

**STAGE 1**

**HUTT CORRIDOR TRANSPORT OPTIONS**

**ECONOMIC EVALUATION OF STAGE 1**

WELLINGTON REGIONAL COUNCIL



INTERNATIONAL  
CONSULTANTS

# HUTT CORRIDOR TRANSPORT OPTIONS

## ECONOMIC EVALUATION OF STAGE 1

For

Wellington Regional Council

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# Hutt Corridor Transport Options, an Economic Evaluation

## Table of Contents

INTRODUCTION.....	3
Interpretation of Results .....	4
Points Considered.....	4
OUTLOOK FOR WELLINGTON REGION.....	5
Hutt Economy.....	6
REGION WIDE / NETWORK.....	8
Delivery by Mode.....	9
Time Savings .....	10
SUSTAINABILITY AND SAFETY .....	11
AFFORDABLE MOBILITY.....	12
REASONS FOR TRAVEL .....	12
Effects on Business .....	13
Effects on Citizens .....	13
LOCATION EFFECTS .....	13
DISTRIBUTION OF BENEFITS .....	13
SUMMARY.....	15

## INTRODUCTION

1. This briefing note looks at and compares 3 sets of options that are being considered as part of the Hutt Corridor Transport Study. Those 3 sets of options are based on a set of state highway 2 (SH 2) roading options: a set of public transport options and a set of options for a cross-valley road link and associated/connected road link to the Transmission Gully Motorway. The components are as follows:
  - A. do minimum includes
    - i) SH 2 Dowse to Petone upgrade
    - ii) State highway 1 (SH 1) Nauranga to Aotea Quay tidal flow lane
    - iii) CBD bus lane schemes
    - iv) Mana to Pukerua Bay 4 laning
    - v) Kapiti link road
    - vi) Inner City Bypass
    - vii) Transmission Gully Motorway (not tolled)
  - B. State Highway 2 roading options
    - a) H1
      - i) do minimum
      - ii) making SH2 a restricted access road throughout the Hutt Valley
      - iii) Upgrading Silverstream Bridge
    - b) H2
      - i) Hutt expressway, HOT high occupancy toll lane
      - ii) Melling to a grade separated interchange
      - iii) Upgrading Silverstream Bridge to 4 lanes
    - c) H3
      - i) Hutt expressway, tidal flow from Petone to Nauranga
      - ii) Grade separated interchanges at Melling; Belmont; Silverstream; Moonshine Road; Gibbons Street; Totara Park Road
      - iii) Realignment of the Petone curve
      - iv) Whakatiki Street access to SH2 closed
      - v) Upgrading Silverstream Bridge to 4 lanes
  - C. Passenger Transport Options
    - a) P1a
      - i) Hutt Expressway: a Busway from Petone to Nauranga
      - ii) New bus and ferry services and routes
      - iii) Bus service between Porirua and Hutt
    - b) P2
      - i) Rail services increased frequency and speed
      - ii) Bus services: new Porirua and Hutt
    - c) P3
      - i) Melling loop light rail LRT
      - ii) Stokes Valley LRT
      - iii) New rail stations at Timberlea and Cruickshank Road
      - iv) Heavy rail services: improved Hutt Valley and Wairarapa

- d) P4
  - i) Rail; speed increased
  - ii) Bus services between Hutt and Porirua
  - iii) Hutt expressway bus lane
  - iv) Wainuiomata super bus network
  - v) Eastbourne ferry service frequency doubled
- D. Cross Valley and Porirua Road Link Options
  - a) X1
    - i) Melling - Porirua link
    - ii) Esplanade upgrade
  - b) X2
    - i) Melling - Porirua link
    - ii) Cross valley link: whites line to Wakefield Bridge and 4 lane Randwick Road to Dowse SH 2
  - c) X3
    - i) Melling - Porirua link
    - ii) Melling grade separated
    - iii) Randwick Melling link around the Lower Hutt CBD
  - d) X4
    - i) Belmont - Porirua Link
    - ii) Randwick Cambridge Terrace Belmont Link
  - e) X6
    - i) SH 58 4 laning
  - f) X7
    - i) Akatarawa Road upgrade

### **Interpretation of Results**

2. This is stage 1 of the evaluation and is a coarse sieve with more complete analysis once the options have been narrowed down. In addition, the analysis is based on model runs undertaken by BCHF and they report that the model may not accurately reflect the bottlenecks at intersections and the benefits from grade separation. Accordingly, those options with grade separation may not generate the correct results. In addition, the lessening of accident risk with a move to limited access may also not be accurately captured.

