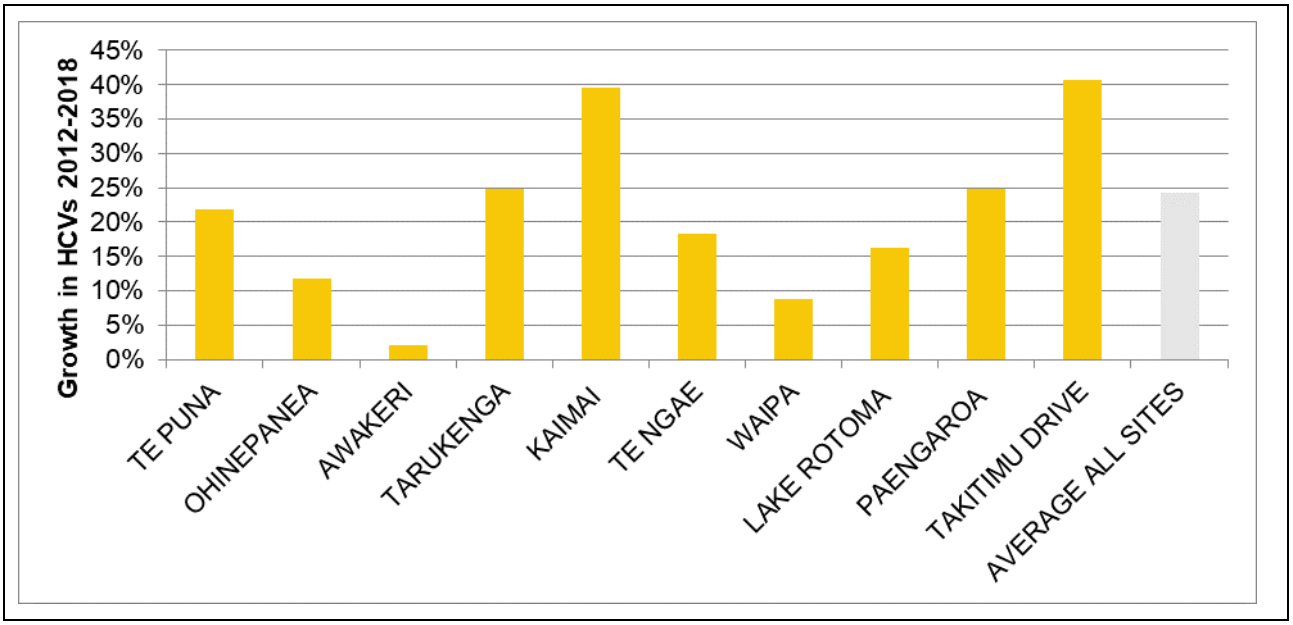


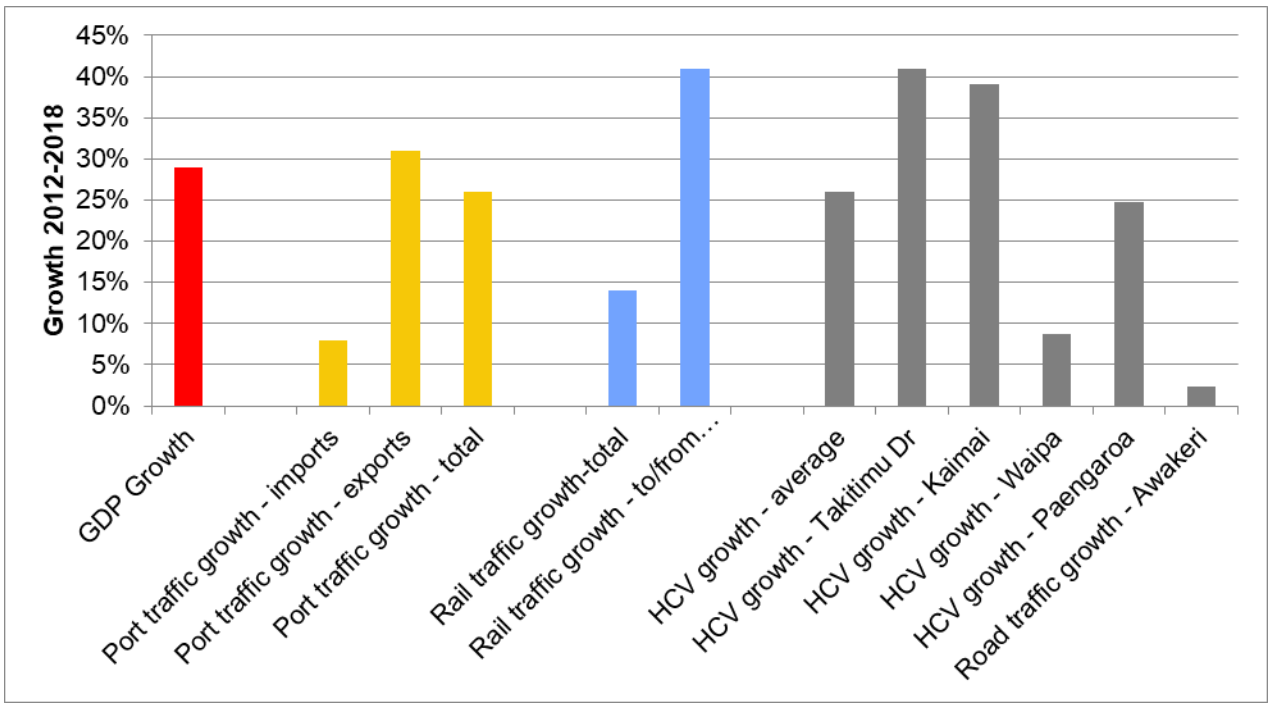
Figure 4.2 - Growth rates for HCV movements at selected sites in Bay of Plenty region 2012-2018



Source: NZ Transport Agency

The increases display varying growth rates at different locations within the region, with in general low growth at the more remote locations especially to the east of the region and higher growth rates closer to the urban centres to the west, particularly in and around Tauranga. The overall position is summarised in Figure 4.3.

Figure 4.3 - Growth in GDP and selected freight flows 2012-2018 (per cent)



The material in Figure 4.3 indicates that to some extent the growth in some of the major traffic measures is similar to that for GDP. However, this may to be some extent fortuitous since much of the growth has been in specific commodities such as milk and dairy and logs and timber where it is the availability of supply rather than domestic demand based on GDP which has driven the increases in flows.

Looking at the patterns of growth in heavy road vehicle movements, increases in the more remote parts of the region, particularly to the east and south have been relatively low. However, within the urban area, growth has been higher, reflecting increases in the volumes of manufactured and retail goods and the complexity of the associated supply chains and also in the movements of commodities associated with construction, which for some commodities like ready mixed cement and aggregates have grown particularly sharply.

In future it is expected that the growth in many of the bulk agricultural products which have driven much of the increase in port traffic will be limited, based on current trends, and this will tend to depress overall rates of growth in freight movements. However, offsetting this, it is expected that increasing supply chain complexity and the growth of construction activities reflecting the relatively high population growth in the urban areas will continue to lead to higher growth rates in these areas.

4.2 Inter-regional flows

a. Overall movements

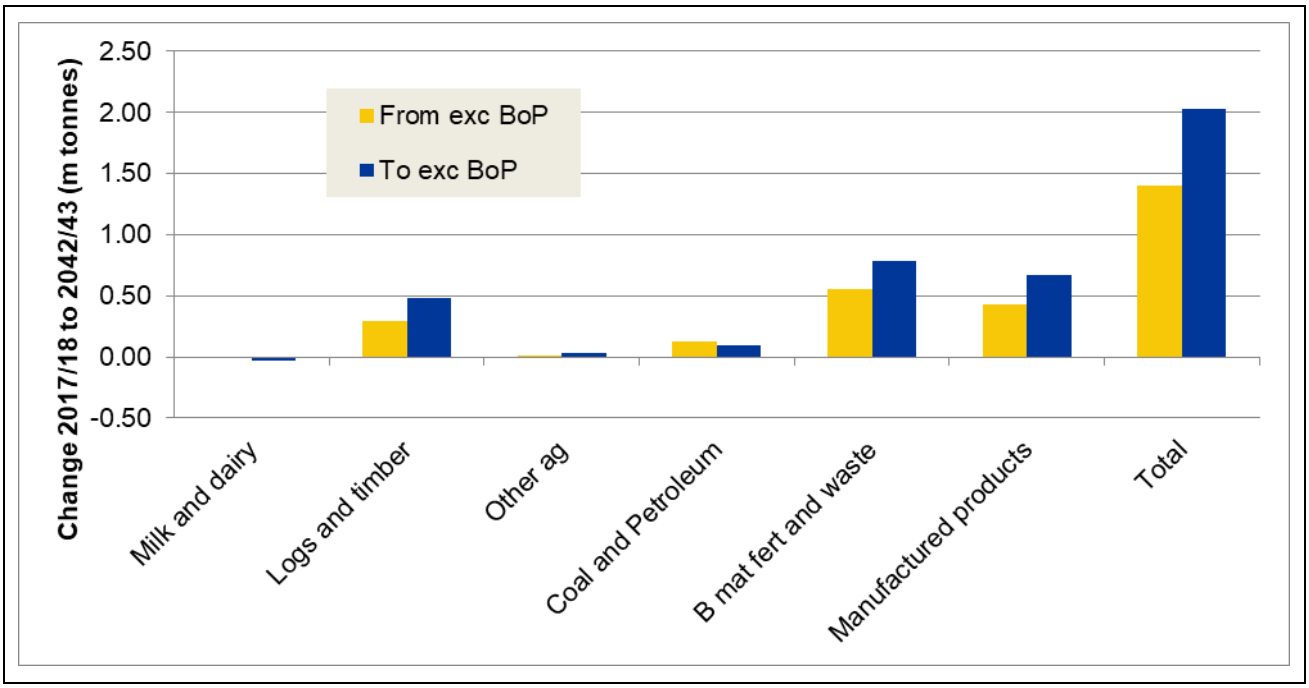
The, BAU forecasts of the growth of freight movements into and out of the Bay of Plenty for 2042/3 are set out in Table 4.1.

Table 4.1

Forecast total inter-regional flows into and out of Bay of Plenty 2042/43 (m tonnes)			
Commodity Group	Flows to the Bay of Plenty	Flows from the Bay of Plenty	**Total**
Dairy Products	1.48	0.26	**1.74**
Logs and Timber Products	6.03	1.56	**7.59**
Meat Products	0.23	0.00	**0.23**
Other Agriculture	0.38	1.49	**1.87**
Building Materials	2.10	1.53	**3.63**
Manufactured Goods	2.93	2.47	**5.40**
Coal and Petroleum	0.00	0.61	**0.61**
Total	**13.15**	**7.93**	**21.08**

Source: National Freight Demand Study 2018 plus MoT Freight Futures Model

Figure 4.4 - Forecast changes in inter-regional freight flows to and from Bay of Plenty by commodity 2017/18 to 2042/43 (m tonnes)



Source: National Freight Demand Study 2018 plus MoT Freight Futures Model

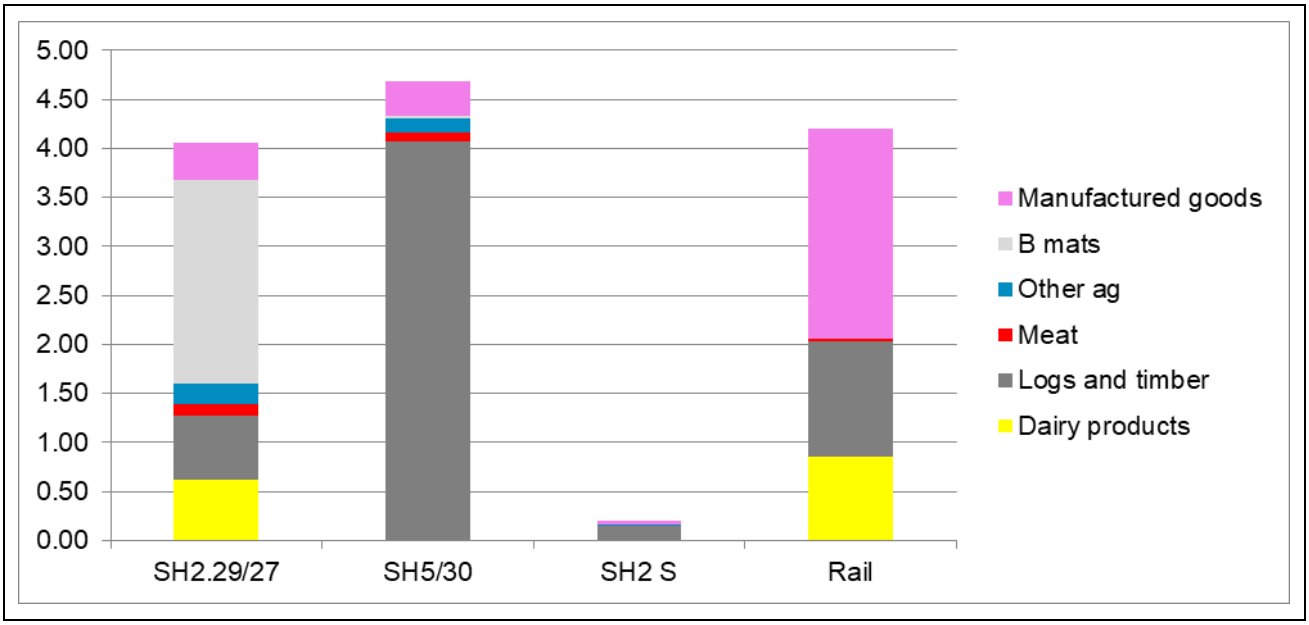
With the exception of horticulture, there is forecast to be little growth in the movements of primary agricultural products at an inter-regional level although the movements of timber products are expected to increase reflecting higher levels of conversion of the logging harvest.

The main growth forecast in the inter-regional movements to and from the Bay of Plenty is in building materials and fertiliser. This forecast growth occurs for both inbound and outbound movements, with a large part of the growth representing the increased movement of aggregates from Waikato to support the growth of construction in the Bay of Plenty region. Outbound growth reflects the movements of products imported via the port and also commodities manufactured in the region. There is also forecast to be strong growth in the movements of manufactured products, largely reflecting increased demands and production in Auckland served by the inbound and outbound supply chains through the Port of Tauranga.

4.2.2 Flows of inter-regional traffic by corridor

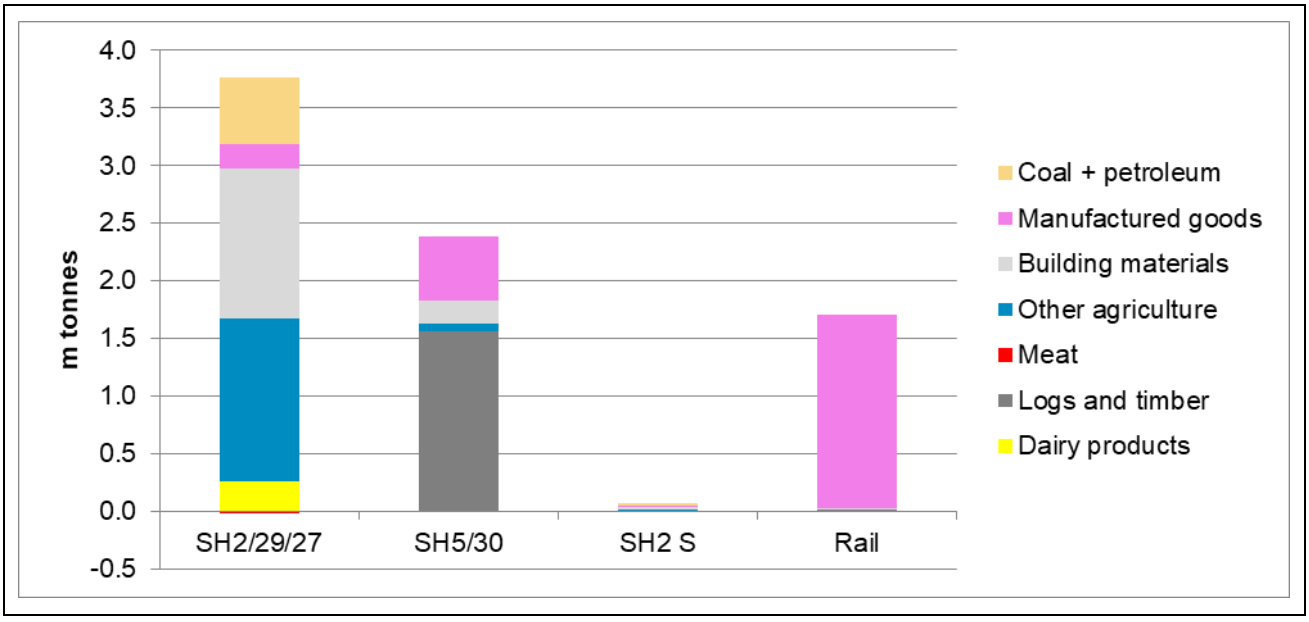
The forecasts have also been considered on a broad corridor basis and the results are set out in Figure 4.5 and 4.6. These assume that the modal split by commodity for rail remains unchanged between 2017 and 2042/43.

Figure 4.5 - Forecast inter-regional flows to Bay of Plenty by corridor and identified commodity 2042/2043



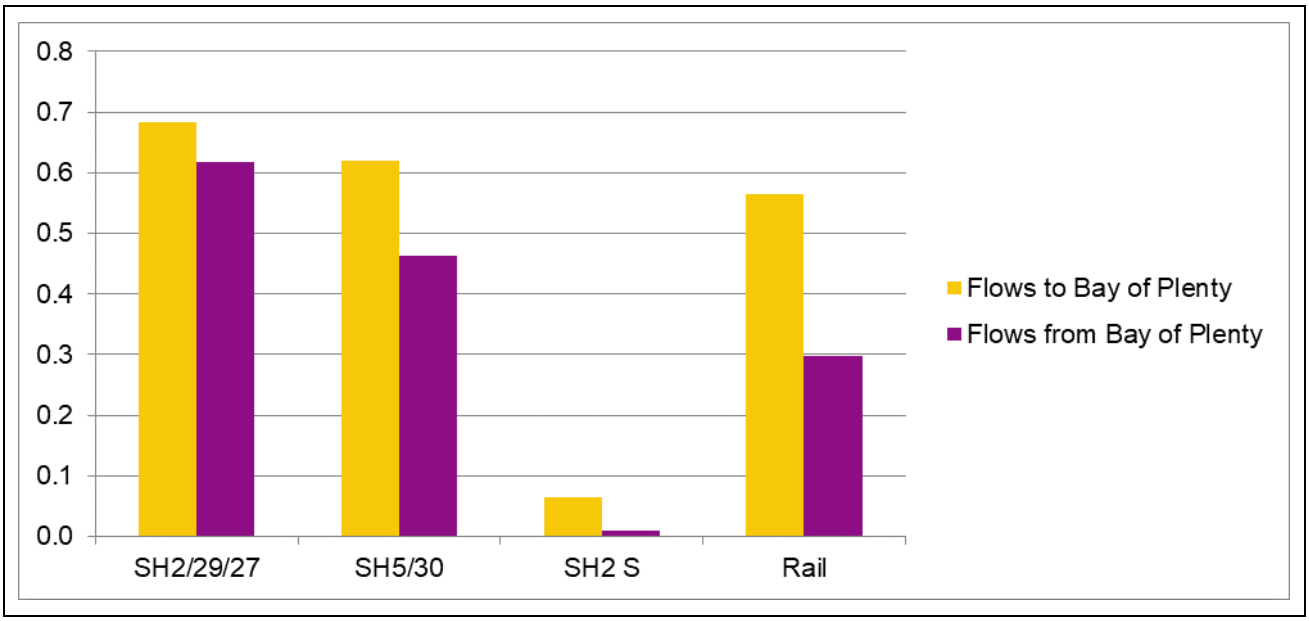
Source: NFDS2017/18 and MoT Freight Futures model

Figure 4.6 – Forecast inter-regional flows from Bay of Plenty by corridor and identified commodity 2042/2043



Source: NFDS2017/18 and MoT Freight Futures model

Figure 4.7 – Forecast changes in inter-regional freight flows on the key road network and rail 2017/18-2042 (m tonnes)



To the forecasts of inter-regional traffic into and out of the Bay of Plenty need to be added the effects of local traffic generation and attraction. Using the same approach as for 2017/18 which looks at the longer distance inter-regional flows and then makes allowance for traffic generation and attraction within the Bay of Plenty region away from Tauranga, the forecasts of freight traffic by corridor are set out in Table 4.2.

