

Zenith iSite GIS Database

Traffic Count Estimates

September 2011

The Zenith Model

Zenith is a strategic travel forecasting model with multi-modal and time-period predictive capabilities which has been developed by Veitch Lister Consulting Pty Ltd. The model has been built using information relating to the following:

- Road and rail infrastructure networks
- Dedicated tram and bus right-of-ways
- Transit service networks (routes), service frequencies and fare details
- Details of various land uses in discrete areas of major cities called travel zones
- Dedicated pedestrian routes/facilities
- Travel patterns (number of trips made between origin and destination travel zone pairs by travel mode and purpose of the journey)
- Details of parking charges, tolls and vehicle operating costs (including petrol price)
- Model calibration parameters which have been derived from household travel surveys that require survey participants to submit travel diaries
- Algorithms which interrogate the models forecasts and produce a wide range of graphical outputs and transport system performance indicators

The Zenith model is capable of estimating the following for a given land use/transport scenario for small areas in selected major metropolitan and fringe metropolitan areas of Australia:

- *Trip generation*: How many trips will people resident in each travel zone make each weekday - and for what journey purposes?
- *Trip distribution*: To which travel zone will they travel to satisfy their travel needs, and at what time of the day?
- *Mode choice*: What mode(s) of travel will they choose?
- *Trip assignment*: Which route(s) will be chosen?

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Using the Zenith model, trip generation, trip distribution, and trip assignment have been simulated for vehicles (i.e. the selected mode of travel) for each small area in selected major metropolitan and fringe metropolitan areas of Australia. A synthesis of this information (i.e. how many trips will people make by vehicles and for what purpose, where will they travel to in their vehicle and at what time of the day, and which routes will they choose for their vehicular travel) has been used to produce traffic count estimates for segments of roads in selected major metropolitan and fringe metropolitan areas of Australia. These traffic count estimates are available in MapInfo (.TAB) and ESRI (.SHP) platforms.

Traffic count estimates for segments of roads have been used to maximize returns from outdoor advertising by advertising on segments of roads with relatively higher traffic, to plan construction activities in areas where traffic flow might be affected etc. One of Spectrum Analysis' service offerings has been to license data to its clients which can assist with network development and site analysis. Such data has includes Spectrum's Population and Household Projections and the Strip Locator Database. In its constant endeavor to offer better decision making tools to its clients, Spectrum has collaborated with Veitch Lister Consulting Pty Ltd to offer a GIS database of traffic count estimates to its clients (i.e. Zenith iSite). Such a database, once licensed from Spectrum, can be used in conjunction with the existing GIS systems in-house (eg. MapInfo or ESRI). Amongst other applications, this database can be used in decisions relating to network development and site analysis.

Our offer to our clients is to offer license for latest road traffic count estimates for the major markets across Australia.

Market Coverage

The Zenith iSite traffic count estimates are available segments of roads in the following areas:

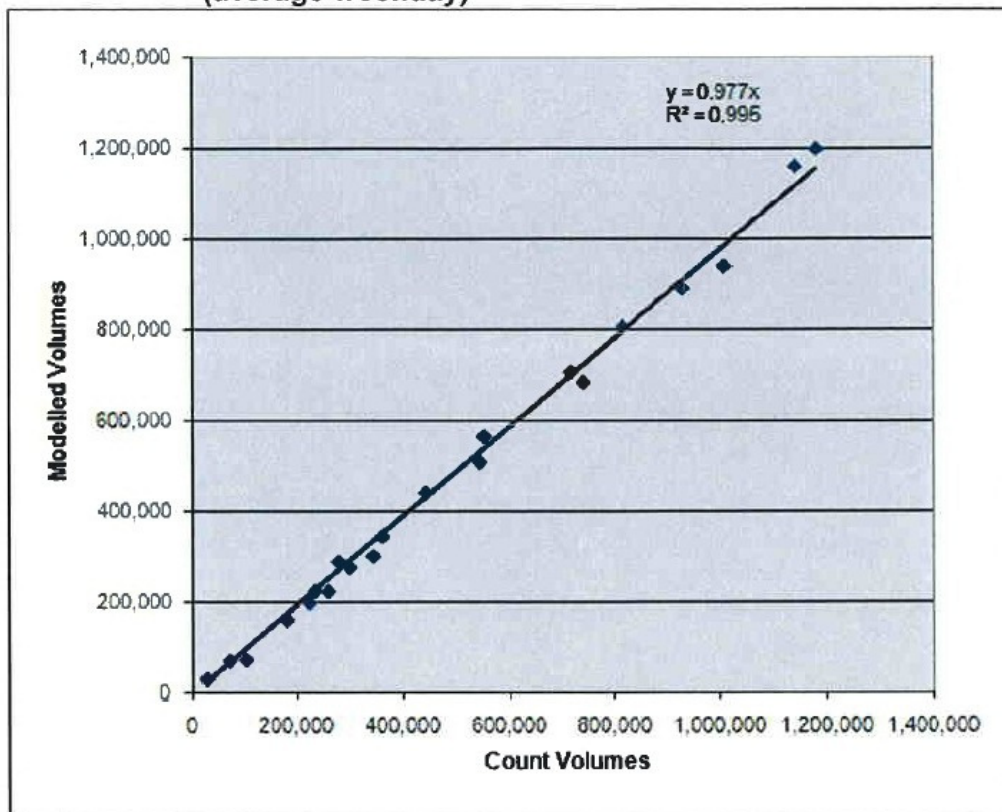
- *New South Wales*: Sydney metropolitan area (within Sydney Statistical Division (SD)). Hunter and Illawarra are being developed and we would anticipate incorporating in the next update (6 - 12 months from present).
- *Victoria*: Melbourne metropolitan area (SD) and Geelong LGA (made up of parts of Barwon SD). Ballarat, Bendigo and Traralgon are also inside the modeled area.
- *Queensland*: Brisbane, Gold Coast and Sunshine Coast metropolitan areas (SD's). Townsville City SSD's - Parts A and B. Toowoomba and Tweed are within this model area.
- *South Australia*: Adelaide metropolitan area (SD)
- *Western Australia*: Perth metropolitan area (SD)
- *ACT*: Canberra (SD)

