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Committee Regional Transport Committee  
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## Transport model update

### 1. Purpose

The purpose of this report is to provide information to the Committee on the transport model update project completed in 2012 and explain the technical reports supporting the update, in particular Technical Report 24 which has been the subject of public attention in recent weeks.

### 2. The decision-making process and significance

No decision is being sought in this report.

### 3. Background

The Wellington Transport Strategic Model (WTSM) is about 10 years old and was built following the 2001 Census and a household travel survey conducted the same year. The transport model is used to investigate policy proposals and infrastructure investment. It supports the development of policy documents such as the Regional Land Transport Strategy (RLTS) and Regional Land Transport Programme (RPTP). While it is owned and operated by GWRC, outputs are used by NZTA and the other Wellington councils to support transport planning and project development activities. The model enables futures to be tested and assists policy-makers to understand how the future transport networks might look or be shaped.

The WTSM was refreshed in 2007 and in 2011/12. Each refresh includes checking the model against observed data in the base year (2011 being the latest). They are usually timed to take advantage of Census data being available, as a cross check. A major project to refresh the model and to develop an associated public transport model (WPTM) was initiated in 2011 because of the requirement to undertake the Public Transport Spine Study (PT Spine Study). The project was completed in 2012 and involved the extensive collection of observed public transport data.

#### 4. Technical reports supporting the 2011/12 model refresh

A series of technical reports were produced as part of the latest model refresh process. **Attachment 1** contains a list of all technical reports. There has recently been some public interest in one of the reports – Technical Report 24 (TN24). This report took available data at one point in time (2011) and used this data to produce estimates of changes in land use, car travel costs and public transport costs through time. These inputs were used to produce future forecasts of highway and public transport trips across the region. The purpose of the process was to test and validate the model, and to help determine if WTSM 2011 was performing as expected given some future assumptions about the Region. Technical Note 24 was produced to document this exercise. A summary of the outputs used in TN24 is in **Attachment 2**.

The following reports are most relevant for understanding in more detail the background to the contents of TN24:

- “TN15 – Input Parameters” – documents and explains the modelling assumptions regarding GDP growth rates, increases in fuel price, public transport fares and car parking charges. These parameters and the relative differences between them will affect future car and public transport trip growth rates. A summary of key information can be found at **Attachment 3**.
- “TN23 – Future Base year Networks and Services” – provides details of committed highway and public transport infrastructure enhancements that are planned to take place over the next 30 years. A summary of key information can be found at **Attachment 4**.
- “TN29 – Demographic Input to WTSM” - documents how the population and employment forecasts look in the future and are the main driver behind changes in highway and public transport trip making. A summary of key information can be found at **Attachment 5**.

In combination the reports show that WTSM is working and producing outputs that are expected. However, as with all modelling an element of uncertainty is associated with any forecasts that are produced. The further into the future that you try and forecast, the greater the level of uncertainty. Within that context, therefore, WTSM is simply a tool to help policy makers assess the relative merits of policy options and transport proposals.

##### 4.1 Projects not considered in TN24

The outputs of TN24 show how car trips, public transport trips and network conditions change through time as a result of growth in population and employment, and the implementation of some of the planned infrastructure improvements.

Two significant projects were not included in the list of improvements. They are:

- Integrated ticketing

- Improvements to public transport identified in the Public Transport Spine Study (PT Spine Study).

The former was not included because a method of assessing its impact in the modelling system was not developed in time for TN24 but was later developed for the PT Spine Study. The latter was not included because the PT Spine Study was not completed when the model development work was undertaken.

In addition to these projects, TN24 also assumes unlimited parking in Wellington City. As part of the PT Spine Study the impact of limiting parking supply in Wellington was analysed. The analysis showed a movement of trips from cars to public transport if the cost of parking was increased above inflation in the future.

#### 4.2 TN24 outputs with public transport projects included

As an illustration of the impacts of including or excluding various projects in the model, the modelling team ran the model to show what the outputs from TN24 would have been had these additional projects been included.

Comparisons are shown between 2011 and 2041 as follows:

2011 Baseline	the estimated state of the network in 2011.
2041 Baseline	the estimated future state as presented in TN24 and summarised in <b>Attachment 2</b> , using a medium land use future scenario.
2041 PT Study	the future forecast as used for the PT Spine Study evaluation. It includes integrated ticketing the best performing PT Spine Study option (Bus Rapid Transit). An intensified version of the medium land use future scenario was also used.

**Table 1** below shows the AM peak public transport mode share for the scenarios outlined above. The region is split into four areas – Wellington CBD, Southern / Eastern suburbs of Wellington, Northern / Western suburbs of Wellington and the Rest of the Region. The purpose of splitting up the region into these areas is to:

- identify the impact that the PT Spine Study has upon trip patterns from its major catchment area, the southern and eastern suburbs
- look at how the non-Wellington City RoNS schemes affect travel patterns and behaviour.

