T R A N S C R I P T

STANDING COMMITTEE ON THE ECONOMY AND INFRASTRUCTURE

Inquiry into electric vehicles

Melbourne — 13 February 2018

Members

Mr Bernie Finn — Chair
Mr Mark Gepp — Deputy Chair
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Mr Shaun Leane
Mr Craig Ondarchie
Mr Luke O'Sullivan

Participating members

Mr Cesar Melhem
Mr Gordon Rich-Phillips

Witnesses

Professor Aniruddha Desai, Director, Centre for Technology Infusion, La Trobe University.

The CHAIR — The committee today is hearing evidence in relation to the inquiry into electric vehicles. The evidence is being recorded and is also being broadcast live on the Parliament's website. Professor, welcome to the public hearings of the Economy and Infrastructure Committee. All evidence taken at this hearing is protected by parliamentary privilege; therefore, you are protected against any action for what you say here today, but if you go outside and repeat the same things, those comments may not be protected by this privilege. In fact there is a fair chance that they will not be. If you would be kind enough to state your name, your organisation, your position and the suburb or town in which you are based, that would be marvellous. You can then go for 5 or 10 minutes to give us an overview, and we will launch into questions at that point.

Visual presentation

Prof. DESAI — Sure. Thank you. My name is Ani Desai. I am a Research Professor at La Trobe University's Centre for Technology Infusion. We are based in Bundoora, which of course is called our Melbourne campus. Thank you for inviting me and for your interest in a project that has been going on at La Trobe University involving a fully autonomous vehicle which is also fully electric. Since we did not make a submission, I will start off by talking about one specific point that I was hoping to make today in addition to providing information about our trials.

In terms of any recommendations or input from us, the one thing we would like to suggest to the committee is to take a proper look at the future of transport in terms of electric vehicles being but one component of four major pillars of what we see as the future of transport. I think there is industry consensus that the future of transport is electric, connected, automated and shared. The slide here — I found a very nice infographic from a report from McKenzie and co, which is very good in the sense that it points out the relationship between all these four pillars and how they, in effect, reinforce each other in terms of adoption and promotion, and basically helping each of the four pillars be strong and stable. I will not go through all of them, but just in making the point, if we look at the pillar of shared mobility, it is something that will effectively increase the utilisation of vehicles, be it electric platform vehicles in this context, which obviously makes the economic case for the use of an electric vehicles better, because the more kilometres you get out of the vehicle the cheaper it is to run.

In terms of autonomous vehicles, again, what we see or what is at least a clear indication, is that it will see some changes in the general mobility patterns that we see today. Those changes essentially will mean that there will be increased consumption of mobility itself, which again sort of goes back into the same loop — it will increase consumption therefore the case for electric vehicles becomes better and stronger.

In addition to those four there would obviously be impacts on other things — for example, public transit. I have heard this question a few times about autonomous vehicles: what is going to happen in the future with public transport or other vehicles? What happens to job losses and things like that? I think, at least our view there, is that autonomous vehicles will provide and basically fill a gap — for example, the first or last-mile access connecting existing modes of mass transit, which will always be there. It actually, in effect, could help increase the consumption, efficiency and throughput in mass transit. There will be impacts of that going more broadly, so our suggestion is for the community to consider looking at, in terms of policy settings, supporting the other three pillars in terms of automation, connectivity and shared mobility.

In terms of the potential impacts, and sort of adding to the point I was making before, when we bring in the other three pillars of transport it will open up opportunities for us to make a very big impact on a number of challenges that we see in the transport sector. For example, if we start off, and just repeating that making an impact on all of these will be difficult to achieve without considering the other three pillars — that is, if we only look at the electric vehicle platform itself. A couple of statistics: for example, the cost of congestion in Australia will be in excess of $50 billion by 2031 — that is from Infrastructure Australia — and if we look at road accidents, which is costing the economy close to $30 billion annually. And specifically some statistics that have come recently, to my knowledge from VicRoads, there is 10-year modelling going to 2026 looking at the population growth and requirement for more transport infrastructure. The modelling shows that basically we will need a 9 per cent mode shift — looking at other modes of transport — otherwise we will need to have close to a 25 per cent increase in capacity on 10 per cent of our road links. If we do not want to end up like the really congested cities like Los Angeles or Manhattan, that is something we need to consider in terms of supporting this mode shift to make our transport more sustainable.