### **Points Considered**

3. The points considered in this briefing are:
- a) Background: outlook for Wellington Region; Hutt demographics & economy
  - b) region wide / network effects
  - c) environmental effects
  - d) affordable mobility
  - e) reasons for travel
  - f) effect on traffic
  - g) effects on business

- h) effects on citizens
- i) location effects
- j) congestion effects
- k) distribution of benefits

## **OUTLOOK FOR WELLINGTON REGION**

### Regional Overview

Our forecasts of what the Wellington Region may look like in the future, based on current trends, are as follows:

- a) Wellington metropolitan area (the four cities) is gaining in importance as:
  - i) an entertainment centre (e.g. the success of “send yourself to Wellington” and the Regional Stadium)
  - ii) as a consulting service centre (especially management consultants, information technology, communications and creative media)
  - iii) a distribution centre (but not in Wellington City)
- b) Wellington metropolitan area will remain the key Government centre
- c) region wide, while large-scale manufacturing is stagnant or declining, forestry is increasing. However, regionally focussed light industry is expected to grow (but not in Wellington City)
- d) the Wellington Metropolitan area could turn into the regional centre for the area south of Taupo (and for the top of the South Island)
  - i) it is important for the Region’s survival to facilitate, help and enable this to happen
  - ii) there is a need to facilitate the movement of people and freight. Also to enable ready access to the services, distribution companies, port and airport in Wellington. Moreover, those service providers and distribution firms in the metropolitan area need ready access to the wider Southern North Island “Region” and the top of the South Island.
- e) the region needs to restructure itself to survive in the future. The factors hindering the region include the inadequate road networks [cf. analysis of Regional Council’s Transport Model runs]
- f) Wellington City has lost its position as the main financial centre, the preferred location for head offices of multinationals and large companies. We forecast the CBD will continue to decline in importance as a national business centre. This continued decline will have an adverse effect on the rest of the region
- g) for the consulting services in Wellington City to survive and prosper, they need to continue to focus on national and international work. This requires fast Internet connections, good access to the airport and good roading access north.

Growth projections are as follows:

- while the Labour government means more Government jobs, the Wellington urban economy is expected to have lower output and employment growth than the New Zealand average.
- we expect job numbers in Wellington City to continue to grow until around 2005, this growth will be mainly low end and part time jobs driven by falls in rentals and rise in retail cafes and information technology. This is a continuation of the current trend.

- under-representation of traded-products industries (manufacturing, tourism) in Wellington means limited benefit from expansion in exports (which underpins national economic growth). Prospects for the major trading centres (Auckland, Christchurch, Waikato-Bay of Plenty) are very good as they have different economic drivers from those affecting the Wellington region
- We expect, tourism, IT and communications to grow. They may not replace the lost jobs
- in the Wairarapa, forestry processing, grape growing and wine production could assume significant importance and lead to an economic resurgence of the area.

## Hutt Economy

**Upper Hutt** – continue as now, little economic development and some residential development. All the risks are on the down side. The ties are to Hutt rather than Wellington

We see growth as being distribution and light industry and concentrated in the industrial area. Given the ample supply of land, we see continued slow growth in residential – this relies on the region doing well. With the conversion of the CIT site to an English language school, there will be a lot more younger people in the Valley, especially in Upper Hutt. This will provide a significant boost to Upper Hutt and a lesser boost to Hutt City

**Hutt** – static population, potentially significant growth in light industry and distribution industries, Hutt will aim to be the centre for light industry and distribution in the Region to reduce its dependant on Wellington for employment and economic success. Access to the North (State Highway 1), port and airport are important. Hutt will interact with the rest of the region and its economic future is likely to still be tied to what happens to Wellington

We see retail (Queensgate) as doubling in size, light industry as growing in Gracefield/ Seaview (there is significant potential but all the factors needed to enable this potential to be achieved have yet to be put in place) and slow growth in media around Avalon. The growth at Queensgate is already putting pressure on the road network and the main route to Gracefield, the Esplanade, is already over loaded. The Esplanade is also important because it runs along the waterfront and, with the current volume of traffic, separates the city from the shore. For Hutt City to provide employment opportunities for its residents, these traffic issues have to be addressed. The most obvious solution is the cross-valley link, which has been mooted for some time. This is one of the options modelled.

## Where People Live and Work

The following data comes from the Statistics NZ 1996 Census. It is based on employees and does not distinguish between full time and part time employees.

