ROAD SAFETY COMMITTEE

Inquiry into improving safety at level crossings

Melbourne — 21 July 2008

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Mr W. Schwalbe, business development director, and
Mr P. Harley, engineer, industry and public sector solutions, Alcatel-Lucent.
The CHAIR — Welcome to the public hearings of the Road Safety Committee’s inquiry into level crossings. All evidence taken at this hearing is protected by parliamentary privilege as provided by the Constitution Act 1975 and further subject to the provisions of the Parliamentary Committees Act 2003 and the Defamation Act 2005. Having said that, any comments you may make outside are not afforded such privilege. As you can see, we are recording the evidence, and will provide a proof version of the Hansard transcript at the earliest opportunity so you can correct it as appropriate. If you could just proceed with introducing yourselves.

Mr SCHWALBE — I am Walter Schwalbe. I am the business development director for industry and public sector solutions at Alcatel-Lucent, and with me is Phil Harley.

Mr HARLEY — I am an engineer with industry and public sector solutions at Alcatel-Lucent.

Overheads shown.

Mr SCHWALBE — We thought we would like to present something a bit different — some of the research that was done out of Bell Labs and presented to the rail industry to support safety. We do not believe in this area that there is any one solution that is going to resolve all the issues that are there. It is almost like when you slice through Swiss cheese — there are all these little holes in it but when you put them together they do not line up. If you get enough layers in elements of safety then you will actually have a solution. What we are presenting is something different — an overlay to the additional problem. What we are hoping to address is something that will allow you to address driver behaviour, to provide feedback to people, and also potential for enforcement.

The solution does not provide any new infrastructure; it is primarily commercial, off-the-shelf equipment. It uses the assets of the mobile carriers to deliver solutions. It can also be deployed virtually anywhere because of the coverage of the mobile networks. There are onboard devices that are mobile compatible that can be customised, such as putting flashing lights on dashboards and things like that, or you can just have devices that are handheld and which buzz when they are carried by individuals. That is one of the solutions we proposed to Swiss Rail. They can also be used by pedestrians, handicapped people, farmers, rail workers or whoever. It is a broadly deployable solution and, as I said, commercial, off the shelf.

I realise we are tight on time here. Basically location-based services are solutions that the public carriers see as value added, utilising the infrastructure of the carrier networks. It is a complex ecosystem. It is made up of physical technologies — which are GPS and assisted GPS services; which is global positioning — and positioning technologies which can be cell based, triangulation or satellite based. The applications for these services are used for navigation, for geographic messenger services, which is particularly what we are going to talk about today.

Part of the ability of these devices to provide more value is the advancement in micro-electrical mechanical systems. These are used by the military in the field to detect the inertia, the movement of individuals and also the positioning. So not only can you tell where things are but where they are moving — ‘Are they laying down?’, ‘Are they on their backs?’, ‘What is the association of them within a particular area?’. It is used by the military, for example, to say when a soldier is down, which way he is pointed and that sort of thing. These devices are becoming very small and very simple to put onto chips and within devices. You can have magnometers for tip tilt and inertial sensors to detect movement all on a very small chip and becoming very cheap. But the key, of course, is the positioning technologies, and the positioning technologies vary very broadly from a very low accuracy to a very high accuracy that can get you down to centimetres of accuracy in measurement. Basic very simple positioning technology would utilise the cell ID. The accuracy is very low — of course it depends on which base station or cell you are connected to, right up to assisted GPS, where you are constantly getting information and you can position right down to centimetres. The price of the solution varies broadly from becoming very low.

The price is somewhat accuracy dependent, and the availability or the reliability of the solution is also dependent on what type of solution you implement. For example, a stand-alone GPS solution has very low reliability because it is just a single device, but when you incorporate that with other devices and you put more layers of duplicity on top of it, then you have a much more reliable solution. We are using location-based services for remote workforce, for direct access to the database. This is utilising the data that is being passed for track safety workers and coordinating the position with where these people are — say, on the track or off the track, or wherever.

If we just take a very simple example of what we call a push location-based services function: this is where a customer would sign up and say, ‘I am interested in location-based services that are part of my community’. We have Mike, who happens to be in a particular area of the city. He says, ‘There is a particular restaurant here’, and,
‘This is a great restaurant’, and when Kylie, who is already signed up, then enters that geographic zone she gets a message, ‘Hey, there is a great restaurant’ in that place. They are very much location-based services.

The CHAIR — It is too much information!

Mr SCHWALBE — There is another one here, and this might be a bit more relevant, where the railways might want to put this into the platforms so people will sign up. They may want to know whether or not trains will be available at a platform so they can make alterations to their journey rather than standing on the platform for some time while trains are being re-scheduled. You can define a geofence around a station. The advantage of defining a geofence is that the location-based message is relevant to a time period, so you are not going to get that message if you are not at the train station; you are only going to get it if there is an event that is related to the particular period of time that you are there and you are actually in that geo area at the same time. So Kylie has subscribed to location-based services; she wants to know whether the train will be there when she arrives. Then she will get the message saying, ‘The train is on time’, or, ‘The train has been delayed’, and she can make alternative arrangements for her journey.

This presentation was done by Bell Labs at the Swiss rail technology conference on how they could improve track worker safety. They put this presentation together so it defined the different environments that rail workers have. Some people are allowed to work on tracks, some people do not work on tracks, and some people can work on tracks at particular times. So they have a device that has a GPS capability, and you know now that those are built into most mobile phones. Then they define particular geographic zones within the track area.