If we look at the really long-term potential impacts of having autonomous and electric and connected vehicles, the picture below is something that we see quite often, and effectively it is just large car parks with cars sitting

there idle. Two quick points that I wanted to make there in terms of the long-term benefits of automated and electric vehicles is that we can address two problems that we see from that picture. One is: urban land utilisation in terms of parking in prime areas is quite a poor form of land utilisation. We will not see that parking would disappear suddenly, but as a long-term view, it is not a very efficient form of land utilisation. The second is: for the average Australian a vehicle is probably the second most expensive investment after their house, and sometimes we have two of them. The fact is that a private vehicle is idle close to 90 per cent of the time, and it is also the fastest depreciating asset that you own.

So those two things, if you look at land utilisation and investment into private vehicles, that is the picture that in the long term, with automation and electric vehicles, can start to change and shift, and therefore it is important that we consider the whole picture in terms of promoting the next policy initiatives around electric vehicles in the transport context.

So let me describe to you little bit about the project that we are engaged in. The project was launched late last year, and it involves a partnership with Keolis Downer, who are the lead agency; La Trobe University; VicRoads, who are the principal sponsors or co-sponsors; HMI Technologies; the Australian Road Research Board; and of course the RACV. The project is looking at a fully automated shuttle bus, which is also fully electric, and evaluating its use in a first and last mile connectivity solution. So in effect it is looking at the data that we provided before — looking at how we can start to evaluate how such solutions work and how they can potentially be rolled out in the near term. This is the first trial of its kind in our great state of Victoria.

What do we expect to achieve from the project? There are a number of things. Given this is the first in Victoria there are a number of aspects for us to clearly consider before we can get them running. The time line has been that the project was initiated about the middle of last year, we have since done mapping exercises and a public launch demonstration late last year, we are currently finishing the mapping for the entire operational loop of the bus and the public trials will commence in April on the university's own campus.

What is unique about this project that I would like to highlight, as compared to other trials you may have heard of around the country or indeed in the rest of the world, is that in this trial we are focusing on a direct use case. So it is not just technology demonstration or technology evaluation, it is a real use case, and the university campus we think is an excellent site. It is about 1.5 times the size of the Melbourne CBD and it has got almost 20 000 students from 100 countries and thousands of staff that work on the campus, so it is an excellent melting pot for us to trial such a technology and its use across an ideal cultural background.

At the same time, looking at the first and last mile connectivity, we have selected the route — which I think was there on the previous slide — which starts off from the bus interchange, which is also the tram stop, and goes all the way through a public road into Science Drive and the side of the campus and to a couple of main bus stops, and that is a route that a lot of our staff and students take in terms of getting to and from campus.

Mr LEANE — Can I ask what that distance is from the first point to the last point?

Prof. DESAI — Sure. That is approximately a kilometre — just over 900 metres. The loop would be just under 2 kilometres in terms of the shuttle loop. This is actually a part of a service that the university actually runs, which is called Glider, to get our students point A to point B across the campus as they run between classes and exams and so on. So it is a very real use case. It is replicating a part of what we actually already run as a shuttle operation. So we hope that that provides a lot of learnings more broadly.

Specific outcomes that the project group expects to achieve include experience in developing the safety case on running fully automated vehicles in a live environment and evaluating the EV platform itself in terms of its performance — what are the issues potentially to consider and the future rollouts indeed if the university itself does decide to roll out something like out as a permanent service. The operational framework is an important aspect that we will be looking at in terms of: how do we operate these shuttles in both commercially viable ways as well as a way in which the customer experience or the needs of the end user are fully met or met as much as possible from our side.

And finally, the plank which is important in this context, because it is the first in our state, is to look at what are the regulatory legislative changes required. The project will of course help VicRoads and other agencies understand what the issues are in running these trials or potentially having a rollout of services like that — what changes are required to regulation and legislation, infrastructure and so on.

So that is a brief overview of the project, and I would be happy to answer any questions.

The CHAIR — Thank you very much indeed. I am very interested in the concept of shared mobility, because as I crawled down Sunbury Road this morning — and crawling was when I was moving quickly —

Mr LEANE — Were you in the car or —

The CHAIR — I was in the car, yes. I was on this occasion, yes. It was a fun trip. I looked around and I saw in just about every other car a single occupant. How do we change that? Do you propose a process whereby we force people into other people's cars, or exactly how do we go about that?