Description	Number	Comment
<b>Region</b>		
population 15 to 59 in the Region	270,250	
number with a job in the region	170,076	63% of the 15 to 59 population has a job
<b>Wellington City</b>		
number of jobs in Wellington	90,177	number of people working in Wellington
number of jobs Wellington CBD	46,782	52% of Wellington jobs are in the CBD
number of jobs Wellington CBD fringe	20,058	22 % work in the Wellington CBD fringe
number of jobs in the rest of Wellington	23,340	26% work outside the inner city
number of non-Wellington residents who work in Wellington	21,186	23% of Wellington jobs filled by non-Wellington residents
number of Hutt Valley residents who work in the Wellington CBD	14,556	16% of Wellington jobs filled by Hutt Valley residents
number of Porirua residents who work in Wellington CBD	6,468	7% of Wellington jobs filled by Porirua residents

Note: not all employees fall into the definitions above (and below). The numbers outside are expected to be small. An example is that not all employees are between 15 and 60 (this is the accepted age group for comparison).

Description	Number	Comment
<b>Hutt City</b>		
population 15 to 59 in Upper Hutt	61,220	
number of jobs in Hutt	34,194	the number of people working in Hutt
number who live in the Hutt and work in Hutt	23,748	44% find work outside Hutt, (35% in 1991) 31% of Hutt jobs are filled by people from outside
number of Hutt citizens who work in Wellington	12,003	28% of Hutt citizens with a job work in Wellington
number of Hutt citizens who work in Upper Hutt	1,377	3% of Hutt citizens with a job work in Upper Hutt
number of Hutt citizens who work in Porirua	474	a negligible percentage of Hutt citizens with a job work in Porirua
number of Hutt citizens who work elsewhere or have no workplace	4,455	11% work elsewhere or have no fixed workplace location
<b>Upper Hutt City</b>		
population 15 to 59 in Upper Hutt	23,410	
number of Jobs in Upper Hutt	9,906	the number of people working in Upper Hutt
number who live and work in Upper Hutt	7,389	55% find work outside Upper Hutt 2,517 (25%) people from outside Upper Hutt work there
number of Upper Hutt employees who work in Wellington	3,389	38% of those in Upper Hutt who work outside Upper Hutt go to Wellington
number of Upper Hutt employees who work in Lower Hutt	3,507	39% of those in Upper Hutt who work outside Upper Hutt go to Lower Hutt
number of Upper Hutt employees who work elsewhere or have no workplace	2,043	23% work elsewhere or have no fixed workplace location