*Table 1 AM Peak Public Transport Mode Share*

Origin	2011 - Base	2041 - Baseline	Diff cf 2011	2041 - PTSS	Diff cf 2011	Perc Diff: 2041 Ptss vs 2041 Baseline
CBD	10.8%	10.2%	-0.7%	11.3%	0.5%	1.1%
Southern and Eastern Suburbs	19.9%	19.1%	-0.9%	20.5%	0.6%	1.5%
Northern and Western Suburbs	19.1%	18.2%	-0.9%	19.9%	0.9%	1.7%
Rest of Region	13.2%	11.8%	-1.4%	12.6%	-0.6%	0.8%
<b>Total Region</b>	<b>14.8%</b>	<b>13.8%</b>	<b>-1.0%</b>	<b>14.8%</b>	<b>0.0%</b>	<b>1.0%</b>

Between 2011 base and 2041 (baseline) the public transport mode share drops for all origins. The greatest decrease of 1.4 percentage points occurs for public transport trips originating outside of Wellington, showing the impact that the Northern Wellington RoNS schemes have upon travel behaviour.

The 2041 PT Spine Study scenario results in a 1 percentage point increase in forecast public transport mode share across the region compared with the 2041 baseline scenario. This scenario also shows an increase in public transport mode share for trips originating in Wellington and a smaller decrease for trips originating outside of Wellington City. The overall net effect is that the public transport mode share in 2041 is estimated to be identical to the public transport mode share in 2011.

**Table 2** below shows the AM peak public transport mode share for trips to Wellington City CBD.

*Table 2 AM Peak Public Transport Mode Share to Wellington CBD*

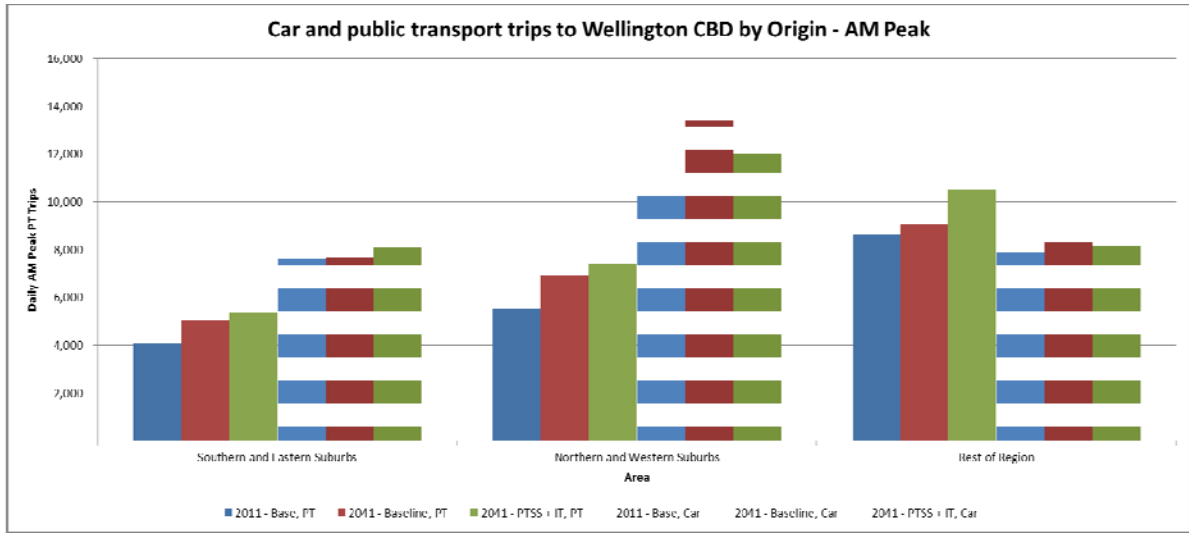
Area	2011 - Base	2041 - Baseline	Diff cf 2011	2041 - PTSS	Diff cf 2011	Perc Diff: 2041 Ptss vs 2041 Baseline
CBD	11.1%	10.0%	-1.1%	11.2%	0.2%	1.2%
Southern and Eastern Suburbs	38.6%	37.5%	-1.2%	40.2%	1.5%	2.7%
Northern and Western Suburbs	34.6%	34.0%	-0.6%	37.9%	3.3%	3.9%
Rest of Region	52.2%	51.2%	-1.0%	55.8%	3.6%	4.6%
<b>Total Region</b>	<b>34.3%</b>	<b>32.0%</b>	<b>-2.3%</b>	<b>35.5%</b>	<b>1.2%</b>	<b>3.5%</b>

The overall pattern is similar to that seen in Table 1 (AM peak public transport mode share) but the magnitude of the change is more pronounced. The combination of integrated ticketing and the PT Spine Study result in a more positive outlook for AM peak public transport mode share to the Wellington City CBD. Whilst the 2041 baseline forecast predicts a 2.3% drop in public transport mode share to the CBD between 2011 and 2041 (34.4% to 32.0%), the 2041 PT Spine Study forecast reverses this trend, with the AM peak public transport mode share to the CBD increasing from 32.0% (2011) to 35.5% in 2041.