Table 4.2

Major commodity flows at selected locations on the Tauranga road and rail network 2043 (m tonnes)					
Total Flows	SH2 East (Kairua)	SH29 (Kaimai)	SH2 North (Te Puna)	Rail from north	Rail from east
Log and Timber Products	2.46	1.03	0.77	1.18	1.86
Kiwifruit	0.50	0.00	0.18	0.00	
Agricultural Products	0.32	1.75	0.00	0.88	
Building Materials and Fertilisers	0.18	2.03	0.85	0.01	
Manufactured Goods	0.87	0.45	0.11	3.83	
Petroleum	0.02	0.46	0.00	0.00	
Total	**4.36**	**5.72**	**1.91**	**5.91**	**1.86**

As indicated earlier these forecasts exclude many of the commodities distributed locally within the region including building materials particularly aggregates and concretes and the movements of retail and manufactured goods both of which are expected to grow strongly.

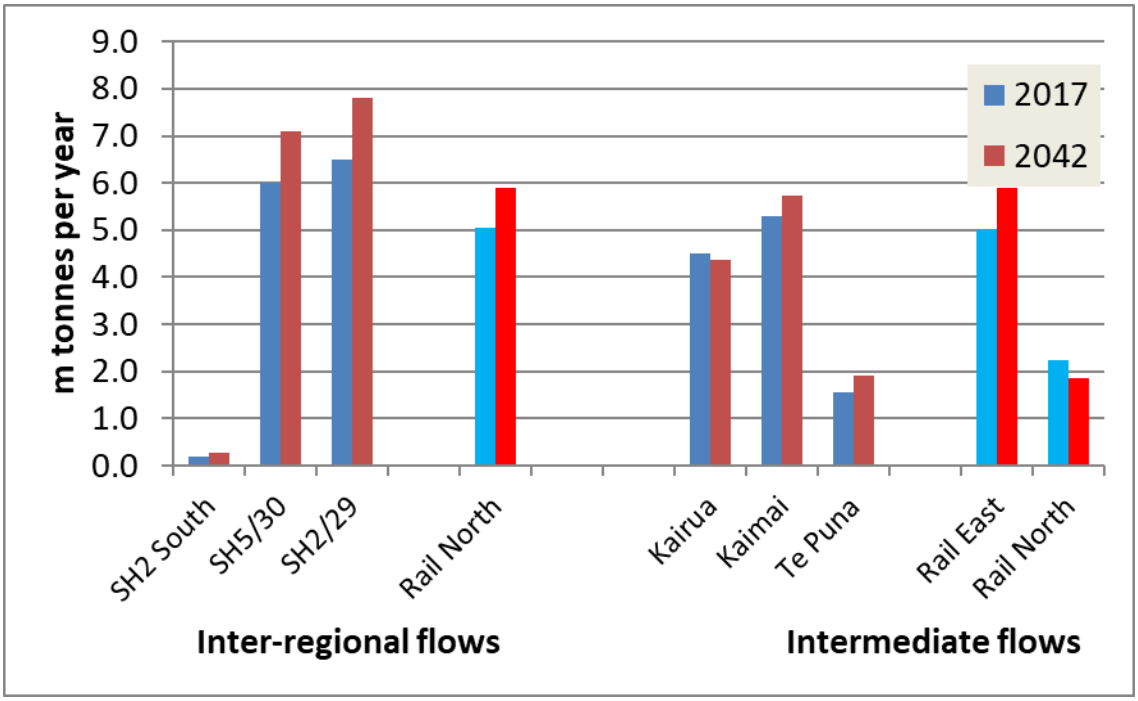
4.2.3 Putting the freight forecasts together

The forecasts of the changes in the freight volumes at both the regional boundary and at the intermediate locations are summarised in Table 4.3 and Figure 4.8

Table 4.3 Changes in forecast freight flows at the regional boundary and at selected intermediate locations 2017/17 and 2042 (m tonnes)

	2017	2042	Total growth 2017/18 - 2042
Inter-regional flows			
SH2 South	0.20	0.27	35%
SH5/30	6.00	7.09	18%
SH2/29	6.51	7.81	20%
Rail North	5.04	5.91	17%
Flows at intermediate locations			
Kairua	4.51	4.36	-3%
Kaimai	5.31	5.72	8%
Te Puna	1.56	1.91	23%
Rail East	2.23	1.86	-17%
Rail North	5.04	5.91	17%

Figure 4.8 Changes in forecast freight flows at the regional boundary and at selected intermediate locations 2017/17 and 2042 (m tonnes).



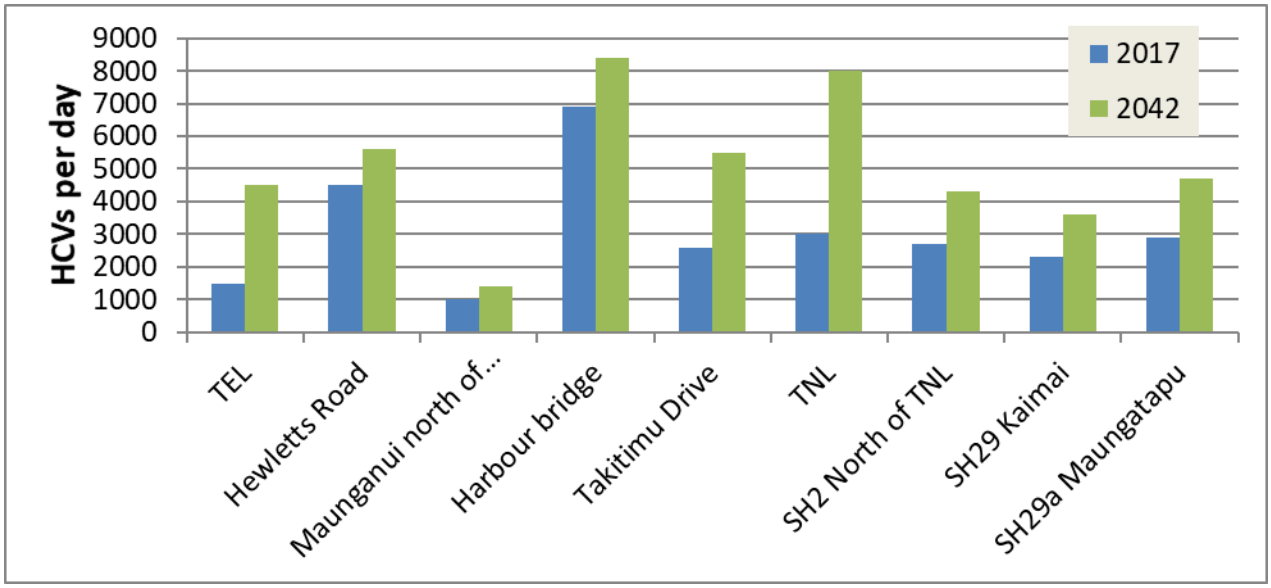
In general, the identified freight flows both at the regional boundary and at the intermediate locations grow fairly slowly reflecting the slow growth forecast for many of the primary agricultural commodities and also the increasing consumption of logs for domestic processing. This in particular is reflected in the decreases in the identified major flows from the east both by road at Kairua and by rail.

A similar exercise has been undertaken for the forecasts of commercial vehicle flows from the TTM and results are set out in Table 4.4 and Figure 4.9.

Table 4.4 Forecast changes in commercial vehicle flows from the TTM (Vehs per day)

	2017	2042	Growth 2017/18 to 2042
TEL	1500	4500	203%
Hewletts Road	4500	5600	25%
Maunganui north of Golf Road	1000	1400	43%
Harbour bridge	6900	8400	22%
Takitimu Drive	2600	5500	112%
TNL	3000	8000	165%
SH2 North of TNL	2700	4300	58%
SH29 Kaimai	2300	3600	56%
SH29a Maungatapu	2900	4700	62%

Figure 4.9 Forecast changes in commercial vehicle flows from the TTM (Vehs per day)



To bring the forecasts of the volumes of freight for identified commodities together with the growth forecast for the commercial vehicle flows on the road network as outlined in Table 4.3 these figures are compared in Table 4.5.

Table 4.5 Comparison of freight forecasts with the HCV forecasts from the TTM at selected locations

	2018	2043	Total growth (per cent)
TTM (HCV AADT)			
Kairua	4500	5600	25%
SH2 Te Puna	2700	4300	58%
SH29 Kaimai	2300	3600	56%
Freight flows (m tonnes per year)			
Kairua	4.51	4.36	-3%
SH2 Te Puna	1.56	1.91	22%
SH29 Kaimai	5.31	5.72	8%

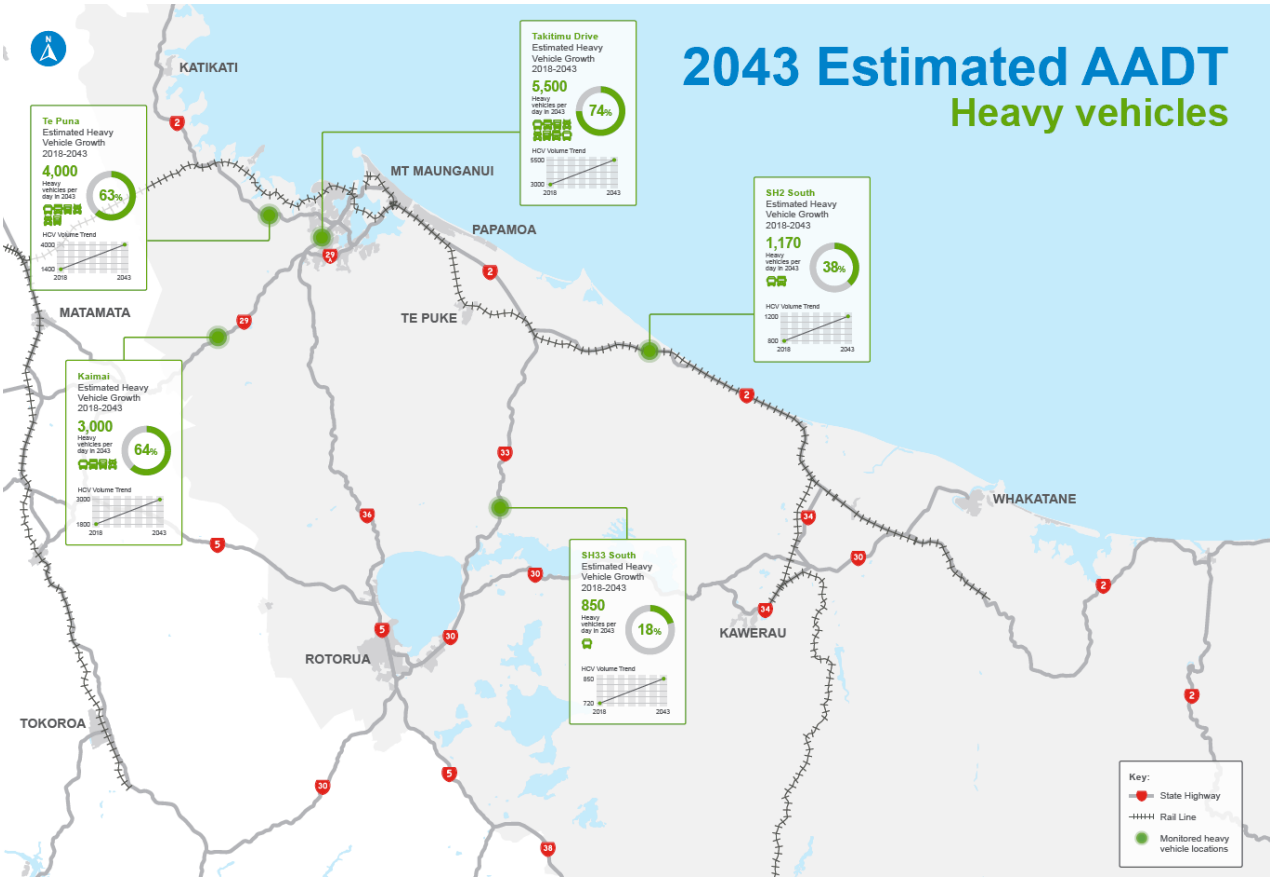
Comparison of the growth implied for the key freight flows with the forecasts from the traffic model suggest that the local components not captured in the freight forecasts would account for much of the growth in the area. This reflects the growth of short distance movements particularly of building materials and the complex supply chains for the distribution of manufactured and retail goods, and repeats the position observed for the period from 2012 to 2018 discussed earlier. The high growth forecast in the freight flows for Te Puna reflects

the high shares identified for kiwifruit and building materials in the overall totals, commodities for which particularly substantial growth is forecast.

In addition, the analysis of the growth in the underlying freight demands indicates relatively low growth to the east at Kairua with higher growth at Te Puna and Kaimai. This pattern is reflected in the forecasts from the TTM which also has higher growth for Te Puna than for Kaimai.

The following figure shows the predicted change in commercial vehicle movements at key locations on the network.

Figure 4.10 Estimate Change in Commercial Vehicle Volumes in 2043



5 Impacts of Possible Disruptors

5.1 Eastern Bay of Plenty Considerations

What Provincial Growth Fund or other emerging projects are planned for areas other than Western Bay of Plenty that could cause a step change in growth?

5.1.1 Introduction

A number of schemes for development in the eastern Bay of Plenty have been considered by Toi-EDA as part of a review of proposals for involvement of the Provincial Growth Fund in the "Eastern Bay of Plenty Regional Development Project" This has identified four main projects for investment at various locations in the eastern Bay of Plenty. These comprise:

- High value horticulture on Māori Land in Eastern Bay of Plenty
- Whakatane tourism hub
- Aquaculture in Opotiki
- Kawerau Putauaki Industrial development cluster

The possible impacts of each of these on the traffic flows in the Tauranga area are discussed below. To some extent the effects of the specific proposals may be included in the more general forecasts discussed above, which include substantial increases in horticultural production and manufactured timber products. Any adjustments to these forecasts should therefore be regarded as illustrative only, reflecting uncertainties as to the scale of the development actually achieved and the extent to which this is already embedded in the existing forecasts.

5.1.2 Agricultural development in eastern Bay of Plenty

The proposed agricultural development in the eastern Bay of Plenty includes the expansion of the area planted to kiwifruit of up to 450 hectares and the areas for high value berry fruits of about 150 hectares. While these are both very valuable crops, the increase in the volume of output from this expansion is more limited, estimated to amount to about 20,000 tonnes per year. This would be the equivalent of an average of 10 heavy vehicle movements per day, although it is likely that this would peak during the harvesting season.

While an increase in high value horticulture through the Eastern Bay of Plenty is imminent, it has initiated the discussion in how the commodity is handled, especially in the transport planning and greater use of containerisation.

Even if harvesting was assumed to take place over 2 months only, the flows per day would increase by about 50 heavy vehicle per day or about 10-15 per cent in the areas furthest to the east. Depending on the way in which the supply chain was organised, the movement to Tauranga might be staggered and so the daily flows on the road network would be less. These flows may also take advantage of the proposed container terminal at Kawerau discussed below which would further reduce their impact on the road network.

5.1.3 Whakatane tourism hub

While there would be some additional freight traffic associated with the development of the tourist hub at Whakatane, the effects of this on freight movement are likely to be insignificant.

5.1.4 Aquaculture in Opotiki

Based on the proposals set out in the PGF paper, it appears that at its fullest extent the area proposed to be farmed for the aquaculture project would ultimately amount to about 20,000 ha. The promoters conservatively anticipate a gross output of about 40,000 tonnes per year by 2040 as the area to be farmed is developed. Although the output could increase after that date as the scale of activity is expanded, this figure has been used as the basis for the assessment of the potential impacts on the transport network.

It is planned that the output would be processed locally in Opotiki, with a total transport requirement for the finished product of about 16 -20,000 tonnes per year. This would generate a two-way HCV flow of about 5-10 vehicles per day.

This would compare with a current daily HCV flow on SH2 at Awakeri of 600-700 per day, so at this location the forecast volume of traffic generated by the aquaculture development would represent only a very small increase in the traffic along the route amounting to about 1 - 2 per cent at this point. Closer to Tauranga where the flows are much higher the effects would be even more limited. There may also be options for transporting this finished product through the proposed container hub at Kawerau so the overall impact on the road network closer to Tauranga could be even lower. Again, these may be routed through the proposed container terminal at Kawerau.

5.1.5 Kawerau Putauaki Industrial development Cluster

A number of integrated proposals have been developed for the Kawerau area, which are estimated to generate up to 1,400 local jobs in existing and new industries. These include:

- Container terminal
- Fenglin particle board plant
- Sawmill expansion by Sequal and other operators
- New dairy plant

While the output of the dairy plant is likely to be focussed on relatively low volumes of high value products, it is estimated that the particle plant would produce up to about 0.4 - 0.5 million tonnes per year. No data is available on the scale of the sawmill expansion, although the increased output of the mill is understood to amount to up to about 400,000 tonnes per year. It is estimated by the proposers that the container terminal will attract up to 90,000 container movements per year, an increase of up to about 80,000 (5 to 10 trains per day) over the current levels, probably equivalent to about 1-1.5 m tonnes of product. Of this, part is probably represented by the output of the new Fenglin facility and the sawmill expansion and also part is based on the possible increases in horticultural output in the eastern Bay of Plenty discussed below. There is also interest in using the container terminal from shippers in Gisborne and this may represent a further component of the traffic.

In the absence of any detailed information and taking in account the substantial growth in the output of manufactured timber products included in the base forecasts set out in Section 4, it has been assumed that about half the traffic associated with the new development would represent flows that are additional to those already identified. The increase in the rail flow of up to 80,000 movements per year would therefore be accompanied by a reduction of road traffic into Tauranga from the east set out in the base forecasts of about 200 vehicle movements per day.

The impact of the inland port will have the potential to change how and where breakbulk and containerisation occurs and has the ability to encourage general freight operators to base themselves closer to this port operation. A feasibility report was completed recently, and the container terminal design prepared. It is expected this will be ready and in operation by mid 2020.

