



21st INTERNATIONAL SURVEYORS' CONGRESS

Towards Smart Cities Enablement in Malaysia

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Department of Survey and Mapping Malaysia



20th June 2019
Plenary Session 2: Towards A Smarter Society

OVERVIEW

INTRODUCTION

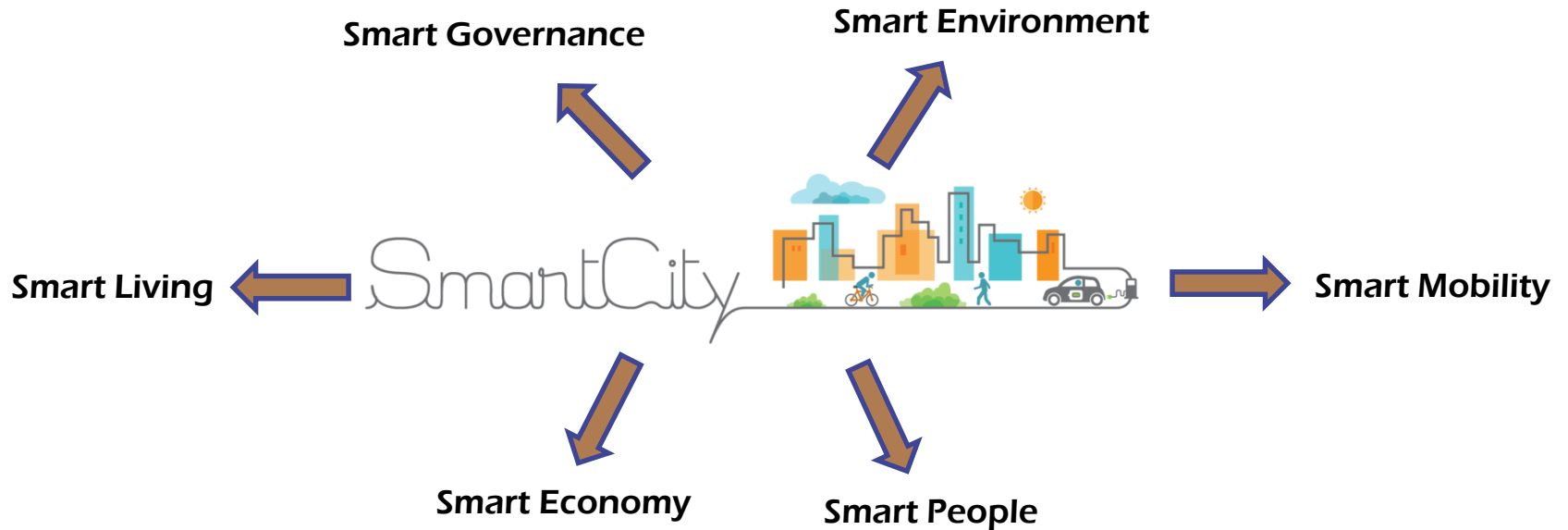
SmartKADASTER
WHAT IS IT?

ROAD TO CADASTRE 4.0

IN THE PIPELINE

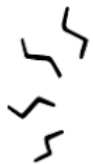
CONCLUSION

INTRODUCTION

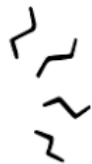


Smart cities not only be able to **converge economic, social and environmental goals** but at the same time must **maintain the sustainability**

INTRODUCTION



**What
Is It?**



**SMART
governance**

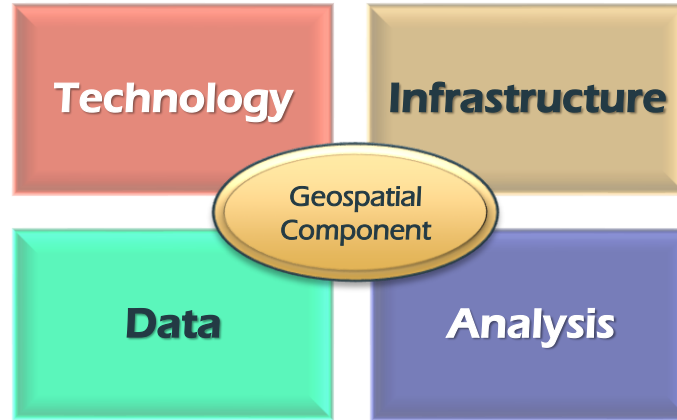
Using **technology** to **facilitate** and **support better planning and decision making**.

It is about **improving democratic processes**.

Transforming the ways that **public services are delivered**. It includes **e-government**, the efficiency agenda and mobile working.



SmartKADASTER



- SmartKADASTER adopts FIG's vision of Cadastre 2.0 drawn from the Web 2.0.
 - ✓ **Open map culture using mobile technologies through collaboration and citizen engagement (Manohar and Sharma, 2016).**
- The main purpose of the project is to establish a multi-purpose cadastral based spatial analysis platform. The spatial analysis can be performed in 2D or 3D interface; according to user's preference.
- Established based on **6 fundamentals** that has the similarity with the attribute of Cadastre 2.0 concept and enhanced by JUPEM to accommodate local requirements.

