PARTIAL TRANSCRIPT – WEST GATE TUNNEL PROJECT

DAY 6 – PART 1

PRESENTATION BY MR VEITCH

1 HOUR 15MINS – TO END OF PART 1 (APPROXIMATELY 15MINS)

So strategic transport models have a number of technical limitations all models have limitations and they make various assumptions and I'll just refer to a few of the key ones here:

- The first one is that they rely on third party inputs so I mentioned the inputs to the model and those inputs when it comes to future years need to be actually forecast so we rely on things like population forecasts and employment forecasts as inputs to our model and we take them from official government forecasts.

- Second key assumption is that we typically project current travel behaviour forward so we're not – these types of models are not great at predicting paradigm shifts, things like autonomous vehicles where our model cannot predict whether or not autonomous vehicles will happen we don't take in count of things like changes that might occur in the world like automation of jobs, artificial intelligence, 3D printing. These things might occur in the future, they might just disrupt travel but they're really inputs for our models the common default assumption is things will continue in a steady as she goes kind of way.

- The third key assumption or limitation you might call it is that in our forecast the travel demands are only partially constrained. Which means that our forecast of travel can exceed the practical capacities of roads and public transport vehicles. And this needs to be borne in mind when interpreting the outputs and potentially making adjustments to the outputs.

So that's my high level intro of strategic of transport modelling.

In terms of the steps taken in this project, I'll talk first about the steps taken to develop the model that was used on the project.

The first step which is pretty much the first step of all of these types of projects, was to ensure that we had a base year model, and a base year model is a model of a recent year. And to ensure that the base year model accurately reflected travel conditions in Melbourne. So initially we started off with a 2011 base year model during the business case phase of this project and then in response to peer review comments, the base year was updated to 2014. So the inputs to the model were all updated and the model was then validated, by which means, I mean checked essentially. So the outputs of the model for 2014 were checked against things like observed traffic counts to make sure that model replicates reality in a reasonable way. When we say reasonable we're really assessing the model against known guidelines or accepted guidelines. So in this case the Victorian State Government has standard guidelines for benchmarks, for assessing whether or not your transport model is reasonable accurate. The outputs of that process are documented into two of our reports, there's a model wide validation report which deals with the entire metropolitan area. And then there's a more local area report that deals with the accuracy of the model within the vicinity of the project. So having established the base year model and proven that it works reasonably well, the next step is to forecast. And in this case the year to forecast was chosen to be 2031. That choice was a function of the fact that it was about 10 years from the opening of the project and also because it coincides with State Government forecasts. State Government forecasts the input to our model in five year increments is coinciding with the census years, so you'll have 26, 31, 36 and so on.

Those 2031 inputs are almost all sourced from, in fact all, sourced from state government reference case assumptions. So the State Government sets out what inputs we should use in our models for population employment, transport network assumptions, commercial vehicle demands in the future airport, travel demands and changes in travel costs. So these assumptions that we are making for these inputs are the same that are used in all transport projects in Victoria including Melbourne Metro. And those assumptions are documented in the report on screen.

So having built the model, we have a base year model, we have a future model for 2031. We then set about applying the model and applying the model really means testing different scenarios and looking at the impacts. The two key scenarios here are; 2031 without the project and 2031 with the project.

The definition of the project was developed collaboratively between VLC and other technical advisors and VicRoads and that can involve defining what connections are assumed, how many lanes each piece of infrastructure has, what the capacity of lanes is, those kinds of things, what speeds should be assumed. And in arriving at that final definition, the final definition of the project, many variations have been tested. So we've tested hundreds of different scenarios for 2031 as part of our work. And typically the outputs of our had provided to other technical advisors to inform the transport impact assessment.

So, I'll talk briefly about how our outputs were used. It was described in Appendix F and essentially our modelled forecasts, because our model of 2014 isn't perfect, it doesn't perfectly reflect 2014 conditions. The approach taken was to take the growth that was forecast by the model between 2014 and 2031 and to apply that on top of known 2014 volumes. Known by reference to traffic counts. And a second step was taken to address the limitation I referred to before, which is that he model's outputs on forecast traffic demands are only partially constrained, which means they can exceed capacity. So a second set was taken to cap the forecast to ensure that they didn't exceed the practical capacities of roads.

An important point is that the peak, when peak forecast exceeded the peak capacity, traffic volume was assumed to travel either earlier or later than the peak. And there's a Figure 8 in Appendix F which shows that process in more detail. So in terms of the kind of outputs that we might produce, this is a plot showing the impact of the project on the arterial road system, arterial and local road system, where red shows increases and blue shows decreases. And essentially those outputs in percentage terms will be taken and used by other members of the team. And the output of that process is the figures that are found in the EES itself. So this is Figure 11.14 which shows changes in total traffic within the vicinity of the project and these are based on our modelled numbers. But with those post processing steps that I described earlier. There's also here a plot of the truck volumes, so that also comes from us because we're forecasting car, traffic and commercial traffic.

So, I now turn to the various issues that have been raised in terms of during the model development which took place during the business case. I'll also talk about issues raised in the expert evidence and in conclave and in the public submissions.

So during the business case there were internal reviews conducted, peer reviews and three key modelling issues were raised, there were a number of other very minor issues raised, comments on reports, requests for information that kind of thing. But these were the technical issues that were raised, and I'll go through each one.

