

GE
SMART
ASIA 2018



Locate
#Locate18



WHEN

9 – 11 APRIL 2018

WHERE

ADELAIDE, AUSTRALIA

[CLICK HERE TO KNOW MORE](#)

Virtual Singapore (VSG)

building blocks of a Smart City

Sonny Andalis

Building and Construction Authority (Singapore)

Smart Nation



beta



About Smart Nation Initiatives Apps Co-Creation Resources Happenings



MANY SMART IDEAS ONE SMART NATION

Uncover the possibilities by clicking the icons!



Smart City

Building a SMART CITY

A slew of initiatives are taking place islandwide, the goal of which is to sharpen the Government's response to city issues and hence improve people's day-to-day lives.

TOWN PLANNING

What: A modelling system to simulate a city's built environment and its impact on the natural environment, people, resources and costs

Who: HDB, Electricite de France, Veolia

Uses: Among other things, show how different land uses affect amenities and transport networks; how to design new housing blocks to get ideal wind flow; where best to build cycling paths

Status: Research collaboration / prototype stage

WATER QUALITY AND LEAKS

What: A network of wireless sensors that monitor water quality and detects leaks in real time

Who: PUB, Singapore-MIT Alliance for Research and Technology, Veolia

Uses: Allows PUB to repair leaks faster and reduce water loss

Status: About 300 sensors installed by end-2015

NOTE: Artist's Impression
COURTESY: PUB

ERP II

What: A satellite-based electronic road pricing (ERP) system that can use an on-board monitor to charge motorists according to distance travelled

Who: Land Transport Authority, IBM

Uses: This may replace the current system, which charges motorists each time they pass through an ERP gantry during certain times

Status: Feasibility being studied

SECURITY

What: A public-private Safe-City Test Bed that produced, for example, a mobile app for commanders to track security forces in real time

Who: Economic Development Board, Ministry of Home Affairs, AGT International, Airbus Defence and Space, NCS, NEC Asia Pacific

Uses: Could help commanders respond to incidents more quickly and precisely

Status: Test bed completed

JURONG LAKE DISTRICT - SMART CITY

What: A government vision for the area to use smart technologies such as driverless cars to improve livability for residents

Who: Singapore Government, various partners

Uses: For now, driverless cars will ply the Chinese and Japanese Gardens later this year. Expected to be used at Jurong East MRT next year

Status: Ongoing

3D MAPPING

What: Mapping the country in 3D from the air by using light planes equipped with lasers and cameras

Who: Singapore Land Authority

Uses: SLA could use the map to model flood patterns, while the Civil Aviation Authority of Singapore could plan more efficient landing paths for planes

Status: Expected to be completed by 2016

DISEASE AND HYGIENE

What: Computer models that use sensors and mobile apps to help detect and forestall dengue and food poisoning outbreaks

Who: National Environment Agency (NEA), IBM

Uses: For example, if people complain on Facebook or Twitter of being sick after eating at a particular restaurant, the system would alert NEA officers

Status: Research collaboration

IMPROVING PUBLIC TRANSPORT

What: Analysing CCTV video feeds and anonymised location-based data from mobile subscribers to learn commuters' travel patterns

Who: Land Transport Authority, SMI, StarHub, IBM

Uses: Help agencies respond better to unexplained incidents on the train and bus networks, such as breakdowns or emergencies

