Memorandum

To:	Hennie Roux, Christine Jones	**Date:**	2 May 2008
From:	Andrew Murray	**Our Ref:**	3814823/600/PFD
Copy:			
Subject:	SmartGrowth Growth Allocations - Assessment of Strategic Transport Impact		

1 Introduction

This note outlines a high-level assessment of the potential transport effects of land use growth scenarios other than those previously developed by SmartGrowth.

This assessment is similar to that undertaken originally in developing the SmartGrowth policies, and is based on long-term traffic modelling for alternative growth strategies.

2 Land Use Strategies Tested

Four different land use strategies were tested as follows:

- SmartGrowth: The current SmartGrowth allocation
- Partial Disbursal East: Transferring 50% of the growth currently allocated to residential intensification to Paengaroa.
- Partial Disbursal North: Transferring 50% of the growth currently allocated to residential intensification to Te Puna.
- Full Disbursal: No (Zero) intensification scenario - with 100% of the population affected by intensification split equally between Te Puna and Paengaroa.

In all four scenarios the total population in the sub-region remains the same, meaning that generally the same number of vehicle trips will occur, albeit in different locations. The total population affected by these scenarios is some 29,500.

3 Methodology

3.1 Traffic Model

The Tauranga Transportation Model (TTM5.4) was used for this assessment. The model was updated to the 2006 census data last year, and predicts traffic movements as a function of population and employment forecasts. The model extends from Katikati in the north to Paengaroa in the east, and south to the BOP/Waikato boundary on the Kaimai Ranges.

Detailed (meshblock) growth forecasts are available only up to year 2031, although SmartGrowth has more aggregate forecasts through to 2051. For this assessment, a model year dubbed '2031+' was created, which had the following characteristics:

- Full development (2051) of the Te Tumu area in Papamoa East
- Full 2051 population growth in the areas affected by intensification (29,500 people)
- Year 2031 population forecasts elsewhere

As such, this 2031+ model is a partial representation of the 2051 scenario.

3.2 Regional Networks

All major roading infrastructure currently anticipated for the sub-region has been included in the models, especially full development of the Tauranga Eastern Motorway, the Tauranga Northern Arterial and 4-laning of SH2 between Te Puna and Omokoroa.

3.3 Multi-Modal Affects

A full multi-modal model is not available for the region, and the existing model only considers travel by private vehicle. It could be expected that the more intensified land use patterns would be more conducive to non-vehicular travel (walking/cycling), and would also have greater access to public transport services. As those affects are not fully reflected in the available model, this assessment is expected to somewhat over-estimate the traffic for the more intensified scenarios. On a comparative basis, this is likely to mean that the benefits of reduced travel expected in the SmartGrowth scenario could be slightly under-stated.

4 Results

Two key sets of results have been extracted from the four scenarios, firstly the overall travel statistics and then traffic forecasts on key strategic parts of the network. These are the same general statistics used in developing the original SmartGrowth policies.

4.1 Sub-Regional Travel Statistics

The following statistics were extracted across the sub-region:

- The total number of vehicle trips
- The total amount of travel (vehicle kilometres of travel – VKT)
- The total time spend travelling (vehicle hours of travel – VHT)
- The average network speed
- The average length of trip (km)
- The average time of trip (minutes)

Daily estimates of these statistics were created by aggregating the modelled results for the morning, interpeak and evening peak period models. The daily travel statistics for each scenario are detailed in **Table 1** below.

Table 1

Daily Travel Statistics by Land use Scenario

Statistic	SmartGrowth	Dispersed East	Dispersed North	Fully Dispersed
Trips	960,500	963,900	964,200	967,994
Vehicle Kilometres	11,722,500	12,024,600	11,921,400	12,224,038
Vehicle Hours	204,000	210,100	210,400	215,529
Average Daily Speed (km/hr)	57.5	57.2	56.7	56.7
Average Peak AM Speed (km/hr)	56.5	55.4	54.3	53.7
Average Trip Distance (km)	12.2	12.5	12.4	12.6
Average Trip Time (minutes)	12.7	13.1	13.1	13.4