So the first issue that was raised was to do with the calibration and validation of the model which is basically where we're checking if the model is accurately reflecting current conditions in a reasonable way. So initially the first request that was made was for sensitivity tests because those sensitivity tests had not been documented. Sensitivity tests are basically where you change an input to your base year model, you might change the fuel price or the cost of public transport fares or something like that and look at how the results change. And you check that the change in the results meets your expectations. So our response to that was that sensitivity tests were undertaken and documented for a variety of things; fuel price, toll prices, parking costs et cetera.

The second issue, which was a criticism, was of certain detailed aspects of what the model was predicting ad they were issues raised with certain of the models predictions in the inner west and near the port. The traffic flows on certain sections of freeway and travel times on certain road, issues related to commercial vehicle movements, various technical issues. And at that stage we were working with a 2011 base year model and one of the problems we encountered at that time was that there was a lot changing in 2011, West Gate Bridge was widened, the widening was completed during 2011 and some of the counts that we were comparing against were before the widening was completed and some were after. So because there were stuff happening we decided to update the base year model to 2014, there was good quality traffic count data available for 2014. So we updated the model to 2014 and those specific calibration issues were then addressed.

The second high level, or technical issue that was raised was to do with the speed flow curves. A speed flow curve is essentially a curve that shows how the speed on a road might reduce as the traffic volume increases. So as the road gets more congested, the speed reduces and some concerns were raised with those speed flow curves. So our response was to review the speed flow curves against observed data for Melbourne. So speed and volume data for Melbourne which was made available to use from VicRoads. And we also compared our speed flow curves to the curves used elsewhere and the outcome of that review was that we demonstrated that our curves were appropriate for Melbourne and for this project and that justification was accepted.

The third issue that was raised and this is one that’s, you might have seen media reports in the last couple of weeks with William McDougall making various statements about the modelling that we've undertaken. This is an issue that William has raised and it relates to how the model is run. And I mentioned earlier that model is a four step model with these four steps of trip generation, trip distribution, mode choice and assignment. The model you don't just run steps one to four and then stop, it's actually a looping process where the outputs accept four can feed back to earlier steps. And the basic reason for that is that the output of step four, the output of the model is estimates of travel speed that are affected by traffic congestion. And those travel speeds are influences of things like mode choice and destination choice, so where you choose to travel and what mode you take. So the outputs of the model feedback is input to the earlier steps and you get this looping process. And the model is run figuratively until it converges to equilibrium solution. Now when forecasting there are different choices you can make about which steps you loop through and I've put on the screen here two alternatives you loop through on the left hand side loop through both distribution and mode choice which means that people's choices of destination and mode change in response to future traffic congestion.

And a second approach I've put up on the board here is where you only loop through to mode choice step. So they're the two different options. Now we were using the single distribution approach which is the approach on the right where we only feed through mode choice and the peer reviewer preferred an approach where we loop through both the distribution and the mode choice steps. Now there was a technically debate that took place about this issue. One of the issues about four step models in general is that, you know, they are models, they make predictions, those predictions are not always perfect or correct and one of the well-known predictions of four step models is that as congestion increases, trip lengths will reduce. So, and that's a function of feeding the travel cost back to the destination choice step which is this trip distribution step. So if you feed future traffic congestion back through that step, it predicts that people will shorten their trip lengths. So, things are harder to get to so I'll travel closer to home. That might mean that people change their job or change where they live to reduce the amount of travel that they need to make.

Now one of the issues with the four step models is that they often overstate the level of trip shortening. Four step models predict trip shortening but imperially that doesn't actually occur. So historically trip lengths have been observed to increase over time and the main cause for that is expansion of the urban area. So as the urban area expands people get on average further away from stuff and they have to travel further. So, we're faced with this situation where the models predict trip shortening if you feed it back through the distribution step but trip shortening doesn't seem to occur in reality as the urban area expands, the people moving to those outlying areas make a choice knowing that they're gonna need to travel long distances. And so that is the motivation for adopting the approach on the right. If you adopt the approach on the right, you don't get that trip shortening. What we get is stable trip lengths increasing slightly and that coincides well with empirical evidence.

So I can understand the arguments in favour of looping through the trip distribution step. I also know there're arguments in favour of what we're doing. It’s a technical issue and there was a difference of opinion between the peer reviewer and us in terms of which approach should be used. The approach we're taking here is the same approach that we take on all projects around Australia. So we were comfortable taking the approach that we were.

Another, a possible reason why models overstate trip shortening if you adopt the left hand approach, is that there's actually another thing people can do in response to traffic congestion which is to just travel earlier or later. So, that's actually a very common thing for people to do and its observed in empirically, there's evidence of it in Melbourne, that as congestion increases people just leave home earlier so the peak spreads. And four step models don't include that capacity to allow the people to spread and because they don’t do that when congestion increases the lever that people change, instead of changing their time, because in the model they're not allowed to change their time, what they do is change their destination. And so the model, because it's has this limitation of not predicting peak spreading, over states the degree of trip shortening.

So we are not the only people not to run models this was, I've seen it used in many different cases. There are a range of different approaches that you can take to get around this limitation of four step models and are comfortable with the approach that we're taking in this case.

So I think the next line just sums up what I was describing.

We might take a break there.

We'll start again at 11.45.

END OF PART 1