Please find below some more comments from Satellic regarding the respective pages of the productivity commission report on “Road and Rail Freight Infrastructure Pricing”.

We very much hope that our comments would still be considered regarding the final version of the commission report.

Kind Regards

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„*The transaction costs* of implementing and enforcing new systems, including technology costs.

In Germany, the *direct* costs incurred collecting road user charges from freight users of autobahns amount to one quarter of total revenue (about $1 billion per year). Compliance costs are not known. *Cost-effective* location-based charging is probably some years away.”

Satellic Comments:

Actually, the direct cost is much lower than the 25% claimed above. Toll-Collect is bound by a non-disclosure agreement with the German Federal Government can not reveal the actual figures. As a matter of fact the system cost per charged vehicle km in Germany is lower than e.g. the cost per charged vehicle km in Switzerland or Austria.

Please note that the services TollCollect provides, are not limited to the operation of the tolling system, but include all system related services such as: system development, installation, maintenance & operation and all other services except those that require official police or government authority.

Services provided by TollCollect are:

- System development, installation, operation and maintenance
- User service & contract management
- Handling of all payment processes this includes taking over all payment and credit risks

- All communications and marketing activities
- A large portion of the enforcement and compliance related services
- All technical infrastructure used by the enforcement authorities,
- Data centre and desktops for the enforcement authorities
- All enforcement and compliance related applications plus all installations in enforcement vehicles.
- Set-up, operation and maintenance of a Europe-wide network of 3600 terminals for manual booking*
- Provision, distribution and financing of the OBU's (OBU (On-board Unit) installation service is paid for by truck owner)

In the future the costs are expected to decrease due to:

The deployment of mandatory self-installable OBUs in Germany
A decrease in HW component cost for the OBU
Higher volumes of OBUs being manufactured

* The German Federal Government This requested this to meet the non-discrimination rules for non-German road users under EU law.

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"For example, in Germany, truck use of autobahns (about 12 000 kilometers of road) is electronically monitored and charged for. The cost of this system is high, however, with an annual administration and enforcement cost of around $1 billion, or almost one quarter of revenue collected. As noted earlier, these costs (*plus* the compliance costs incurred by truck operators, which are not included in the $1 billion) should be compared with the efficiency benefits, not the revenue. (A major objective of a number of road charging schemes operating in Europe has been to charge foreign trucks in transit. Therefore, the efficiency impacts on truck operators and freight costs have not been a major concern.)"

Comments by Satellic

About two-thirds of all revenue in Germany is generated from national operators, who are one of the strongest lobby groups in the country. Cost effectiveness is a major issue for these operators. In addition, EU rules do not allow discriminating non-German road users against German road users in any way and the European Commission is very closely guarding and enforcing those rules – in Germany and abroad.

The cost implied to the transport sector and to society in general is low, since this system is the only one that can be installed and operated without any impact on traffic flow or environment.

Considering a tag & beacon system for Germany would have meant to build approximately 6000 gantries across the autobahn network, which would have brought the traffic to a total standstill for months. The estimated cost for the gantries themselves, the construction work including other infrastructure required such as power supply, network connectivity, etc. would have been enormous. Additionally it would have taken a significant amount of time to get the clearance from up to 8 different government authorities on local, district, state and federal level for approval of each of these gantries. Entering into contracts and disputes with land owners

affected by the gantry roll-out would have been an extremely time and cost consuming procedure.

Please keep in mind that the German system has been a world-first implementation of GPS /GSM based road user charging technology and had to include all cost for initial development and the time to resolve technical challenges.

Today OBUs are available for less than half the original cost and it is estimated that in about 3-4 years the OBU cost will be less than a quarter. The same cost effects can be seen in many other areas, since technology used will be mass manufactured and processes and operations are constantly being optimized based on the real-life experience.

There are many parallels when it comes to the introduction of cutting edge technology. Here is an example on how the GSM mobile phone technology evolved: The first GSM handsets had the size of 2 bricks, the weight of 1 brick and cost (inflation corrected to today's prices) around 10,000 €. Calls could only be made once the first GSM network was up and running. Rates were in the range of 1.5 € per minute, on top of a base rate of 100 € per month.

The open European GSM standard was initially adopted by a few operators in the four GSM-A countries, subsequently many other new European operators came on board and the GSM standard finally spread out globally. Today a handset has the size of a match box, contains about 100 times the computer power and about 1000 times the memory of the first Apollo Spacecraft. A handset today comes with a digital still & video camera and a bundle of other applications – at a price of approximately 30 € from the manufacturer. Many operators offer flat rates of about 25€ per month – including a limited number of free call bonus. All this became reality after a few years of GSM mass manufacturing pushing costs and prices down, since the early adopters started using mobiles for the first time ever.

The same is likely to happen with satellite based road charging technology in the coming few years - while the DSRC tag & beacon, which is based on more than 20 year old legacy technology, has reached it's lowest point on the price development curve. DSRC tag & beacon technology will not and can not become any cheaper than today.

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"Although the German system is considered to be among the costliest, even if the cost for Australia were half this amount (around $500 million per year), this would require a permanent increase in productivity of at least 1.25 per cent for the road freight sector.

A New Zealand study (New Zealand Business Roundtable 1997) estimated that location-based charges for New Zealand highways would cost the equivalent of about 40 per cent of annual expenditure on those roads. Although productivity benefits of this order of magnitude could be achieved, the lower the costs the better, especially where the magnitude of efficiency gains may be uncertain. This suggests that there would be some benefit in using pricing technologies that 'piggy-back' on tracking technologies already used by truck operators.

Comments by Satellic:

Today's cost factors for tolling systems in general are:
- Number of trucks, which will determine the cost caused by OBUs & Communication –

(Significant impact for GPS/GSM systems)
- Number of distribution & service points for OBUs
- Size of the road network (in km) to be covered and the number of road segments, off-ramps and on-ramps (Major impact for tag & beacon systems)
- Total revenue and linked include all vehicles to that the cost for financial services, e.g. credit card fees, debt recovery, lost revenue insurance

When analyzing the cost factors above it becomes obvious that for small road networks (~ 100 km) and a large number of vehicles (=number of OBUs), a tag & beacon solution is likely to be more cost effective - typically if you want to charge all vehicles (including passenger cars) on a small stretch of road. On the other hand a GPS solution would be more cost effective, if a particular segment of all registered vehicles (e.g. heavy trucks) are to be tolled on a large road network, since no road side infrastructure is required. These considerations determined the German business case for a GPS/GSM solution even though it was a worldwide-first implementation of GPS and GSM technology for road usage charging. The same considerations would apply to Australia and other countries: A national tolling scheme for heavy trucks provides a good business case for GPS/GSM solution - and offers a platform for other services such as fleet management, logistics tracking, security services such as:

- Low bridge ahead
- Collision warning
- Notification in case of accident
- Railway crossing ahead
- Max. permissible weight on bridge warning
- Tailgate open ….

A GPS/GSM solution could also be used for the Australian Intelligent Access Program (IAP) providing monitoring functionality on:

- Transit corridors for heavy loads
- Axle load,
- Tire pressure,
- Reefer temperature in cooling trailers or trucks

Specifically in the context of truck road usage charging it is important to mention that according to privacy legislation in Germany the vehicle movement will not be made available to any German Government authority.