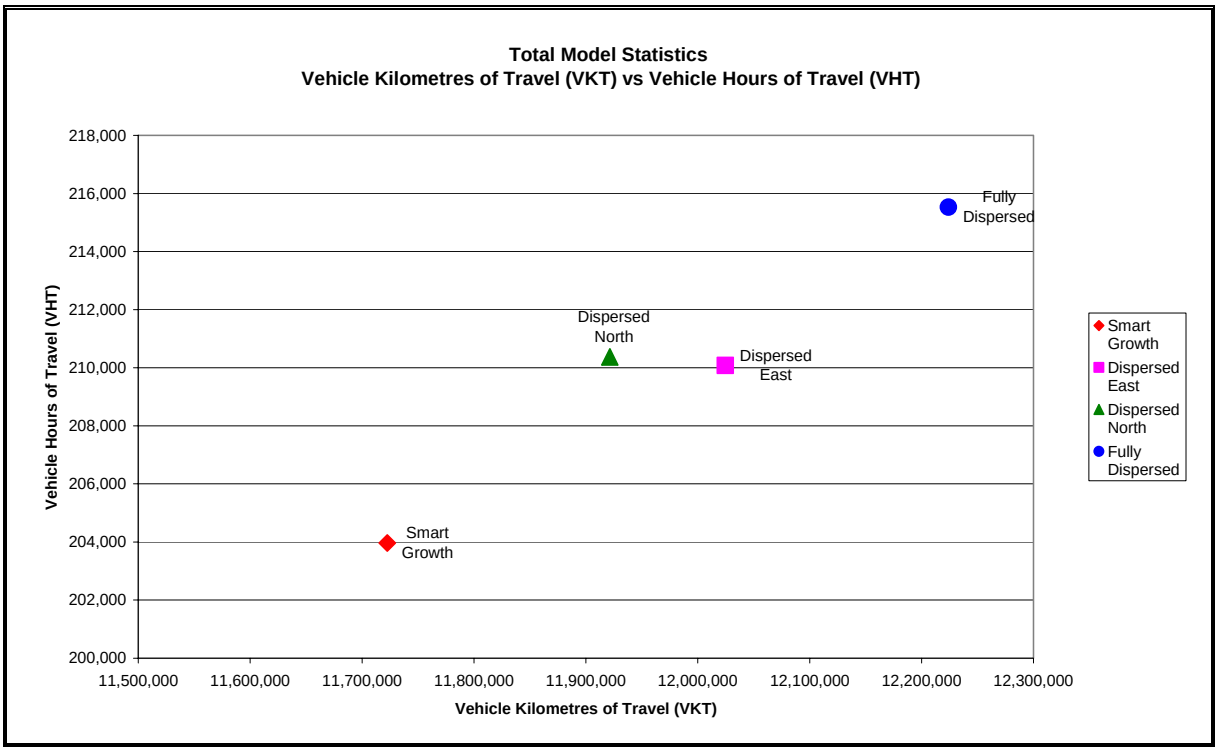

Figure 1 – Total Model Statistics (VHT vs VKT)

Figure 1 above graphically illustrates the vehicle kilometres of travel (VKT) and vehicle hours of travel (VHT) for all four scenarios. The above graph has been used as it is possible to reduce either the VKT or VHT at the expense of the other and therefore it is important to look at both these statistics together rather than in isolation.

The key points to note form this data are as follows:

VKT:

- The vehicle kilometres of travel (VKT) increase for all scenarios compared to the “SmartGrowth” scenario.
- The two partial dispersed scenarios are relatively similar in VKT with the “Dispersed East” scenario having a higher VKT than for the “Dispersed North” scenario.
- The “Fully Dispersed” scenario has a more significant increase for VKT that the other scenarios.

VHT:

- As expected, the increase in VKT also results in an increase in VHT.
- Given that the SmartGrowth scenario has both lowest VKT and VHT, this scenario would represent the most efficient transport scenario.

Average Speed / Congestion

- The dispersed scenarios locate the population at the other fringes of Tauranga, which is serviced by higher speed roads. However, the modelling indicates that even under these scenarios, the average speed decreases compared to the SmartGrowth scenario. This suggests that the dispersed scenarios are creating noticeable increases in congestion.

Average Trip Length

- The modelling confirms that the dispersed land use scenarios result in higher average trip lengths.

5 Traffic Flows on Key Routes

Daily traffic flows for each scenario were extracted and are summarised in **Table 2** below.