Status: Research collaboration

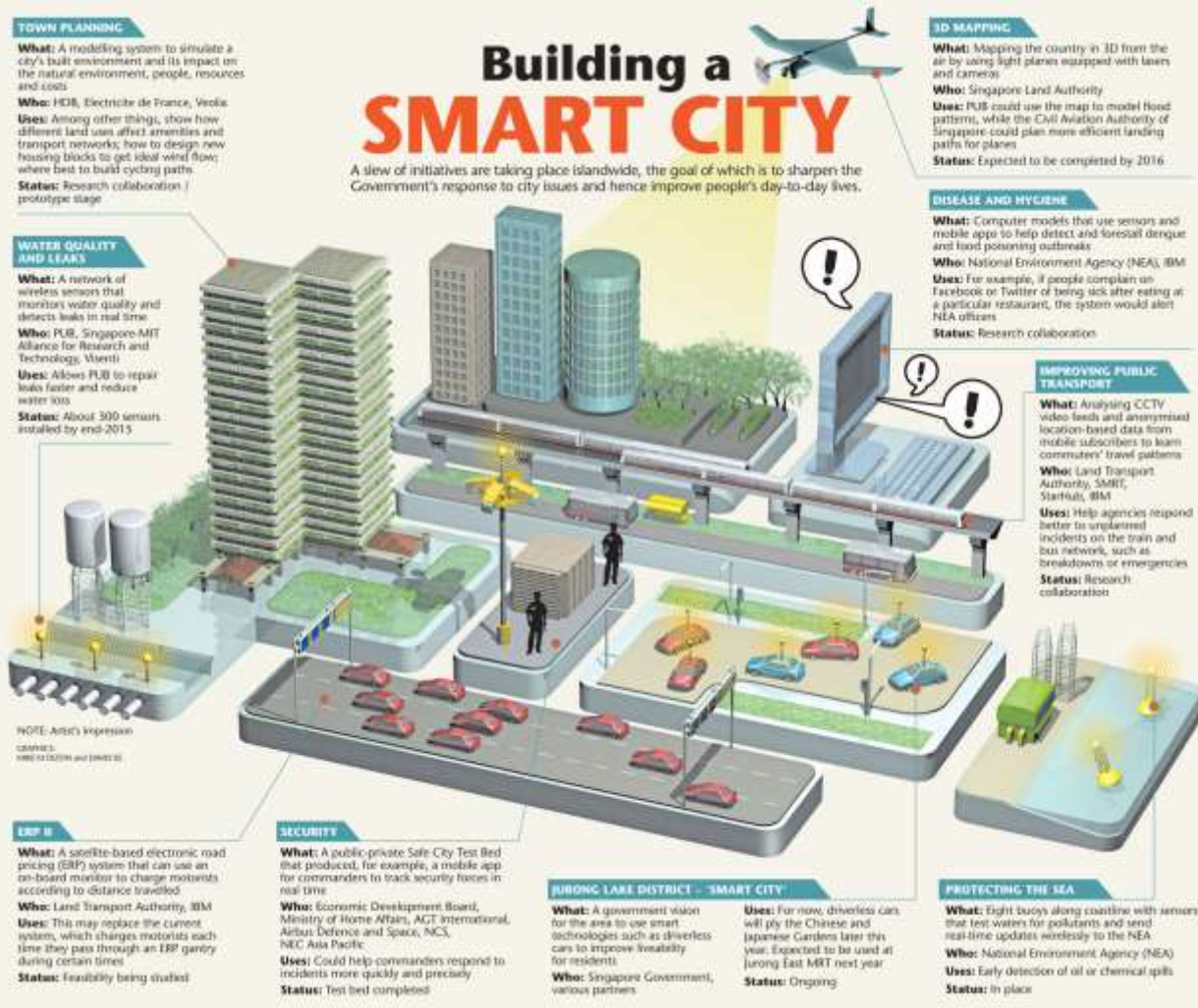
PROTECTING THE SEA

What: Eight buoys along coastline with sensors that test waters for pollutants and send real-time updates wirelessly to the NEA

Who: National Environment Agency (NEA)

Uses: Early detection of oil or chemical spills

Status: In place



Virtual Singapore



Funder & Coordinator



Technical Manager



System Owner



R&D Partner



THE STRAITS TIMES

Singapore to map out its Smart Nation dream in 3D

Digital model of country to help planners, businesses and citizens

By ANN TAYLOR

SINGAPORE'S digital city planning and infrastructure development is set to take a major leap forward with the launch of a 3D digital model of the island, the Virtual Singapore Platform.

The platform, which will be launched in 2018, will allow planners, businesses and citizens to interact with a digital model of the island, providing a more comprehensive view of the city's infrastructure and planning.

The platform will be developed by the Singapore Land Authority (SLA) and GovTech, with support from the National Research Foundation (NRF).

The platform will be a key component of Singapore's Smart Nation initiative, which aims to transform the city into a smart, sustainable and inclusive society.

Virtual Singapore Platform will be **launched in 2018**

Virtual Singapore



Virtual Singapore



Chicago



New York



City of London

ASIA PACIFIC
futureGOV

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ARTICLE | TRENDS | NEWS | BUSINESS | ANALYSIS | POLICY/STY | TRADE | OPEN/AVI | E-CON | COMMERCE/GOV | TRANSPARENCY | REPORTING | GOALS | BUDGET | WORLD

10/20/14

Singapore to build Asia's first 3D Semantic Map of a country

Government allocates \$250 million to develop hyper-realistic visualization of the entire country, an initiative which promises to revolutionize smart city solutions.

By Charlotte Clark

33 SHARES

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COMMENT SECTION

What do you think?
Isn't it time to join up central and local government agencies? [View Comment](#)

How often should you overhaul your government portfolio?
If at all you don't overhaul. [View Comment](#)

The downside of open data
Hidden and be damned, or perfect everything first? [View Comment](#)

Should government be transparent?
It isn't as clear cut as it sounds. [View Comment](#)

10/20/14

ATTACHED FILE



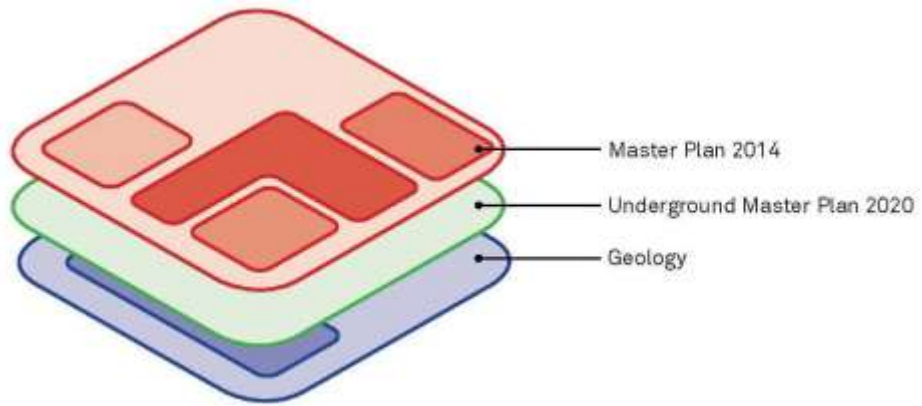
Virtual Singapore



Underground Master Plan 2020

Subterranean Land Use Informed by:

- Master Plan 2014
- Geological Conditions
- Policy



Virtual Singapore

**NATIONAL
RESEARCH
FOUNDATION**
PRIME MINISTER'S OFFICE
SINGAPORE

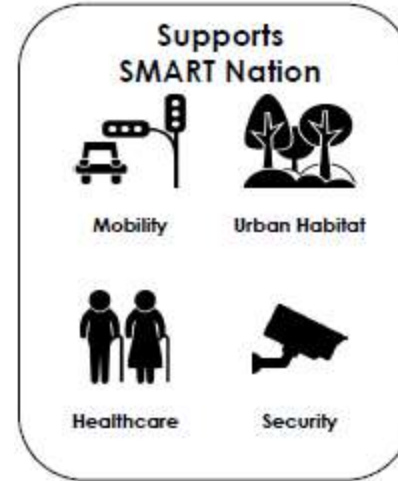


PRESS RELEASE

Monday, 1 December 2014

Virtual Singapore - a 3D city model platform for knowledge sharing and community collaboration

1. The National Research Foundation (NRF), Prime Minister's Office, Singapore, today unveiled Virtual Singapore¹, a dynamic three-dimensional (3D) city model and collaborative data platform, including the 3D maps of Singapore.
2. When completed, Virtual Singapore will be the authoritative 3D digital platform intended for use by the public, private, people and research sectors. It will enable users from different sectors to develop sophisticated tools and applications for test-bedding concepts and services, planning and decision-making, and research on technologies to solve emerging and complex challenges for Singapore.



Virtual Singapore

June 2015 – June 2017

Virtualize and Visualize the city

June 2016 – June 2018

Experience the City

January 2018 – June 2019

Manage and Operate the City



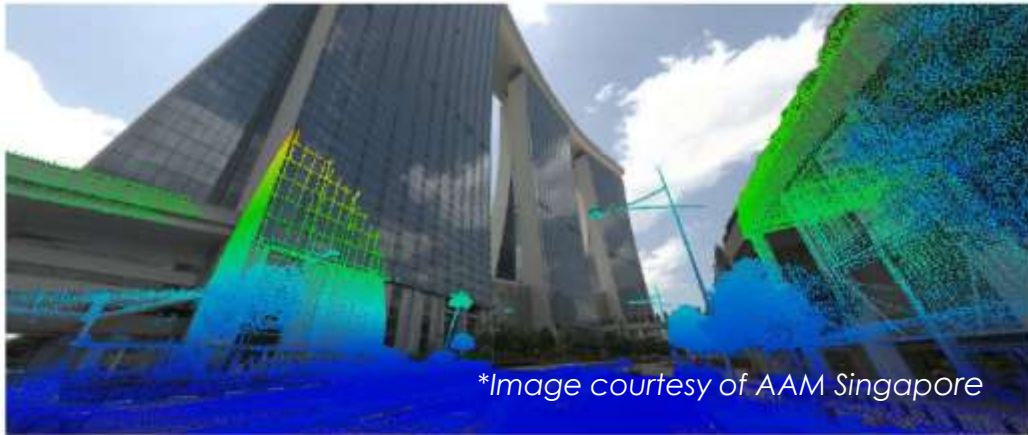
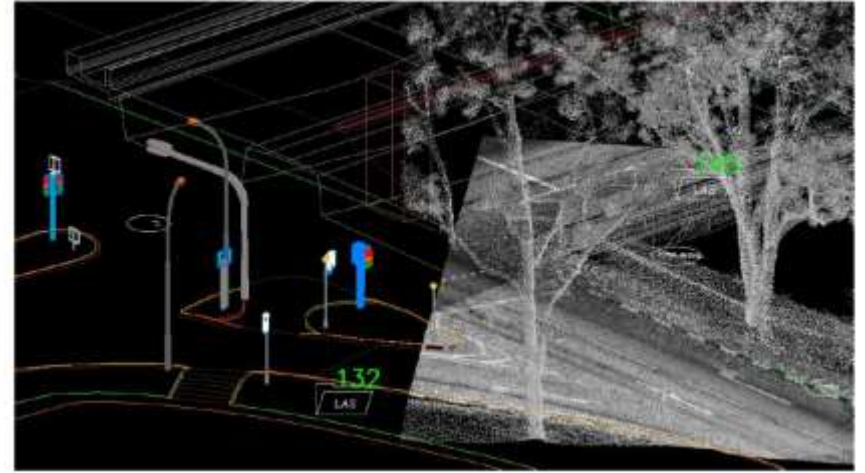
3DEXPERIENCE 3DEXPERIENCE City 2017x

