

# Whakatu Arterial Link

## *Local and Regional External Economic Effects Assessment*

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## Executive Summary

### 1. Project Assessed

This report provides a local and regional external economic effects assessment for the Hawke's Bay region, of the proposed Whakatu Arterial Link (WAL). The specific matters covered in the report include the current economic profile of the Whakatu area, the strategic economic/transport context for the WAL, the assessed Hastings district and wider Hawke's Bay region potential economic impact gains of the development, other economic benefits of the WAL, adverse economic effects and an overall assessment of the potential economic effects of the WAL.

### 2. Potential Effects

The potential external Hastings District and wider Hawke's Bay Region economic effects addressed in the report include:

- i) The linkage between the WAL and the economic and business growth dynamics of the Whakatu and wider Hastings District areas;
- ii) The importance of the proposed new road to future economic, industry, trade and Port of Napier growth and development in the Hawke's Bay Region;
- iii) The positive economic impact gains potentially accruing from the construction and ongoing operation/maintenance of the WAL and from the new industry activity potentially developing in the Whakatu business area directly as a result of the road;
- iv) Other external economic benefits potentially arising from the WAL; and
- v) Potential adverse local and regional economic effects of the WAL on existing business and horticultural production activity based in the Whakatu area.

### 3. Assessments Undertaken

The specific economic assessments undertaken and presented in the report include:

- i) An analysis of the historical, current and forecast profile of the Whakatu area economy;
- ii) An analysis of the strategic Hastings District and Hawke's Bay Region economic development context for the WAL;
- iii) A detailed modelling assessment of the local and regional multiplied economic impact gains over a 30-year period (in both present dollar and Net Present Value (NPV) terms), of the construction and operation of the WAL, as well as new industry development in the Whakatu area potentially resulting from the new link;
- iv) An analysis of other potential economic benefits arising locally and regionally from the WAL;

- v) A modelling analysis (as per Section iii above) of the potential adverse economic impacts of the proposed road for horticultural production activity affected by the proposed development; and
- vi) An overall assessment of the potential external economic effects of the proposed WAL for the Hastings District and wider Hawke's Bay Region.

#### 4. Results of Assessments

The main results of the above assessments are as follows:

- i) The Whakatu area is an important Hastings District and Hawke's Bay Region industry/business zone; the base for a number of major food and other 'wet' production/distribution/exporting industries; has grown its business numbers significantly over the past decade; is well located (although not well connected) with respect to the key freight transport route (Hawkes Bay Expressway) to the Port of Napier; and has capacity (particularly in association with the Tomoana business area) to accommodate significant additional business development;
- ii) The WAL is consistent with both the need for and profile of significantly increased regional/industry development in Hawke's Bay, as well as the further improvements required in the region's freight transport network in support of this objective;
- iii) The construction of the new road is estimated to increase overall economic activity/GDP in Hastings District by \$13.7 million and in the full Hawke's Bay region by \$17.1 million, taking into account both direct and flow-on spending impacts, over an 18 month period. Ongoing maintenance and renewal work on the new road over a forecast 30-year period could potentially add up to \$1.64 million to the Hastings economy and \$2.07 million to the regional economy, depending on the extent to which Council funding for the work is sourced from existing budgets or from new budgetary allocations. The above figures are in current dollar terms, as are the figures referred to in part iv) below;
- iv) Assuming 5% annual average GDP growth (compared with the longer-term historical growth rate of 4% per annum) in the Whakatu area over the forecast period and 40% of this GDP growth coming from industrial activity new to the Hawke's Bay Region, the total Value Added/GDP gain (including flow-on/multiplied impacts) with the new road over 30 years is estimated at \$565 million (annual average of approximately \$19 million) for Hastings District and \$748 million (annual average GDP gain of approximately \$25 million) for the wider Hawke's Bay Region. This excludes the possible development in the medium to longer-term of a specialised freight distribution centre in the Whakatu area, which will add to the new road's overall economic impact;
- v) Other potential economic benefits of the proposed WAL include increased transport-operating efficiencies for local businesses, increased overall business appeal of the Whakatu area, further business development and utilisation of the available land resource in the area, strengthening of the export industry base in the area with flow-on benefits to the Port of

Napier operations and tourism advantages in respect of reduced commercial vehicle use of Napier's key Marine Parade tourism precinct;

- vi) Construction period issues potentially facing horticultural and other firms in the Whakatu area include dust, odour, noise, vibration, access to some business premises, heavy construction vehicle and traffic delay impacts. These issues will need to be addressed during both planning for the construction stage for the new road and also in the course of the actual construction work itself.
- vii) Over a 30-year period, the potential value of 'lost' horticultural (pip-fruit/cropping) production in the Whakatu area due to the new road's current alignment is estimated at \$41.3 million. The adverse total Value Added/GDP impact of this is estimated at \$34.4 million for Hastings District and \$42.1 million at the Hawke's Bay Region level, in present dollar terms.
- VIII) In order to establish the overall or net external Hawke's Bay Region economic impact of the new road, the total Value Added/GDP results for the 30-year period for the different aspects of the project assessed, have been recalculated in Net Present Value terms. The results are indicated in Table A below. Assuming public and private discount rates of 5% and 8% respectively, the WAL on its own potentially almost doubles the regional Value Added/GDP impact of the road in NPV terms over the period, with the possible development of a major specialised freight distribution centre in the medium to longer-term further increasing the regional Value Added/GDP impact of the road to a significant degree.

**Table A: Hawke's Bay Region Total Value Added Impacts of Proposed New Whakatu Arterial Link in Discounted Net Present Value Terms over a 30 Year Period**

Total Value Added Impact Over 30 Years in Discounted Net Present Value (NPV) Terms In \$M	Activity					Increase in Net Value-Added Impact
	Road Construction	Ongoing Road Maintenance	New Industry Development	Lost Pipfruit Production	Net Impact	
1. Without The New Road	-	-	118.00	-	118.00	-
2. With the new WAL road and associated steady industry development. (But excluding a major new freight distribution centre operating in the Whakatu industrial area)	17.08	1.11	231.10	17.06	232.23	114.23
3. As in Point 2 above but also including the establishment of a major new freight distribution centre in Whakatu	17.08	1.11	483.04	17.06	484.17	251.94

## 5. Suggested Approach for Effects Identified

The following recommendation is made in respect of the identified potential issues facing horticultural and other businesses in the Whakatu area during the actual construction period for the WAL:

*That prior to construction of the WAL commencing, the Hastings District Council establishes an ongoing project information provision and business consultation process for the Whakatu area, and also implements suitable policies and procedures to directly address issues associated with the construction of the WAL that potentially could have adverse economic effects on properties and businesses in the Whakatu area.*