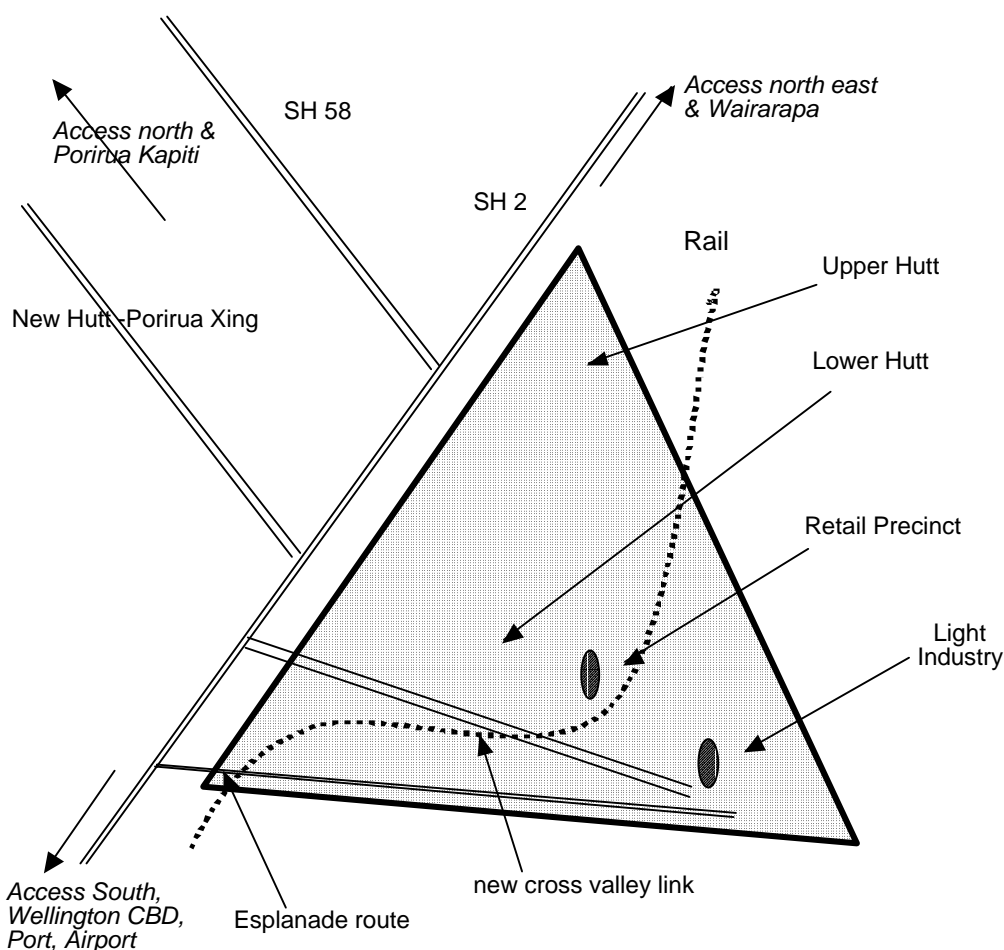


What this all means is that public transport and the road network are very important for commuting:

- Wellington is the major employment destination for Hutt Valley residents 15,400 live in the Hutt Valley and work in Wellington
- 3,500 live in Upper Hutt and work in Lower Hutt, more than go to work in Wellington
- 1,400 live in Lower Hutt and work in Upper Hutt
- hardly any Hutt Valley residents work in Porirua

## REGION WIDE / NETWORK

4. The following simple diagram shows what we are looking at. Essentially the valley can be regarded as a triangle with Upper Hutt at the top and Hutt at the bottom. State Highway 2 runs along the west side and provides access to the Wairarapa and the northeast and south to Wellington, port and airport. The link south is also a key route north because of the nature of SH 58 (narrow, windy and no easy access to SH1 at the Porirua end.). The new cross-valley link takes the pressure of the Esplanade and provides ready and easy access to Gracefield and the retail precinct. The cross-valley link potentially joins up to a new Hutt Porirua (Transmission Gully Motorway) road.



5. We are looking at how usage of the roads changes with the options and how many people are delivered to the key destinations and at what cost in time & pollution.

6. All the results clearly indicate that the region is highly interconnected. Indeed, changes to one part of the network usually affect the whole of the network. Moreover, since the region must make itself into the regional centre for the lower half of the North Island (and the top of the South Island) then we need to cast the net further and look at the broader interests of the region.

### Delivery by Mode

7. The following tables show the delivery by mode for the various options. The issue we are looking at here is accessibility – how many people are able to take the trip south. Please note that included in the figures below are the people who travel to the Nauranga interchange and turn right to go north. The figures from the modelling of the various cross-valley link and Hutt Porirua link imply that this is at least 1,600 vehicles or around 2,240 people.
8. The figures show that (in comparison to the “Do Minimum”)
- as expected H1 has little effect as it is more aimed at safety and improving the link between Upper Hutt and Hutt City
  - H2 gains a significant improvement but sees people switch from train to bus
  - H3 delivers the most people although public transport, especially rail, has lost around 1,000 passengers
  - while all the public transport options improve on the Do Minimum. All PT options appear to make no difference to vehicle usage (changes are well within the modelling error)
  - P4 is little different to P1
9. The target then is to move around 20,000 people along the corridor. H3 shows it can be done. The modelling of combinations, such as H2, P2 and X2, in the next stage may well show how this can be achieved.

### Using State Highway 2, Petone to Nauranga

	<b>Do Mini</b>	<b>H1</b>	<b>H2</b>	<b>H3</b>
SH1, road	8,075	8,076	7,439	10,974
Expressway HOT			1,907	
bus	144	144	519	385
rail	6,200	6,181	5,429	4,849
<b>Total</b>	<b>16,841</b>	<b>16,823</b>	<b>18,097</b>	<b>19,500</b>

	<b>Do Mini</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>
SH1, road	8,075	7,966	8,005	8,056	7,945
busway		3,059			2,682
bus	144		160	137	0
rail	6,200	4,231	6,729	6,515	4,725
<b>Total</b>	<b>16,841</b>	<b>17,645</b>	<b>17,295</b>	<b>17,124</b>	<b>17,735</b>

10. The following table shows the effects of the various cross-valley link and Hutt Porirua link combinations. X1 is interesting because it shows that at least 1,600 vehicles use the SH2 to Nauranga to go north to Porirua and beyond. What is clear is that there are significant benefits to travellers from the combination of a cross-valley link and a new link between Hutt and Porirua. It is also clear from the model runs that the SH58 four laning alone (without the cross valley link) does not deliver any real accessibility benefits.