The overall changes which might result from the PGF schemes are summarised in Table 5.1.

Table 5.1

PGF Schemes: Possible impacts on total heavy vehicle flows			
PGF Proposal	High Transport Demands		
	Estimated Tonnes pa	HCV's per day average	HCV's per day peak
High Value Horticulture	20,000	10	50
Whakatane Tourist Hub	-	-	-
Opotiki Aquaculture – Processed material	16-20,000	5-10	5-10
Kawerau Putuaki Industrial Development Cluster	-	Reduction of 200	Reduction of 200
Total impact west of Matata		Reduction of 180-200 HCVs per day	Reduction of 140-160 HCVs per day

Overall, the effects of the PGF schemes on the road network approaching Tauranga would depend on a number of factors including the location where the aquaculture outputs were processed and the extent to which the Kawerau container terminal attracted traffic from other areas. However, any resulting changes in flows are likely to represent only a small change in the future flows on the main traffic links from the east predicted by the TTM, and for example would represent about 3-4 per cent of the forecast flows at Kairua.

5.1.6 Other identified major land use change, e.g. water bottling

There is an increasing level of attraction in the food and beverage industry in the region. This links closely with the introduction of high technology and innovation to support research and development, manufacture and processing.

The Otakiri Water Bottling plant application is still in consideration by the Environment Court at this time. If consented this Water Bottling operation could generate up to 200 truck movements per day (in peak times of peak extraction seasons with less impact at other times). At this stage, the site does not connect to the railway network and the application proposes that water would be containerised on site and transported by truck.

A proposal for a water bottling plant in Murapara has also been mentioned in the last few years and was envisioned to be larger than the Otakiri operation, but this proposal is uncertain at this stage. This site is connected to the rail network and has potential to shift water by rail if it proceeds.

The outcome of the Otakiri application is likely to impact on decisions to proceed or not with water bottling applications in the eastern bay and this should be monitored following release of the Court decision.

5.2 Other disruptors

5.2.1 Introduction

Outside of the potential growth and freight generators from within the Western Bay and wider to include the Eastern Bay of Plenty the report has identified several other disruptors that may have a positive or negative impact to future freight movements.

How will national and other port strategies influence or change freight flows into the Western Bay of Plenty and Port of Tauranga? i.e. Upper North Island Supply Chain Review; Ruakura inland Port development.

5.2.2 UNI Supply Chain Strategy - closure of Auckland Port

The recently published UNI Supply Chain Strategy has considered a number of scenarios for port development in the Upper North Island. The strategy favoured by the report involves the closure of the port in Auckland and the relocation of activities to Northport, but if accomplished as proposed, this option should have little impact on the Port of Tauranga. An alternative hypothetical strategy would be the closure of Port of Auckland and the transfer of trade to the Port of Tauranga. Although not the recommended strategy, this has been examined to give an indication of the extreme case of the impacts that might result for the Bay of Plenty land transport network in this scenario.

Based on current flows, Auckland handles about 6 million tonnes of freight traffic per year of which the majority is to or from Auckland or areas to the south. At present traffic between these areas and Tauranga is split broadly equally between road and rail and for this analysis we have assumed that this would continue with the changed traffic patterns. This would therefore result in increases in road and rail traffic to and from the Port of Tauranga of about 3 million tonnes each.

The impact of these increased flows on the road and rail flows to the port and into the Bay of Plenty in general are set out below.

Table 5.2

Impact of transfer of Port of Auckland (POAL) traffic to Tauranga on road and rail flows (m tonnes)			
	Road	Rail	**Total**
Increases in traffic with POAL closed (m Tonnes)	2.9	2.9	**5.8**
Current port flows	10.2	7.3	**17.5**
Increase in port traffic with POAL closed	28%	40%	**33%**
Total inter-regional traffic between Bay of Plenty	11	7.3	**18.3**
Increase in inter-regional flows with POAL closed	27%	40%	**32%**

On the assumptions made, the international export and import traffic through Port of Tauranga would increase by about a third, with rail flows increasing by about 40 per cent and road flows by 25-30 per cent. Increases of these magnitudes would clearly increase the pressures on the transport networks. While as

discussed above in principle the rail network should be able to accommodate an increase of this magnitude with suitable investment in passing loops, there would be the need to increase terminal capacities at the origins and destinations of the trips, either by expanding existing facilities or constructing new ones as for example at Ruakura or Rangiuru.

The impact on the road network would also be substantial and it is recommended that this option could be considered as one of the scenarios for testing as something of an extreme case.

5.2.3 Rangiuru Business Park

With consenting at Rangiuru now complete, opportunities in terms of how the location best develops and leverages itself as a transport hub depends on expected demand to be realised and sustainable. Although the rail spur sits on the wrong wide to support effective and efficient road and rail hub, and observations that there was limited value given the relative close proximity to the Port.

However, given the scale of port operations and use of high value land surrounding the port there does appear to be potential for some port operations to relocate to Rangiuru Business Park with goods then freighted to the port by rail. This may be sufficient to achieve mode shift to rail at Rangiuru.

5.2.4 Ruakura Inland Port

The Ruakura Inland Port based east of Hamilton has been identified as a key freight hub along the ECMT line. It will sit as the key rail connection between Port of Tauranga and Port of Auckland and supports an integrated road rail approach to freight movement in the Waikato region. The inland port may reduce the volume of truck movements on SH29 over the Kaimais but may also serve as an origin and destination for rail traffic to and from the port. It will also serve significant new industrial development in the Ruakura area. Development at Ruakura is expected to commence after completion of the Hamilton section of the Waikato Expressway.

5.2.5 Role of technology

Within the context of the transport industry, it is expected that technology will continue to be present and characterised more as a form of continuous based improvement rather than transformational. It was identified that as additional means to capture information (in real time) by the logistic and transport operators to support transport, route or business decisions then this may lead to more efficiencies in operations and supply chain.

What impact will technology changes and climate have?

Recent improvements to battery technology have led to a rapid increase in electric vehicles. In particular the mass-production of electric cars, buses, micromobility options (bicycles, motorcycles, scooters, skateboards, mobility scooters, etc etc), and light delivery vehicles. These are particularly common in urban areas, where they meet mobility demands without further adding to urban pollution.

Currently there has been only limited uptake of long-haul heavy freight. The main reason for this relates to the battery weights required to replicate the range of a diesel vehicle. The additional weight then has an impact on maximum axle loading. There are also limitations when it comes to charging infrastructure and charging times. One viable means of reducing weight while maintaining range is the idea that (in the future) batteries could be swapped out at service stations in a similar manner to the way some Service stations currently swap gas cylinders. However, such a system would require some standardisation and has yet to be implemented. Other forms of zero emission vehicles have also been trialled (such as Hydrogen cells). However, a substantial shift from diesel to zero emissions vehicles is likely to be some way off, and is unlikely to have a significant impact on freight demands. The transition to electric vehicles will affect the

means of transportation, and is unlikely to have any significant impact on the underlying demands on where and why freight needs to be shifted from production to ports and markets.

In recent years, there has been significant investment in developing autonomous vehicles, including autonomous freight vehicles with some companies already trialling on-road short and long-haul autonomous freight vehicles. As with electric vehicles, the early adopters have typically been in urban environments, e.g. resolving the First Mile / Last Mile delivery challenge, although there are some long-haul autonomous vehicles in development. A pedestrian-free, access controlled American Freeway or European Autobahn environment is less challenging than other types of roading environment.

As with electric vehicles, any significant change to travel demand is a long way off. Reduced operating/staff costs will initially be offset by higher capital costs for purchasing the technology. Further down the track, cheaper travel could result in some additional induced demand, particularly in urban environments. This could have an adverse impact on urban congestion. Additional induced demand is unlikely to have a significant impact on rural corridors with existing spare capacity.

5.2.6 Significant growth in general freight production and movement?

A broader consideration and the impact to economic growth is the availability and accessibility of industrial and commercial land remains a constraint. There remains a scarcity of 9, 10 and 12 acre sites close to transport hubs or on good transport routes within the Western Bay of Plenty.

6 Rail Transport

6.1 The Rail Environment

6.1.1 Introduction

The recent Government Policy Statement on Land Transport 2018 (GPS) has provided a clear intent around greater consideration and possible integration of rail as a means to support both freight and passenger movement within New Zealand. As a result, this has led to several activities including the initiation of reviews for the transport sector, namely the Upper North Island Supply Chain Review, and The Future of Rail Review. At the same time and within the Provincial Growth Fund mechanism, KiwiRail has submitted several feasibility-based studies to support potential investment decisions. These funding applications are primarily based in the known surge regions, Northland, Eastern Bay of Plenty, Gisborne and the West Coast in the South Island. Within the context of this report, the funding of a study would concentrate on options for creating an inland hub to connect exports from Murupara and Kawerau to rail.

This section looks specifically at the Future of Rail Review and describes the opportunities and constraints for greater integration of rail in the region and identifies some of the characteristics of key rail locations in the region.

6.2 The Future of Rail Review

What will the government's Future of Rail Review mean for KiwiRail and the wider Bay of Plenty rail network?

The Government is in the process of reviewing the way rail is planned and funded, with the aim of supporting a resilient and reliable rail system. Much of this review remains ongoing. So far, however the following elements are publicly known:

- Of four scenarios, the choice of having a resilient and reliable scenario around which to plan investments is the favoured way forward. The status quo, effectively managed decline, was specifically rejected. The resilient and reliable scenario provides a baseline to support further investment in the future. These could include specific improvement projects from the two scenarios beyond “resilient and reliable”, namely “capacity and growth” and “additional opportunities”.
- The benefits of investing in the resilient and reliable scenario include increased reliability of the network, ferries, and rolling stock, enhanced customer satisfaction, improved fuel efficiency, a safer network, less freight moving on road, a reduction in emissions and better commercial returns
- A move into a new planning and funding arrangement will see investments in road and rail infrastructure being undertaken on a more mode-neutral basis. The government has noted the current lack of integration between road and rail investments.
- Investment (in the 2019 Budget) in locomotives, container wagons, ferries, and upgrading facilities.
- The development of a 10 year Rail Plan. This has not yet been released. It is expected to cover the government’s longer-term strategic vision for rail, the planning and operating environment for rail, a 10-year programme of indicative investments and benefits, roles and responsibilities for the entities involved, funding sources and principles, and a monitoring plan (against government objectives). There will be consultation on this plan in conjunction with the next draft Government Policy Statement on Transport.
- The plan includes looking at how rail fits into national and regional transport planning, and how rail infrastructure can be funded sustainably.
- The development of a programme of rail infrastructure maintenance, renewals and improvement (Rail Network Investment Programme).

The Government’s Provincial Growth fund has also invested in rail projects, including the proposed Kawerau freight hub, although most of its investments are outside the Bay of Plenty region.

While the review has not yet been completed, and only some information is publicly available, there are some implications for Bay of Plenty freight. These should be regarded as tentative until the full policy is released.

- Improvements in reliability and resilience of assets. While this may have more implication elsewhere, it could for instance cover investment in maintaining and enhancing the capacity of the East Coast Main Trunk line, including the Kaimai tunnel.
- Increases in rolling stock, especially container wagons, will improve KiwiRail’s ability to serve the region’s needs.
- The mode-neutral treatment of rail alongside road may result in investments in rail rather than road, where there is a choice. This could be of importance in the Bay of Plenty where rail could take some of the freight burden off road.
- In this context, the Rail Network Programme process should enable regional priorities to be considered.
- Mode neutrality may increase rail traffic in the region.
- The funding arrangements (as yet unannounced) could provide funding for projects that enhance the Bay of Plenty rail system.

This information indicates support for increased rail transport going forward, but the actual change will be uncertain until the 10 year rail plan is released.

6.3 Capacity of the Rail Network

6.3.1 Bay of Plenty rail Capacity

In 2017/18 nearly 8m tonnes moved on rail, to, from, and within the Bay of Plenty. That is, about half of all rail traffic in the country had an origin or destination, or both, within the Bay of Plenty region. This is set out in Table 6.1 below.

Table 6.1

Rail Traffic to from and within the Bay of Plenty 2017/2018 (m tonnes)		
	Tonnes (m)	Commentary
To Bay of Plenty	3,654	Excluding internal BOP traffic
From Bay of Plenty	1,448	Excluding internal BOP traffic
Within Bay of Plenty	2,684	
Total	**7,785**	

Source: KiwiRail Weight of Freight only, excluding containers

All lines in the region and connecting to the Main Trunk through the Kaimai tunnel are single track. The volume of traffic on them raises the potential of the need to improve capacity. This is likely to be even more relevant should rail passenger services be re-established in the region.

Capacity issues will affect both the running lines and the terminals. In fact, if traffic increases significantly, the terminals will be the first to feel the pinch.

The rail traffic falls into three quite distinct groups:

- Traffic from the eastern Bay of Plenty to Mount Maunganui. Mostly logs, with some pulp and paper. This does not cross the harbour nor impinge on central Tauranga. It is about 35% of all traffic in the region.
- Traffic to and from the Sulphur Point container terminal through the Kaimai Tunnel. This is mostly Metroport traffic to and from Auckland, plus containerised primary exports, principally dairy. This does not cross the harbour nor travel through downtown Tauranga, although it does terminate adjacent to it. It is about 50% of all traffic in the region.
- Traffic from West of the Kaimai tunnel to Mt Maunganui and vice versa, This is mainly logs and pulp from Kinleith, and steel products from Mission Bush. There is also intermittent coal traffic from Mt Maunganui to Huntly. This group of traffic travels through downtown Tauranga and crosses the harbour. It is about 15% of the total.

Consequently about 70% of the region's rail traffic passes through the Kaimai Tunnel, 45% uses the Mt Maunganui terminal, and 55% the Sulphur Point terminal.

Are there opportunities to optimise the Bay of Plenty rail network to better manage current and future flows?

6.3.2 Mt Maunganui

According to the growth predictions elsewhere in this report, the rail traffic using Mt Maunganui are unlikely to grow substantially, unless rail makes substantial market share gains. Such gains may come about through Government initiatives, but it is probably too early to predict what they may be.

6.3.3 Sulphur Point (Tauranga Container terminal)

At present only small volumes (of paper from Kawerau) travel by rail from eastern Bay of Plenty to Sulphur Point. While this traffic is not likely to grow significantly, there are potential developments in the eastern Bay that could radically change this.

The potential terminals or hubs at Kawerau and Rangiuru are essentially designed to shift traffic from road to rail, in all probability containerised, and will thus add to the rail traffic to Sulphur Point. Also potentially of significant impact will be bottled water from Kawerau and other eastern Bay points, which if it goes ahead may add several trains a day to the line, and to the rail terminal at Sulphur Point.

Currently the major traffic impacting on Sulphur Point is the Metroport traffic from Auckland. While the commodity classification of this traffic is unknown, the import component at least will likely include the equivalent of manufactured goods, which as this report shows are likely to grow. The export component is less likely to grow, as it includes primary product exports, and the same is true for the identified dairy exports. Already Tauranga's catchment for primary exports by rail extends over most of the North Island (Auckland and south), so the prospects for expansion by growth from expansion of that catchment are slim. Indeed, any increased use of coastal ship feeders could take some of that traffic away.

In the past, the rail system and the terminal have coped with large and sudden increases in Metroport traffic as a result of disruptions at the Ports of Auckland. Given the current debate over the future of that port, there is a chance of significant increases in the future, albeit possibly shared with Northport.

The future demands on the terminal from both east and west may place an upper limit on the role of rail in the region, well ahead of any restriction imposed by the Kaimai tunnel. This is an area that planning should be focused on before the tunnel capacity.

6.3.4 East Coast Main Trunk Hamilton to Tauranga

This 97km ECMT line is the busiest single track line in the country. It is broken into 11 sections by 10 crossing loops. The sections range in length from 4km to 13km. One of these (though not the longest in terms of either distance or time) includes the 8.85km Kaimai Tunnel. Typically, a single track section can be increased in capacity by dividing the longest sections with new crossing loops. This was last done some 10 years ago, and significantly increased the capacity of the line. It is a relatively cheap solution too.

Such a solution would be neither easy nor cheap for the Kaimai tunnel. A report by Beca in 2017 suggested that with current predicted growth rates, and a conservative reinterpretation of the capacity of the tunnel section, the tunnel could cope with 20-30 more trains per day, and would be at capacity (on a high traffic scenario) between 2029 and 2037. As noted above, the growth rates have eased. However, a change in shipping patterns or ports could result in a significant increase in traffic. Changes in shipping patterns were the primary drivers of the increased demand on the tunnel in the Beca scenarios, particularly the increases in the numbers of larger vessels. If passenger services were reintroduced, that would also impact on the capacity of the tunnel for freight.

There are however relatively simple solutions to increase the capacity of the tunnel when measured on tonnes of freight moved through it, rather than trains. One is to increase the length of the trains. Recent improvement in the drawgear on wagons should mean longer trains can be hauled, thus reducing the number of trains required to move a given tonnage. This of course would require investment in lengthening crossing loops and terminal sidings, but that is a rather more tractable problem than adding physical tunnel space.

A more radical solution would be to divide the tunnel into two or more sections by increased signalling, to allow following trains. This would enable the "flighting" of trains, running several in one direction followed by several in the other direction, giving a substantial increase in capacity. More trains in the tunnel at once, or even more trains using it, may cause a fume problem, which may require the line to be electrified.

The Beca study called for planning for increasing the tunnel capacity. In view of the relatively sudden changes in demand that could be placed on the tunnel by port and shipping changes, a plan would help understand their impact (and may feedback on the practicality of those changes. themselves). An extreme

case could be the diversion of all of Ports of Auckland's traffic to Tauranga, which is estimated to increase rail traffic through the ECMT and the tunnel by 40%. As noted, this has happened before and the system coped. There should be sufficient capacity to handle such growth, even if changes in operation like longer trains have to be made.

However, the actual capacity of the tunnel needs definitive review (as recommended by Beca) and a wider suite of potential solutions needs to be considered. These reviews should be accelerated if a reintroduction of passenger services is proposed.

The tunnel is not currently the most restrictive section on the line from Hamilton. Fixing issues elsewhere on the line would add capacity before needing to consider the tunnel section.