2018x

2019x



Data Capture

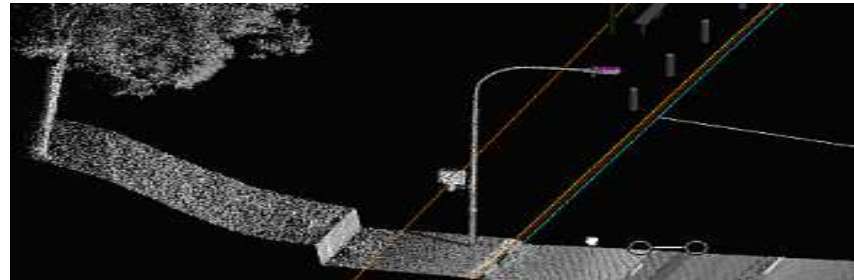
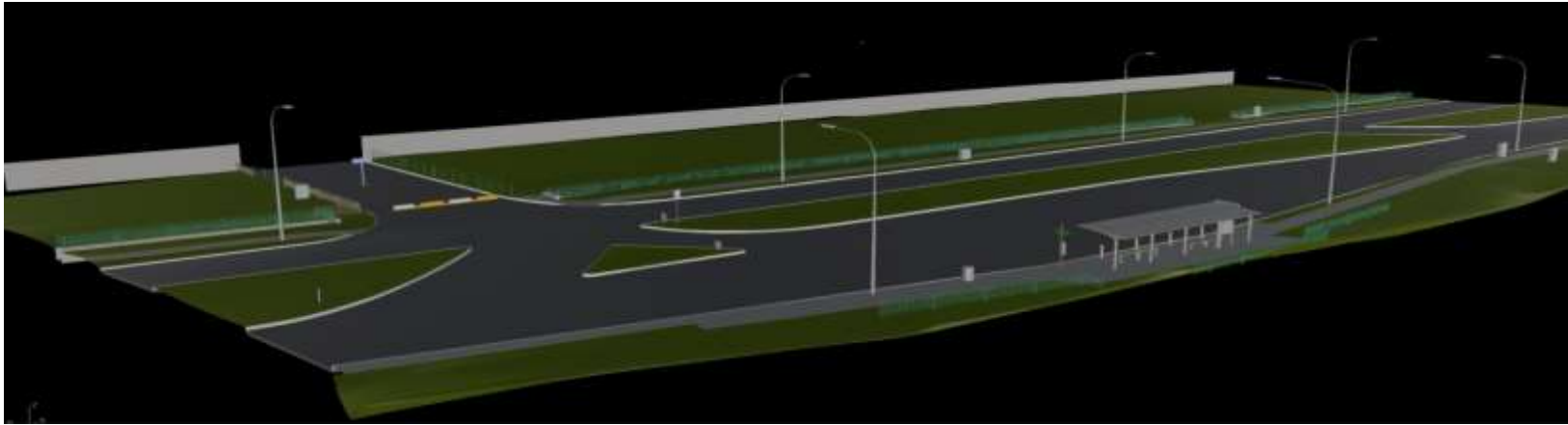


**Image courtesy of AAM Singapore*



3D Models

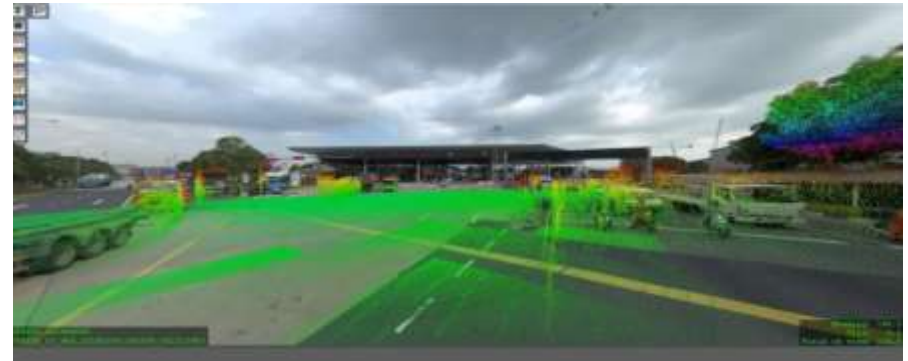
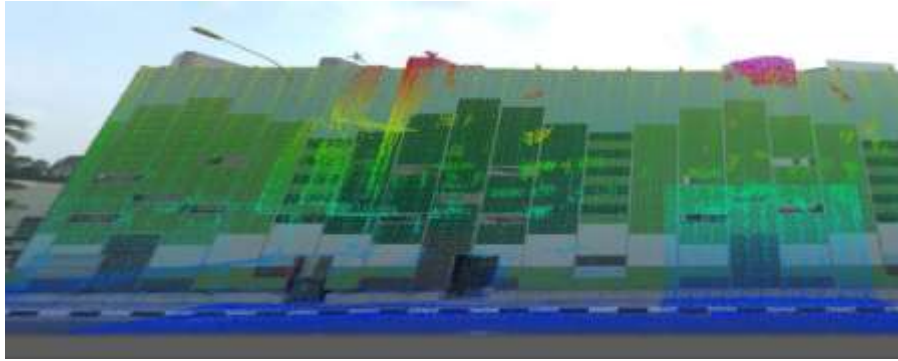
Data Capture