This increase in public transport mode share is greatest for trips from the rest of the region, showing how an integrated ticketing system makes public transport more attractive for trips to Wellington CBD. The public transport mode share also increases for trips from all Wellington suburbs to the CBD, highlighting the impact of both the PT Spine Study and integrated ticketing.

**Figure 1** below shows public transport and car trips to the Wellington CBD by origin territorial authority area.

*Figure 1 Car and Public Transport Trips to Wellington City CBD – AM Peak*



A number of points can be drawn from **Figure 1**:

- car and public transport trips from all areas to the Wellington City CBD increase between 2011 and the 2041 baseline scenario.
- the number of additional car trips added is greater than the number of additional public transport trips added for all areas except the southern and eastern suburbs.
- comparing the 2041 (baseline) and 2041 (PT Spine Study + integrated ticketing) scenarios, all comparisons result in additional public transport trips to the CBD.
- one area southern / eastern suburbs - show additional car trips to the CBD when comparing the 2041 (baseline) and 2041 (PT Spine Study + integrated ticketing) scenarios. The remaining areas – northern and western suburbs, rest of the region – show a decrease in car trips between these two scenarios.

In general terms, **Figure 1** shows how two public transport infrastructure projects, namely integrated ticketing and the PT Spine Study, improve public transport travel times and reduce the cost of travelling by public transport, resulting in an increased public transport mode share when compared against the current situation and the 2041 baseline forecasts.

## **5. Using the models to support future transport policy reviews**

### **5.1 Regional Land Transport Plan**

The development of a Regional Land Transport Plan (RLTP) is proceeding over the next 24 months. This is a requirement of the Land Transport Management Act 2003 (as amended 2013). This work is expected to be completed and a final RLTP adopted by the Regional Transport Committee by July 2015. The Regional Land Transport Plan replaces the Regional Land Transport Strategy and the Regional Land Transport Programme. The RLTP development will involve a review of the strategic policy framework (currently provided by the Regional Land Transport Strategy) and the various implementation plans to form a new integrated network plan.

Development of a programme for all the transport activities in the region will form the later stage of the RLTP development. As part of these review processes, a range of new tests using the WTSM will be undertaken to review the predicted transport patterns and trends and assess any implications.

### **5.2 Regional Passenger Transport Plan**

The amendments to the Land Transport Management Act 2003 have also changed provisions relating to Regional Passenger Transport Plans (RPTP). The purpose of the RPTP is now to provide:

- a means for encouraging regional councils and public transport operators to work together in developing public transport services and infrastructure;
- an instrument for engaging with the public in the region on the design and operation of the public transport network; and
- a statement of:
  - the public transport services that are integral to the public transport network;
  - the policies and procedures that apply to those services;
  - the information and infrastructure that support those services.

GWRC is undertaking a review of the RPTP to comply with these new requirements, with public consultation on a draft of the new RPTP expected in early 2014. In addition to the meeting the new legislative requirements, the review will also reflect:

- changes to enable the procurement of public transport services under the new Public Transport Operating Model (PTOM);
- the outcomes of the Wellington Bus Review, PT Spine Study, Fare Structure Review and refresh of the Regional Rail Plan.

The WTSM and the Wellington Public Transport Model will be used to support this review.

Until June 2015, the RPTP must take the public transport components of the current RLTS into account and must not be inconsistent with the regional land transport programme. Following the adoption of the new RLTP, the RPTP will need to be reviewed to ensure that it is consistent with the new plan.

The RPTP and RLTP will be developed in parallel to ensure as much as possible that they remain consistent.

## **6. Communication**

Communications on the models and their uses will be on-going.

## **7. Recommendations**

*That the Committee:*

1. ***Receives the report.***
2. ***Notes the content of the report.***

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Attachment 1: Wellington Transport Models – List of Technical Reports

Attachment 2: Summary of Technical Report 24 – Baseline Forecasting

Attachment 3: Summary of Technical Report 15 – Input Parameters

Attachment 4: Summary of Technical Report 23 – Future Networks & Services

Attachment 5: Summary of Technical Report 29 – Demographic Inputs to WTSM