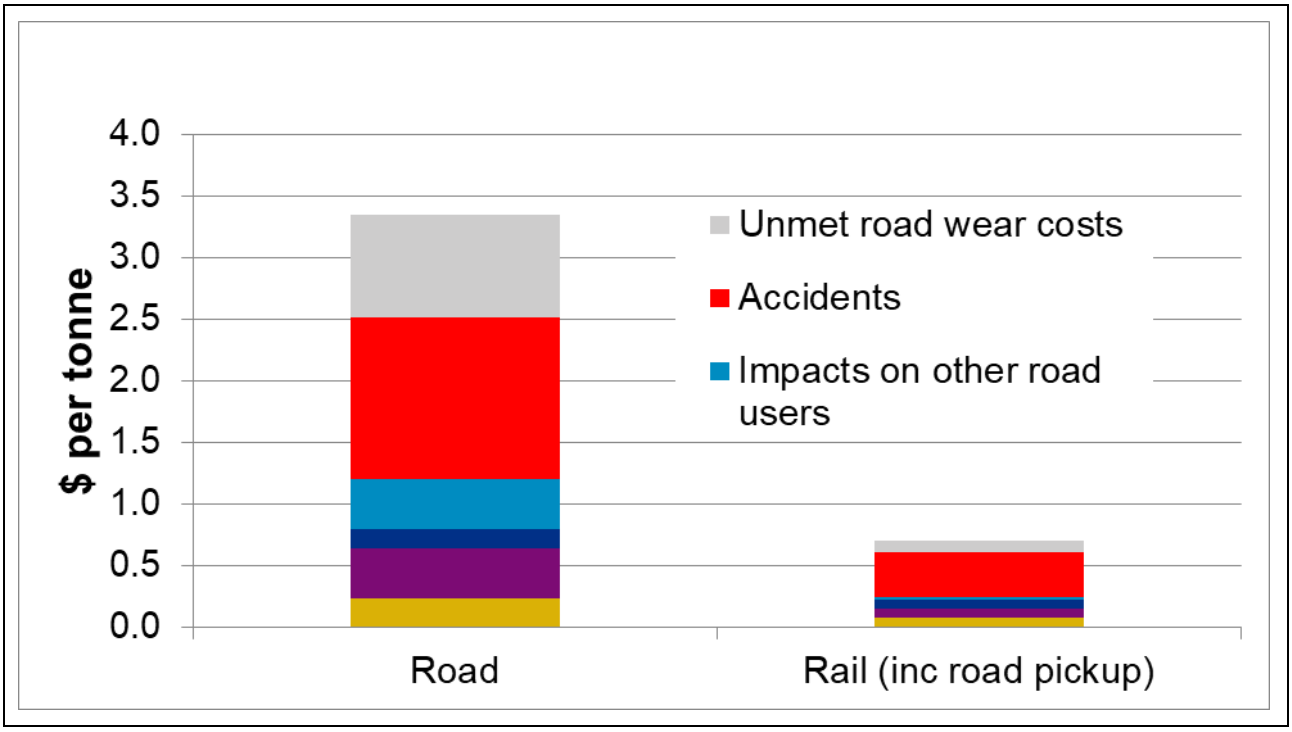
6.3.5 Overall conclusions

The main constraints on the significant expansion of rail operation in the area primarily lie in the terminals where goods are transferred to and from the rail network. The line sections generally have the capacity to handle increases in flows and are not constraints on traffic.

What is the net impact of diverting a unit of road freight to rail in regard to traffic in the sub-region?

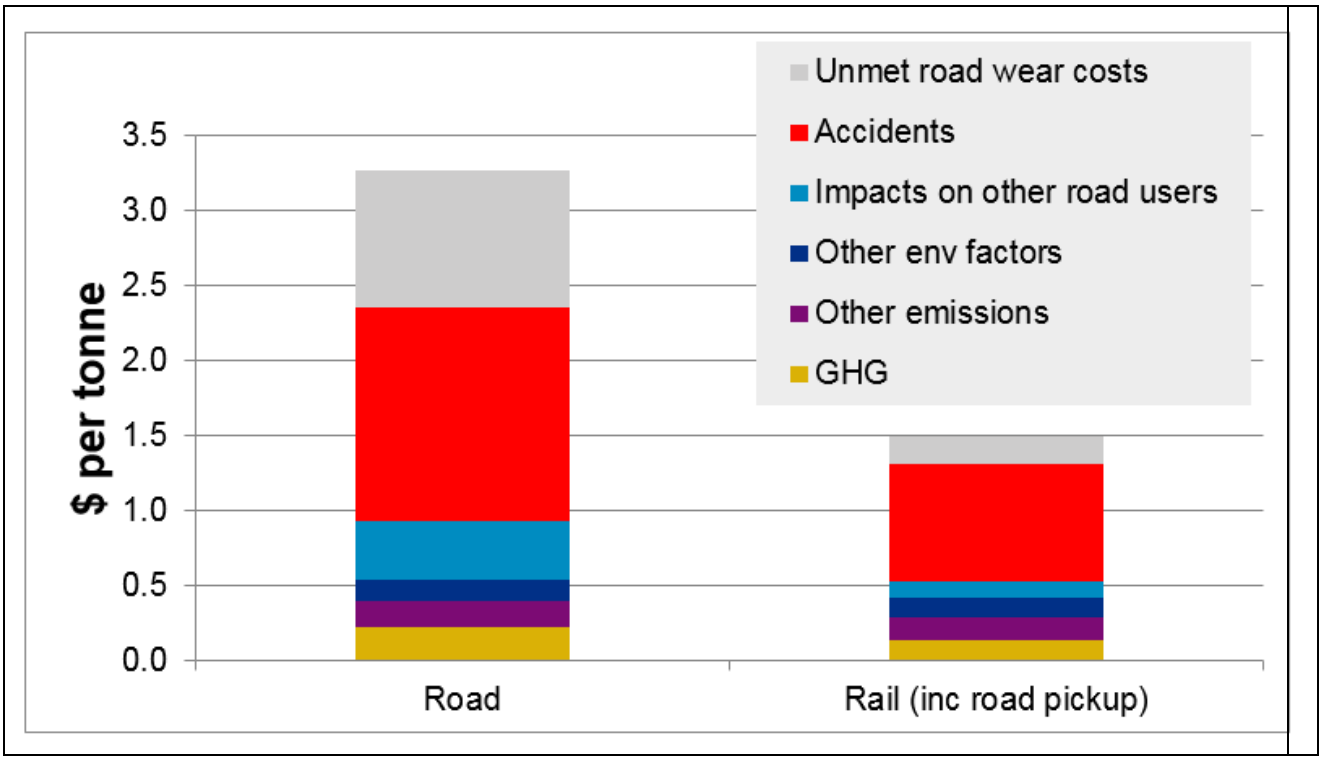
Based on work undertaken as part of the, the "South Island Freight Study -: Identification of the opportunity for mode shift and preparation of a mode shift implementation plan"[4] the relative externality costs of moving selected cargoes by road and rail have been estimated and the results are set out in Figures 6.1 and 6.2.

Figure 6.1 – Impacts of shifting from road to rail (Based on the externality costs of moving containers of water from Kawerau to Tauranga ($/tonne))



[4] https://www.ecan.govt.nz/get-involved/news-and-events/2019/rail-freight-takes-pressure-off-roads/

Figure 6.2 – Impacts of shifting from road to rail (Based on the externality costs of moving containers of water from Putaruru to Tauranga ($/tonne))



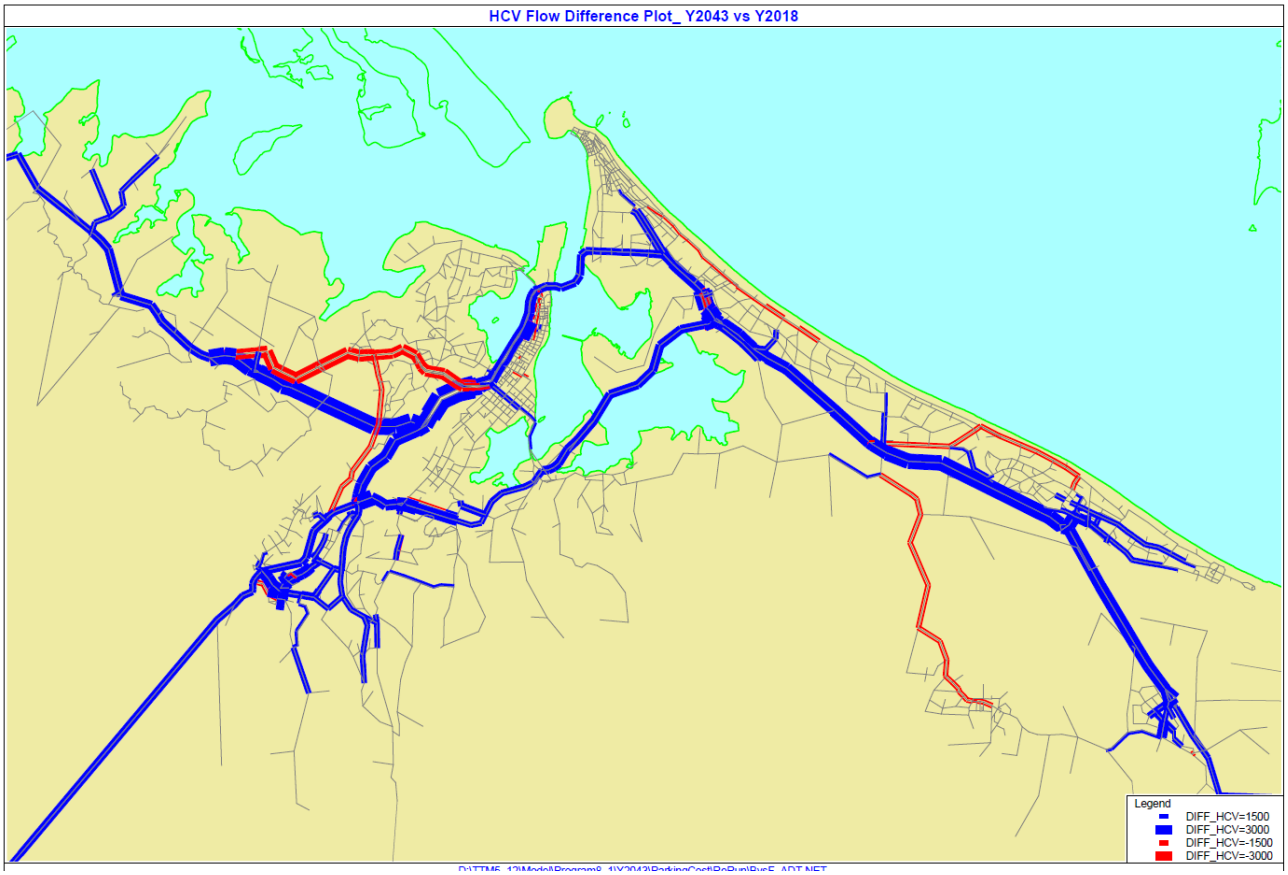
6.4 Significant growth in general freight production and movement

Not necessary directly port related, but a big increase in general industrial production will drive a large increase in heavy vehicle traffic within Tauranga. Reflecting this Takitimu Drive has experienced high growth influenced by the Tauriko Business Estate and further large increases in commercial / industrial land use growth could result in high general freight movements across the Tauranga City area in particular.

7 Possible Transport Model Considerations

What future scenarios could we test via UFTI, for example industry change in the eastern Bay of Plenty i.e. aquaculture, water bottling, forestry, high value horticulture.

The following figure shows the estimated change in goods vehicle movements within the TTM between 2018 and 2043. Growth is expected on the key state highway corridors and the impact of the Tauranga Northern Link in redistributing truck movements away from Bethlehem can be seen by the red lines that indicate a reduction in truck volumes, where blue lines represent an increase.



Being a regional strategic model, the TTSM predicts growth in freight movements to be linked to economic growth (industrial and service job growth in particular) within the region. In the business as usual scenario, the TTM predicts HCV growth of around 3% per annum between 2018 and 2031 and around 2% per annum between 2031 and 2043. This is slightly higher than the interregional freight growth defined in this study, but this would take into account higher internal growth of goods vehicle movements in the main urban areas, reflecting the growth of shorter distance construction traffic and more complex supply chains for manufactured and retail goods.

The following table shows the predicted goods vehicle growth in the TTM in key locations. Modelled growth is highest on the key state highway corridors of TEL, TNL and Takitimu Drive.

Location		Total 2018 to 2043		
	2018 Total Vol	Total	%PA	CGR
TEL	1500	203%	8%	5%
Hewletts Road	4500	25%	1%	1%
Maunganui north of Golf Rd	1000	43%	2%	1%
Harbour bridge	6900	22%	1%	1%
Takitimu drive	2600	112%	4%	3%
TNL	2964	165%	7%	4%
SH2 north of TNL	2700	58%	2%	2%
SH29 Kaimai	2300	56%	2%	2%
SH29a Maungatapu	2900	62%	2%	2%
			Ave	2%

Based on comparison of modelled TTM growth in the business as usual scenario and the predicted change in freight movement identified in this study there is no apparent reason to change the way TTM predicts future freight volumes.

With a large port and potentially strong growth in export industries outside the region, there is potentially a case to estimate port HCV movements more specifically in the model. This would account for growth outside the Western Bay that is linked with the port but not reflected in growth within the Western Bay. Growth in port volumes has surpassed population growth in Tauranga for the last five years for example (around 6% vs around 4%). Supplementary scenarios could consider very high growth in new industries such as water bottling generating high volumes of truck movements to and from the port. This would however potentially still have a relatively minor impact, especially at the strategic model level, considering the contribution of port traffic to total freight and the relatively small proportion of freight in total traffic volumes. However, it warrants testing given the uncertainty about possible disruptors.

The scenarios that may warrant testing within the TTM arising from this study are:

- A scenario where freight movement between zones in the east (Te Puke area and external trips) and the Port of Tauranga Totara Street and Sulphur Point zones are increased to reflect increased growth in kiwifruit, aquaculture and water bottling. This would be a high freight growth scenario test rather than a forecast. The change in trips to and from the Port of Tauranga zone and the east could be in the order of 300 additional movements per day.
- A scenario where the number of trains per day using the rail network in Tauranga to access the port is increased by 10 trains per day (around 25%). This may need to be modelled using the Tauranga Transport Hybrid Model (TTHM) to understand the impact of increased level crossing movements on road capacity at peak times.
- Lastly a possible major disruptor that may be worth considering in a transport model scenario would be the closure of Port of Auckland and redistribution of freight to Northland and Tauranga, as summarised in this report this could have a significant impact on freight movement in the Bay of Plenty.

8 Conclusions

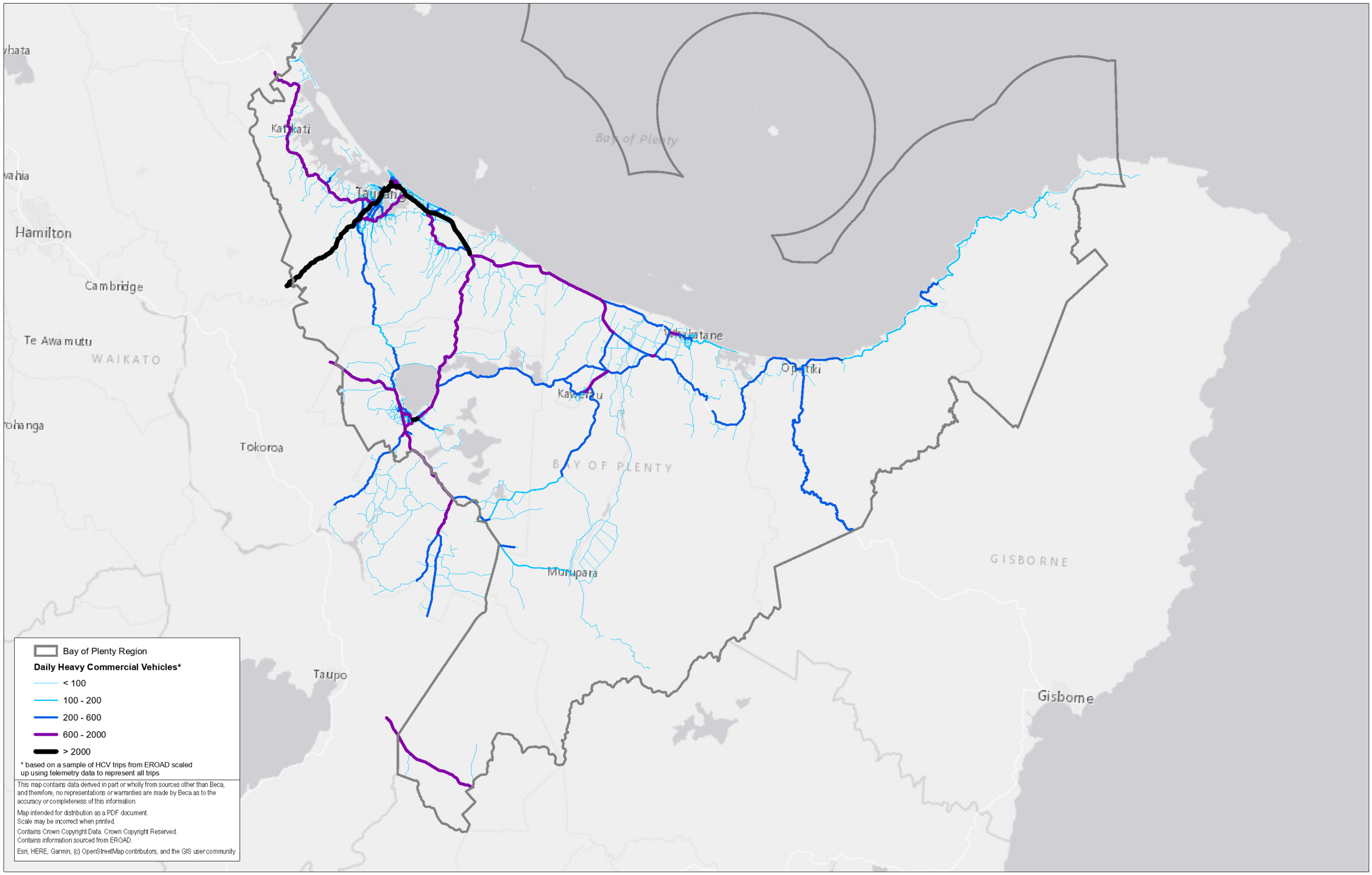
Freight movements into the Bay of Plenty region are dominated by the movement of logs and timber products either for direct export or for processing within the region before export. There are also substantial flows of milk and dairy products inbound primarily for export and also outbound flows of other agricultural products mainly imported cattle feed. Manufactured goods flow in both directions reflecting the role of the Port of Tauranga in the supply chains for imports to and exports from Auckland.

In future it is likely that the growth in many of the bulk agricultural products which have driven much of the increase in port traffic will be limited and this will tend to depress overall rates of growth in freight movements into the region. However, offsetting this, it is likely that increasing supply chain complexity and the growth of construction activities reflecting the relatively high population growth in the urban areas will continue to lead to higher growth rates in these areas. Production of high-quality horticulture and aquaculture developments will contribute to locally produced flows. Growth in commercial vehicle movements is anticipated to be higher around the Tauranga urban area and in particular on routes to and from the port.

There are several possible disruptors that could change the business as usual outcome. Of these higher growth in exports from the east by road and a high shift to rail (to examine the impact on level crossings in particular) are recommended for further TTM analysis.