## 1- Introduction

- 1.1 The Hastings District Council is proposing to construct a major new arterial road link from Pakowhai Rd (north of Ruahapia Rd), passing through the Whakatu industrial/business zone and extending on to the State Highway 2/Napier Rd/Pilcher Rd area in the general Mangateretere locality of Hastings. The development is referred to as the 'Whakatu Arterial Link' (hereafter termed WAL in this report).
- 1.2 The objectives of the project are to improve accessibility for individuals and businesses and support economic growth and productivity; provide convenient, efficient and safe access for freight movements to and from the Whakatu Industrial Area; promote the use of the Hawke's Bay Expressway for the road transport of freight and vehicles between the Whakatu Industrial Area and the Port of Napier; provide convenient, efficient and safe access between Havelock North and the Napier/Hastings Airport and Napier's north-western employment and residential areas; and enhance the safety of the Whakatu residential area by reducing freight movements through it.
- 1.3 As part of its Resource Management Act applications to construct the WAL, the Council has requested this detailed assessment of the potential external/community-level economic effects of the WAL. These cover both the multiplied economic impacts (economic impact assessment) of the development and other potential effects (assessment of other benefits/losses) resulting from it. They also cover local and regional economic effects.
- 1.4 The specific matters addressed in the report include:
  - (i) Economic profile and trends within the general Whakatu area, as a context for the proposed WAL;
  - (ii) The strategic roading/transport economic context for the development;
  - (iii) Potential economic impacts for the Hastings District and wider Hawke's Bay Region of the construction stage for the development, its ongoing operation and maintenance, potential new business/industry growth spurred by the project and potential rural production losses resulting from it;
  - (iv) Other potential economic gains and losses arising from the WAL; and
  - (v) An assessment of the overall/net economic effects of the proposed road.
- 1.5 The main information sources used for the report are:
  - WAL figures and design information provided by GHD Ltd in the Whakatu Arterial Project Description Report GHD 2014a;
  - Relevant information on the project provided by the Hastings District and Hawke's Bay Regional Councils;
  - Statistics NZ industry data for the Hastings District and Hawke's Bay Region;
  - NZ Institute of Economic Research economic and industry growth data; and
  - Economic impact assessment modelling results provided by Dr Warren Hughes, economic impact modelling consultant and analyst based in Auckland (**Appendices 1, 2 and 3**).

## 2- Whakatu Economic Catchment

2.1 This section provides a current economic profile of the broad Whakatu economic catchment for the WAL, an analysis of historical economic trends in the area and an assessment of its general longer-term economic outlook. For the purposes of the analysis, the Whakatu catchment is represented by the Statistics New Zealand Whakatu CAU ('Census Area Unit') which covers most of the catchment area.

### Economic Profile

2.2 The Whakatu area is one of Hastings District's key business and employment nodes. Statistics New Zealand industry employment information for 2013 indicates that Whakatu is the third largest employment node in the district after the 'Central Hastings' and combined Camberley/Woolwich (including the Regional Hospital complex and Omahu Rd industrial area) Census Area Units (CAUs). Total full and part-time employment in the Whakatu CAU in February 2013 was recorded at 3,990 or 10% of total industry employment in Hastings District.

2.3 **Table 1** below provides industry employment details for the Whakatu CAU in February 2013.

**Table 1: Whakatu Area Industry Employment 2013**

Industry	Total Employment	% of Total
Primary Production and Related Services	870	21.8
Food and Textile Processing	760	19.0
Other Manufacturing	90	2.3
Transport/Storage/Warehousing	330	8.3
Employment Services	710	17.8
Packaging and Labelling Services	990	24.8
Other Services	240	6.0
<b>TOTAL</b>	<b>3,990</b>	-

The leading industry employers are, in order: packaging and labelling services, primary production (in particular fruit-growing and agricultural support services), food and textile processing, and employment services. It is understood from Statistics New Zealand that the latter primarily covers the management and administration of contract/seasonal staff employed in primary sector processing and storage/distribution activities.

2.4 Statistics New Zealand information indicates a significant number of enterprises based in the Whakatu area, with a total of 145 individual business operations recorded for February 2013. The leading industry categories in terms of the number of operations are primary production, rental and hiring services, construction, processing-manufacturing and wholesaling services.

2.5 Within the industrial zone component of the wider Whakatu CAU area, the range of known significant individual firms and their business focus include Amcor Packaging, Apollo Apples (apple pack-house and cool-store), Bidvest (cool/dry food storage and distribution), Bird Concrete Pumping (concrete equipment), Carter Holt Harvey (handling/packaging of building products), Cedenco Foods (food processing and packing), David Trubridge (urban design and



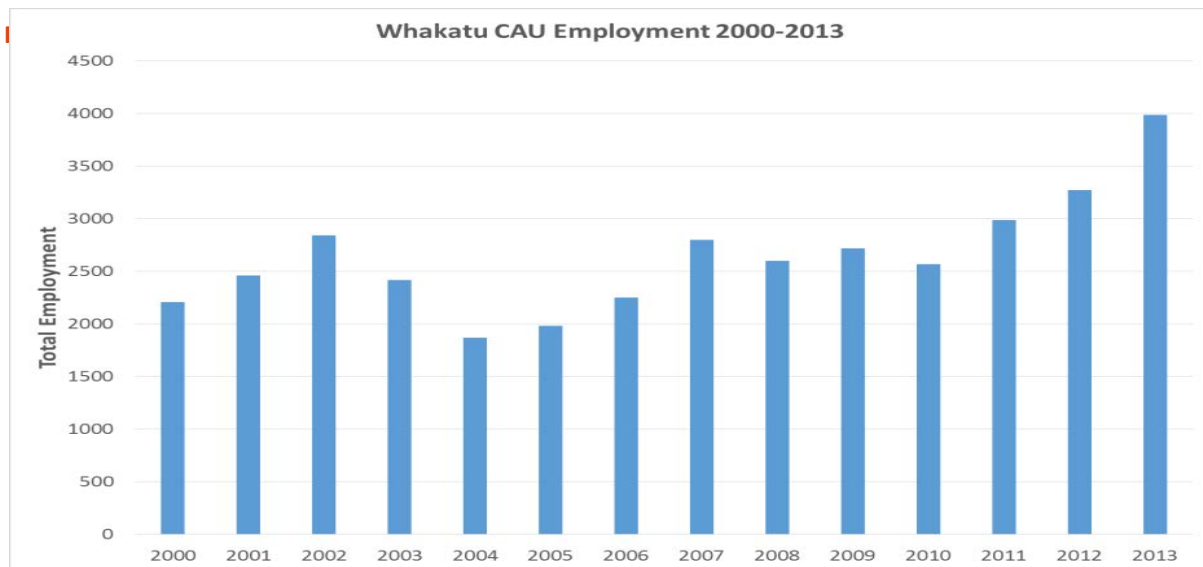
showrooms), Diamond Apparel Master (factory and dry-cleaning shop), ENZA Group, Etika Dairy (production of bottled milk and juice products), Fruit Packers Hawke's Bay Cooperative (fruit packing), Halls International (refrigerated transport), Hawke's Bay Towing, Mipenco Holdings Ltd (provision of office space), Kooga (sportswear), Mr Apple New Zealand (apple packing and exporting), Mt Erin Cannery, NH Packing (packing squash and pumpkins), Nimons Bus Depot (bus operation, vehicle workshop and truck fuelling facility), Number One Shoes (warehouse and distribution centre), Orchard View Trust light industrial factory, Orton Trading (food services), Patton Engineering Ltd (engineering services), Progressive Leathers, Ray Withers Contractors Ltd (earthmoving services), Scales Property Development (property services), Silver Fern Farms Ltd (meat processing and marketing), 'Spec' Industrial Building (provision of business space), Total Lubricants (oil and related vehicle/equipment lubricants), Transpower New Zealand Ltd (electricity substation), Turners and Growers International (horticultural product storage), Unison Contracting, Whakatu Coldstores Ltd (cold storage services), Whakatu Industrial Park Ltd (provision of business space/facilities), Whakatu Wool Scour Ltd (wool scouring) and Your Move (house moving and storage).