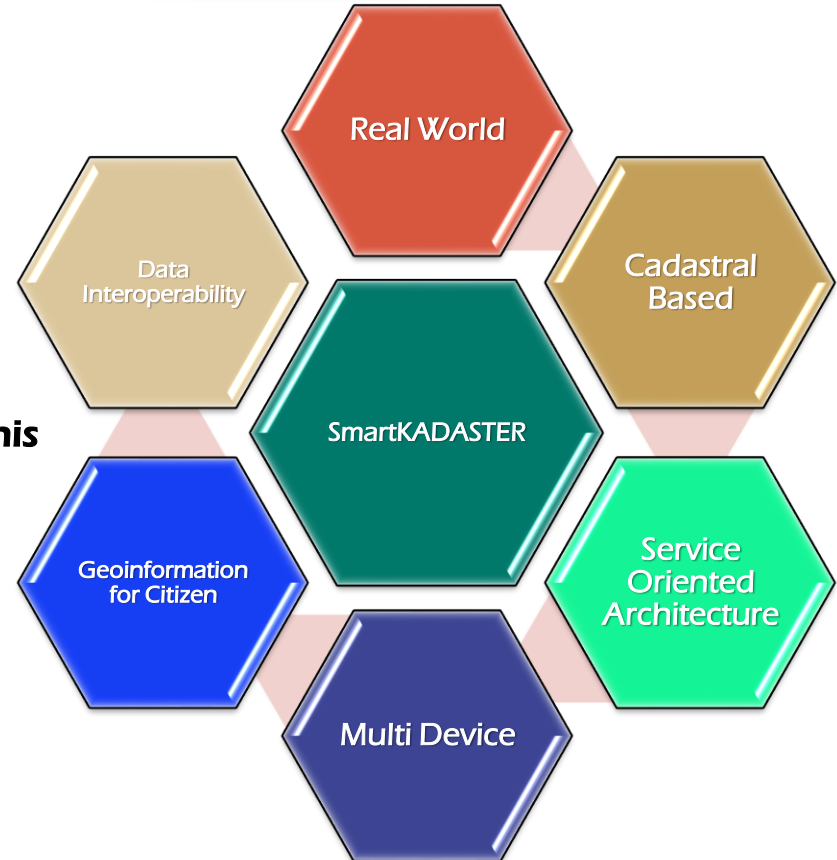
SmartKADASTER

CADASTRE 2.0

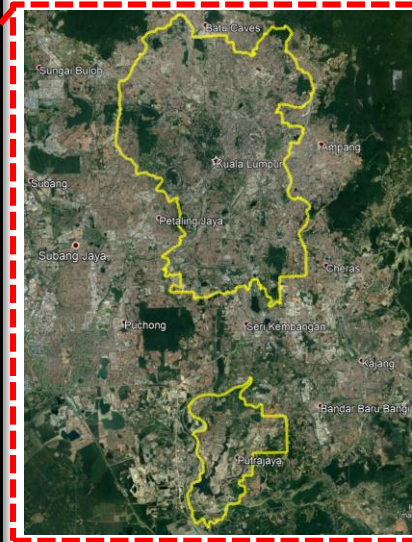
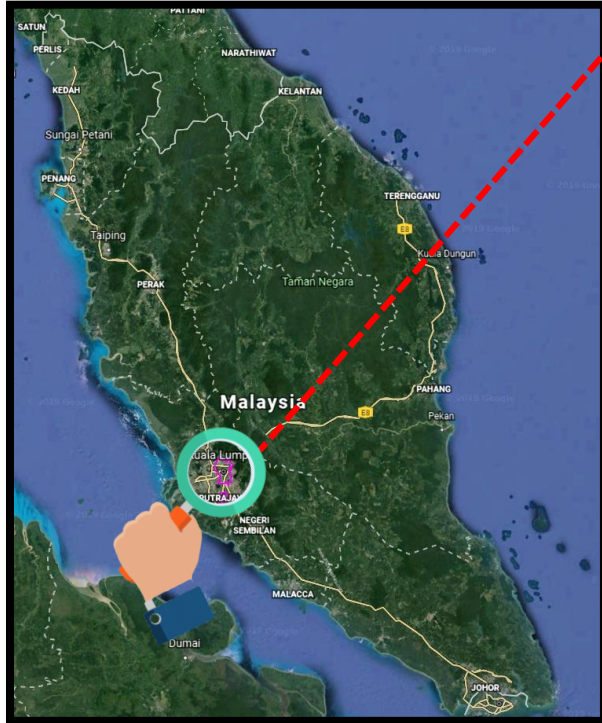
From this....