**Image courtesy of AAM Singapore*

Data Capture

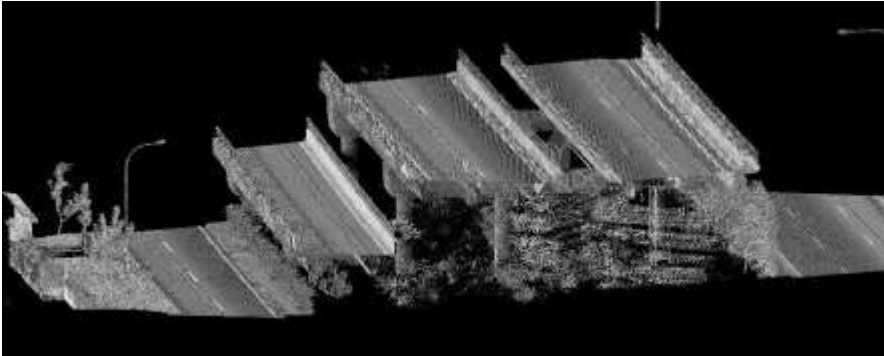
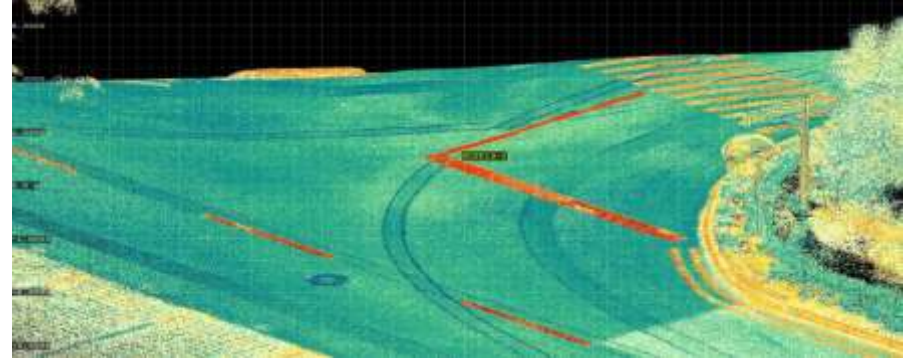
487,478 panorama images generated



**Image courtesy of AAM Singapore*

Data Capture

579,549 million LiDAR Points



**Image courtesy of AAM Singapore*

Data Capture

- Over 50,000km actually driven
 - 3 drivers and 2 surveyors, 12 hours day / 7 days week
 - (with 2 cars. . .)
- 14+ TB of processed data delivered
 - 45+ TB of raw data collected



**Image courtesy of AAM Singapore*

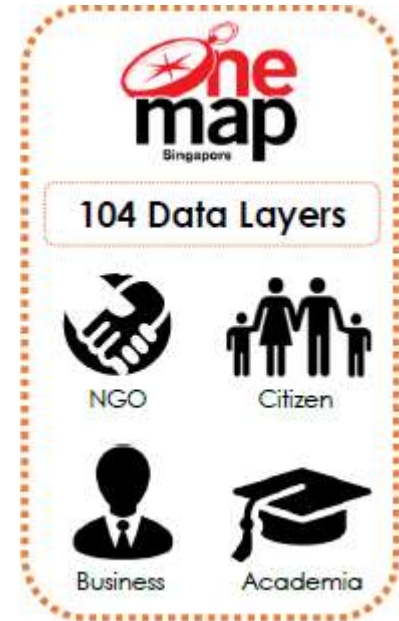
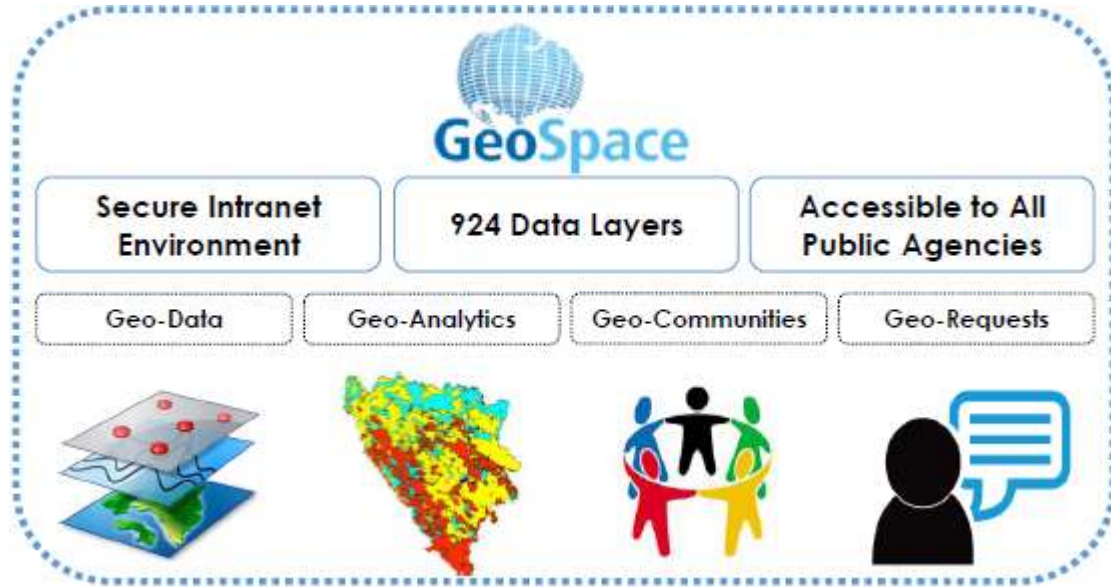
Data Capture

3D Model Enhancement (End Product)



**Image courtesy of AAM Singapore*

GeoSpace & OneMap



SG-GeoSpace

No.	UGI Theme	Contributing Agency
1	Water & Sewerage Utility Networks	PUB
2	Power & Gas Utility Networks	EMA
3	Telco Networks	IMDA
4	Transport & Mobility Infrastructure	LTA
5	Subterranean Buildings, Structures and Ownership	SCDF
		SLA
6	Underground Land Use Plans	URA
7	Borehole, Soil & Geology	BCA
		DSTA
		JTC

