

SPEECH BY PERMANENT SECRETARY FOR TRANSPORT MR PANG KIN KEONG, AT THE CREATE FUTURE MOBILITY SYMPOSIUM 2015 ON WEDNESDAY 8 JULY 2015, 9.00 AM, AT THE Ngee Ann Kongsi Auditorium, National University of Singapore

Dr Lim Kiang Wee, Executive Director, CREATE,

Ladies and Gentlemen,

Introduction

1. A very good morning.
2. The topic of this symposium, “Future Mobility”, is both timely and exciting. Many cities around the world, including Singapore, are rethinking urban mobility. I look forward to the discussions at this symposium, on the latest ideas and initiatives which might help all of us in our efforts.
3. Urban transportation as we know it today emerged around the turn of the 20th century. The first underground railway, the London Underground, was launched in 1863. The first motorised public bus service was introduced, also in London, in 1902. The first mass-produced private cars, the Ford Model T, rolled off the production line in 1908. All this came together to form a typical model for urban transport – mass transit provided by the subway and/or buses, travelling on fixed schedules and fixed routes, and point-to-point, on-demand mobility provided by taxis and cars.
4. Since then, the vehicles have become faster and more comfortable, but the model of urban transport of the early 20th century has remained largely unchanged.
5. Technology, however, has now placed us on the cusp of the next revolution in urban transport. The type of transport available to the man-on-the-street, the manner of deployment of transport resources, and hence the planning and regulation of urban transport, will change significantly.
6. Let me share my Ministry’s perspective of some of the areas of technology and innovation in which we are particularly interested, and which will help us address some of our mobility challenges.

Singapore’s Vision for Future Mobility

7. Singapore is a dense metropolis, housing about five and a half million people in just 700 square km. For comparison, 700 square km is less than half of London city. But within this 700 square km, Singapore needs to build an entire country, not just a city.
8. A car-oriented transport system is therefore not sustainable for Singapore. We simply will not have enough land to accommodate more and more private cars. Key

for us therefore is to build and operate a public transport system that provides a high enough level of connectivity, speed and comfort, that Singaporeans will feel less of a desire to drive.

9. Hence we have laid out concrete plans for the next 15 years to invest heavily in the public transport system, as well as active modes of mobility like walking and cycling. Many improvements to our train, bus and taxi services have been implemented or are underway, and we have plans to build several more new MRT lines.

10. There are three areas of technology and innovation which we particularly believe can lead to a stepped improvement in our public transport services.

Data Analytics for More Effective Transport Designs and Policies

11. First, data analytics. We have millions of commuters on the move every day. Detailed understanding of their mobility patterns and behaviour will help us to develop even more effective transport designs and policies.

12. For example, the Singapore Land Transport Authority, or LTA, already does very interesting analysis of the travel patterns and behaviour of train and bus commuters through fare card data, obtained when commuters tap in and out. We also have the exact location of the trains, buses and taxis in our public transport network. With all this data, LTA is looking to develop systems to simulate and predict commuter crowding, behaviour and movements across the entire public transport system. The aim is to enable LTA to further optimise the deployment of trains and buses under various operational and incident scenarios. For example, to understand the impact on crowd levels at different stations if additional trains are injected or turned around at various locations; how to rationalise bus services to optimise resources and yet meet commuter needs; or to understand the build-up of the crowd should a train service disruption occur at various times of the day at various locations, and hence the best way of redeploying trains and buses to help move the affected commuters.

13. We are also working with some of the telcos to leverage mobile phone data, which can be aggregated and anonymised to provide the mobility patterns of the wider public including those who do not take public transport but walk or cycle to their destinations.

14. In the very near future, data from Singapore's next-generation electronic road pricing system, or ERP, will offer immense opportunities to better understand motorist behaviour. We are implementing a new satellite-based ERP system to replace the existing gantry-based system. The new system consists essentially of GNSS-enabled sensors which all vehicles will be required to install. The sensors will provide real-time data to the transport regulator not just on the location of the vehicles but the speed and smoothness of travel. This will enable the regulator to build up a comprehensive, accurate and real-time picture of the traffic situation on every road in Singapore.

Smarter Interfaces between Commuters and Transport Service Providers

15. The second area of technology and innovation which is revolutionising the transport scene relates to the interface between commuters and transport service providers.

16. Over the past few years, LTA has launched transport applications such as MyTransport.SG. MyTransport.SG was launched in 2010 to help commuters better plan their journeys by providing essential transport information and tools. It was enhanced in April to provide more accurate bus arrival times, as well as information on the level of crowding on each specific bus, for example whether the next bus arriving has seats available or there is standing room only.

17. The advent of third-party taxi booking apps has also been a positive development. They have enhanced the provision of taxi services in Singapore by improving the matching of taxi supply and demand. Apps are also making chauffeured services, car-pooling and car-sharing more accessible to the man-on-the-street.

18. Even where bus services are concerned, there are now means to make them more customised and attractive to the commuter. LTA and the Info-Comms Development Authority are developing a demand-driven, point-to-point bus service called Beeline. This is similar to schemes that have been piloted in Helsinki and New York. Essentially, Beeline will harness public transport and crowd-sourced data to identify potential express bus routes, and adjust its routes to respond to requests from commuters. This means shorter journey times for commuters, and commuters being picked up and dropped off at, or much nearer their origin and destination than if they take the public bus.