#### Effects of Cross Valley Link

Access to	Via	X1	X2	X3	X4	X6	X7
Wellington	Road SH2	6,475	7,515	7,415	7,535	8,035	8,065
Western Corridor	SH 58	1,440	2,190	2,280	3,340		
Cross link	Esplanade new	7,780	6,500	6,700	7,590		218

#### Time Savings

11. All the figures are for motor vehicle access times to the airport and are for changes from the do minimum and are for the morning peak. As one would expect, there are significant savings from H3 and H2 and minor savings from all the other options. It must be remembered that the public transport options are targeted towards the Wellington CBD not the Airport (which is probably not a valid PT target).

#### Access times to the Airport

From	H1	H2	H3	P1	P2	P3	P4
Upper Hutt	5%	-11%	-22%	-3%	-2%	-1%	-5%
Hutt	0%	-14%	-23%	-4%	-3%	-1%	-5%
East External	-2%	-5%	-10%	-1%	-1%	0%	-2%
Johnsonville	0%	0%	1%	0%	0%	0%	-2%
Porirua	0%	-1%	-1%	-2%	-1%	0%	-2%
Plimerton	0%	0%	-1%	-1%	-1%	0%	-2%
Paraparaumu	0%	0%	-1%	-1%	-1%	0%	-1%

From	X1	X2	X3	X4	X6	X7
Upper Hutt	-6%	-1%	-3%	-3%	0%	0%
Hutt	-8%	-1%	-3%	-4%	-1%	0%
East External	-2%	-2%	-1%	-1%	0%	0%
Johnsonville	-4%	-2%	-2%	-1%	0%	0%
Porirua	3%	-2%	-2%	0%	0%	0%
Plimerton	3%	-1%	-1%	0%	0%	0%
Paraparaumu	1%	-1%	-1%	0%	0%	0%

## SUSTAINABILITY AND SAFETY

12. Sustainability is enhanced with a significant drop in emissions – a step to meeting the 1997 Kyoto Protocol on green house gas emissions. It is important to note that the model is deterministic and so, based on the Ministry of Transport commissioned work, the model does not capture the most significant generator of pollution, especially PM10, congestion. The CO2 and CO changes from the do minimum set out below only reflect the generation of pollution from the average speed. The congestion level figure is a coarse means of estimating the real level of pollution on the roads.
13. Both H2 and H3 significantly affect pollution levels in the region. It is interesting to note that of the public transport options only P1 and P4 significantly affect pollution.

Effect	H1	H2	H3	P1	P2	P3	P4
CO	0%	0%	0%	-2%	-1%	0%	-2%
CO2	0%	1%	2%	-1%	-1%	0%	-1%
Congestion	-1%	-5%	-9%	-5%	-3%	-1%	-6%
Safety costs	-1%	1%	-4%	0%	0%	0%	-1%

Effect	X1	X2	X3	X4	X6	X7
CO	1%	0%	0%	1%	0%	0%
CO2	2%	1%	1%	1%	0%	0%
Congestion	-5%	-3%	-6%	-4%	-1%	0%
Safety costs	4%	5%	5%	5%	0%	0%

### Efficiency of Motor Vehicles

14. The following is a coarse estimate of the efficiency of the network. It reflects how well the design and management of the network enables vehicles to be used efficiently where efficient is in terms of fuel efficiency. Only H3, P1, P2, X2, X3 and X4 deliver efficiencies.

Effect	H1	H2	H3	P1	P2	P3	P4
Total distance	0%	1%	4%	0%	0%	0%	1%
Total fuel	0%	1%	2%	-1%	-1%	0%	-1%
Net effect	0%	0%	-2%	-1%	-1%	0%	0%

Effect	X1	X2	X3	X4	X6	X7
Total distance	2%	2%	2%	2%	0%	0%
Total fuel	2%	1%	1%	1%	0%	0%
Net effect	0%	-1%	-1%	-1%	0%	0%

## Safety

15. The following two tables show the increase in safety costs of the various options. Only H3 delivers any significant accident cost savings. We are surprised at the level of increased accident costs from the cross-valley and Hutt Porirua link options. We would have expected them to be neutral to low increase.