- 2.6 The Whakatu industrial area thus contains a diverse range of individual commercial activity, with a number of the firms based there also making an important contribution to Hawke's Bay's export performance. The Whakatu catchment area's share of total Hastings District GDP is currently estimated at approximately \$198.1 million or 9.1%.
- 2.7 Information provided by the Hastings District Council indicates that at the present time, approximately 26% of the total Whakatu industrial zone site area is still available for development. It is noted that 'Business Hawkes Bay' (the regional development organisation for Hawkes Bay) regional industry marketing information currently comments that "There are many development possibilities at Whakatu from 'greenfield' development to purpose-built properties available for sale and lease".

## Trends

- 2.8 The total number of business operations in the Whakatu CAU has increased overall by 38 businesses or 36% since Year 2000, compared to 23% district-wide. Noticeable growth has occurred in the food processing, construction, wholesaling, property operation and packaging/labelling industries.
- 2.9 Statistics New Zealand building consent information also indicates the significant industry growth that has occurred in the Whakatu area over the past two decades or so. For example, over the 1991-2001 period 25 new primary production sector buildings in the area were consented and these were followed by a further 29 buildings over 2002-2011. At the same time, 9 new industrial buildings received consent in Whakatu over 1991-2001 and a further 21 over 2002-2011. The 1991-2011 period also saw 10 new commercial/service sector buildings consented for the area. Since 2011, a total of 17 new industrial and commercial/service buildings have been consented for the area.
- 2.10 **Figure 1 over page** indicates the annual trend in total Whakatu CAU employment from Year 2000. Employment increased over 2000-2002, fell back sharply over 2003-2004 but has generally increased again since then and overall by 2,120 or 113% (compared to 5% at the

district-wide level). Noticeable employment gain in the Whakatu area over the past three years has been recorded by the fruit-growing, meat processing, transport and warehousing, employment services and packaging/labelling industries.



2.11 Total GDP for the Whakatu economic catchment has risen overall by an estimated 60% in real terms since 2001 or at an average annual growth rate of 4%. This compares to the figure of 2.1% at the Hastings District level and 1.3% at the Hawke's Bay Region level.

### Broad Economic Outlook

2.12 This section briefly indicates the broad longer-term economic growth environment for the Whakatu area. Section 5 of the report concerning the economic impacts of the proposed WAL provides more specific economic growth forecasts for the area.

2.13 The following points are pertinent:

- The NZ Institute of Economic Research is currently forecasting annual real GDP growth for the national economy in the range 2-3% over the next decade, followed by 1.5-2% over the 2024-2032 period;
- At the same time, the Institute is forecasting annual real GDP growth for the combined Hawke's Bay/Gisborne area of 1-2% over the next decade, followed by 0.5-1.5% over 2024-2032;
- Later last year, the Institute was forecasting national agricultural sector annual average GDP growth of 2.9% over 2012-2017 and 1-1.5% over 2017-2032. The comparable figures for other relevant industries (in the WAL context) were food processing (1.9% and 0.2-0.4%), wholesaling (2.7% and 1.3-1.7%), transport/storage (3.6% and 2.5-2.7%), property services (2.3% and 0.6-0.8%) and business services (2.4% and 2.3-2.5%);
- The Ministry of Primary Industries January 2014 SOPI (Situation and Outlook For New Zealand Primary Industries) update report forecasts total primary sector export revenue growth for the national economy of 13% over the 2013/14 production year in nominal

dollar terms, followed by a slight fall for the 2014/15 year (although still up 11% on the 2012/13 production year); and

- Total export returns for the dairy, meat and forestry sectors for this current 2013/14 production year are forecast to be approximately 20% above the level forecast in the 2013 SOPI report. The horticultural sector figure is 3.4%. Significant further growth in export receipts during the 2014/15 year is forecast for the meat and wool, forestry and horticultural sectors, with dairy returns falling noticeably.

2.14 In summary, the above forecasts point to a generally positive longer-term national and regional economic and industry growth context for the proposed new Whakatu roading development. In addition, it is noted that the estimated resident population of the combined Hastings District/Napier City area has increased by 2.7% since 2006 and is currently projected to increase a further 5.1% in total over 2013-2031, under the Statistics New Zealand Medium growth scenario. Additional household growth of 12% is also projected for the period.

### 3- Strategic Economic/Transport Context

3.1 This section comments on a number of strategic economic considerations that are also pertinent to and underpin the proposed WAL.

3.2 **Regional Land Transport Strategy** – the Hawke’s Bay Regional Land Transport Strategy 2012-2042 (the Strategy) Vision statement is that *“Our people are able to move around an integrated, sustainable, resilient and safe transport network that **enhances our economy**.....and connects us to each other, the rest of New Zealand and the world”*. The Strategy also includes a specific economic development goal which is *“a resilient and highly efficient transport system that supports and contributes to the development of our economy.....particularly in creating opportunities for wealth through economic growth, new jobs, and improved incomes and living standards for people...”*

3.3 A number of other relevant statements to note from the Strategy are as follows:

- Hawke’s Bay’s key rural production industries include pastoral farming, fruit-growing, vegetable-growing, viticulture and forestry;
- Future developments in these industries along with the proposed Ruataniwha water storage project and possible new activities based around oil and gas, could have significant regional transport implications e.g. the development of key freight routes;
- The Whakatu industrial area is one of the main regional centres for the processing and distribution/export of rural commodities;
- Tourism is a further key industry in the region;
- The Port of Napier is the single largest generator of freight movements in Hawke’s Bay;
- Road transport is responsible for 90% of the region’s freight movement;
- The Whakatu area is likely to best provide an effective and efficient location for the development of a specialised freight distribution centre in the Hastings-Napier area; and
- The Whakatu area contains an important rail siding/link to the Palmerston North-Gisborne railway line.