Table 2

Daily Traffic Flow

Screenline	SmartGrowth	Dispersed East	Dispersed North	Fully Dispersed
West of Proposed TNA – SH2	38,300	38,200 (-100)	39,300 (1,000)	39,100 (800)
Wairoa River – SH2 and TNA	53,700	53,400 (-200)	61,600 (7,900)	61,000 (7,300)
West of Takitimu Drive – Chapel Street, Waihi Road, SH2 and TNA	130,400	127,700 (-2,600)	133,400 (3,000)	130,500 (200)
Cameron Road / Fraser Road	50,600	49,100 (-1,500)	49,100 (-1,500)	47,800 (-2,900)
SH29 - Tauranga Harbour Bridge	74,400	73,900 (-500)	74,400 (no change)	73,900 (-400)
SH2/29 – Maungatapu Bridge	35,100	34,900 (-200)	34,700 (-400)	34,200 (-900)
Welcome Bay Road	5,500	5,400 (-100)	5,400 (-100)	5,300 (-100)
South of Papamoa - SH2, TEM, Kaituna Link	70,800	80,300 (9,500)	70,300 (-500)	79,900 (9,100)

Note: Values in brackets are the difference compared to the SmartGrowth scenario

The key points to note from this data are as follows:

West of Tauranga CBD:

- Changes in the western area:
  - The increase in population at Te Puna in the “Dispersed North” and “Fully Dispersed” scenarios result in a large increase in traffic volumes across the Wairoa River screenline
- Changes in the inner-western area:
  - “Dispersed East” scenario:

    A reduction of 1,300 daily vehicle trips on Chapel Street and a reduction of 700 daily vehicle trips on Waihi Road. A total reduction of 2,600 daily vehicle trips across the screenline on the western side of Takitimu Drive (Chapel Street, Waihi Road, SH2 and Tauranga Northern Arterial)
  - “Dispersed North” scenario

    A reduction of 1,300 daily vehicle trips on Chapel Street, however, moving this population to Te Puna results in an increase of 4,300 daily vehicle trips on the combined Waihi Road, SH2 and Tauranga Northern Arterial corridor, which results in an increase of 3,000 daily vehicle trips across the screenline

– "Fully Dispersed" scenario

A reduction of 2,700 daily vehicle trips on Chapel Street and a reduction of 500 daily vehicle trips on Waihi Road. Moving 50% of the population shift to Te Puna results in an increase of 3,400 daily vehicle trips on the combined SH2 and Tauranga Northern Arterial corridor, which results in a minor increase of 200 daily vehicle trips across the entire screenline.

South of Tauranga CBD:

- Along the Cameron Road / Fraser Road corridor (near the Tauranga Girls College), there is a reduction of 1,500 vehicles per day under the "Partial Dispersion" scenarios and a reduction of 2,900 vehicles per day under the "Fully Dispersed" scenario.

East of Tauranga CBD:

- Changes in the inner-eastern area
  - Across the Tauranga Harbour Bridge, there is a slight reduction in daily traffic volumes across all scenarios compared to the SmartGrowth scenario, however, the largest reduction is less than 500 daily vehicle trips.
  - On SH2/29 at Maungatapu Bridge, there is a reduction of less than 400 vehicles per day under the "Partial Dispersion" scenarios with a reduction of 900 vehicles per day under the "Fully Dispersed" scenario.
  - Along Welcome Bay Road, there is a reduction of approximately 100 vehicles per day for all scenarios.
- Changes in the eastern area
  - Moving 50% of the population shift to Paengaroa results in an increase in traffic volumes on the SH2, Tauranga Eastern Motorway / Kaituna Link corridor of 9,500 vehicles per day under the "Dispersed East" scenario and 9,100 vehicles per day under the "Fully Dispersed" scenario.

6 Summary

Three options have been modelling and compared to the current SmartGrowth land use scenario. These options include transferring 50% of the growth currently allocated to residential intensification to either Paengaroa in the east, Te Puna in the west or 50% to both locations.

The vehicle kilometres of travel (VKT) and vehicle hours of travel (VHT) increase for all scenarios compared to the "SmartGrowth" scenario with the "Fully Dispersed" scenario having a larger increase than the two partial dispersed scenarios. The modelling also confirms that the dispersed land use scenarios result in higher average trip lengths.

Given that the SmartGrowth scenario has both lowest VKT and VHT, this scenario would represent the most efficient transport scenario.

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