A

Appendix A – Report Maps



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4	BGP	KRH2	CMR	05/02/2020
3	HEC	DRAFT	DRAFT	08/10/2019
2	BGP	DRAFT	DRAFT	06/09/2019
1	HC7	DRAFT	DRAFT	30/08/2019

Title:

UFTI Freight Demand Study

Aggregated Heavy Commercial Vehicles Trip Data August 2018

Bay of Plenty Region

Client: Bay of Plenty Regional Council, Tauranga City Council and NZ Transport Agency

Project: UFTI Regional Freight Flows

Beca

Discipline: GIS

Drawing No: GIS-3812261-01
Page 1 of 4

GIS@beca.com

Okere Falls
Hamurana
Lake Rotoiti
Mourea
Lake Rotoiti
Lake Okataina
Tikitere
Ngongotaha
Lake Rotorua
Mamaku
Fairy Springs
Hannahs Bay
Western Heights
Pukehangi
Owhata
Lynmore
Glenholme
Springfield
Tihiotonga
Lake Okareka
Lake Okataina
BAY OF PLENTY
WAIKATO
Lake Tarawera
Lake

Bay of Plenty Region

Daily Heavy Commercial Vehicles*

- < 100
- 100 - 200
- 200 - 600
- 600 - 2000
- > 2000

* based on a sample of HCV trips from EROAD scaled up using telemetry data to represent all trips

File: \\beca.net\projects\77\77-GIS-WL\GIS\3812261\TGI\01 Map\BoP_Freight_Heatmaps.aprx Author: BGP Date: 05/02/2020

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Kilometres

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3	HEC	DRAFT	DRAFT	08/10/2019
2	BGP	DRAFT	DRAFT	06/09/2019
1	HC7	DRAFT	DRAFT	30/08/2019

Title:

UFTI Freight Demand Study

Aggregated Heavy Commercial Vehicles Trip Data August 2018

Rotorua

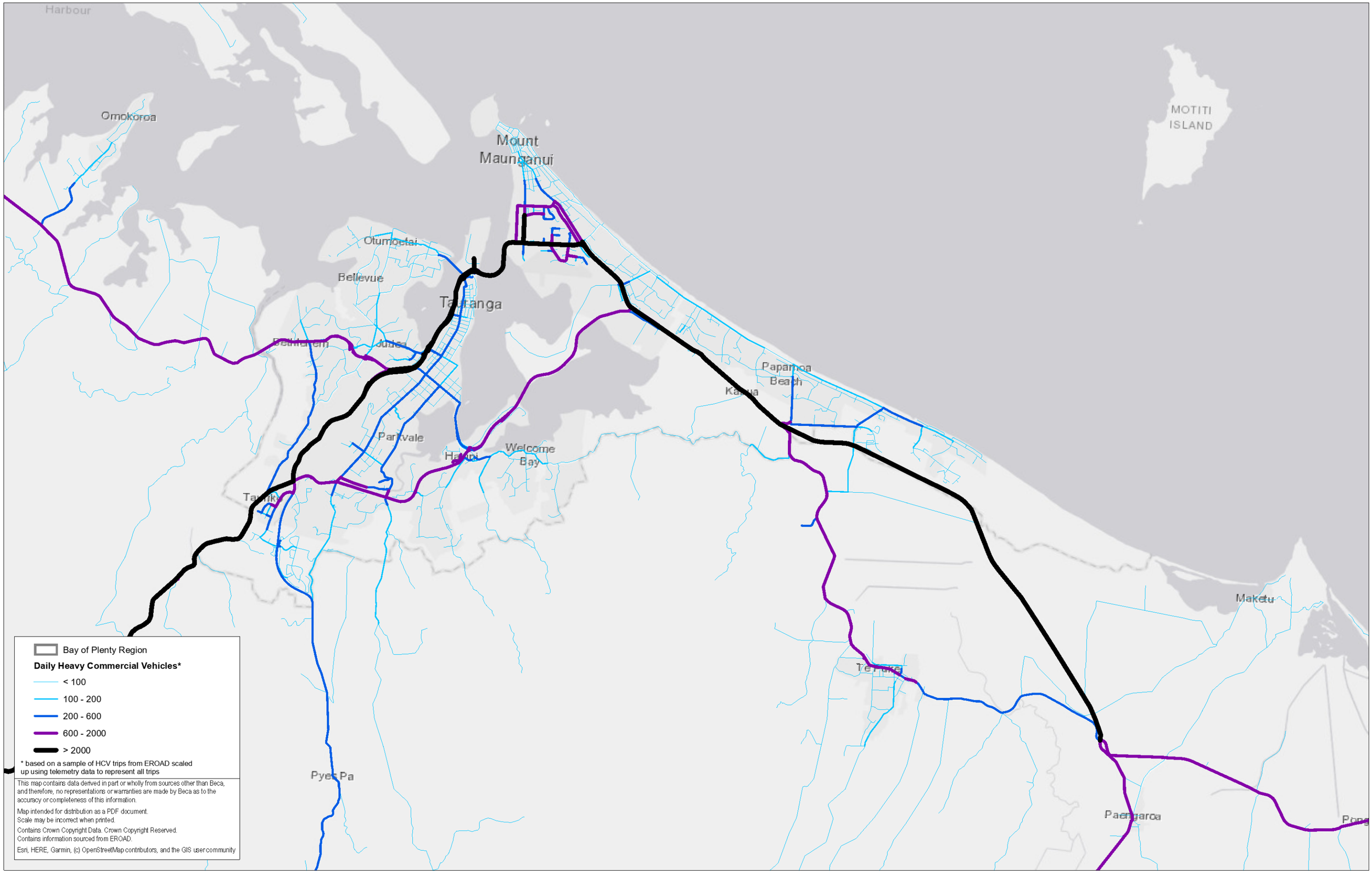
Client: Bay of Plenty Regional Council, Tauranga City Council and NZ Transport Agency

Project: UFTI Regional Freight Flows

Beca

Discipline: GIS

Drawing No: GIS-3812261-01



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Kilometres

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3	HEC	DRAFT	DRAFT	08/10/2019
2	BGP	DRAFT	DRAFT	06/09/2019
1	HC7	DRAFT	DRAFT	30/08/2019

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UFTI Freight Demand Study

Aggregated Heavy Commercial Vehicles Trip Data August 2018

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Project: UFTI Regional Freight Flows

Beca

Discipline: GIS

Drawing No: GIS-3812261-01

Page of 0

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Mount Maunganui

Tauranga Harbour

Otumoetai

Tauranga

Tauranga Airport

Bay of Plenty Region

Daily Heavy Commercial Vehicles*

- < 100
- 100 - 200
- 200 - 600
- 600 - 2000
- > 2000

* based on a sample of HCV trips from EROAD scaled up using telemetry data to represent all trips

File: \\beca.net\projects\777\777-GIS-WLG\3812261\TGI\01 Map\BoP_Freight_Heatmaps.aprx Author: BGP Date: 05/02/2020

Map Scale @ A3: 1:21,000

0 0.5 1

Kilometres

N

Revision	Author	Verified	Approved	Date
4	BGP	KRH2	CMR	05/02/2020
3	HEC	DRAFT	DRAFT	08/10/2019
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Title: **UFTI Freight Demand Study**
Aggregated Heavy Commercial Vehicles Trip Data August 2018

Client: **Bay of Plenty Regional Council, Tauranga City Council and NZ Transport Agency**

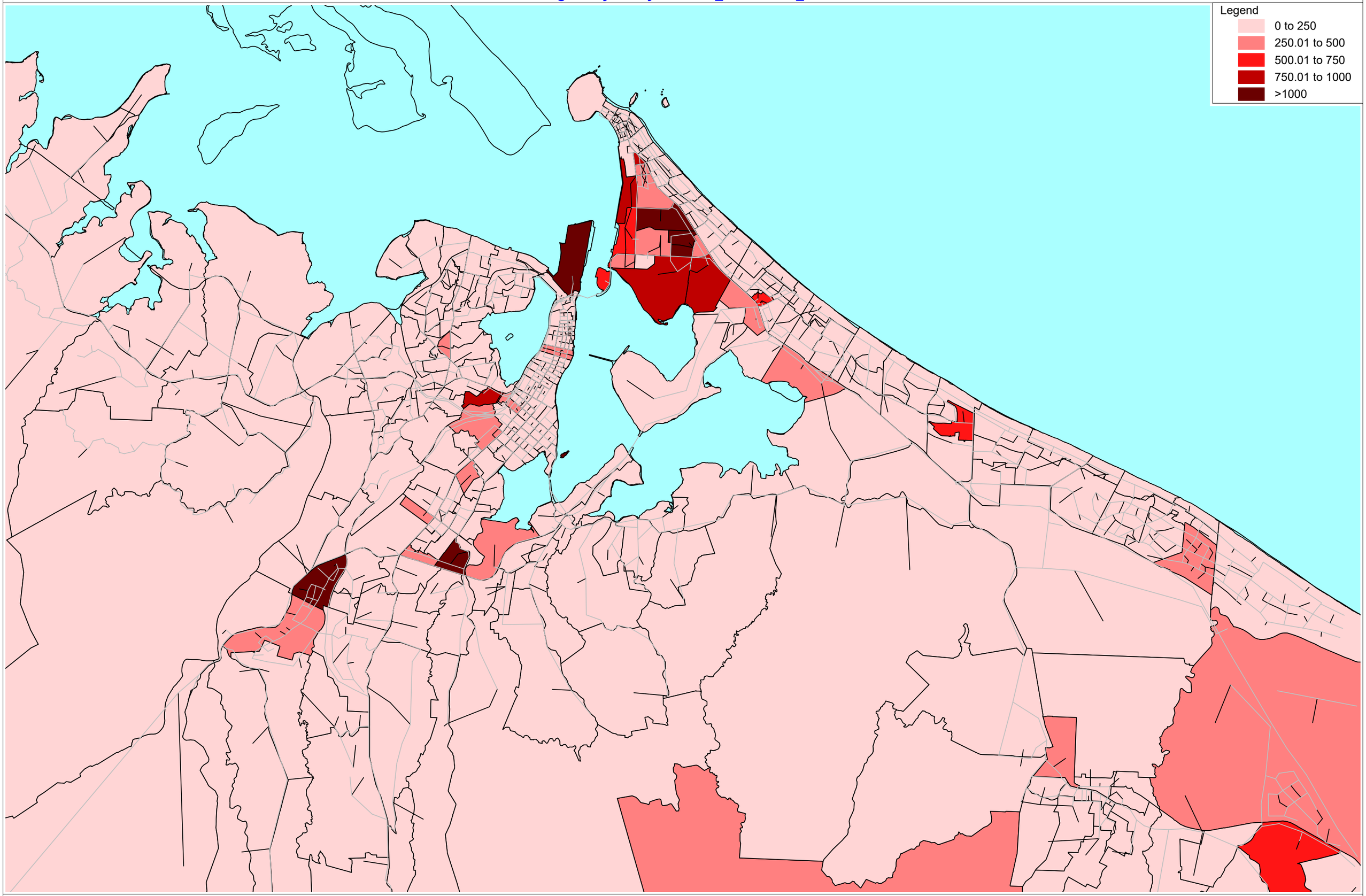
Project: **UFTI Regional Freight Flows**

Beca

Discipline: **GIS**

Drawing No: **GIS-3812261-01**
Page of 0

Average Daily Heavy Vehicles_Production_Y2018



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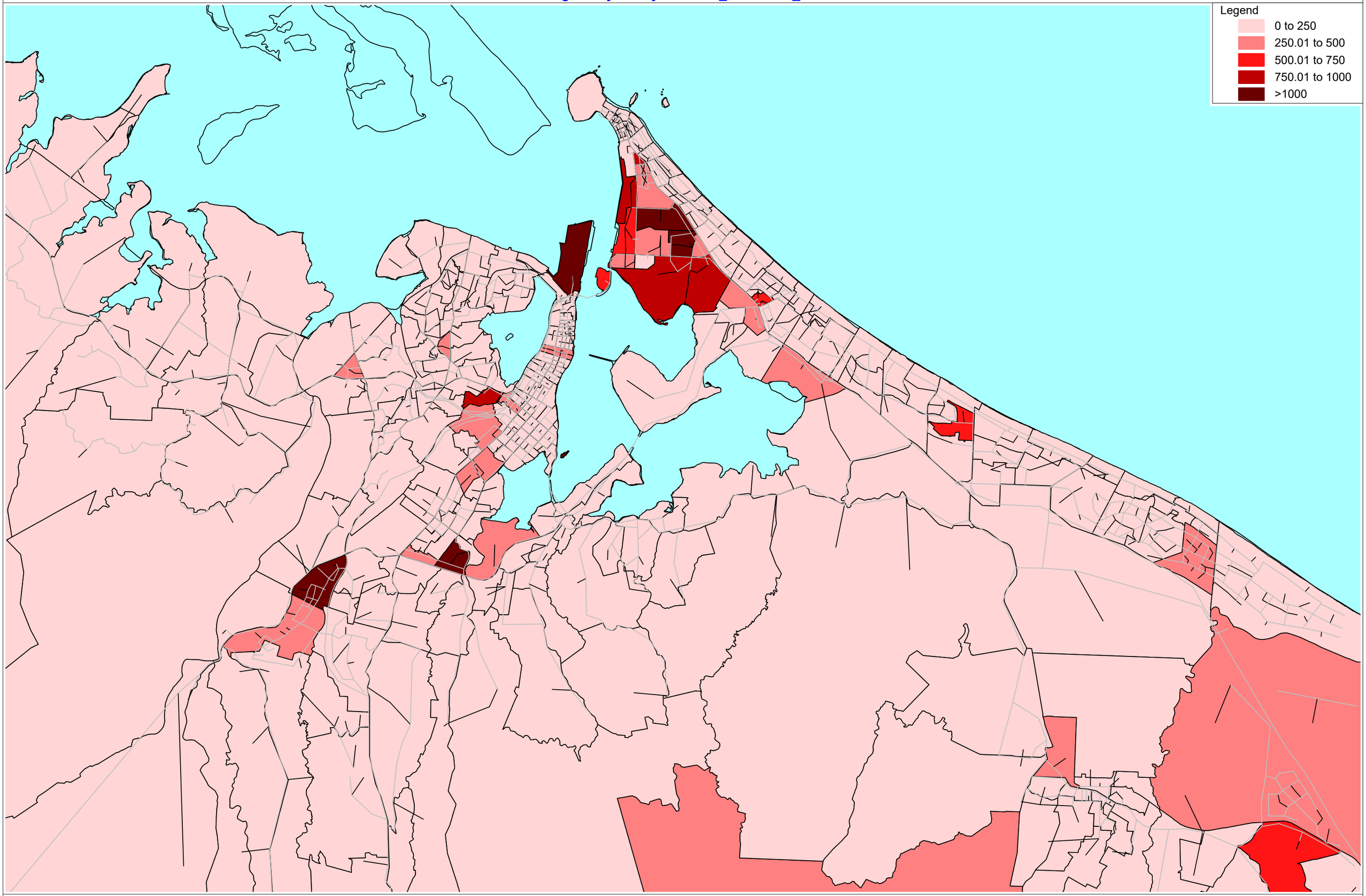
Average Daily Heavy Vehicles_Attraction_Y2018



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2018 AADT
Heavy vehicles

KATIKATI

MT MAUNGANUI

PAPAMOA

TAURANGA

MATAMATA

TE PUKE

WHAKATANE

KAWERAU

ROTORUA

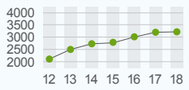
TOKOROA

Takitimu Drive
Heavy Vehicle Growth 2012-2018

3,166 Heavy vehicles per day in 2018

41.0%

HCV Volume Trend

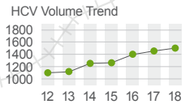


Te Puna
Heavy Vehicle Growth 2012-2018

1,457 Heavy vehicles per day in 2018

23.4%

HCV Volume Trend

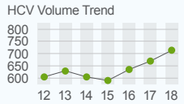


Paengaroa
Heavy Vehicle Growth 2012-2018

724 Heavy vehicles per day in 2018

24.8%

HCV Volume Trend

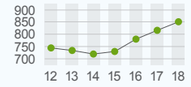


Ohinepanea
Heavy Vehicle Growth 2012-2018

845 Heavy vehicles per day in 2018

11.5%

HCV Volume Trend

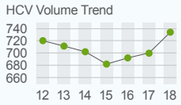


Awakeri
Heavy Vehicle Growth 2012-2018

737 Heavy vehicles per day in 2018

2.4%

HCV Volume Trend

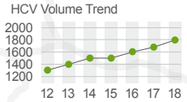


Kaimai
Heavy Vehicle Growth 2012-2018

1,833 Heavy vehicles per day in 2018

39.1%

HCV Volume Trend

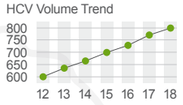


Tarukenga
Heavy Vehicle Growth 2012-2018

750 Heavy vehicles per day in 2018

25.2%

HCV Volume Trend

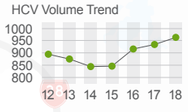


Waipa
Heavy Vehicle Growth 2012-2018

964 Heavy vehicles per day in 2018

8.8%

HCV Volume Trend

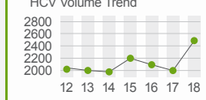


Te Ngae
Heavy Vehicle Growth 2012-2018

2,444 Heavy vehicles per day in 2018

17.8%

HCV Volume Trend

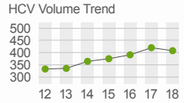


Lake Rotoma
Heavy Vehicle Growth 2012-2018

400 Heavy vehicles per day in 2018

16.3%

HCV Volume Trend



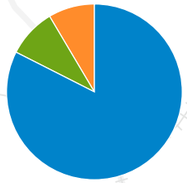
Key:

- State Highway
- Rail Line
- Monitored heavy vehicle locations

Key freight movements and generations in the Bay of Plenty

General freight to/ from Auckland via State Highway 2

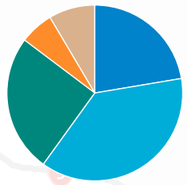
SH2 North



- Logs and timber products
- Manufactured goods
- Kiwifruit

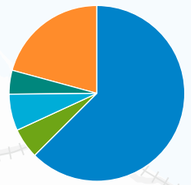
General freight to/from Auckland & Waikato

SH29 Kaimai



- Logs and timber products
- Manufactured goods
- Kiwifruit
- Building materials and fertiliser
- Petroleum

SH2 East (TEL)



- Logs and timber products
- Agricultural products
- Manufactured goods
- Kiwifruit
- Building materials and fertiliser

Key:

- Agricultural products
- Kiwifruit
- Logs and timber
- Horticulture
- Dairy
- State Highway
- Rail Line

KATIKATI

MT MAUNGANUI

PAPAMOA

TAURANGA

TE PUKE

WHAKATANE

KAWERAU

ROTORUA

TOKOROA

Exports to Tauranga, general freight to/from Gisborne via State Highway 2

2043 Estimated AADT

Heavy vehicles

Takitimu Drive
Estimated Heavy Vehicle Growth 2018-2043

5,500
Heavy vehicles per day in 2043

74%

HCV Volume Trend
5500
3000
2018
2043

Te Puna
Estimated Heavy Vehicle Growth 2018-2043

4,000
Heavy vehicles per day in 2043

63%

HCV Volume Trend
4000
1400
2018
2043

SH2 South
Estimated Heavy Vehicle Growth 2018-2043

1,170
Heavy vehicles per day in 2043

38%

HCV Volume Trend
1200
800
2018
2043

Kaimai
Estimated Heavy Vehicle Growth 2018-2043

3,000
Heavy vehicles per day in 2043

64%

HCV Volume Trend
3000
1800
2018
2043

SH33 South
Estimated Heavy Vehicle Growth 2018-2043

850
Heavy vehicles per day in 2043

18%

HCV Volume Trend
850
720
2018
2043

KATIKATI
MT MAUNGANUI
PAPAMOA
MATAMATA
TE PUKE
WHAKATANE
ROTORUA
KAWERAU
TOKOROA

Key:
- State Highway
- Rail Line
- Monitored heavy vehicle locations

B

Appendix B – Notes from Stakeholder Meetings

Urban Form & Transport Initiative Regional Freight Flows Study

Meeting notes for regional Rotorua and Eastern Bay of Plenty

Meeting: Wednesday 11 Sep 2019, 11-12pm, Bay of Plenty Regional Council offices Whakatane

Attendees:

Bron Healey	Bay of Plenty Regional Council
Ann-Elise Reynolds	Whakatane District Council
John Glabraith	Freight Logistics Action Group
Rex Humpherson	Opus Whakatane
Hanno Vander Merwe	Kawerau District Council
Peter Dine	Rotorua Lakes District Council
Craig Richards	Beca
Krish Singh	Beca
Apologies:	Martin Taylor - Whakatane District Council
	Ari Erickson – Opotiki District Council

1 Purpose

The intent of the information and data gathering is to inform the teams understanding of the existing situation and potential changes to freight movements within the region and through the region. This also extends to the way in which freight is transported (road and rail), and the generation of new types of freight and commodities.