Now you have to have a very accurate positioning system to make sure that you can tell whether people are on one section of track or another. Employees sign up for particular activities — some are allowed to work on track, alerts can be sent when people go between areas or when they are encroaching an area that they are not supposed to be in, not-allowed employees are warned, employees are warned when they are moving from a safe area, and train drivers can be alerted to reduce speed when they are entering an area where track work is going on. Those are the types of areas that can be associated. For this particular application for level crossings we assume there is a level crossing out in the middle of Woop Woop somewhere with no-one around. We define a geofence around the level crossing. As the train approaches the level crossing it deposits a message for any traffic that is potentially coming into that zone. So you have a truck driver or a trucking that has subscribed to the service — —

The CHAIR — That is via mobile phone?

Mr SCHWALBE — It is using the mobile data network. What we do not do is use SMS because SMS does not have guaranteed delivery. We would use a mobile data service.

Mr KOCH — What about vehicle radio interface?

Mr SCHWALBE — There are things we can do with that. The problem is that they are not necessarily available in a lot of these remote areas where the mobile data networks are typically broadly available.

Mr WELLER — So this would talk to the navigational things that people buy to put in their cars now?

Mr SCHWALBE — It could, the development could be done to do that, or it could be just a device by itself. The back-end system that is the intelligence sits elsewhere and it gets information from the trains, from the vehicles, and you pre-define the geographic zones that you are monitoring. So as the association occurs — a train goes into a zone and a vehicle comes into the zone — then the messages are generated by the system.

Mr LEANE — So a trucking company could subscribe?

Mr SCHWALBE — Yes.

Mr LEANE — And they would get it through whatever device — —

Mr SCHWALBE — Yes.

Mr LEANE — They would be told. How do you set up the geofence zone?
Mr SCHWALBE — It is through a graphical interface; it is a map interface and you can set it up pretty much anywhere.

Mr LEANE — So there is not something physically sitting in that, there is no technology sitting in that zone?

Mr SCHWALBE — No.

Mr LEANE — It is happening via satellite?

Mr SCHWALBE — It is a map interface, and the information about the location is via the mobile network. There is no satellite involved per se.

Mr LEANE — Is that an expensive process?

Mr SCHWALBE — We estimate that an application like this would be in the neighbourhood of about $1 million.

The CHAIR — But there are lots of areas where there is no mobile phone reception.

Mr SCHWALBE — They are getting to be less and less — you are right; and, like I say, there is no silver bullet but this would cover a lot of area where there is no coverage right now.

Mr WELLER — So when you said a million dollars, how much would that cover?

Mr SCHWALBE — That would cover the development of the application; it would not necessarily include the devices and the vehicle, which are about the cost of a mobile phone.

Mr WELLER — But for a million dollars, would that be all the crossings across Victoria or just one crossing?

Mr SCHWALBE — Perhaps Phil could speak to that.

Mr HARLEY — All the crossings across Victoria, basically.

Mr WELLER — For a million dollars?

Mr HARLEY — Yes. But the whole thing depends very much on how many carriers you interface with, how many devices you will have on the end of it — —

The CHAIR — But that is why it would make sense if it was via satellite rather than being dependent on certain carriers, would it not?

Mr HARLEY — Except that the data link to the vehicle is via a carrier, so you have to have a mobile phone coverage there for that.

Mr SCHWALBE — Unless you wanted to tell people that they had to buy carriers. The advantage of this is that you can actually start looking at recording the driver behaviour in those zones, and then tracking it and providing feedback. So you might be able to encourage trucking companies to say, ‘If you install this, we can manage your driver behaviour and provide feedback for you on how your drivers are behaving when they approach level crossings’. And that is one of the benefits you can start getting back.

Mr KOCH — And it would be portable so you could take it from one unit to another unit?

Mr SCHWALBE — Absolutely, yes.

Mr KOCH — Have you spoken to transport companies about this, and what is their attitude?

Mr SCHWALBE — We have not yet, no. It is something we have just been speaking about in the last five or six months. It is being developed. So it is really meant to enhance existing safety systems and utilise existing technologies that are off the shelf. We are not telling you to buy anything that is not already there. You can perhaps
get a little GSM modem and put a light on the dashboard if that is what somebody wanted to do; you could put it into a tractor for people who are out in the field where it is noisy and they are sometimes not watching what is going on so they would get lights on their phone. You could also give it to handicapped people to warn them because you cannot always tell the speed of approaching trains, and that is a big problem that people have. They just do not know how quickly a train can move when they see this object coming towards them. You could also provide indications to train drivers, but we know that that would not actually do much good except to they tell them to get out of the way.

You could also use this now, once it is in place, to warn of emergencies ahead much more quickly. For example, if you take the accident that occurred in Adelaide where you had the metro rail network and the Australian Rail Track Corporation running parallel and not actually communicating, there was no way to tell the commuter rail that there was an out-of-gauge problem because a train had come off its tracks and was intruding over the top of the metro rail. By setting up a geofence you can set up warnings almost immediately; so there are many different applications, and the cost is more in developing the applications and the user interface. Once that is set up, the users would define the geofence areas themselves.

Mr TREZISE — So to get this right in my mind, you are saying this system is still being developed at present?

Mr SCHWALBE — There are geofence applications that are already in place and we are proposing alternate uses for something that is already in existing technology.

Mr TREZISE — But it is not being used at level crossings at present?

Mr SCHWALBE — No.

Mr KOCH — So there are no pilots?

Mr SCHWALBE — Right.

Mr KOCH — Do you envisage in the near future that you will be approaching people to do several pilots in the state of Victoria, for instance?

Mr SCHWALBE — We would be very interested in talking to people to develop an application that would be along this type. It does take development and some investment, and it is very important that the developers and people looking to put the solution in place understand what is trying to be achieved. There has to be this correlation in the software development.

Mr KOCH — Have you any time-frames that you propose in which these discussions may take place?

Mr SCHWALBE — Some time in the next six to nine months.

The CHAIR — Thank you very much for your time today.

Witnesses withdrew.