- 3.4 The Strategy concludes that the key medium-term transport challenge facing the Hawke's Bay Region is in "*resolving longstanding freight movement problems*" and improving the quality of the routes servicing the region's economic production centres and linking the centres to the Port of Napier.
- 3.5 The Strategy also indicates the proposed WAL as being one of the key priority roading development projects in Hawke's Bay for the 2012-2016 period.
- 3.6 **Port of Napier** – as noted earlier, this facility is one of the main considerations with the proposed new road. The effective and efficient movement of export and import commodities both within the Hastings-Napier/Hawke's Bay areas and between the Whakatu area and the Port, is an important regional and local economic growth requirement. It is noted that over the past 25 years, total international exports handled at the Port have increased in volume terms at an average annual rate of 5.4%. At the same time, the facility's share of national seaport export volumes has risen from 6.9% to 7.4%. The Port of Napier is currently ranked 5th in New Zealand in terms of the annual volume of overseas exports handled. Exports currently account for 83% of the total volume of international cargo handled by the Port. International import volumes handled at the facility over the period have increased 3.9% on an average annual basis. The Port is currently the 4th largest container handling facility in the country. Its 2012 annual report indicates that over the next decade, a total of approximately \$130 million is budgeted for further capital and growth developments at the facility. The Strategy indicates that in excess of 85% volume growth is forecast for the Port of Napier over the period to 2026, given further rural sector production growth and the national promotion of shipping as a key transport mode.
- 3.7 **Regional Development Strategy** – the WAL proposal has a number of important synergies with the current formal regional development strategy for Hawke's Bay ('Hawke's Bay Regional Economic Development Strategy 2011' (EDS)). These include the Strategy's call for resilient primary production sector growth, further economic diversification, more business and investment attraction and increased utilisation of the region's transportation and distribution infrastructure. The Hawke's Bay business development organisation (Business Hawke's Bay) is now promoting the Whakatu industrial area as a key 'business park' locational opportunity within the region.
- 3.8 **Hastings District Council** – the Council's specific objectives for the WAL are to:
- Improve accessibility for individuals and businesses and support economic growth and productivity;
  - Provide convenient, efficient and safe access for freight movements to and from the Whakatu Industrial Area;
  - Promote the use of the Hawke's Bay Expressway for the road transport of freight and vehicles between the Whakatu Industrial Area and the Port of Napier;
  - Provide convenient, efficient and safe access between Havelock North and the Napier/Hastings Airport and Napier's north-western employment and residential areas; and

- Enhance the safety of the Whakatu residential area by reducing freight movements through it.

Thus, economic factors are a key consideration with the project, from the Council's perspective.

- 3.9 **Industrial Land Strategy** – it is noted that the Whakatu (in association with Tomoana) area is one of the Hastings District Council's three main 'zones' available for future industrial development in the district. The Whakatu industrial zone is primarily intended for the operation of wet industries, as compared to Irongate (dry industry) and Omahu (service industry).

## 4- Local and Regional Economic Impacts

- 4.1 This section quantifies the potential economic impact gains at the Hastings District and Hawke's Bay Region levels, for the following aspects of the proposed WAL development:

- The construction period (estimated at 18 months) for the new road;
- Its ongoing annual operation and maintenance/renewal activity; and
- New industrial/business development potentially occurring over time within the Whakatu industrial/business zone, as a result of the development.

### 4.2 Economic Impact Assessment

- 4.2.1 Economic impact assessment is concerned with quantifying the total multiplied or flow-on impacts of a new development at a specific geographical level. The impacts include the initial direct expenditure impact involved and indirect and induced (flow-on) impacts. The indirect impacts cover the impact of expenditure on 'backward-linked' or supplier industries providing inputs to the development. Induced impacts cover the impact of a development on the consumption spending of employees directly involved in the development and those associated with supplier or backward-linked industries. The standard indicators used for economic impact assessment are *Total Revenue* or *Gross Output* (the total value of economic impacts including imports of goods and services), *Net Household Income* (the total value of household income generated by a new development net of taxation and allowing for various forms of saving), *Employment* (labour-years or jobs) and, importantly, *Value Added/GDP* (the additional economic activity generated within a particular area after removing import payments flowing out of the area).

- 4.2.2 The economic impact assessment modelling work for this report was undertaken by Dr Warren Hughes, specialist economic impact modelling consultant based in Auckland. Copies of Dr Hughes' work background details and modelling results are attached as **Appendices 1 and 2**. Dr Hughes used Year 2011 88-industry input/output models of the local and regional economies. These are based on the latest national input-output table of March 2007. Detailed industry models such as this provide better economic impact estimates for regional areas such as Hawke's Bay, than do less detailed models which are based on broader industry sectors. It is further noted that the (Type II) multiplier values referred to in this report originate from the economic impact modelling process itself and are specific to the Hawke's Bay Region; they are not externally sourced national or general regional multipliers which are then used for the specific Hawke's Bay analysis.

4.2.3 It is noted that the economic impacts calculated in the following sections represent the total or gross impacts before any offsetting impacts are taken into account. The latter are referred to in Section 6 of the report.

### 4.3 Construction Impacts

4.3.1 **Table 2** provides summary details of the economic impact results for the construction stage for the proposed new road, based on a total direct expenditure impact of \$19.75 million (this figure is sourced from GHD Ltd, transport consultants for the Hastings District Council for the WAL project). **Appendix 2** provides further details on these and the other economic impacts. The potential total increase in the level of economic activity (Value Added or GDP) in the Hastings District is \$13.71 million and \$17.08 million for the wider Hawke's Bay Region. The implied regional multiplier value for Value Added is 2.56. The total Hastings District multiplied employment impact is 154 labour-years and 206 labour-years at the Hawke's Bay Region level. The additional total net household income accruing to households as a result of the road construction stage is \$5.45 million for the Hastings district and \$7.23 million for the Hawke's Bay Region.

**Table 2: Whakatu Arterial Link Construction Stage Local and Regional Economic Impacts**

Economic Impact Measure	Total Direct and Flow-On Economic Impacts		
	Hastings District	Hawke's Bay Region	Hawke's Bay Multipliers
Revenue (\$M)	37.18	46.94	2.38
Net Household Income (\$M)	5.45	7.23	2.58
Labour-Years	154	206	2.94
Value Added or GDP (\$M)	13.71	17.08	2.56

4.4 It is noted that in the following two sections which concern the economic impacts of the ongoing new road operation/maintenance and potential new industry development resulting in the Whakatu area from the road, the impacts have been calculated for a 30-year period with the impact results being expressed in 'today's dollars' terms. This period has been adopted for the purpose of enabling a realistic assessment of the wider economic benefits and costs of the new road including its new industry development impact. It is further noted that the analysis later in the report on the project's overall benefits and costs has been undertaken in Net Present Value (NPV) terms.