Prof. DESAI — Okay. I guess the best approach there, or probably the easiest approach, is to show what can be done in a shared mobility scenario. There are many cases where priority lanes exist for motorists with multiple passengers.

Mr FINN — Not on Sunbury Road, I am afraid.

Prof. DESAI — Sure, but looking at priority lanes and things like that would be one approach, which I have seen being deployed in many areas, like on my recent trip to California. Also, as it occurs, for fully electric vehicles you can get into that lane even if you are single occupant, so I guess that is sort of encouraging more use of zero emission vehicles.

But also, in terms of looking at the overall price of mobility and the overall convenience of mobility, if you are able to connect more passengers onto arterial networks which are having not as much congestion, including main public transport lanes, that is probably a better way.

The CHAIR — I think what you are saying makes eminent sense, but how do we actually do that?

Prof. DESAI — What comes to my mind is supporting, at least in high-density areas, the rollout of some of these shared mobility solutions — encouraging them, subsidising them up to an extent, until people actually see their value and then the subsidies can go off because it is sort of paying for it by itself. Initially the shared models are going to be a little bit difficult to get in volume, but unless we get a shared model going and a model going that actually connects with existing mass transit, it is going to be difficult to operate. So I would suggest undertaking a mobility review overall in districts that have such problems and looking at a number of these solutions and potentially subsidising some trials so that people can actually see the value.

As it happens, we have a large proposal with a number of transport operators — bus operators and tram operators, Yarra Trams — in collaboration with the City of Darebin. The project we call Mind the Gap. The partners I have already mentioned have all come together and effectively put together a proposal of the shared mobility scenario — basically reducing the gap, the one that I described just now. How do we do that? We actually have a detailed proposal. I am more than happy to give you a copy of how we propose to do that in terms of at least getting some momentum into the shared mobility scene — not just shared mobility in terms of first and last mile but also looking at broader approaches to bridge this gap.

Mr LEANE — When you talk about first and last mile, it is a mile for me to get to the public transport, so that is the gap, is it? Yes; okay. In April the university will have a driverless electric bus picking up students in that last mile scenario.

Prof. DESAI — Sure.

Mr LEANE — It is about a kilometre, which is still a long walk if you have gotten off public transport. I have asked you a few dumb questions, I think. When there is a driver on a bus and I run for the bus, if I am the person running for the bus, I want the driver to look at me and wait. If I am sitting on a bus and in a hurry, I would not want the driver to wait for me. I suppose that opens up a number of safety scenarios. What are the safeguards when someone runs for the bus and the bus has no driver — it has its own program? What are the safety standards?

Prof. DESAI — That is a very important question in terms of the safety of automated vehicles in general. That is a question that we get quite often. I will give you an example of this particular bus. It has got a number of sensors such as radars, stereoscopic cameras and laser detectors, which are able to basically take in a full

360-degree view around the bus in real time — not what a human driver can do. Already the information that the bus collects and uses in terms of its operation in real time is much more than a human is able to do, and therefore it will inherently be safer than a human actually operating a bus.

I mean, that is the theory. When we talk about actually applying that in practice, of course, it is software testing and certification — all of those things would come into play, where in theory if you have got more information than you can use to drive safely, you should be able to drive safely, which is what happens in most of the cases. But there will be a time when hopefully there are specific test cases and use cases that these vehicles are able to go through to certify that they are fully safe to operate. But having said that, these buses have already gone through a range of safety tests. In fact we looked at what sort of safety tests they have already been through in terms of doing our own safety planning and test analysis. We have not so far found any safety cases that are not being met with this particular bus.

Mr LEANE — So the situation that you have got at the university is that a lot of people do access the service now with the shuttle — is that correct?

Prof. DESAI — Yes.

Mr LEANE — So for a lot of the people that are going to access this service, it will not be too dissimilar to your first and last mile situation out in the suburbs, and that is an issue. Part of the issue in accessing public transport, whether that be a bus linking to a train or whatever, is that mile. Is that the evidence that you have had? Is that mile a deterrent, as in 'I do not want to walk a mile to the bus stop'?