Model Validation and Accuracy

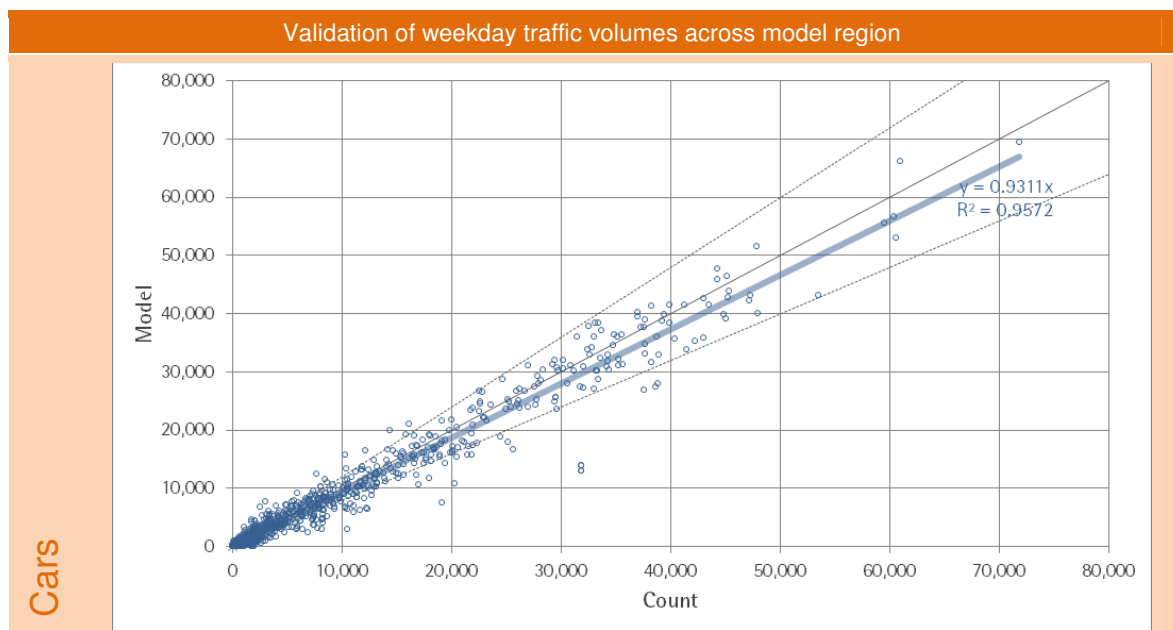
Model validation is a procedure to test whether a model is 'fit-for-purpose'. It involves comparing the model's outputs (i.e. traffic count estimates) against 'observed' or 'actual' counts at locations across the network. If a model is able to replicate or closely match the 'observed' or 'actual' counts then the model can be considered robust and reliable. A statistical indicator of the accuracy of a predictive model is R-Square. R-Square indicates the proportion of variability in a data set that is accounted for by the statistical model.