### 4.5 Ongoing Road Operation/Maintenance

4.5.1 Information provided by GHD Consultants indicates an estimated total road operation and maintenance/renewal direct expenditure figure of \$2.33 million, over a 30-year period. This figure covers ongoing minor works, sealing, resurfacing, rehabilitation work and bridge repainting. The local and regional impacts of this expenditure figure are indicated in **Table 3** below. **Appendix 2** provides further detail on the impact results.

**Table 3: Whakatu Arterial Link Road Maintenance and Renewal Expenditure Local and Regional Economic Impacts for A 30-Year Period**

Economic Impact Measure	Total Direct and Flow-On Economic Impacts		
	Hastings District	Hawke's Bay Region	Hawke's Bay Multipliers
Revenue (\$M)	4.37	5.59	2.40
Net Household Income (\$M)	0.58	0.76	2.62
Jobs	22	33	3.0
Value Added or GDP (\$M)	1.64	2.07	2.52

4.5.2 The key points to note from the table are as follows:

- Within the *Hastings District*, the initiating total direct expenditure impact of \$2.33 million results in additional total economic activity or Value Added generated in the area of \$1.64 million. Associated with this are a total employment impact of 22 jobs and a net household income impact of \$0.58 million; and
- At the *Hawke's Bay Region* level, the maintenance and renewal work expenditure over the period generates additional total economic activity or Value Added of \$2.07 million. Associated with this are a total employment impact of 33 jobs and a net household income gain of \$0.76 million. The regional multiplier values are generally slightly higher than those indicated in Table 2 for the project construction stage, reflecting the different expenditure profile of the two activities.

#### 4.6 New Industry Development Impacts

4.6.1 This section indicates the potential local and regional economic impact gains resulting from further economic and industry growth in the Whakatu area, over the 30-year time horizon. It is noted that the results provided below are based on consideration of a range of possible economic and new business growth outcomes over the long-term with and without the WAL. The construction period assumed for the analysis is 2016-2017.

4.6.2 Three interrelated and indicative scenarios were developed for this assessment, as follows:

- Status Quo/Base Line* – a continuation over the forecast period of the historical long-term annual average real GDP growth rate for the Whakatu area of 4%, excluding the WAL development. This scenario results in a total GDP gain over the 30-year period of approximately \$576 million or an annual average level of approximately \$20 million.

From a Hawke's Bay Region economic impact perspective, the extent to which this figure represents a net gain to the region depends on the extent to which the Whakatu area attracts new regional business activity (particularly from outside Hawke's Bay) during the period. For the purposes of the analysis, a range of different new regional business ratios were evaluated before a ratio of 30% (partly based on the business growth history of the Whakatu industrial area over the past decade) was applied for this scenario.

This ratio results in an overall regional GDP gain for the 30-year period of approximately \$173 million in current dollar terms;

- ii) *New Road* – for the purposes of the analysis, it is assumed that the proposed new road on its own will increase the attractiveness of the Whakatu industrial area as a future strategic business location in the district, particularly for firms from outside the Hawke’s Bay Region. Accordingly, a higher annual average real GDP growth rate of 5% is assumed for the (2018-2048) forecast period (both existing and new firms in Whakatu should benefit from the WAL), along with a 40% ratio for the proportion of the increased GDP contributed by business activity new to the region. The resulting total GDP gain over the period is \$845.5 million and the ‘new business’ proportion of this \$338 million; and
- iii) *New Road Plus Freight Distribution Centre Initiative* – the operation of a new specialised freight distribution centre or hub in the Whakatu industrial area from an assumed start time of two years after the WAL begins operation, will further enhance its overall commercial attractiveness and growth prospects. On the basis of an assumed further increase in the area’s annual average GDP growth rate to 6% and also an increase to 60% in the proportion of the total GDP gain over the (2020-2048) forecast period coming from new regional business activity for Hawke’s Bay, the total GDP gain over the period has been calculated at \$1,178 million and the proportion of this that is new regional business activity at \$707 million.

4.6.3 **Table 4** indicates the local and regional economic impacts associated with Indicative Scenario ii above. The key economic impact results for this scenario for the 30-year period, are as follows:

- A total Value Added or GDP gain for the Hastings District over the 30-year period of approximately \$565 million and \$748 million for the Hawke’s Bay Region. (This compares with figures of \$289 million for Hastings District and \$382 million for the Hawke’s Bay Region for Scenario i; and \$1,136 million for Hastings District and \$1,563 million for the Hawke’s Bay Region for Scenario iii).
- A total jobs impact over the long-term period of 5,465 for Hastings District and 6,839 for the Hawke’s Bay Region. (This compares to Scenario i Hastings District 2,793 and Hawke’s Bay Region 3,495; and Scenario iii Hastings District 11,422 and Hawke’s Bay Region 14,294).
- Additional net household income generated in the Hastings District of approximately \$251 million over the 30-year period and \$334 million at the regional level. (For Scenario i, the comparable impacts are Hastings District \$128.3 million and Hawke’s Bay Region \$170.7 million; for Scenario iii, the results are Hastings District \$524.6 million and Hawke’s Bay Region \$698.1 million).



**Table 4: Whakatu Arterial Link New Industry Development Local and Regional Economic Impacts Over a 30-Year Period (Excluding Possible Freight Distribution Centre)**

Economic Impact Measure	Total Economic Impacts		
	Hastings District	Hawke's Bay Region	Hawke's Bay Multipliers
Revenue (\$M)	1,446.7	1,886.0	1.93
Net Household Income (\$M)	250.8	333.9	2.11
Jobs	5,465	6,839	2.09
Value Added or GDP (\$M)	564.8	747.7	2.21

4.6.4 It is emphasised that the above results are based on indicative Scenario figures for forecast GDP growth in the Whakatu area and the proportion of this growth coming from industries locating there during the forecast period that are new to the Hawke's Bay Region. To the extent that the proposed new road results in a different GDP growth path and/or attracts a lower or higher proportion of new firms, the resulting economic impacts will also differ from those presented above in Section 4.6.3. Whilst Scenario i represents the status quo situation, Scenarios ii and iii potentially provide lower and upper bounds for future growth in the area including the impact of the WAL.

## 5- Other Economic Benefits

5.1 The economic impact analysis in the previous section infers a range of potential economic benefits for the Hastings District/Hawke's Bay Region from the proposed WAL. In broad terms, these include increased economic activity/GDP, employment and household income; and increased business for local and regional suppliers.