Effect	H1	H2	H3	P1	P2	P3	P4
Safety costs	-1%	1%	-4%	0%	0%	0%	-1%

Effect	X1	X2	X3	X4	X6	X7
Safety costs	4%	5%	5%	5%	0%	0%

## AFFORDABLE MOBILITY

16. These issues will be addressed in stage 2. The discussion will be focussed as set out below.
17. A key question is how affordable is it for people to move around the region. The international evidence is that the less well off tend to have jobs outside the CBDs and need to use a car to get there.
18. The following table shows the difference in average auto travel time from the “do minimum” from trips from throughout the region to the various CBDs.

Trips to		
Wellington		
Porirua		
Kapiti		
Upper Hutt		
Lower Hutt		
Port		
Airport		

## REASONS FOR TRAVEL

19. These issues will be addressed in stage 2. The discussion will be focussed as set out below.
20. There are many reasons why people travel and why they chose a particular mode to travel by. Some people have to choose public transport because they do not drive, others because the costs of driving and parking are considered too much. Some people drive because they want to do more than one activity (more than one trip purpose) and it is cheaper to use a car to do so, other drive because they have to for work reasons. Some people:
- h) commute
  - i) drive trucks delivering freight as and end in itself
  - j) drive trucks delivering freight, which is an intermediate product (vegetables) – used in some process (a restaurant) as a component in a final product. Cheaper access leads to cheaper final products.
  - k) drive their family to the airport
  - l) drive for social reasons (visit grandma)

21. Overseas research shows that congestion, high cost and unreliable travel times combine to suppress demand. This severely affects use of the road network and as so many trips that could have taken place do not, it affects the economy and quality of life. Thus social trips to grandma, for example, are infrequent, and work opportunities are less as people chose low quality work options because access is poor to the higher quality work options. The region suffers both economically and socially – quality of life is affected. The work undertaken for the Hutt Corridor shows that the region is currently seriously affected.
22. Access is a two-way street. Improved access to Wellington (or Porirua) leads to people from outside Wellington (or Porirua) offering their services to those in Wellington – cheaper products, better choice. In addition, better access enables people from Wellington (or Porirua) to more readily access the rest of the region and offer those people and firms their products and services.

### **Effects on Business**

23. These issues will be addressed in stage 2. The discussion will be focussed as set out below.
24. A good transport system is a necessary but not sufficient condition for economic growth. The figures clearly show that transport costs will be lowered considerably and thus the potential is there for improved economic performance. Moreover, without the better access the region will not be able to restructure itself into the centre for the lower North Island and the top of the South Island.

### **Effects on Citizens**

25. These issues will be addressed in stage 2. The discussion will be focussed as set out below.
26. The figures show considerable improvements in access. This is all about improvements in quality of life – both social and economic.

### **LOCATION EFFECTS**

27. These issues will be addressed in stage 2. The discussion will be focussed as set out below.
28. Changes in transport change the underlying asset values at origins and destinations. For instance, the development of railroads in the USA was largely to enable the significant profits from property development. This means that some areas will see appreciable growth in land values because of the newfound ease of access. Perhaps the most significant effect will be on the cheap housing areas. We expect that areas like Wainuiomata will lose to new areas that are opened up with better access. This depends upon whether potential areas are zoned to enable their development.

### **DISTRIBUTION OF BENEFITS**

29. These issues will be addressed in stage 2. The discussion will be focussed as set out below.
30. Some areas of the region will benefit more than others from the options considered here. Our preliminary conclusion is that Hutt City will be the largest beneficiary. The cross-valley link and better access to Porirua and the Transmission Gully Motorway

will enable industrialisation of Gracefield and should halt the economic decline. Upper Hutt will also benefit, but to a lesser extent because there is not equivalent option to the cross-valley link with all the economic benefits that it brings Hutt City. Note, there is not a need in Upper Hutt for such a link.

## SUMMARY

31. The results of the stage 1 evaluation are:
- 1) there is clear evidence of a need to introduce
    - a) improvements on SH2 (a HOT lane/ Busway, tidal flow etc.)
    - b) a cross valley link road
    - c) a new link road to Porirua and the Transmission Gully Motorway
    - d) public transport improvements
  - 2) there are demonstrated
    - a) access improvements
    - b) efficiency gains
    - c) safety improvements
    - d) a considerable lowering of pollution
  - 3) there is a clear need to progress to Stage 2 and to fine tune and test combinations of the options tested in Stage 1.