The group identified the following key freight and commodity types for discussion:

- Forestry - including logs, timber products, pulp and paper
- Dairy
- Horticulture – kiwifruit etc
- General freight – includes supplies to building development, petroleum, fertilizer, cement, products etc
- Rock aggregate
- Aquaculture (A potential future contributor)
- Water (A potential future contributor)

1.1 Data Available

John Galbraith has several data sets and Ann-Elise Reynolds can provide additional information on volumes in the district, plus information with regard to current and new quarries coming on-line.

Much of the 2014 forecast in the region still holds – just need to account for variables like forestry maturity and market prices.

2 Current State

2.1 Forestry

There is a mix or on and off-road networks that support logging between Kawerau and Murapara. Logging further around the East Coast is dependent on the market, specifically the demand for these logs are based on exchange rate. The Manawahe (?) region is significant in terms of volume and rotation.

North of Whakatane and are planted in 1990's and will be ready 2020-2030. John has data on the forestry, and also details on the Gisborne route.

Whakatane Mill Board and particle board.

Matawai is about the cut off for logging freight to either PoT or Gisborne.

General acceptance that just outside of Opotiki to the east running through towards Whakatane that there are changes as Kawerau processing 12% of the particle board.

Logging is estimated at seven trips per day. Constraints with logging by rail will be capacity (areas for double tracking) and the loading and unloading requirements at the Port of Tauranga and Kawerau. Log movements are not time constrained.

Rotorua remains a road transport hub for logging with several haulage operators.

Constraints include the off-road network and the availability, and the transfers and links onto the State Highway network.

Transportation to Whakatane Board Mills via Rotorua. There is also a volume of logs that travel in both directions between Rotorua and Taupo. This can be dependent on the harvesting operations in the sub-region and includes movements through State Highway 30. State Highways 30 and 38 remain attractive for forestry as these are not as 'winding'.

WDC and RDC to provide traffic count data for roads that carry a high % HCV.

2.2 Dairy

Farms in the region are supported by both Reporoa and Edgecumbe dairy factories.

Water regulations – related legislation will make it tough for dairy conversions into the future.

Suggestion that Fonterra is contacted. Fonterra own GPS data run through trucks (possibly already on e-Road data sets)

Some dairy will be transported west across to Te Awamutu as Fonterra's pants are specialised. High transfer volumes can occur.

2.3 High Value Horticulture - Kiwifruit

Rangitaiki plains / Te Kaha / Ruatoki areas identified as future locations for further growth in kiwifruit. Subject to seasonal freight movements.

Future focus, where the Kawerau Inland Terminal progresses then this will change the way in which internal freight movement could occur. Suggesting that packhouse location will be critical to how/where the containerisation of kiwifruit takes place. Break bulk then once containerised railed from Kawerau to Port of Tauranga.

2.4 Rock Aggregate

There are several quarry's in the sub region that are existing, and between 2-4 that have either been re-activated or the establishment of new quarries.

To date supply has been received from out of the district and region. It is expected that work in Opotiki to support the harbour (estimated 0.5 M tonnes) will require solid supply for the next 2.5-3 years period. Other locations will require significant rock supply. Also, the range or roading and resilience-based projects will continue to create demand for locally sourced material.

Quarries identified -

- Waitohi
- Swaps
- 2 x Awakeri
- Ruatoki
- Taneatua Road Quarry
- Manahei (?) - new quarry
- Ruatoki – new quarry
- 2 x Matahina new quarries
- Galatea road

Introduction of new quarries will reduce the existing requirement for out of region aggregate to support the local demand.

Likely that any infrastructure and roading projects through to Gisborne would lean on supply in this region.

Within the Rotorua region the Henderson's and Awakeri quarries supply fill and aggregate. Rainbow Mountain supplies high quality aggregate. Aggregate has often been sourced from Taupo and Te Puke (Poplar Lane).

2.5 Aquaculture

Currently there are lower volumes (estimated 4,000T per annum) and is primarily Opotiki based activity. Transportation movements are largely within the sub-region to supermarkets and onto Port of Tauranga. Frozen mussels time sensitive, other products not.

3 Future Changes

3.1 Forestry

The harvesting of forestry will continue, and this is partially due to the 1 Billion Trees programme. It is expected that replanting will occur in the North of Whakatane with the harvesting to occur in 2020-2030.

A vast nursery at Minginui has been established and will support the 1 Billion Trees programme. It is likely that areas of non-productive iwi-land remains suitable for the investment and support of this programme.

Growth and demand in the wider region has led to expansion of mills in the Rotorua (Redstag and Waipa) and Whakatane region, These 'SuperMills' will produce products like cross laminate timber (CLT), sawn timber and logs.

3.2 Dairy

Not expected to be significant conversion to dairy. More likely to go the other way toward horticulture. Some forestry could be converted to pastoral – depending on wood prices.

3.3 High Value Horticulture – Kiwifruit

The signal from the group is that the lower flats around the Rangitaiki sub-region are ideal for the production of kiwifruit. There are several locations between Whakatane and Tauranga that have already been converted and prepared for kiwifruit.

Packhouses in the immediate Eastern Bay have indicated they have sufficient capacity for projected growth over the next 5-10 years.

Large Iwi developments in Te Kaha, Omaio and Raukokore.

3.4 Rock Aggregate

The new quarries in the region are estimated to supply 100-200,000T of aggregate.

3.5 Aquaculture

It is estimated that the enabling of the Opotiki Harbour and investment into aquaculture with mussel farming and other adjacencies would see an increase to 50,000T in the next 20 years. Substantial increase in volumes for time sensitive export product to Tauranga.

3.6 Water

There are two bottling plants identified within the Eastern Bay of Plenty. It is expected that the manufacture and export of water could generate more than 200 truck movements per day. Options around the shift to rail to be confirmed as both plants are close to existing rail infrastructure.

3.7 Others

Manuka honey, dropping off a bit.

Rail to Rotorua not part of current plans.

4 Local Environment

4.1 Transport Companies

Transport companies as part of the business operations are considering their fleet size and capacity and what the implications are on Heavy Vehicle Commercial's (HVC) especially on local rural roads.

The importance here is that anecdotally across New Zealand, transportation makes up 40% of the construction-based activities. This can present an unintended consequence of enabling greater

economic growth in regions where part of the access may not allow for this type of transportation use.

Bridge capacity is a key constraint. There is a strong preference to use the HVC's as often as possible and not be constrained by road restrictions. Within the Whakatane District Council, there are two bridges that are not able to carry 50T max vehicles and eight bridges that are unable to receive HPMVs. There are two instances within the Rotorua district where 50T max vehicles are unable to cross bridges.

4.2 Kawerau Inland Container Port

The role of the Kawerau Inland Container Port will provide opportunities in the region to consider changes in road transport options. The expectation is that the introduction of the Inland Port and the addition of a rail alternative that this will reduce up to 70,000 truck movements per annum. The majority of the freight movements will be to the container terminal Tauranga side of the port operations, with a smaller portion to Hamilton and Auckland.

The impact of the Inland Port will change how and where breakbulk and containerisation occurs and has the potential to encourage general freight operators to base themselves closer to this port operation. It will also change the internal movements and patterns along the contributing east-coast as high-value horticulture and aquaculture come online.

A feasibility report was completed recently, and the container terminal design prepared. It is expected that this will be ready and in operation by mid-2020.

It is realistic that several of OJI-based products would shift from road to rail..

Beca contacting Fonterra, Oji, Balance, Priority One and Port of Tauranga

Freight study draft report expected around the end of October, will be circulated for information and comment.

Urban Form & Transport Initiative Regional Freight Flows Study

Meeting notes for Provincial Growth Fund

Meeting: Wednesday 18 Sep 2019, 1-2pm, Te Puni Kokiri offices Tauranga

Attendees:

Jocelyn Mikaere	PGF Regional Manager
Bron Healey	Bay of Plenty Regional Council
Krish Singh	Beca

5 Purpose

The Provincial Growth Fund established in late 2017 is part of the current coalition government's response to lift economic growth in the regions. As a result there have been several applications that have funding approved to support the development of business and industry, primarily in the Eastern Bay of Plenty and Rotorua district. There has been two applications in the Western Bay of Plenty.

5.1 Data Available

The Provincial Growth Fund regularly lists the approved applications and application amount. This can be found here:

https://www.growregions.govt.nz/about-us/funded-project-announcements/

6 Current State

6.1 Eastern Bay of Plenty

No significant changes or new applications lodged that were different to the current understanding based on the data above.

6.2 Kawerau Inland Container Port

The role of the Kawerau Inland Container Port will provide opportunities in the region to consider changes in road transport options. The expectation is that the introduction of the Inland Port and the addition of a rail alternative that this will reduce up to 70,000 truck movements per annum. It is expected this will scale up overtime.

The impact of the Inland Port will change how and where breakbulk and containerisation occurs and has the potential to encourage general freight operators to base themselves closer to this port operation. It will also change the internal movements and patterns along the contributing east-coast as high-value horticulture and aquaculture come online.

A feasibility report was completed recently, and the container terminal design prepared. It is expected that this will be ready and in operation by mid-2020.

Urban Form & Transport Initiative Regional Freight Flows Study

Meeting notes for Priority One

Meeting: Thursday 19 Sep 2019, 3-4pm, Beca Offices

Attendees:

Bron Healey	Bay of Plenty Regional Council
Greg Simmonds	Priority One
Nigel Tutt	Priority One
Mark Irving	Priority One
Krish Singh	Beca

7 Purpose

Priority One is the Western Bay of Plenty's economic development agency. In there recent strategy the key focus areas are:

- Lifting the income levels in the sub-region
- Establishing a high growth economy
- Attracting the right talent (currently there is a shortfall)
- Developing the right environment to lift number of Maori youth into jobs
- Sustaining prosperous city

The group shared the following industries that they are placing focus around:

- Innovation based technology into the existing industry groups
- Horticulture
- Transport and logistics
- Research and Development capability
- Attracting new business to the region who would benefit from better access to the Port, and

8 Future State - Summary

8.1 Port

Port of Tauranga will experience an increase in both imports and exports. The expectation is that Auckland will account for 40% of the distribution from the Port. With the size of vessels coming to New Zealand and the phasing out of smaller vessels, the view is that into the future there will be less of a requirement for break bulk at the Port. This may drive how freight in the future is prepared/received and transported to/from the Port destination. Expectation is that containerisation will continue to grow.

Observation that the intensity around the golden triangle will amplify the constraints with the Kaimai Tunnel and roading across the Kaimais on SH29.

General view is that the multi-modal road/rail is cost prohibitive currently. The view of the Kawerau Inland Port is that there would need to be significant additional changes and demand to be viable, and so this may come at a cost to another sub-region perhaps.

8.2 Land

The availability and accessibility of industrial and commercial light land remains a constraint. The business development view is that there is a scarcity of 9/10/12 acre sites close to transport hubs or on good transport routes within the Western Bay of Plenty.

Significant requirement for land to be developed west.

Consenting at Rangiruru completed. The rail spur effectively sits on the wrong side to support an effective transport (road/rail) hub, and observations were there was limited value given the close proximity to the Port.

The housing development is not meeting the housing requirement in the region, therefore more land needs to be developed West, East to support. Intensification along Te Papa also an area of focus.

Raised airport land in the future.

8.3 Horticulture

With the demand and proposed expansion of high value horticulture (kiwifruit) the observation is that this will change the current way in which the commodity is handled, especially in the transport planning and greater use of containerisation. Key question is where can/will this occur into the future

8.4 General Freight

Increasing level of attraction in the food and beverage industry in the region. This links closely with the introduction of high technology and innovation to support R&D, manufacture and processing. No change in the expectation of continued growth and impact on the construction sector, and this also covers the immediate need for social infrastructure (schools).

8.5 New Industry

Identified Hydrocarbon and Waste Management were two areas that will possibly have an impact on freight movements into the future.

Urban Form & Transport Initiative Regional Freight Flows Study

Meeting notes for Waipa DC

Meeting: Thursday 19 Sep 2019, 1-2.30pm, & Friday 20 Sep 2019 by Phone

Attendees:

David Totman	Planning Manager, Waipa DC
Bryan Hudson	Transport Planning Manager, Waipa DC
Krish Singh	Beca

9 Purpose

The intent of the information and data gathering is to inform the teams understanding of the existing situation and potential changes to freight movements within the region and through the region. This also extends to the way in which freight is transported (road and rail), and the generation of new types of freight and commodities.

The group identified the following key freight and commodity types for discussion:

- Forestry - including logs, timber products, pulp and paper, this is limited
- Dairy, primarily based on the two factories (cheese and milk powder)
- General freight – includes supplies to building development, petroleum, fertilizer, cement, products etc, includes agriculture
- Rock aggregate, and sand

9.1 Data Available

Bryan advised Beca would have access to the transport and trip data.

More broadly, the Waikato Economic Development group was referenced as it provides an indication of the future for the region.

10 Current State

10.1 Forestry

Seasonal harvesting occurs within the region, and due to volume this has limited influence on the networks and highways (predominantly SH29). Kawhia and Pirongia Mountain in the West are the primary locations.

10.2 Dairy

A mature industry within the region. Fonterra is the primary operator in the region. Majority of the products manufactured (cheese and milk powder) are exported through the Port of Tauranga. Fonterra receives milk product from outside of the district.

Into the future, the region is observing the following:

- Growing interest in Chinese firms looking at dairy manufacturing niche products and processing opportunities in the region.
- Possibility that Fonterra's operation containerises at a hub/stores then seeks to use rail to move to the Port.
- Dairy sector is moving south, and more dry stock inevitable given the environmental issues.

10.3 General Freight

There is an amount of general freight that typically leave the district towards the Bay of Plenty. These commodities outbound include:

- Palm kernel
- Construction materials, including aluminium and glass
- Small amount of agriculture

Receiving inbound:

- Petroleum
- Fertilizer
- General goods imported from the Port

10.4 Rock Aggregate

There are several quarry's in the sub region that are existing, the main two are Karapiro and Whitehall Road, both have links to SH1. High quality greywacke is transported to the Bay of Plenty for chipseal and road building aggregate for asphalt. There remains a large quantity.

New consents for sand quarry west of Te Awamutu - estimated 2M tonnes at this location, with additional quarry with an estimated 5M tonnes of sand, consent through to 2040. Uses include concrete, specialist concretes and pebbles to support the construction industry.

11 Future State

The region is supporting significant and accelerated growth to both the Waikato and Bay of Plenty regions, with a shift out of the Auckland region.

Central government has identified Waikato to resolve Auckland's growth issues. This includes the re-awakening of the rail North South passenger services. The inclusion of continued roading upgrades, Hamilton to Auckland project and the Waikereao Prison will create a demand for rock aggregate. Expectation from central government is for Hamilton to plan towards being a 0.5M people city.

There is no desire to freight by rail outside of Hamilton-based hubs and existing freight centres. However rail designations still remain in place, and these are reserved for passenger services as part of a broader move to public and passenger transport, and relieve congestion between WDC and Hamilton City.

Cambridge is becoming more accessible and desirable place to live. Significant growth in young families, and baby boomers down-sizing. This is leading to increase in the housing and construction

sector. This will also reflect in an increase in general freight movements to and from the Bay of Plenty.

Expect a continued increase in the movement of freight through the golden triangle.

12 Local Environment

12.1 Constraints

Transport companies as part of the business operations are considering their fleet size and capacity and what the implications are on Heavy Vehicle Commercial's (HVC) especially on local rural roads.

The importance here is that anecdotally across New Zealand, transportation makes up 40% of the construction-based activities. This can present an unintended consequence of enabling greater economic growth in regions where part of the access may not allow for this type of transportation use.

The Kaimai access SH29 there still remains a level of congestion and not an ideal route given the limited dual carriageway. There is an opportunity to use the rail better.

Bridge capacity remains a constraint. There are three/four bridges across the Waipa district that have been identified as challenges for predominantly general freight and dairy movements. These include:

- Hora Hora bridge top end of Karipiro has a 44T weight limit
- Karipiro Damn, one-way bridge that can take 3T weight limit
- Shakespeare Street Bridge (in Cambridge), key bridge for Cambridge commuter traffic and all freight south and Te Awamutu to Port. 110years old and needs replacement (3T weight limit)

12.2 Inland Container Ports

The role of the Ruakura Inland Container Port will assist in the movement of freight by rail. Observations are that this is slow in progressing.

Port of Auckland's Horatiu inland port situated north of Hamilton is proceeding at pace and located next to Kiwirail's North South trunk line.

Urban Form & Transport Initiative Regional Freight Flows Study

Meeting notes for OJI Lodestar

Meeting: Friday 20 Sep 2019, 12-1pm, OJI Lodestar office

Attendees:

Pete Mattock	National Transport Manager, OJI Lodestar
Krish Singh	Beca

13 Purpose

The intent of the information and data gathering is to inform the teams understanding of the existing situation and potential changes to freight movements within the region and through the region. This also extends to the way in which freight is transported (road and rail), and the generation of new types of freight and commodities.

OJI Lodestar utilises a trucking fleet of 900 nationwide. Within the Bay of Plenty, the group's primary freight groups are:

- Packaging for exports – specifically kiwifruit, avocados and stone fruit
- Recycled fibre
- Chip
- Freight in and outbound to Whakatane Board Mills
- Kawerau Pulp and Paper
- Ply-mill chip inbound to Kinleith
- Treatment transfer between Kawerau and Kinleith
- Spec boards and packaging

They are one of the larger employers and their network spans 80 sites. Frequency and volumes have not significantly changed. Below is a partial snapshot on information and transport figures for the region.

Start	Destination	Commodity	Frequency
Kawerau	Kinleith	Timber	20x Daily
Kawerau	Port	Timber	70x Daily
Kinleith	Across NZ	Ply	40x Daily
Levin	BoP	Packaging Material	4x Daily

Auckland	BoP	Packaging Material	4x Daily
Kawerau	Kinleith	Chip / Hog	15x Daily
Kawerau/Kinleith	Taupo	Wood Pellets	15x Daily
Kawerau	Rotorua / Taupo SuperMills	Timber	20x Daily
Whakatane Board Mills	Port	Packaging Board (Cardboard)	12-15x Daily

Movement to/from Tokoroa identified, but no information available in terms of frequency.