Prof. DESAI — The rule of thumb, they say, is usually if something is more than 300 metres away, then people take their car. That is not even a mile. But that is just the rule of thumb, I guess. It is very common in the suburbs — for example, where I live, in Craigieburn, if I have to take a bus, it takes me 15 minutes to get to the nearby train station, and that is only because the bus stop is close to where I live. If it was 500 or 600 metres away, getting to the train station would not be as convenient if I wanted to use public transport. The last mile definition is to actually bridge the gap between the source or destination and the main modes of transport that are already on offer.

Mr LEANE — Thanks so much. I might drive up at some point and jump on it. It sounds fantastic.

Prof. DESAI — You are more than welcome.

Mr LEANE — Maybe I will wait until May or June.

Ms DUNN — Wait until it is running.

Mr LEANE — When is it running?

Ms DUNN — Soon.

Mr LEANE — It says 18 April.

Prof. DESAI — We are already doing once-a-month or twice-a-month demonstrations for people from different stakeholder groups to come and take a ride. That already occurs every month, so we had the last one on 8 February. We have not set a date for the one in March. You are all more than welcome to let us know, and we can facilitate a ride and a real look and feel of how it operates.

Mr LEANE — That would be great. Thanks so much.

Ms DUNN — It would be great. Thank you for your presentation. In terms of the route that the bus is doing, what sort of speeds is it travelling at?

Prof. DESAI — The road itself is limited to a speed of 30. It is an internal road inside our campus. We are looking at operating the bus at around 15 or 20 kilometres an hour on that particular route.

Ms DUNN — I guess the bus is not running yet, so this might be a difficult question to answer, but is there a reticence by people to get on a bus that does not have a driver attached to it?

Prof. DESAI — That is actually one of the questions that we want to explore. What are the concerns that people have —

Ms DUNN — Yes, is this a barrier?

Prof. DESAI — It is not very different in terms of the feel of getting on a train, where you do not actually see your driver. Most of the carriages —

Ms DUNN — Yes, you are completely removed.

Prof. DESAI — That is effectively how the bus looks. It does not have a steering wheel. You go in, and actually it can drive in both directions. It just looks like a train carriage, except it is a lot smaller.

Ms DUNN — Except it is a lot smaller and does not need rail.

Prof. DESAI — Correct.

Ms DUNN — Where is that bus manufactured?

Prof. DESAI — The bus is manufactured by a French company called Navya. It is a French-built, 15-person bus that basically one of our partners, HMI Technologies, has leased for the project. They also operate the shuttle in terms of these trials. I also heard recently that there have been announcements that Navya would be looking at manufacturing or assembling some of these buses here in Australia — I think in South Australia if I am not wrong.

Ms DUNN — I guess in this project it may be subsidised, but do you know what the actual cost of that bus is in terms of build costs?

Prof. DESAI — It depends on how you option it, just like with any car, but the approximate price of the bus would be around $420 000 or $430 000 with most of the options — about 80 or 90 per cent of the options — that have been taken. But that is in our specific case.

Ms DUNN — Terrific. Thank you.

Mr O'SULLIVAN — I was just wondering whether the project is referred to as Skynet internally.

Prof. DESAI — Well, I hope not.

Mr O'SULLIVAN — Have you got a plan for what happens when it becomes self-aware?

Prof. DESAI — Do you mean in terms of cyber security?

Mr O'SULLIVAN — No, I am joking in relation to one of my favourite movies, *The Terminator*. The question I want to ask is: we were talking earlier about avoidable congestion — can you elaborate a bit in terms of how you think you can address that?

Prof. DESAI — Sure. Coming back to the same sort of logic, if our roads are already at capacity, especially during peak hours, the only way to alleviate that is to not have as many people driving, like the Chair said, with one passenger per vehicle. That is one easy way to reduce the actual number of cars that are there on our roads and to basically reduce the congestion.

The approach to that, of course, the first and last mile, helping with getting more people on mass transit, is an excellent approach. Having more shared models, whether it is shared taxis, shared shuttles or even just carpooling — all of those approaches would be a way to reduce the percentage of people that are on our roads driving in a car by themselves.

The CHAIR — Professor, thank you very much for joining us and contributing this afternoon. You will be sent within the next week or two a transcript of this afternoon's proceedings. If you could have a look at that and get back to us if need be, that would be a marvellous thing. We thank you so much for being with us today.

Prof. DESAI — Thank you so much.

Witness withdrew.