5.2 In addition, there are other potential local and regional economic benefits resulting from the roading development. These include:

- Generation of transport, storage and distributional operating efficiencies for Whakatu based businesses, other Hastings businesses servicing the Napier-Hastings market, local businesses and households utilising Hawke's Bay Airport services and Hastings employees working in the Napier area;
- The transport efficiencies should flow through to the domestic and international export and import sectors in the region and also to the Port of Napier in terms of both the range and quality of services provided by the Port. This includes a possible freight distribution centre based in the Whakatu industrial area. Regional and local exporting activity and competitiveness should also be enhanced;
- These factors along with further industry growth should increase the overall appeal of the Whakatu industrial area as a strategic business location in the Hastings-Napier area for a range of 'wet' industries in particular. This will, in turn, provide a stronger platform for the external marketing of the district/region for additional business development and industrial investment. This includes potential additional industry cluster development;

- Further Whakatu wet industry development should, in turn, result in increased utilisation of the valuable industrial land and supporting utility services resource in the Whakatu/Tomoana area. This is consistent with the Hastings District Council's Industrial Strategy which provides alternative specialist locations for dry and service industry;
- The proposed roading development may encourage some business relocation activity to the Whakatu area from other business areas of the district, thus also freeing up valuable real estate in these areas for possibly more appropriate business operation;
- Consequential roading developments such as intersection upgrades on the Hawke's Bay Expressway and access improvements in Napier City to the Port of Napier, will be of further benefit to business operational efficiencies; and
- Reduced commercial vehicle use of the Marine Parade, Napier roading route to the Port of Napier will significantly enhance its overall tourism appeal.

5.3 Over the longer-term, these benefits should collectively generate additional economic impact gains for the district and region via increased and more efficient business development.

## 6- 'Downside' Economic Effects

6.1 This section comments on the potential 'downside' economic effects of the proposed new WAL. For the purposes of this report, these relate to the construction stage for the road and its rural production impact over time.

### Construction Stage

The Whakatu Arterial Project Description (GHD 2014a) identifies a number of potential issues particularly for horticultural production related activity (pip-fruit and vegetable growing) arising during the construction stage for the road. Some of the issues are also relevant to other business activity in the Whakatu area. The issues include the impact of dust on crops and sensitive equipment in pack-houses, odour and noise impacts on local businesses/workplaces, vibration impacts, access required to some business sites for road construction purposes, the impact of heavy commercial construction vehicles on existing roads in and around the Whakatu area and traffic delays particularly during the peak horticultural packing and distribution season.

As these issues have already been identified in the formal project description document for the WAL and recommendations made there for their effective remediation, the issues obviously have the potential individually and more so collectively to significantly affect some business activity in the area. Accordingly, this report recommends that in the event that the proposed new road proceeds, the Hastings District Council establishes an ongoing project information provision and business consultation process for the Whakatu area and also implements suitable policies and procedures to directly address the above and other relevant construction period issues.

## 6.2 Road Operation-Rural Production Loss

6.2.1 On the basis of detailed information provided in the Productive Land Use Impact Assessment for the WAL (AgFirst Consultants2014), the figure used in this report for the estimated total area of orchard and cropping land directly affected by the new road is some 23 hectares. This figure covers the land required for the actual road itself and an additional setback for orchard and cropping headlands. It is noted that WAL design refinements have reduced this figure to approximately 20 hectares (as reflected in the final Productive Land Use Impact Assessment), however, for the purposes of this report the higher figure of 23 hectares has been used to reflect a worst case scenario, and to provide some recognition of potential severance effects. On the basis of the current level of annual production returns per hectare (figures also provided by AgFirst) for the range of individual crops grown on the affected land, the total annual value of lost horticultural production with the arterial link is estimated at \$1.38 million or \$41.3 million over a 30-year period.

6.2.2 **Table 5** indicates the total local and regional economic impacts of this potential level of lost production value, over the long-term period and in current dollar terms. For the Hastings District, the economic impact losses are Value Added/GDP \$34.4 million, Jobs 597 and Net Household Income \$20.1 million. For the wider Hawke's Bay Region, the comparable results are Value Added/GDP \$42.1 million, Jobs 643 and Net Household Income \$21.9 million.

**Table 5: Whakatu Arterial Link Local and Regional Economic Impacts of Potential Horticultural Production Losses over a 30-Year Period**

Economic Impact Measure	Total Economic Impacts		
	Hastings District	Hawke's Bay Region	Hawke's Bay Multipliers
Revenue (\$M)	74.3	96.4	2.33
Net Household Income (\$M)	20.1	21.9	1.45
Jobs	597	643	1.40
Value Added or GDP (\$M)	34.4	42.1	2.03

## 7- Overall Economic Effects Assessment

7.1 This section provides an overall assessment of the net external/community-level economic effects of the proposed new WAL, from two different perspectives, that is:

- a) A Benefit-Cost assessment of the WAL in terms of the regional level Value-Added/GDP impacts resulting from its construction (although only a short-term impact) and ongoing annual operation, new industry activity spurred on by the new link and 'lost' horticultural production; and

- b) A comparison between the regional-level Value Added economic impacts for the 'status quo' (no WAL) situation, the construction and operation of the new road, and the associated development of a specialised freight distribution centre in Whakatu.
- 7.2 It is again noted that Value Added/GDP refers to the true level of additional economic activity generated in an area, by a significant new expenditure activity.
- 7.3 Both assessments are undertaken for a 30-year period, with the Value Added/GDP results provided in discounted Net Present Value (NPV) terms. Discounted NPV values take into account the changing time value of money and alternative rates of return on investments. The model for calculating the NPV results was also prepared by Dr Hughes and incorporates two different public discount rates (5% and 7%) and two different private discount rates (8% and 10%). The higher private discount rates reflect the increased risk profile for the private sector activities of industrial development and horticultural production.
- 7.4 **Appendix 3a** provides the detailed Hawkes Bay level results of Dr Hughes' NPV analysis, for the WAL construction stage and annual operation, as well as the new industry development Scenario ii situation described on page 10 earlier in the report. This situation covers the impact of the new road without the possible freight distribution centre. The results indicate that over the 30-year period and assuming public and private discount rates of 5% and 8% respectively, the net Value Added/GDP impact of the proposed WAL (including its construction impact) is an overall gain of approximately \$232 million in NPV terms, at the Hawke's Bay Region level. Excluding the WAL construction stage, the net GDP impact is approximately \$215 million.
- 7.5 With public and private discount rates of 7% and 10% respectively (see **Appendix 3b**), the comparable net Value Added/GDP impacts in NPV terms are \$190 million (including the construction impact) and \$173 million (excluding the construction impact).
- 7.6 It is noted that the net impacts indicated in Sections 7.4 and 7.5 above will vary depending on the extent to which the road maintenance spending over the forecast period is reallocated from existing Council budgets rather than from additional/new budgetary allocations and also the extent to which horticultural production losses are recovered elsewhere in the district or region.
- 7.7 **Table 6** compares the regional Value Added/GDP impacts over the forecast period in NPV terms for the 'status quo' situation versus the WAL development with and without the possible construction of a new freight distribution centre facility. The new industry development impacts are based on the three different scenarios presented in Section 4.6.2 of the report.
- 7.8 The public and private discount rates used for the NPV calculations in the table are 5% and 8% respectively. The public rate was applied in the case of the road construction and annual maintenance GDP impacts and the private rate in the case of the new industry development and pip-fruit loss GDP impacts.