GeoSpace is composed of 128 Layers in 7 Themes

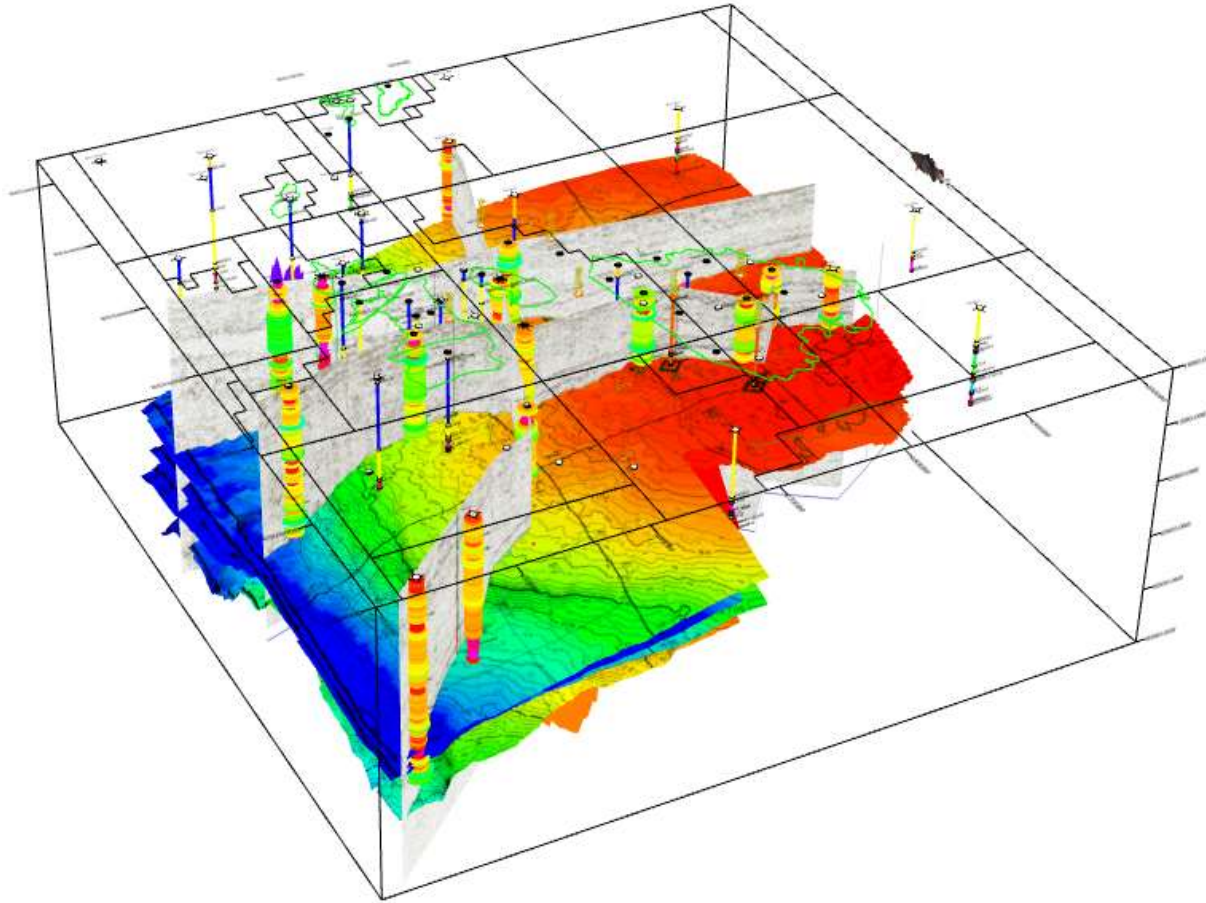
SG-GeoSpace

The screenshot displays the SG-GeoSpace web application interface. At the top, there is a navigation bar with the following elements: "Welcome Sir Tan", "Map Home", "About SG-Space", "Communities", "GeoApps", "Data Layers", and "Logout". Below this is a search bar containing "SLA" and a "Data Request" button. The main map area shows a detailed view of Singapore, with various data layers overlaid. A "Table of Content" window is open on the left side, listing the following layers:

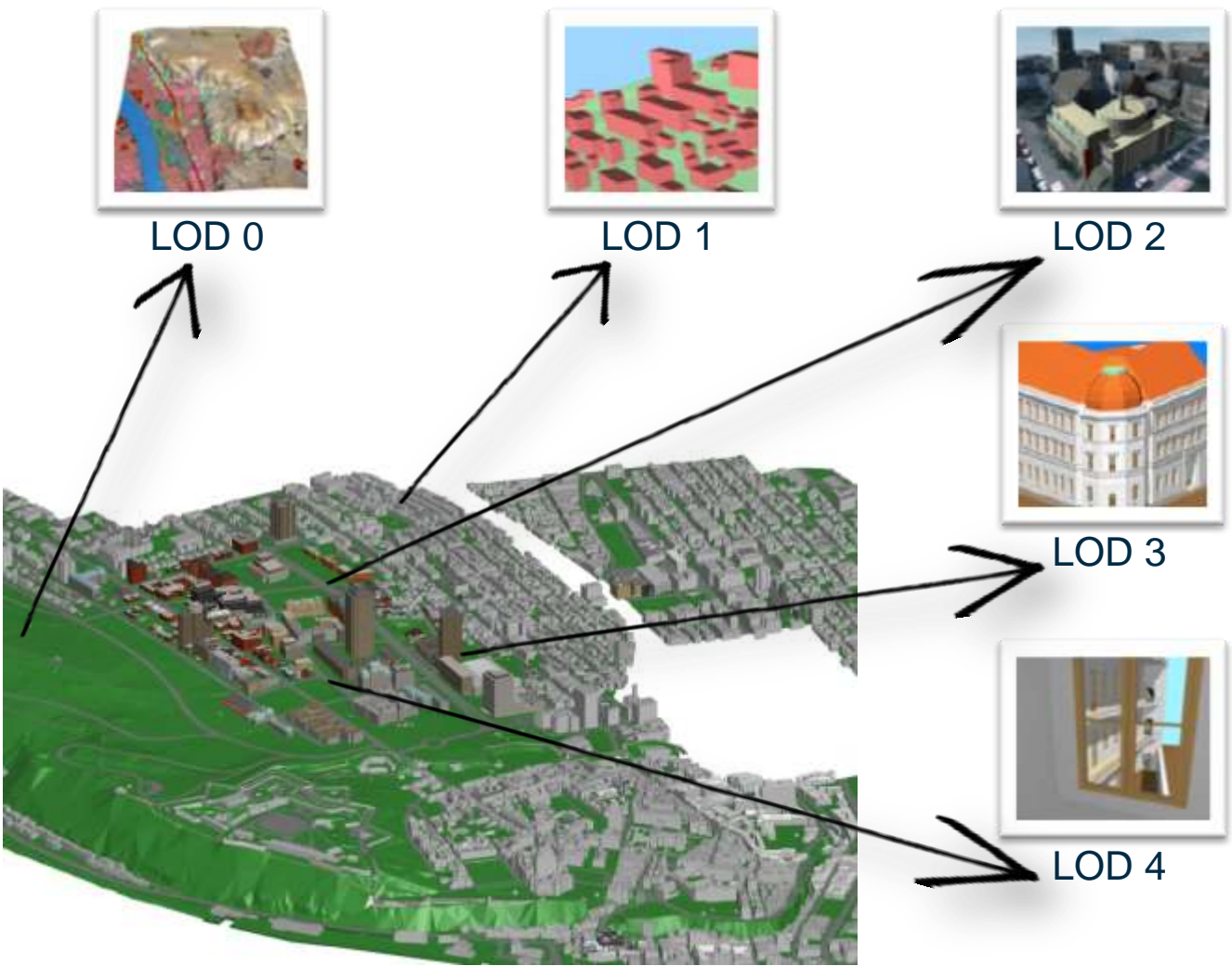
Layer Name	Actions
SLA Vacant State land and properties (1687) Scale: All	<input checked="" type="checkbox"/>
HDB Existing Building (12222) Scale: 25000	<input checked="" type="checkbox"/>
Singapore Police Force Establishments (127) Scale: All	<input checked="" type="checkbox"/>
Aggregated Data Zones June 2016 (11396) Scale: All	<input checked="" type="checkbox"/>

The map also features a compass rose in the bottom left corner and a scale bar. The interface is designed for users to explore and interact with various geographic data layers related to Singapore's land and infrastructure.

3D Geology



cityGML



Use Cases

The screenshot displays a 3D urban simulation interface. At the top left, the logo for '3DEXPERIENCE Globe | Singapore' is visible. The top right corner shows the user name 'Benjamin Mousseau (Eifer)' and navigation icons. Below the header, there are several control buttons: 'Ortho', 'Hide perimeter', 'Show POIs', 'Show Access Zones', and 'Show Roads'. A blue banner on the right side of the interface indicates '38 selected Buildings'. The main view shows a 3D model of a city with buildings colored in various shades of blue, purple, and red, representing different energy consumption levels. A 'Color Results' pop-up window is open in the foreground, displaying 'General KPIs - Total Annual Electricity Consumption (kWh/year)'. It includes a timeline slider set to '2010' and a horizontal bar chart showing a range from 19.9K to 907.6K, with a current value of 463762.8. The bottom of the interface shows the model name 'Model: RGG6.2 Phase I (With ANN)', the simulation type 'Simulation: Sustainable', and a '3D Bookmark: front' dropdown menu.

3DEXPERIENCE Globe | Singapore Benjamin Mousseau (Eifer)

Ortho Hide perimeter Show POIs Show Access Zones Show Roads

38 selected Buildings

Color Results X

General KPIs - Total Annual Electricity Consumption (kWh/year)

Timeline: 2010

19.9K 907.6K

463762.8

Model: RGG6.2 Phase I (With ANN) Simulation: Sustainable

hide compass 3D Bookmark: front

Use Cases

VIRTUAL YUHUA

Home | Location | Tools | Greenprint | Walkability | Dynamic Content | Research

Virtual Singapore | DSS CONSULT SYSTEMS

- Energy Consumption
 - Solar Photo Voltaic (PV) System
 - Query Solar PV Data
 - Remove External Geographies & Geobases
 - Solar PV Potential Placement
 - Remove the Previous Energy Status
- Greenfield Overlay
- Roofing Overlay
- Waste Management
- Passive Waste Collection System (PWCS)
- Green Compliance
- Dark Energy Scan System

Solar Energy Generation & Consumption of Common Area

Generate (Cyan) | Consumption (Orange)