A majority of the fleet are HPV and at 62T. This enables efficiencies through the Kawerau to Kinleith run, and Kinleith to the Port runs. Majority of roads allow for the 62T fleet.

Constraints include a drain at Matata that cannot take the 62T HPV, this means the shortest route from Whakatane to the Port cannot be taken.

Tolling was raised as an issue (cost) on the East West Connection.

14 Current State

14.1 Forestry

This remains the primary source for OJI Lodestar transported within the region. Products are listed above and includes movements from site to Port, and between sites, particularly Kawerau and Kinleith. There is little inbound to the region, the exception is packaging from Auckland and Levin.

14.2 Port Activity

Shared a similar view to Priority One, in that an increase in vessel size coming to New Zealand and the phasing out of smaller vessels, the view is that into the future there will be less of a requirement for break bulk at the Port. This may drive how freight in the future is prepared/received and transported to/from the Port destination. Expectation is that containerisation generally will continue to grow. We are seeing containerisation of logs at the Port.

More broadly, there continues to be planning around strategically located inland ports subsidised by Auckland and or Tauranga port companies within the golden triangle. View that between Auckland and Hamilton these inland ports will continue from Wiri, Penrose and Horatiu.

Felt that the Rangiruru industrial park may have limited rail activity, primarily due to time and transfer costs involved. Kawerau and Kinleith to port volumes remain high.

14.3 Forestry – Pulp and Paper

Observation is that changes in this industry overtime may reduce the need for manufacture and processing.

14.4 Others

Not raised.

Local Environment - Future

14.5 Need for flexibility

The contingency plans on the road network are limited and existing infrastructure needs to be considered including appropriate permitting to support the future requirements. Overall a preference for larger vehicles to be on the road transporting freight.

Opportunity in time and as greater demand increases for greater integration between road and rail, however the capital and ongoing costs need to be better understood and the supported. Conditions around integration are based on maintaining a level of flexibility and overtime behavioural changes (increase in rail).

14.6 Transport Kawerau Inland Container Port

The role of the Kawerau Inland Container Port will provide opportunities in the region to consider changes in road transport options. An observation is that there needs to be significant demand from industry (including manufacturing) to make this inland port feasible.

Urban Form & Transport Initiative Regional Freight Flows Study

Meeting notes for TKL

Meeting: Monday 21 October 2019, 9-10 am, Beca Office

Attendees:

Ian Mearns	National Manager
Craig Richards	Beca
Krish Singh	Beca

15 Purpose

The intent of the information and data gathering is to inform the teams understanding of the existing situation and potential changes to freight movements within the region and through the region. This also extends to the way in which freight is transported (road and rail), and the generation of new types of freight and commodities.

TKL is responsible for the coordination and collection of export kiwifruit from sites predominantly to the Port of Tauranga. Due to the seasonality of kiwifruit, there is a requirement through the season to ensure that requirements and management through the supply chain are co-ordinated with timing of vessels for export. They are owned and operated under a co-operative based model.

Season is typically March to September with the first 4 months focussed in loading the pipeline with the remaining 4 months.

They have recently undertaken a review for the next ten years. The initial findings highlight continued growth and identify the impact and scale of current key constraints on their networks. A movement from 24,000 to 34-35,000 export loads over the next ten years. Key constraints include three major choke points in terms of getting freight into the Port to meet vessel loading and turn-around times. Operations typically run from 0630-1930 seven days a week during the season.

- Omokoroa at peak times
- Bayfair and Baypark
- Entry to the port via Hewletts Road and Totara Street, Mount Maunganui

Considerations to operate outside if these times is possible, however this places pressure on existing shortage of truck drivers in the region. Deeper concerns around truck driver hours and how this is managed into the future and indicated that there will be changes going forward in order to be sustainable. Currently 45 vehicles in the fleet with an estimated 200 loads per day, with most vehicles completing upto four loads per day from site to Port.

Conscious that if the shipping schedules shifting past the weekly frequency (i.e. ten days or fortnightly), that this will place additional pressure in that double the load in half the time will be required to meet the vessel.

Potential for transporting kiwifruit by rail however logistics around locations, keeping containerised freight on rail refrigerated and that currently there are limited locations close to rail sidings at entry point for this to occur.

Role of technology in the industry and transport sector. Limited as at present it is uneconomical. However opportunity to innovate through use of bus lanes at Mount to be an integrated bus/freight lane. Observed opportunity for technology and innovation to be more present on the growing and packing activities directly, noting that the three largest packhouses are investing in these technologies into the future.

Outside of the region kiwifruit produce will continue in Northland, Eastcoast and Gisborne. Eastcoast and Gisborne will continue at this stage for post harvest and export preparation to continue out of Opotiki and Te Puke.

C

Appendix C – Freight Data

FLOWS FROM BoP

TOTAL FLOWS 2042

	Destination															
0	Northland	Auckland	Waikato	Bay of Pler	Gisborne	Hawke's B	Taranaki	Manawatu	Wellingtor	TNM	West Coas	Canter-bur	Otago	South-lanc	Total	Total exc BoP
Milk	0.00	0.00	0.20	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	0.20
Man dairy	0.00	0.03	0.02	0.12	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.07
Logs	0.00	0.00	0.04	5.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.90	0.04
Timber prc	0.00	1.23	0.18	1.99	0.00	0.04	0.01	0.01	0.03	0.00	0.00	0.02	0.01	0.00	3.51	1.52
Meat	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
Livestock	0.00	0.01	0.08	0.10	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.12
Hort	0.00	0.03	0.00	1.22	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00	1.28	0.06
Wool	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Ag	0.00	0.13	1.15	0.45	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.76	1.31
Fish	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Coal	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
Petroleum	0.00	0.27	0.30	0.80	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40	0.59
Aggregate	0.00	0.00	0.00	2.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.60	0.00
Limestone	0.09	0.05	0.63	0.99	0.02	0.04	0.02	0.09	0.03	0.00	0.00	0.00	0.00	0.00	1.95	0.96
Concrete	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00
Steel + Alu	0.00	0.01	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.0
Man+retai	0.02	1.66	0.18	5.33	0.01	0.03	0.03	0.10	0.08	0.01	0.00	0.32	0.03	0.00	7.79	2.5
Waste	0.00	0.05	0.31	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.4
Other mine	0.00	0.08	0.05	0.16	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.2
Total	0.1	3.5	3.2	23.8	0.1	0.2	0.1	0.2	0.1	0.0	0.0	0.4	0.0	0.0	31.7	7.9
															Total from	From exc BoP
Milk and d	0.00	0.03	0.22	1.34	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60	0.26
Logs and ti	0.00	1.23	0.21	7.86	0.00	0.04	0.01	0.01	0.03	0.00	0.00	0.02	0.01	0.00	9.42	1.56
Other ag	0.00	0.17	1.23	1.85	0.01	0.02	0.01	0.03	0.00	0.00	0.00	0.01	0.00	0.00	3.34	1.50
Coal and P	0.00	0.27	0.32	0.80	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41	0.61
B mat fert	0.09	0.18	0.99	5.97	0.02	0.07	0.04	0.11	0.03	0.00	0.00	0.00	0.00	0.00	7.50	1.53
Manufactu	0.02	1.67	0.18	5.93	0.01	0.03	0.03	0.10	0.08	0.01	0.00	0.32	0.03	0.00	8.41	2.47
Total	0.11	3.54	3.16	23.76	0.07	0.15	0.10	0.25	0.14	0.01	0.00	0.35	0.04	0.00	31.69	7.93

TOTAL FLOWS 2017

	Destination															
0	Northland	Auckland	Waikato	Bay of Pler	Gisborne	Hawke's B	Taranaki	Manawatu	Wellingtor	TNM	West Coas	Canter-bur	Otago	South-lanc	Total	Total exc BoP
Milk	0.0	0.0	0.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.2
Man dairy	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1
Logs	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0
Timber prc	0.0	1.0	0.2	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	1.2
Meat	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Livestock	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1
Hort	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1
Wool	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Ag	0.0	0.1	1.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.3
Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Petroleum	0.0	0.2	0.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.5
Aggregate	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0
Limestone	0.1	0.0	0.4	0.6	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.6
Concrete	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
Steel + Alu	0.00	0.01	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.0
Man+retai	0.02	1.38	0.15	4.30	0.01	0.03	0.02	0.09	0.06	0.01	0.00	0.24	0.03	0.00	6.34	2.0
Waste	0.00	0.03	0.22	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.3
Other mine	0.00	0.05	0.03	0.10	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.1
Total	0.1	2.9	2.7	18.9	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.3	0.0	0.0	25.4	6.5
FLOWS FROM BoP															Total from	From exc BoP
Milk and d	0.00	0.03	0.22	1.37	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63	0.27
Logs and ti	0.00	0.96	0.19	7.08	0.00	0.03	0.01	0.01	0.03	0.00	0.00	0.02	0.01	0.00	8.35	1.27
Other ag	0.00	0.17	1.23	1.51	0.01	0.02	0.01	0.03	0.00	0.00	0.00	0.01	0.00	0.00	3.01	1.49
Coal and P	0.00	0.19	0.27	0.69	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.48
B mat fert	0.08	0.11	0.61	3.43	0.02	0.04	0.03	0.08	0.02	0.00	0.00	0.00	0.00	0.00	4.41	0.98
Manufactu	0.02	1.39	0.15	4.82	0.01	0.03	0.02	0.09	0.06	0.01	0.00	0.24	0.03	0.00	6.86	2.04
Total	0.10	2.85	2.68	18.90	0.06	0.12	0.08	0.21	0.11	0.01	0.00	0.28	0.04	0.00	25.43	6.53

FLOWS FROM BoP
CHANGE IN FLOWS 2017-2042

							Destination												
#REF!	Northland	Auckland	Waikato	Bay of Pler	Gisborne	Hawke's B	Taranaki	Manawatu	Wellingtor	TNM		West Coas	Canter-bur	Otago	South-land	Total			
Milk	0.00	0.00	0.00	-0.02	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	-0.03			
Man dairy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00			
Logs	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.15			
Timber prc	0.00	0.26	0.02	0.64	0.00	0.01	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.92			
Meat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00			
Livestock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00			
Hort	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.33			
Wool	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00			
Other Ag	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00			
Fish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00			
Coal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00			
Petroleum	0.00	0.08	0.05	0.12	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.25			
Aggregate	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.99			
LCF	0.01	0.02	0.27	0.40	0.01	0.01	0.01	0.02	0.01		0.00	0.00	0.00	0.00	0.00	0.76			
Concrete	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.91			
Steel + Alu	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.09			
Man+retai	0.00	0.28	0.03	1.03	0.00	0.00	0.01	0.01	0.01		0.00	0.00	0.07	0.01	0.00	1.46			
Waste	0.00	0.01	0.10	0.18	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.29			
Other mine	0.00	0.04	0.02	0.06	0.00	0.01	0.01	0.01	0.00		0.00	0.00	0.00	0.00	0.00	0.14			
Total	0.02	0.69	0.48	4.86	0.01	0.03	0.02	0.04	0.03		0.00	0.00	0.08	0.01	0.00	6.26	From BoP	To BoP	Total change
FLOWS FROM BoP																Total from	From exc E	Total to	To exc BoP
Milk and d	0.00	0.00	0.00	-0.03	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	-0.03	-0.01	-0.06	-0.03
Logs and ti	0.00	0.26	0.02	0.78	0.00	0.01	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	1.07	0.29	1.26	0.48
Other agric	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.37	0.03
Coal and P	0.00	0.08	0.05	0.12	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.25	0.13	0.21	0.09
Bldg matls	0.02	0.07	0.38	2.54	0.01	0.02	0.02	0.03	0.01		0.00	0.00	0.00	0.00	0.00	3.09	0.55	3.33	0.79
Manufactu	0.00	0.28	0.03	1.12	0.00	0.00	0.01	0.01	0.01		0.00	0.00	0.07	0.01	0.00	1.55	0.43	1.79	0.67
Total	0.02	0.69	0.48	4.86	0.01	0.03	0.02	0.04	0.03		0.00	0.00	0.08	0.01	0.00	6.26	1.40	6.89	2.02
FLOWS FROM BoP																Total from	From exc E	Total to	To exc BoP
Growth (per cent)																			
Milk and d	-0.02	-0.02	-0.02	-0.02	0.00	-0.02	-0.02	-0.02	-0.02		0.00	0.00	-0.02	-0.02	0.00	-2%	-2%	0.00	-0.02
Logs and ti	0.00	0.27	0.11	0.11	-0.07	0.16	-0.31	-0.10	0.12		-0.19	-0.42	0.01	-0.06	0.00	13%	23%	0.03	0.01
Other agric	0.00	-0.02	0.00	0.22	0.00	0.00	0.00	0.02	0.01		0.00	0.00	0.19	0.00	0.00	11%	0%	0.78	0.84
Coal and P	0.00	0.40	0.20	0.17	0.02	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	21%	27%	0.00	0.00
Bldg matls	0.20	0.68	0.62	0.74	0.44	0.49	0.64	0.35	0.71		0.00	0.00	0.00	0.00	0.00	70%	57%	0.91	2.13
Manufactu	0.19	0.20	0.17	0.23	0.13	0.18	0.29	0.14	0.24		0.24	0.11	0.30	0.22	0.13	23%	21%	0.00	1.47
Total	0.19	0.24	0.18	0.26	0.15	0.26	0.24	0.18	0.27		0.18	-0.19	0.28	0.17	0.05	25%	21%	1.72	4.42

CHANGE IN FLOWS 2017-2042 (PER CENT)

							Destination										
#REF!	Northland	Auckland	Waikato	Bay of Pler	Gisborne	Hawke's B	Taranaki	Manawatu	Wellingtor	TNM		West Coas	Canter-bur	Otago	South-land	Total	Total exc BoP
Milk			-2%	-2%												-2%	-2%
Man dairy	-2%	-2%	-2%	-2%		-2%	-2%	-2%	-2%				-2%	-2%		-2%	-2%
Logs			0%	3%												3%	0%
Timber prc		27%	13%	47%	-7%	16%	-31%	-10%	12%		-19%	-42%	1%	-6%		36%	23%
Meat		0%		0%		0%		0%	0%							0%	0%
Livestock	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%	0%
Hort		-9%	20%	37%			10%	3%	11%				23%			35%	1%
Wool						0%										0%	0%
Other Ag		0%	0%	0%	0%	0%	0%	0%	0%				0%			0%	0%
Fish				0%												0%	#DIV/0!
Coal			0%													0%	0%
Petroleum		40%	22%	17%	2%											22%	28%
Aggregate				62%												62%	#DIV/0!
LCF	19%	85%	73%	66%	44%	52%	47%	34%	71%							63%	60%
Concrete				129%												129%	#DIV/0!
Steel + Alu		41%		17%												18%	41%
Man+retai	19%	20%	17%	24%	13%	18%	29%	14%	24%		24%	11%	30%	22%	13%	23%	21%
Waste		44%	44%	44%												44%	44%
Other mine	54%	77%	63%	59%	44%	46%	78%	45%								62%	65%
Total	19%	24%	18%	26%	15%	26%	24%	18%	27%		18%	-19%	28%	17%	5%	25%	21%

FLOWS TO BoP

TOTAL FLOWS 2042

Source of traffic

0	Milk	Man dairy	Logs	Timber prc	Meat	Livestock	Hort	Wool	Other Ag	Fish	Coal	Petroleum	Aggregate	Limestone	Concrete	Steel + Alu	Man+retai	Waste	Other min	Total
Northland	0.00	0.03	0.14	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.61	0.00	0.15	0.00	0.00	0.01	0.00	0.01	1.0
Auckland	0.00	0.03	0.16	0.01	0.00	0.00	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.05	0.00	0.20	1.99	0.00	0.00	2.5
Waikato	0.00	1.15	4.30	0.94	0.05	0.03	0.09	0.00	0.00	0.01	0.00	0.00	1.79	0.00	0.00	0.00	0.24	0.00	0.05	8.6
Bay of Pler	1.22	0.12	5.87	1.99	0.05	0.10	1.22	0.00	0.45	0.02	0.00	0.80	2.60	0.99	1.61	0.61	5.33	0.61	0.16	23.8
Gisborne	0.00	0.00	0.00	0.14	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.2
Hawke's B	0.00	0.00	0.00	0.30	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.11	0.00	0.00	0.5
Taranaki	0.00	0.21	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.08	0.00	0.00	0.4
Manawatu	0.00	0.06	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.2
Wellingtor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.0
TNM	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.1
West Coas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Canter-bur	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.1
Otago	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.0
South-lanc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Total	1.22	1.60	10.46	3.43	0.28	0.14	1.53	0.00	0.46	0.03	0.00	1.41	4.39	1.25	1.61	0.80	8.06	0.61	0.22	37.5
Total exc B	0.00	1.48	4.60	1.43	0.23	0.04	0.31	0.00	0.02	0.01	0.00	0.61	1.79	0.25	0.00	0.20	2.73	0.00	0.06	13.75

TOTAL FLOWS 2017

Source of traffic

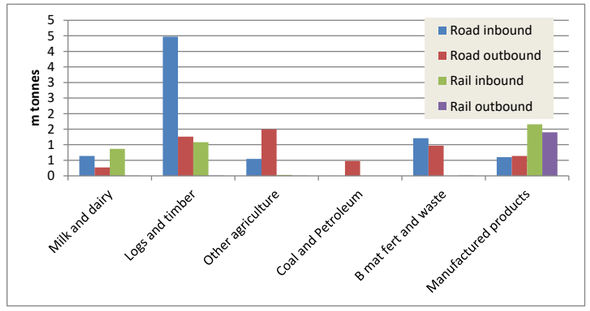
0	Milk	Man dairy	Logs	Timber prc	Meat	Livestock	Hort	Wool	Other Ag	Fish	Coal	Petroleum	Aggregate	LCF	Concrete	Steel + Alu	Man+retai	Waste	Other min	Total
Northland	0.00	0.03	0.14	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.52	0.00	0.10	0.00	0.00	0.00	0.00	0.01	0.8
Auckland	0.00	0.03	0.41	0.01	0.00	0.00	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.03	0.00	0.17	1.50	0.00	0.00	2.2
Waikato	0.00	1.17	4.10	0.58	0.05	0.03	0.08	0.00	0.00	0.01	0.00	0.00	1.11	0.00	0.00	0.00	0.19	0.00	0.03	7.3
Bay of Pler	1.25	0.12	5.72	1.36	0.05	0.10	0.89	0.00	0.45	0.02	0.00	0.69	1.61	0.60	0.70	0.52	4.30	0.42	0.10	18.9
Gisborne	0.00	0.00	0.00	0.09	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.1
Hawke's B	0.00	0.00	0.00	0.20	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.09	0.00	0.00	0.4
Taranaki	0.00	0.21	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.06	0.00	0.00	0.4
Manawatu	0.00	0.06	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.2
Wellingtor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.0
TNM	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.1
West Coas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Canter-bur	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.1
Otago	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.0
South-lanc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Total	1.25	1.63	10.37	2.27	0.28	0.14	1.17	0.00	0.46	0.03	0.00	1.21	2.72	0.77	0.70	0.69	6.39	0.42	0.14	30.6
Total exc B	0.00	1.51	4.65	0.91	0.23	0.04	0.28	0.00	0.02	0.01	0.00	0.52	1.11	0.17	0.00	0.17	2.09	0.00	0.04	11.73