**Table 6: Hawke’s Bay Region Total Value Added Impacts of Proposed New WAL in Discounted Net Present Value Terms Over a 30-Year period**

Total Value Added Impact Over 30 Years in Discounted Net Present Value (NPV) Terms In \$M	Activity					Increase in Net Value-Added Impact
	Road Construction	Ongoing Road Maintenance	New Industry Development	Lost Pipfruit Production	Net Value Added Impact	
1. Without The New Road	-	-	118.00	-	118.00	-
2. With the new WAL road and associated steady industry development. (But excluding a major new freight distribution centre operating in the Whakatu industrial area)	17.08	1.11	231.10	17.06	232.23	114.23
3. As in Point 2 above but also including the establishment of a major new freight distribution centre in Whakatu	17.08	1.11	483.04	17.06	484.17	251.94

7.9 The results in the table indicate an approximate \$114 million or almost doubling in the overall gross regional Value Added/GDP impact of the proposed WAL for the 30-year period, compared to the existing situation. If, in addition to the WAL, a specialised freight distribution centre is subsequently developed in the Whakatu area, it is estimated that over the forecast period this will increase the total net Value Added impact of the road at the regional level by a further approximately \$252 million. The last column of the table indicates the gains in net Value Added for the region firstly with just the WAL and secondly with the operation of a major new freight distribution centre.

7.10 Using discount rates of 7% (public) and 10% (private), the total net Value Added impact of the WAL itself over the period is \$189.68 million, representing a regional gain for this indicator of \$71.68 million compared to the status quo situation. Including the potential new freight distribution centre, the overall net Value Added impact increases to \$392.45 million, representing a regional gain for this indicator of \$202.77 million over and above the impact of the WAL on its own. These figures can be compared with those in the last two columns of Table 6.

7.11 To the extent though that part of the total funding requirement for the construction and/or operation-maintenance of the new road is met from existing regional resources, and future underlying Whakatu area economic growth and the proportion of new firms locating in the area are different from the levels assumed for the analysis in the report, the overall local and regional economic impacts will be different from those indicated in the above table.

## APPENDIX 1:

### Dr WARREN R HUGHES - AUTHOR PROFILE

The author is Cambridge, NZ born and a graduate of the University of Auckland and Indiana University in the USA, where he completed his doctorate in Business Economics and Public Policy in 1970.

Since that time, he has taught in the areas of econometrics, forecasting, financial economics and managerial strategy at The University of New South Wales in Sydney (1970 – 1978) and most recently at The University of Waikato (1978 – 2007). At various times, he has taught in MBA programmes at the University of Florida in Gainesville and in the Graduate School of Management at the University of California at Irvine. At the present time, he works as an independent economic consultant.

The author has published extensively, mainly as single-authored articles in international journals such as *Decision Sciences*, *Theory and Decision*, *The Journal of Business*, *Mathematical & Computer Modelling*, *Environment & Planning*, *Australian Journal of Management*, *Forest Science*, *Australasian Journal of Regional Studies* and, most recently, *OMEGA*, the international journal of management science. Other articles on theoretical and applied economics have been published by the author in *NZ Economic Papers* and *Australia's Economic Record*. He is a member of the Advisory Board for the Wiley journal *Managerial and Decision Economics* and maintains a continuing interest in the latest developments in economic theory as it relates to management and business. The author has developed a particular expertise in the area of impact and regional analysis. He is the Editor/Manager of the *Regional Economic Bulletin*, which focuses on topical issues relevant to the business and wider communities, mainly but not exclusively, in the Waikato and Bay of Plenty regions. The *Bulletin* is a complimentary publication of the Department of Economics at The University of Waikato.

The author has acted as a consulting economist for *Alpha Aviation Limited*, *Environment Waikato*, *Carter Holt Harvey Limited*, *Norske Skog Tasman Limited*, *Port of Tauranga Limited*, *Port of Napier*, *Feltex Carpets Limited*, *NZ Refining Company Limited*, *Zespri International*, *Waikato Innovation Park*, *Property Council of NZ*, *Creative Napier*, *Katolyst*, *Priority One BOP*, *Vision Manawatu*, *Enterprise Franklin*, *Venture Taranaki*, various District Councils in the Waikato, Bay of Plenty, Hawke's Bay and other regions and for events such as *Tauranga's Montana Jazz Festival*, *Hamilton's Balloons Over Waikato* and *Napier's Art Deco Weekend*.

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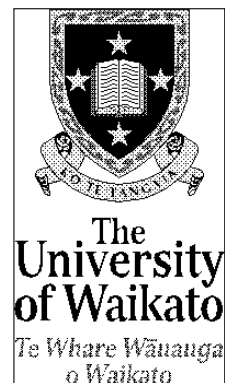
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## APPENDIX 2:

### Modelling Analysis Results Prepared By Dr W. Hughes, Economic Impact Consultant, Hughes Economics, Auckland for Economic Solutions Ltd, Napier.

#### ECONOMIC IMPACTS FOR THE WHAKATU ARTERIAL LINK

REVISED 15.11.13

The following economic impacts were derived using 88-sector economic models for the Hastings District Council region and the Hawke's Bay Regional Council economy (includes Hastings). These models were constructed for the year ended December 2011. Changes in both economies since then have been minimal so the updated results are still valid as of November 2013.

#### 1. ROAD CONSTRUCTION - \$19.75 m

Detail shown for \$19.75 m direct spending impact.

Impact Round	Revenue \$ millions	Net Household Income \$ m	Jobs (Labour-Years)	Value Added or GRP \$ m
Hastings DC Direct	19.75	2.80	70	6.66
Flow-ons to Hastings region	17.43	2.65	84	7.05
<b>TOTAL HASTINGS DC</b>	<b>37.18</b>	<b>5.45</b>	<b>154</b>	<b>13.71</b>
Flow-ons Rest of Hawke's Bay	9.76	1.78	52	3.37
<b>TOTAL HAWKE'S BAY RC</b>	<b>46.94</b>	<b>7.23</b>	<b>206</b>	<b>17.08</b>

#### 2. ROAD OPERATION AND MAINTENANCE/RENEWAL - \$2.33 m Over A 30-Year Period

Detail shown for \$2.33 m direct spending impact.

Impact Round	Revenue \$ millions	Net Household Income \$ m	Jobs (Labour-Years)	Value Added or GRP \$ m
Hastings DC Direct	2.33	0.29	11	0.82
Flow-ons to Hastings region	2.04	0.29	11	0.82
<b>TOTAL HASTINGS DC</b>	<b>4.37</b>	<b>0.58</b>	<b>22</b>	<b>1.64</b>
Flow-ons Rest of Hawke's Bay	1.22	0.18	11	0.43
<b>TOTAL HAWKE'S BAY RC</b>	<b>5.59</b>	<b>0.76</b>	<b>33</b>	<b>2.07</b>



### 3. RURAL LOSSES FOR PIPFRUIT SECTOR - \$41.3 MILLION LOSS OVER 30-YEAR PERIOD

Detail shown for \$41.3 million direct revenue loss over a 30-year period.