19. This concept of “demand-driven shared transit” has the potential to dramatically transform even the way that public bus services are provided in the future. Imagine a suite of adaptive bus routes – where new routes are activated based on commuter demand and existing routes evolve dynamically with changing travel needs.

20. We are also looking at bringing greater convenience to commuters through innovative fare payment systems. In the near term, LTA is working on contactless payment modes that will allow devices with Near-Field Communication technology to be used at the fare gates. Such devices including wristbands and mobile phones will be tested out in the later part of this year. We are also working towards an account-based payment system where we need only identify commuters upfront and the transaction will be processed and charged back-end, just like post-paid mobile phone subscription schemes. This eliminates hassle for the commuters in having to top up their fare cards regularly. For the operators, this reduces the need for front-end top-up service counters and machines. Our ultimate vision for fare payment systems, however, is what the industry has termed the Be-In-Be-Out (BIBO) system. Under this system, a commuter does not need to tap the smartcard in or out to register a trip. Instead, the technology will be able to detect and automatically register commuters in a bus or train so long as the commuter has the fare card somewhere on his person. Such BIBO systems do not require any user action and

are therefore “hands-free”. To the commuter, this will offer the ultimate convenience. LTA will be studying its feasibility and applicability to our transport system.

Autonomous Vehicles to Revolutionise First-Last Mile Travel

21. The third area of technology which has transformative potential for Singapore’s transport system is Autonomous Vehicles or AVs. Most of the buzz surrounding AVs has been about how they will transform driving for the car owner. That day will come and we are preparing for it by studying the regulatory, liability and insurance frameworks, amongst others. However, replacing one driven car today with one driverless car tomorrow is not what the Singapore Government is most excited about. It will not reduce the number of cars on our roads, nor reduce the amount of land needed for roads and car-parks.

22. For us, the most exciting potential of AVs is to apply the technology to public transport, or to shared transport, bringing new forms of mobility for the masses with the convenience of private transport. To achieve this vision, my Ministry set up the Committee on Autonomous Road Transport for Singapore, or CARTS for short, in August last year.

23. With the exception of our very first two MRT lines, all our other MRT lines already run on driverless technology. When we are able to apply AV technology to buses as well, we would solve one of our most pressing transport challenges today, which is to recruit enough bus drivers.

24. We are also interested in trialling and deploying demand-driven, dynamically-routed, point-to-point shared services that are responsive to apps or internet bookings. This can potentially serve as a commuter-friendly, mass transport mode for intra-town and first-last mile travel.

25. To facilitate such trials, we had announced earlier this year the One-North district as our first mixed-use test site for AV technologies and mobility concepts. It comprises public roads in a R&D and high technology business park, which also has a suite of commercial and food-and-beverage offerings. And last month, we launched a request for information (RFI) for Mobility-on-Demand and Autonomous Buses trials at One-North. The AV trials will give us the opportunity to learn and understand the technical capabilities and infrastructural requirements necessary for AVs to operate safely on our roads, and also to understand the interaction between AVs, motorists, cyclists and pedestrians.

26. We will announce more test sites in due course to accommodate different testing needs. The trials by SMART-NUS in Chinese and Japanese Gardens last year introduced AVs to the public. Going forward, we can also expect to see AVs plying pavements and roads in popular locations such as Gardens by the Bay and Sentosa.

27. In freight transport, we will be testing truck platooning, or what is also known as ‘follow-me’ technology. This comprises a lead truck that is steered by a driver, followed by a convoy of about three to four driverless trucks, which reduces

manpower reliance and increases productivity. The technology will benefit Singapore's logistics sector which has been facing a shortage of drivers. We are working to test this technology for the port sector for movement of containers between the different port terminals.

Strong Partnership between Government and Research Institutions

28. We welcome opportunities to work with and host industry partners, academia and researchers, to test such and other mobility technologies and innovations here in Singapore. You help my Ministry push our own mental models and also the physical boundaries of what is possible for the future of mobility.

29. In particular, I would like to express my appreciation to the research centres under CREATE. They have embarked on several interesting projects with LTA, which will bring significant benefit to Singapore's urban and transport landscape.

- a. SMART-FM was the first to trial their AVs locally for public use.
- b. TUM CREATE has designed and developed a fast-charging electric taxi for operation in a tropical climate like Singapore.
- c. And SEC-FCL has developed a multi-agent transport simulation model, MATSim Singapore, which simulates Singapore's island-wide travel flows on roads and public transport, with an unprecedented level of detail and which takes into account dynamic phenomena such as bus bunching, vehicle overcrowding and congestion.

30. I am very pleased to be here to celebrate these and other milestones of CREATE.

Conclusion

31. These are exciting times in the development of Singapore's transport system. My colleagues and I at the Ministry of Transport and LTA look forward to continuing to work with you to design, develop and deploy smart mobility solutions for the future that can be applied not only in Singapore, but in other cities as well.

32. On this note, it is my pleasure to declare the symposium open. I wish all of you a fruitful and engaging discussion.