CHANGE 2017-2042

Source of traffic

0	Milk	Man dairy	Logs	Timber prc	Meat	Livestock	Hort	Wool	Other Ag	Fish	Coal	Petroleum	Aggregate	Limestone	Concrete	Steel + Alu	Man+retai	Waste	Other min	Total
Northland	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.09	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.16
Auckland	0.00	0.00	-0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.50	0.00	0.00	0.28
Waikato	0.00	-0.02	0.20	0.36	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.05	0.00	0.02	1.30
Bay of Pler	-0.02	0.00	0.15	0.64	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.12	0.99	0.40	0.91	0.09	1.03	0.18	0.06	4.86
Gisborne	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.07
Hawke's B	0.00	0.00	0.00	0.10	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.13
Taranaki	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.02
Manawatu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
Wellingtor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TNM	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
West Coas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Canter-bur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02
Otago	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
South-lanc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	-0.02	-0.03	0.10	1.16	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.21	1.67	0.48	0.91	0.11	1.67	0.18	0.08	6.89
Exc BoP	0.00	-0.03	-0.05	0.53	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.09	0.68	0.08	0.00	0.02	0.64	0.00	0.02	2.02

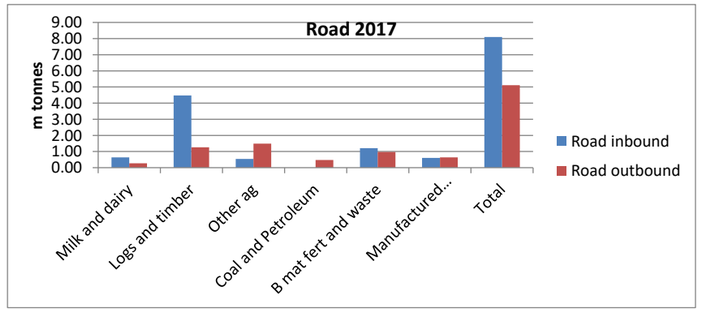
	Milk and d	Logs and ti	Other agric	Coal and P	B mat fert	Manufactured products	
Inbound 2042	1.48	6.03	0.60	0.61	2.10	2.93	13.75



Total	Milk and d	Logs and ti	Other agric	Coal and P	B mat fert	Manufactu	Total
Inbound 2017	1.51	5.56	0.57	0.52	1.31	2.26	11.73
Outbound 2017	0.27	1.27	1.49	0.48	0.98	2.04	6.53

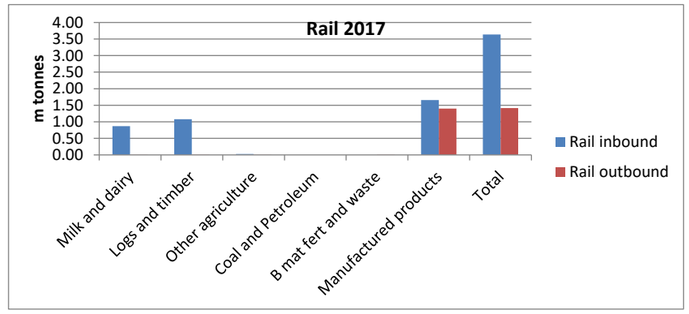
rail	Milk and d	Logs and ti	Other agric	Coal and P	B mat fert	Manufactu	Total
Rail inbound	0.87	1.08	0.03	0.00	0.00	1.66	3.64
Rail outbound	0.00	0.01	0.00	0.00	0.01	1.40	1.42

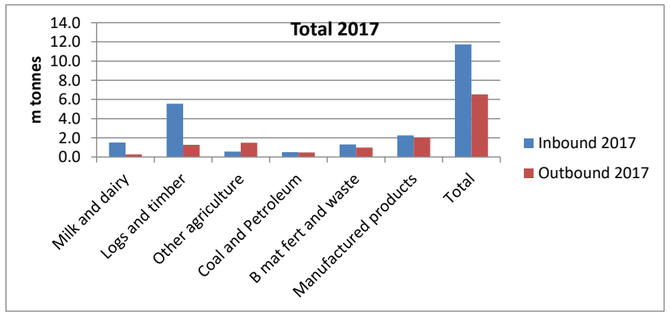
Road	Milk and d	Logs and ti	Other ag	Coal and P	B mat fert	Manufactu	Total
Road inbound	0.64	4.48	0.54	0.00	1.21	0.60	8.09
Road outbound	0.27	1.26	1.49	0.48	0.97	0.64	5.11



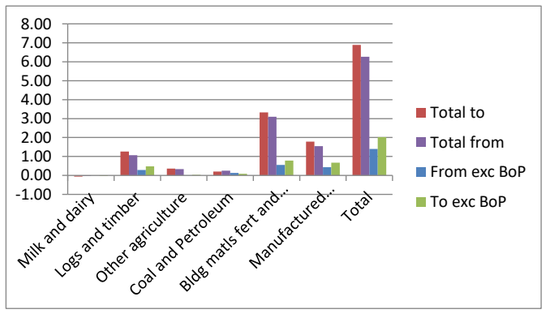
CHANGE 2017-2042 Per cent

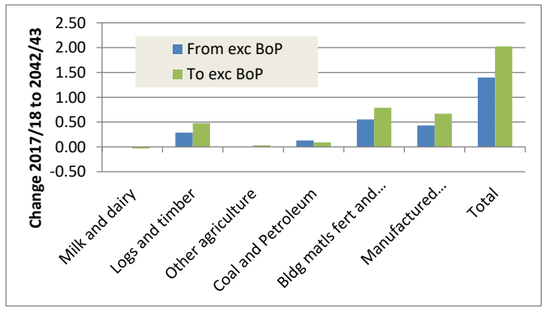
0	Milk	Man dairy	Logs	Timber prc	Meat	Livestock	Hort	Wool	Other Ag	Fish	Coal	Petroleum	Aggregate	Limestone	Concrete	Steel + Alu	Man+retai	Waste	Other min	Total
Northland	0.00	-0.02	0.00	0.39	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.17	0.00	0.52	0.00	0.00	0.25	0.00	0.59	0.19
Auckland	0.00	-0.02	-0.61	0.66	0.00	0.00	-0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.14	0.33	0.00	0.00	0.13
Waikato	0.00	-0.02	0.05	0.62	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.29	0.00	0.59	0.18
Bay of Pler	-0.02	-0.02	0.03	0.47	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.17	0.62	0.66	1.29	0.17	0.24	0.44	0.59	0.26
Gisborne	0.00	0.00	0.00	0.64	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.48
Hawke's B	0.00	0.00	0.00	0.48	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.19	0.00	0.00	0.36
Taranaki	0.00	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.28	0.00	0.00	0.06
Manawatu	0.00	-0.02	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.06
Wellingtor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.16
TNM	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.16
West Coas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.13
Canter-bur	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.27
Otago	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.21
South-lanc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.18
Total	-0.02	-0.02	0.01	0.51	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.17	0.62	0.63	1.29	0.16	0.26	0.44	0.59	0.22
Exc BoP	0.00	-0.02	-0.01	0.58	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.17	0.62	0.50	0.00	0.14	0.31	0.00	0.59	0.17

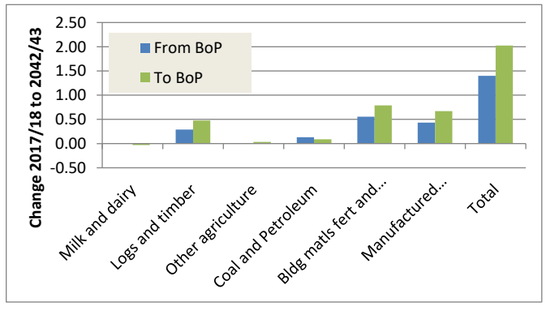


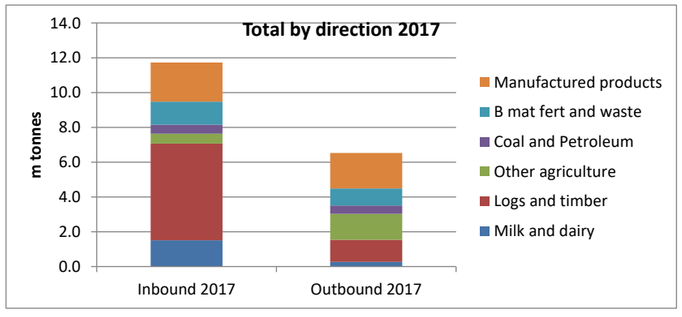


Changes in flows 2017/18 to 2042/43 (m tonnes)









2017 local flows

Stats estimate	4367
NFDS	5720
Correction factor	1.309744

Inbound

	NFDS								Local production				Total - local + int	Local use	Rail	Final throughput	
SH2 East	Dairy prod	Logs and ti	Meat	Other ag	B mats	Manufactu	Coal + pet	Total	Logs	Timber prc	Kiwifruit	Total		Logs		Total	Total logs
Gisborne	0.00	0.09	0.00	0.02	0.00	0.03	0.00	0.14	3.00	0.86	0.08	3.94	4.07	2.78		1.29	0.30
SH5	0.01	3.54	0.09	0.13	0.02	0.30	0.00	4.08	1.57	0.50	0.20	2.27	6.35	1.62	2.22	2.51	3.49
SH29/2	0.63	0.85	0.11	0.20	1.30	0.27	0.00	3.36	1.16			1.16					
SH29	0.63	0.85	0.11	0.20	0.86	0.21	0.00	2.88	0.39			0.39	3.26			3.26	1.23
SH2					0.43	0.05		0.49	0.77		0.10	0.87	1.35			1.35	0.77
										1.36							5.79

Outbound

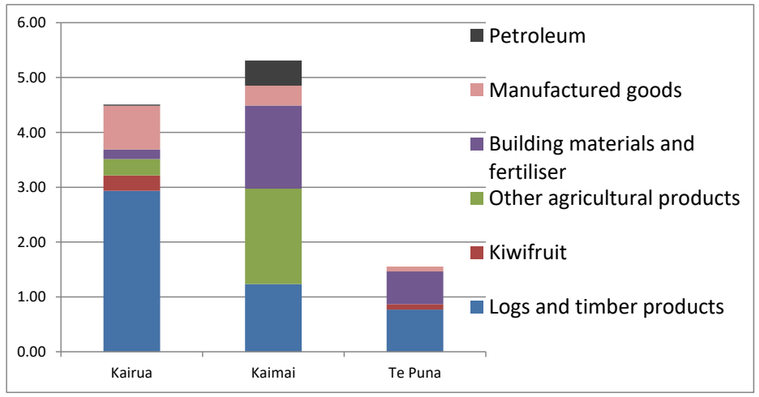
	NFDS								Local production				Total - local + int	Local use	Rail	Final throughput	
SH2 East	Dairy prod	Logs and ti	Meat	Other ag	B mats	Manufactu	Coal + pet	Total	Logs	Timber prc	Kiwifruit			Logs		Total	Total logs
Gisborne	0.00	0.00	0.00	0.01	0.02	0.01	0.02	0.06	0	0	0	0	0.06	0		0.06	0.00
SH5	0.01	0.00	0.00	0.06	0.14	0.45	0.00	0.66	0	0	0	0	0.66	0		0.66	0.00
SH29/2	0.26	0.00	0.00	1.42	0.81	0.19	0.46	3.14	0			0					
SH29	0.26	0.00	0.00	1.42	0.65	0.15	0.46	2.94	0			0	2.94			2.94	0.00
SH2					0.16	0.04		0.20	0		0	0	0.20			0.20	0.00
										0							0.00

Total flows	Longer distance								Local			Total	Total plus local	Local use		Total overall	
	Dairy prod	Logs and ti	Meat	Other ag	B mats	Manufactu	Coal + pet	Total	Logs	Timber prc	Kiwifruit			Logs		Total	Total logs
SH2 East	0.01	3.63	0.09	0.21	0.17	0.80	0.02	4.94	4.56	1.36	0.28	6.20	11.14	4.40		4.52	3.79
SH29	0.90	0.85	0.11	1.63	1.52	0.36	0.46	5.82	0.39	0.00	0.00	0.39	6.20	0.00		6.20	1.23
SH2 North	0.00	0.00	0.00	0.00	0.59	0.09	0.00	0.69	0.77	0.00	0.10	0.87	1.56	0.00		1.56	0.77

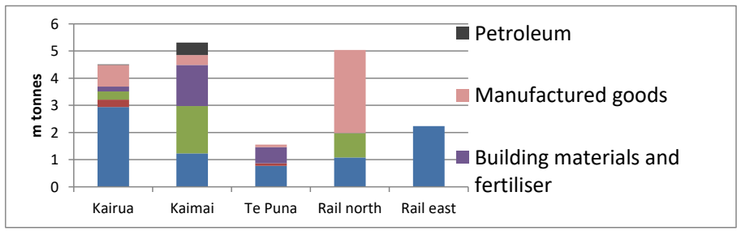
Total flows		SH2 East	SH29	SH2 North	Rail from r	Rail from East
		Kairua	Kaimai	Te Puna		
Longer distance	Dairy prod	0.01	0.90	0.00		
	Logs and ti	3.63	0.85	0.00	5.04	2.23
	Meat	0.09	0.11	0.00		
	Other ag	0.21	1.63	0.00		
	B mats	0.17	1.52	0.59		
	Manufactu	0.80	0.36	0.09		
	Coal + pet	0.02	0.46	0.00		
	Total	4.94	5.82	0.69		
Local Generation of movements into	Logs	4.56	0.39	0.77		
	Timber prc	1.36	0.00	0.00		
	Kiwifruit	0.28	0.00	0.10		
Total		6.20	0.39	0.87		
Total plus local		11.14	6.20	1.56		
Local use	Logs	4.40	0.00	0.00		
	Rail	2.22				
Total overall	Total	4.52	6.20	1.56		

Total flows	SH29	SH2 North			
	Kairua	Kaimai	Te Puna	Rail north	Rail east
Logs and timber products	2.93	1.23	0.77	1.08	2.23
Kiwifruit	0.28	0.00	0.10		
Other agricultural products	0.30	1.74	0.00	0.90	
Building materials and fertiliser	0.17	1.52	0.59	0.01	
Manufactured goods	0.80	0.36	0.09	3.05	
Petroleum	0.02	0.46	0.00	0.00	
Total	4.51	5.31	1.56	5.04	2.23

Key commodity flows by road by corridor 2017/18 (m tonnes)



Key commodity flows by road and rail by corridor 2017/18 (m tonnes)



Sensitivity: General

2042 local flows

Stats estimate	4367
NFDS	5720
Correction factor	1.309744

Inbound

SH2 East	Dairy proc	Logs and t	Meat	Other ag	B mats	Manufacts	Coal + pet	Total	Logs	Timber pr	Kiwifruit	Total	Total - local + inter-reg	Local use	Rail	Final throughput	Total logs	
	NFDS								Local production					Logs		Total		
Gisborne/Whakatane	0.00	0.14	0.00	0.02	0.00	0.04	0.00	0.20	3.00	1.26	0.14	4.40	4.60	4.08417	1.855031	0.52	-0.94	
SH5 Rotorua	0.01	4.07	0.09	0.14	0.03	0.37	0.00	4.70	1.57	0.73	0.36	2.66	7.36	2.376208		4.98	3.26	
SH29/2	0.62	0.65	0.11	0.22	2.07	0.37	0.00	4.05	1.16			1.16						
SH29	0.62	0.65	0.11	0.22	1.381933	0.297319	0.00	3.28	0.39			0.39	3.67			3.67	1.03	
SH2					0.690966	0.07433		0.77	0.77		0.18	0.95	1.71			1.71	0.77	
										1.99							4.12	6.11

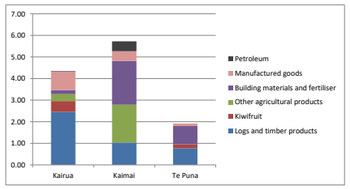
Outbound

SH2 East	Dairy proc	Logs and t	Meat	Other ag	B mats	Manufacts	Coal + pet	Total	Logs	Timber pr	Kiwifruit		Total - local + inter-reg	Local use	Rail	Final throughput	Total logs	
	NFDS								Local production					Logs		Total		
Gisborne	0.00	0.00	0.00	0.01	0.02	0.01	0.02	0.06	0	0	0	0	0.06	0		0.06	0.00	
SH5	0.01	0.00	0.00	0.06	0.14	0.45	0.00	0.66	0	0	0	0	0.66	0		0.66	0.00	
SH29/2	0.26	0.00	0.00	1.42	0.81	0.19	0.46	3.14	0			0						
SH29	0.26	0.00	0.00	1.42	0.651214	0.150565	0.46	2.94	0			0	2.94			2.94	0.00	
SH2					0.162804	0.037641		0.20	0		0	0	0.20			0.20	0.00	
									0								0.00	

Total flows

	Longer distance								Local			Total	Total plus local	Local use		Total overall		
	Dairy proc	Logs and t	Meat	Other ag	B mats	Manufacts	Coal + pet	Total	Logs	Timber pr	Kiwifruit			Logs	Rail	Total	Total logs	
SH2 East	0.01	4.21	0.09	0.23	0.18	0.87	0.02	5.62	4.56	1.99	0.50	7.06	12.68	6.46	1.86	4.37	2.32	0.00
SH29	0.88	0.65	0.11	1.64	2.03	0.45	0.46	6.22	0.39	0.00	0.00	0.39	6.61	0.00		6.61	1.03	0.00
SH2 North	0.00	0.00	0.00	0.00	0.85	0.11	0.00	0.97	0.77	0.00	0.18	0.95	1.91	0.00		1.91	0.77	0.00

Total flows		SH2 East Kairua	SH29 Kaimai	SH2 North Te Puna	Rail north	Rail east
Longer distance	Dairy proc	0.01	0.88	0.00	0.85	
	Logs and t	4.21	0.65	0.00	1.18	
	Meat	0.09	0.11	0.00	0.03	
	Other ag	0.23	1.64	0.00	0.00	
	B mats	0.18	2.03	0.85	0.01	
	Manufacts	0.87	0.45	0.11	3.83	
	Coal + pet	0.02	0.46	0.00	0.00	
	Total	5.62	6.22	0.97	5.91	
Local Generatic	Logs	4.56	0.39	0.77		1.86
	Timber pr	1.99	0.00	0.00		
	Kiwifruit	0.50	0.00	0.18		
Total		7.06	0.39	0.95		
Total plus local		12.68	6.61	1.91		
Local use	Logs	6.46	0.00	0.00		
Local rail	Logs+Timb	1.86				
Total overall	Total	4.37	6.61	1.91		



Total flows	SH2 East Kairua	SH29 Kaimai	SH2 North Te Puna	Rail north	Rail east
Logs and timber products	2.46	1.03	0.77	1.18	1.86
Kiwifruit	0.50	0.00	0.18	0.00	0.00
Other agricultural products	0.32	1.75	0.00	0.88	0.00
Building materials and fertiliser	0.18	2.03	0.85	0.01	0.00
Manufactured goods	0.87	0.45	0.11	3.83	0.00
Petroleum	0.02	0.46	0.00	0.00	0.00
Total	4.36	5.72	1.91	5.91	1.86