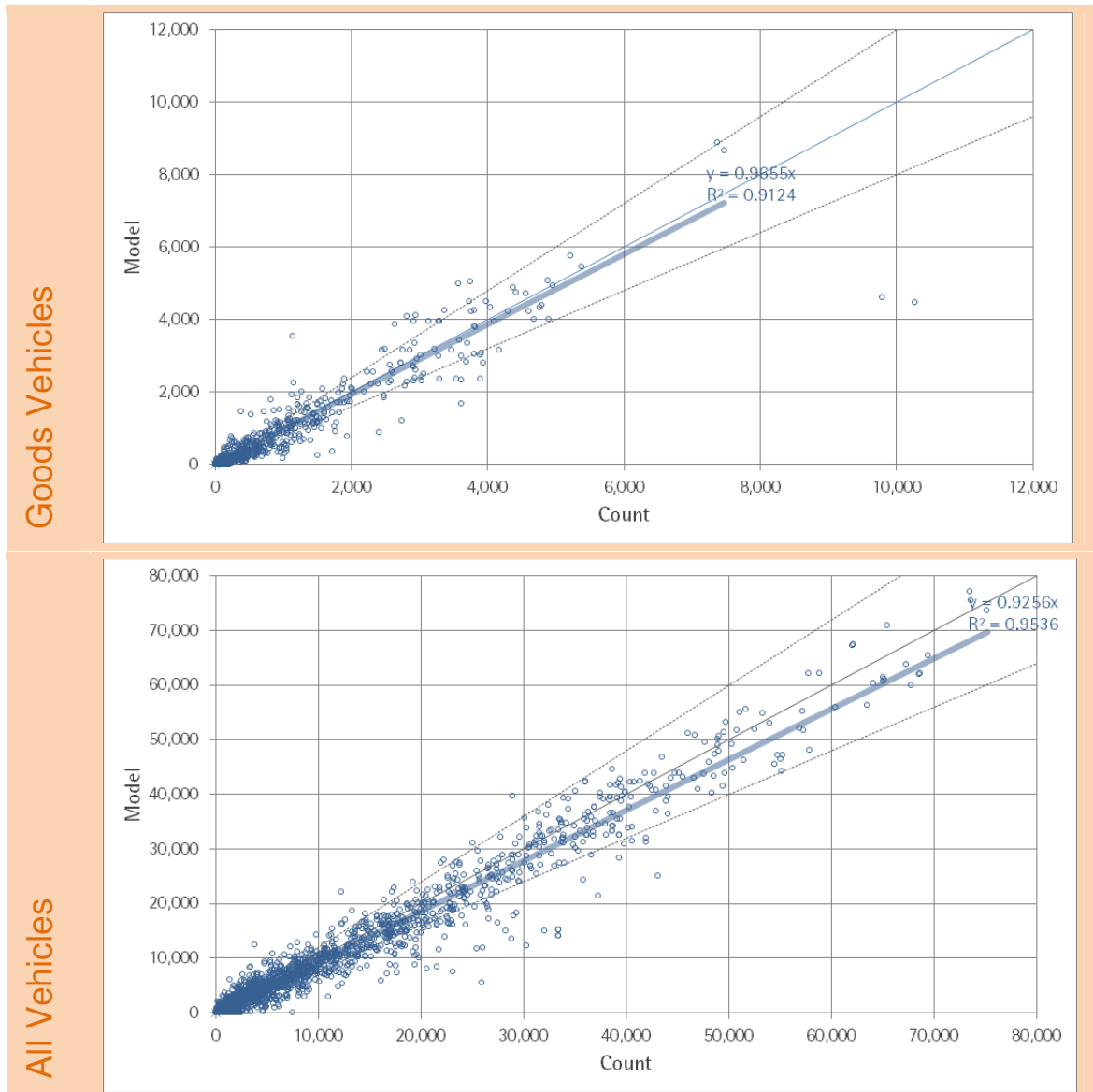
The Zenith iSite model has been validated against some stringent industry standards including VicRoads' (Roads Corporation of Victoria) "Guidelines on the Validation Process and Criteria for Strategic Transport Modelling - June 2008". In part, these Vicroads' guidelines are based on those adapted by the USA's Federal Highway Administration. The key component of the guideline is that the best-fit regression line (constrained to pass through the origin) should achieve an R-Square value greater than or equal to 90% with a slope within the range 0.9-1.1. The Zenith iSite traffic count estimates have been validated against VicRoads' traffic counts in the past, and it has been found that Zenith iSite traffic count estimates closely match the actual traffic counts. For instance, at the time of the validation, the R-Square between modeled weekly traffic flows and counts at the individual VicRoads' screenlines was found to be 99.5% (figure below).

**Modelled v Observed Traffic at Screenlines
(average weekday)**



Zenith iSites model outputs frequently have R-Square values in excess of 90%. The figures below compare model estimates against traffic counts for cars, goods vehicles and total traffic where they are available, for the entire South East Queensland region. This demonstrates the accuracy and reliability of Zenith iSites' traffic count estimates.





Summary

The Zenith iSite GIS database will allow you to have a new level of confidence in traffic count estimates in all major markets across Australia, and easily accessible for your analysts. We look forward to you participating with us in this wealth of data.

Spectrum Analysis Australia Pty Ltd

Peter Buckingham
Managing Director