

## **Task 11 Commercial Vehicle Model**

### **Scope**

In ART3 the commercial vehicle model covers medium/heavy commercial vehicles. The focus will be on developing a good matrix of current travel patterns and then using growth factors on this for forecasting.

Generally very few trucks are possessed by households and they are relatively easily distinguished from other vehicles in observed data. Hence the modelling process for medium/heavy commercial vehicles combined involves:

- developing trip ends by adapting models from elsewhere for Auckland and verifying the fit against specifically collected generation count data (Task 11.1);
- deriving the base matrix using matrix estimation, with inputs: the trip ends plus counts at the Ports, a CV operator survey providing information on the trip length distribution, and a large scale general road count programme (Task 11.2);
- applying specific matrix growth factors related to economic growth and the distribution of employment (Task 11.3)

In the data processing, the count databases required for the commercial vehicle model will be constructed. In the preliminary studies, some basic statistics on CV travel from the surveys will be assembled and will provide information on trip rates of specific centres.

The following sections set out the specific tasks required for the development of the MCV/HCV model:

- Task 11.1 MCV/HCV Trip Ends
- Task 11.2 MCV/HCV Base Year Matrix
- Task 11.3 MCV/HCV Forecast Matrices and Growth Factors
- Task 11.4 Commercial Vehicle Report

## **Task 11.1 MCV/HCV Trip Ends**

### *Inputs*

Counts of MCV/HCVs around specific generators

2006 employment data by ASP3 employment types by meshblock for each generator

MCV/HCV trip rates from other sources: WTSM, NZ research, etc

### *Processing*

Assemble MCV/HCV count data and corresponding employment data for each generator area.

Compare the estimates of trip generation using the trip rate models (from other research) with the cordon counts for each generator area and for all areas combined. Adjust the trip rates to achieve the best match with the Auckland CV trip generation data.

Compare the results of these tests with rates from other sources and finalise the set of MCV/HCV trip rates for implementation.

For the zones with the Ports (sea and inland) the trip ends will be the counts of Port MCV/HCV traffic and a different forecasting approach is envisaged (see Task 11.3).

### *Outputs*

24-hour trip rates

Note

## **Task 11.2 MCV/HCV Base Year Matrix**

### *Purpose*

This involves developing a 24 hour matrix, and then splitting this into time period matrices using factors derived from count data.

### *Inputs*

2006 planning data by zone

Trip end models from Task 11.1

Results of Preliminary Studies Task and Data Processing Task, including:

- CV travel statistics, tabulated trip length distributions (TLF),
- Screenline counts MCV/HCVs.

### *Processing*

Two possible approaches will be considered for the development of the 24-hour matrix.

In the first instance we will run MVESTM with input counts, the TLF, and trip ends. As there is some ambiguity in the software specification, if this proves to be infeasible with MVESTM, we would set up a distribution model on the trip ends, calibrating the deterrence function (exponential) to reproduce the TLF, and then undertake matrix estimation.

The tasks are:

- Produce 24-hour trip ends; for the zones with the Ports the estimated trip ends are replaced by MCV/HCV counts.
- Prepare the following inputs for estimation with MVESTM:
  - The trip ends
  - Paths through the road network, which can be obtained from an assignment of an Interpeak all-vehicle matrix,24-hour MCV/HCV screenline counts,
  - If the second approach is used, develop a prior initial matrix through gravity model calibration.
- Run the matrix estimation procedures.
- Develop time period factors using count data across the screenlines, investigating whether there are spatial differences (e.g. for town centres, specific industrial areas, the Ports, etc) and if these warrant more than global factors.

### *Outputs*

24-hour and time period matrices

### **Task 11.3 MCV/HCV Forecast Matrices and Growth Factors**

#### *Purpose*

Forecast MCV/HCV matrices will be developed by:

- determining MCV/HCV trip ends using the models from Task 11.1 and future land use data;
- adding to these additional growth factors related to wider economic growth;
- undertaking trip matrix balancing of the base year matrix against the growth factors

This task is to determine the additional growth factors and specify how they will be combined with the forecasts from the trip end models for matrix balancing. It will draw on the information and analysis used for WTSM.

#### *Inputs*

Trip end models from Task 11.1

Data on growth in MCV/HCVs and goods versus other traffic and economic indicators (GDP), including data used for WTSM analysis

Port company forecasts of growth in Port traffic

#### *Processing*

Assemble the required data: any historic CV count trends (from classified counters), national vehicle fleet and annual vehicle kilometre data etc.

Analyse trends in the data, in relation to GDP, and the Port forecasts.

Determine additional growth factors and specify how they are to be combined with land use-based growth; for the Ports determine the growth factors to be applied to the base year trip ends (counts).

#### *Outputs*

Additional growth factors

Methodology for application of growth factors to base year MCV/HCV matrix

**Task 11.4 Commercial Vehicle Report**

Write the Commercial Vehicle report.