Impact Round	Revenue \$ millions	Net Household Income \$ m	Jobs (Labour-Years)	Value Added or GRP \$ m
Hastings DC Direct Loss	41.3	15.1	459	20.7
Flow-ons to Hastings region	33.0	5.0	138	13.7
<b>TOTAL HASTINGS DC</b>	<b>74.3</b>	<b>20.1</b>	<b>597</b>	<b>34.4</b>
Flow-ons Rest of Hawke's Bay	22.1	1.8	25	7.7
<b>TOTAL HAWKE'S BAY RC</b>	<b>96.4</b>	<b>21.9</b>	<b>643</b>	<b>42.1</b>

### 4. ECONOMIC IMPACTS FROM NET NEW ECONOMIC/BUSINESS DEVELOPMENT IN WHAKATU

Details shown for impact of a direct Value Added/GDP gain in the Whakatu area over a 30-year period of \$338.2 million, representing the new industry impact of the ongoing operation of the proposed new arterial link.

Impact Round	Revenue \$ millions	Net Household Income \$ m	Jobs (Labour-Years)	Value Added or GRP \$ m
Hastings DC Direct Gain	975.7	158.6	3265	338.2
Flow-ons to Hastings region	471.0	92.2	2200	226.6
<b>TOTAL HASTINGS DC</b>	<b>1446.7</b>	<b>250.8</b>	<b>5465</b>	<b>564.8</b>
Flow-ons Rest of Hawke's Bay	439.3	83.1	1374	182.9
<b>TOTAL HAWKE'S BAY RC</b>	<b>1886.0</b>	<b>333.9</b>	<b>6839</b>	<b>747.7</b>

## APPENDIX 3a:

### MODEL FOR ESTIMATING NET REGIONAL ECONOMIC/VALUE ADDED GAINS DUE TO NEW WHAKATU ARTERIAL LINK AND ASSOCIATED NEW INDUSTRY DEVELOPMENT (Refer to Section 7.4 of Main Report)

Public discount rate =		0.0500		Private discount rate =		0.0800	
YEAR	Construction GRP \$ millions	Maintenance GRP \$ millions	New Industry GRP \$ millions	Rural GRP Losses \$ millions	Net Gains \$ millions		
1	17.0800	0.0690	11.2500	1.4033	26.9957		
2		0.0690	11.8100	1.4033	10.4757		
3		0.0690	12.4100	1.4033	11.0757		
4		0.0690	13.0200	1.4033	11.6857		
5		0.0690	13.6800	1.4033	12.3457		
6		0.0690	14.3600	1.4033	13.0257		
7		0.0690	15.0800	1.4033	13.7457		
8		0.0690	15.8300	1.4033	14.4957		
9		0.0690	16.6200	1.4033	15.2857		
10		0.0690	17.4500	1.4033	16.1157		
11		0.0690	18.3300	1.4033	16.9957		
12		0.0690	19.2500	1.4033	17.9157		
13		0.0690	20.2100	1.4033	18.8757		
14		0.0690	21.2100	1.4033	19.8757		
15		0.0690	22.2800	1.4033	20.9457		
16		0.0690	23.3900	1.4033	22.0557		
17		0.0690	24.5600	1.4033	23.2257		
18		0.0690	25.7900	1.4033	24.4557		
19		0.0690	27.0800	1.4033	25.7457		
20		0.0690	28.4300	1.4033	27.0957		
21		0.0690	29.8500	1.4033	28.5157		
22		0.0690	31.3400	1.4033	30.0057		
23		0.0690	32.9100	1.4033	31.5757		
24		0.0690	34.5600	1.4033	33.2257		
25		0.0690	36.2800	1.4033	34.9457		
26		0.0690	38.1000	1.4033	36.7657		
27		0.0690	40.0000	1.4033	38.6657		
28		0.0690	42.0000	1.4033	40.6657		
29		0.0690	44.1100	1.4033	42.7757		
30		0.0690	46.5100	1.4033	45.1757		
<b>TOTALS</b>	<b>17.0800</b>	<b>2.0700</b>	<b>747.7000</b>	<b>42.0990</b>	<b>724.7510</b>		
<b>NPVs</b>	<b>17.0800</b>	<b>1.1137</b>	<b>231.0953</b>	<b>17.0619</b>	<b>232.2271</b>		

## APPENDIX 3b:

### MODEL FOR ESTIMATING NET REGIONAL ECONOMIC/VALUE ADDED GAINS DUE TO NEW WHAKATU ARTERIAL LINK AND ASSOCIATED NEW INDUSTRY DEVELOPMENT (Refer to Section 7.4 of Main Report)

Public discount rate =		0.0700		Private discount rate =		0.1000	
YEAR	Construction GRP \$ millions	Maintenance GRP \$ millions	New Industry GRP \$ millions	Rural GRP Losses \$ millions	Net Gains \$ millions		
1	17.0800	0.0690	11.2500	1.4033	26.9957		
2		0.0690	11.8100	1.4033	10.4757		
3		0.0690	12.4100	1.4033	11.0757		
4		0.0690	13.0200	1.4033	11.6857		
5		0.0690	13.6800	1.4033	12.3457		
6		0.0690	14.3600	1.4033	13.0257		
7		0.0690	15.0800	1.4033	13.7457		
8		0.0690	15.8300	1.4033	14.4957		
9		0.0690	16.6200	1.4033	15.2857		
10		0.0690	17.4500	1.4033	16.1157		
11		0.0690	18.3300	1.4033	16.9957		
12		0.0690	19.2500	1.4033	17.9157		
13		0.0690	20.2100	1.4033	18.8757		
14		0.0690	21.2100	1.4033	19.8757		
15		0.0690	22.2800	1.4033	20.9457		
16		0.0690	23.3900	1.4033	22.0557		
17		0.0690	24.5600	1.4033	23.2257		
18		0.0690	25.7900	1.4033	24.4557		
19		0.0690	27.0800	1.4033	25.7457		
20		0.0690	28.4300	1.4033	27.0957		
21		0.0690	29.8500	1.4033	28.5157		
22		0.0690	31.3400	1.4033	30.0057		
23		0.0690	32.9100	1.4033	31.5757		
24		0.0690	34.5600	1.4033	33.2257		
25		0.0690	36.2800	1.4033	34.9457		
26		0.0690	38.1000	1.4033	36.7657		
27		0.0690	40.0000	1.4033	38.6657		
28		0.0690	42.0000	1.4033	40.6657		
29		0.0690	44.1100	1.4033	42.7757		
30		0.0690	46.5100	1.4033	45.1757		
<b>TOTALS</b>	<b>17.0800</b>	<b>2.0700</b>	<b>747.7000</b>	<b>42.0990</b>	<b>724.7510</b>		
<b>NPVs</b>	<b>17.0800</b>	<b>0.9162</b>	<b>186.2292</b>	<b>14.5517</b>	<b>189.6737</b>		