Month	Generate (kWh)	Consumption (kWh)
1/1	10000	15000
1/2	12000	18000
1/3	15000	22000
1/4	18000	25000
1/5	22000	30000
1/6	25000	35000
1/7	28000	40000
1/8	32000	45000
1/9	35000	50000
1/10	38000	55000
1/11	42000	60000
1/12	45000	65000
1/13	48000	70000
1/14	52000	75000
1/15	55000	80000
1/16	58000	85000
1/17	62000	90000
1/18	65000	95000
1/19	68000	100000
1/20	72000	105000
1/21	75000	110000
1/22	78000	115000
1/23	82000	120000
1/24	85000	125000
1/25	88000	130000
1/26	92000	135000
1/27	95000	140000
1/28	98000	145000
1/29	102000	150000
1/30	105000	155000
1/31	108000	160000

Exported Energy to Power Grid

Export (Green)

Month	Export (kWh)
1/1	10000
1/2	15000
1/3	20000
1/4	25000
1/5	30000
1/6	35000
1/7	40000
1/8	45000
1/9	50000
1/10	55000
1/11	60000
1/12	65000
1/13	70000
1/14	75000
1/15	80000
1/16	85000
1/17	90000
1/18	95000
1/19	100000
1/20	105000
1/21	110000
1/22	115000
1/23	120000
1/24	125000
1/25	130000
1/26	135000
1/27	140000
1/28	145000
1/29	150000
1/30	155000
1/31	160000

Overall

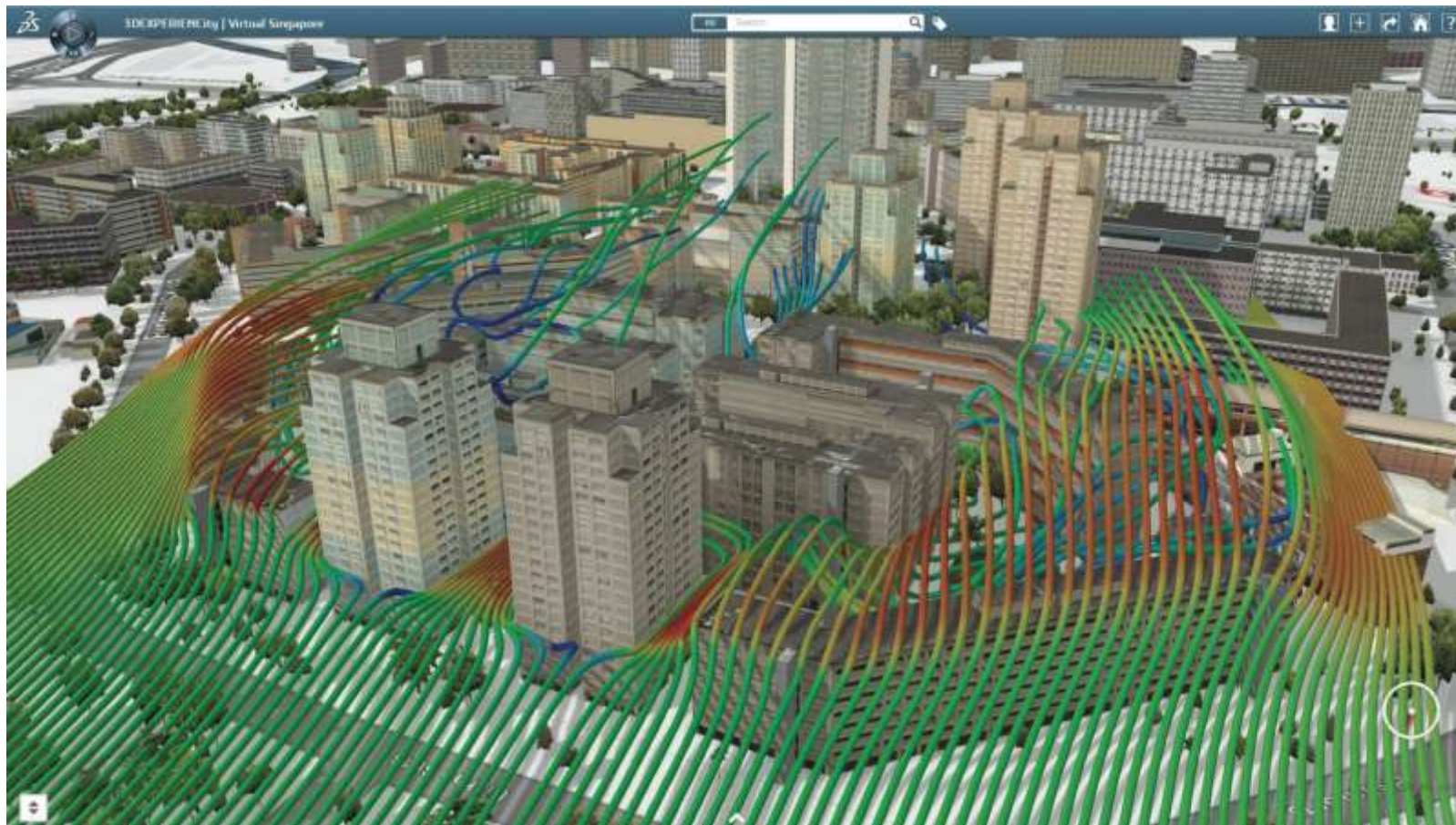
Total Generation (Cyan) | Total Consumption (Cyan) | Total Export (Green)

Metric	Value (kWh)
Total Generation	108000
Total Consumption	160000
Total Export	52000

Scale: 1:34000, No. 103.79223

Back

Use Cases



Questions?

Virtual Singapore

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