

**Mr Tan Boon Khai, Chief Executive, Singapore Land Authority**  
**Serving the citizen in a 3D virtual state.**

**Abstract:**

Mr Tan showcased the work that Singapore has been undertaking, and their move from a 'map' to a 'virtual state'. Singapore faces a problem that its population has grown too fast in recent decades, and the national infrastructure has not kept up with developments. The government is now looking at how to serve their citizens better.

One of the ways Singapore is solving this challenge is to create a virtual state which seamlessly links information on the surface, under the surface and within buildings, this is also integrated with all aspects of data, technology, innovation, and infrastructure. Singapore believes that it can move from the concept of smart cities to become a Smart Nation. A Smart Nation will support interactive engagement and be the driver for delivering change, the challenge is to develop a platform which can support and provide this.

**Notes to support the presentation:**

- Mr Tan showcased the work that Singapore has been doing, they aren't calling it a map, rather a virtual state.
- Singapore had its own moment of realisation in 2011, where the government felt constrained by a huge chunk of the population. There was a huge growth in the population of Singapore. Public infrastructure has not kept up with the growth in population. They are now looking at how to serve the citizen better.
- From 2010, saw a rise in Internet of Things, which track everything and can give actionable intelligence.
- Singapore also features Internet of People – services made by the people, for the people. This is a disrupter, in food, people are looking to UBER Eat. This is driven by the demand side, using location based sensors, people can get what they want, when they want.
- Singapore believes in creating a virtual state.
- With this comes the importance for coverage, over and underground
- Integrating four aspects: data; technology; innovation; and interaction.
- Growth is in augmented reality. AR is used in many aspects, including commerce.
- What is the Singapore model? A smart city state is better placed to serve the state.
- Singapore is small, essentially it is a city state, they think they can fuse everything to create a smart state, bringing technology together.
- Singapore is experimenting with platform technologies to provide services. The technology is only as good as those who can use it, and can get the benefits from it.
- A smart nation = supporting interactive engagement, and Singapore are at cusp of delivering this.
- Three examples were given:
  - Reporting on municipal services. Citizen no longer has to contact each of them. Providing one service there is an app for geo-tagged photos, and the data serviced to the correct agency.
  - Property prices. Homebuyers can analyse trends in house prices through one map, a map based free app.
  - Decision making. People click government e-services to give views through the 'my responder' app, in the case of first aid. These are citizen services which are location based.
- There is always the need for quality geospatial information.
- The world of geospatial has expanded from 2D, which is incomplete.

- There is a need to go underground, to make the best use of space.
- Trying to create and maintain a 3D virtual state.
- In the future, the value can be unlocked by using real-time 4D data.
- Tried to pilot this in a few areas. To look at some ways to deliver analytics, and to engage with the citizen.
- If we should build once, we should build right.
- Allows citizens to plan their own cycle routes. Mapping of the traditional routes, but by giving access to a virtual immersive map, you can give other, and better, services. The ability to map indoors, gives the ability to map to virtual environments.
- Citizens can determine their own path. This can be over ground or underground.
- Only a glimpse of a virtual Singapore, it's not easy but a necessary stage to take the outcomes for desired, better public services to citizens.
- What is the role of government? As a facilitator. Government has to make the decisions, without all the data. Many countries have got good SDIs and really robust legal and policy frameworks, for geospatial information collection.
- There are issues of trust – sensors are collecting sensitive data. This can empower people to make their own decisions. Does provide the threat of being the bed-rock of national resilience.
- Brokering. May have all the data, and all the sensors, but don't have all the keys. Copenhagen has a City Data Exchange. This data marketplace is a key concept for nations, and adoption of a model for local, state needs.
- There are challenges to building a platform. How do you add value for users? How do you interact 3<sup>rd</sup> party data? This leads to greater peer-to-peer sharing.