- Participatory Information Sharing
- Interoperability
- Collaboration Better Modelling
- Continuum Of Rights
- Citizen Of Engagement

.....to this



SmartKADASTER



COVERAGE

FT of Kuala Lumpur and Putrajaya – 300 square kilometre

TECHNOLOGY INVOLVED

LiDAR, MVO, MLS, 3D TLS & 360- Degree Panoramic Street View

MAIN OUTPUT

SmartKADASTER Interactive Portal (SKiP)

DATA

LiDAR & Orthophoto

DTM & DSM

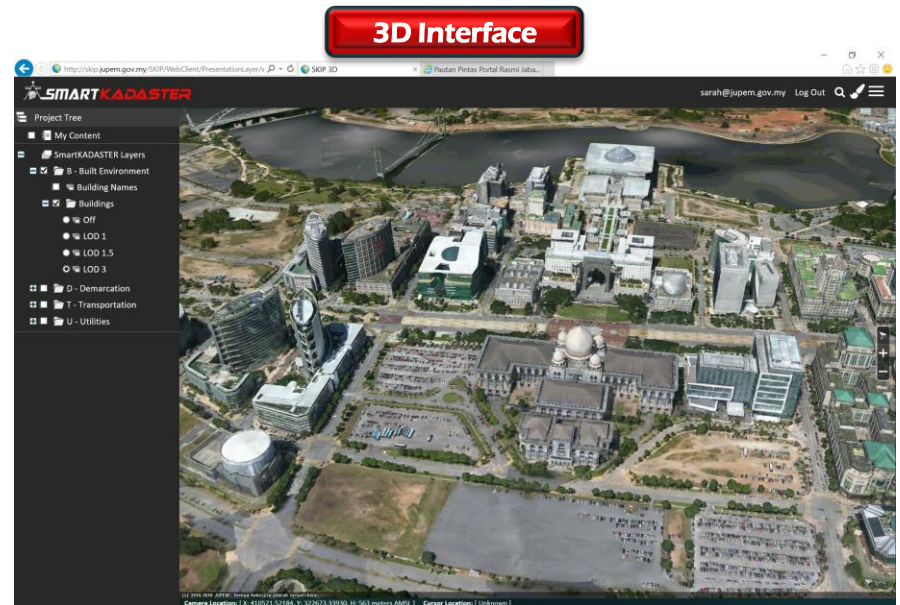
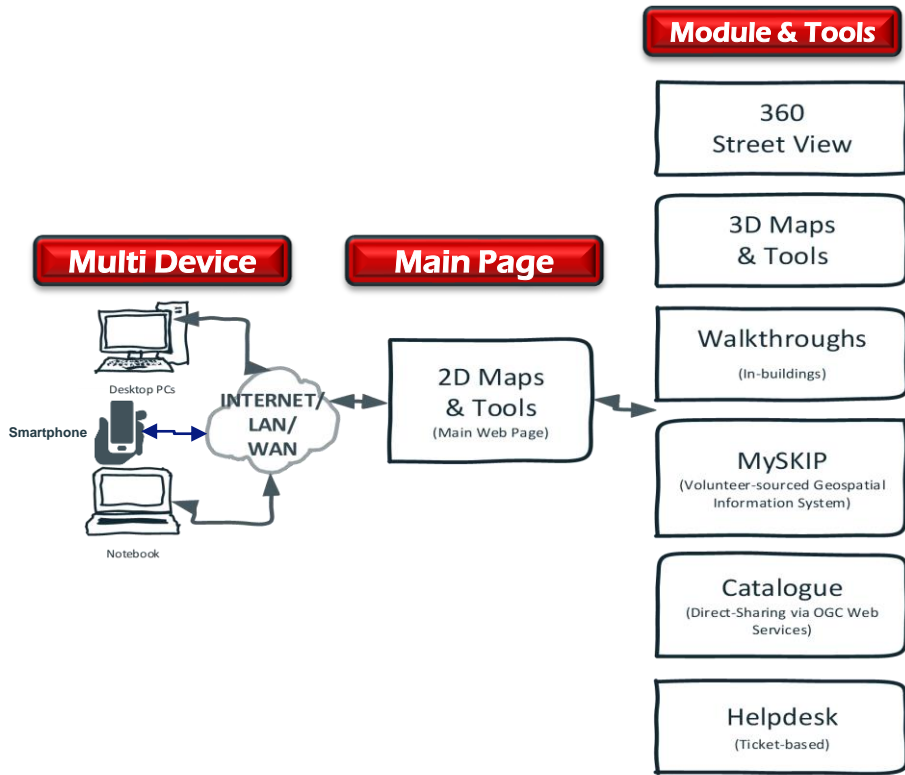
Contour

Oblique Images

360 Images

2D & 3D Information

SmartKADASTER Interactive Portal (SKiP)



SmartKADASTER Interactive Portal (SKiP)

skip.jupem.gov.my/mapportal



SmartKADASTER Interactive Portal (SKiP)

2D Map Tools – Directions

SMARTKADASTER

Search Categories **Directions** Go To

Wisma JUPEM, Kuala Lumpur, Wilayah Persekutuan
Persiaran KLCC, 50450 Kuala Lumpur, Wilayah P

via Jalan Sultan Yahya Petra 2.5 km

Directions

Information of destination in shortest route.
It is reversible - the direction from point A to B, B to A.
Routing function able to add more destination and not limited to two destination

Four Seasons Place

Wisma JUPEM

Point A

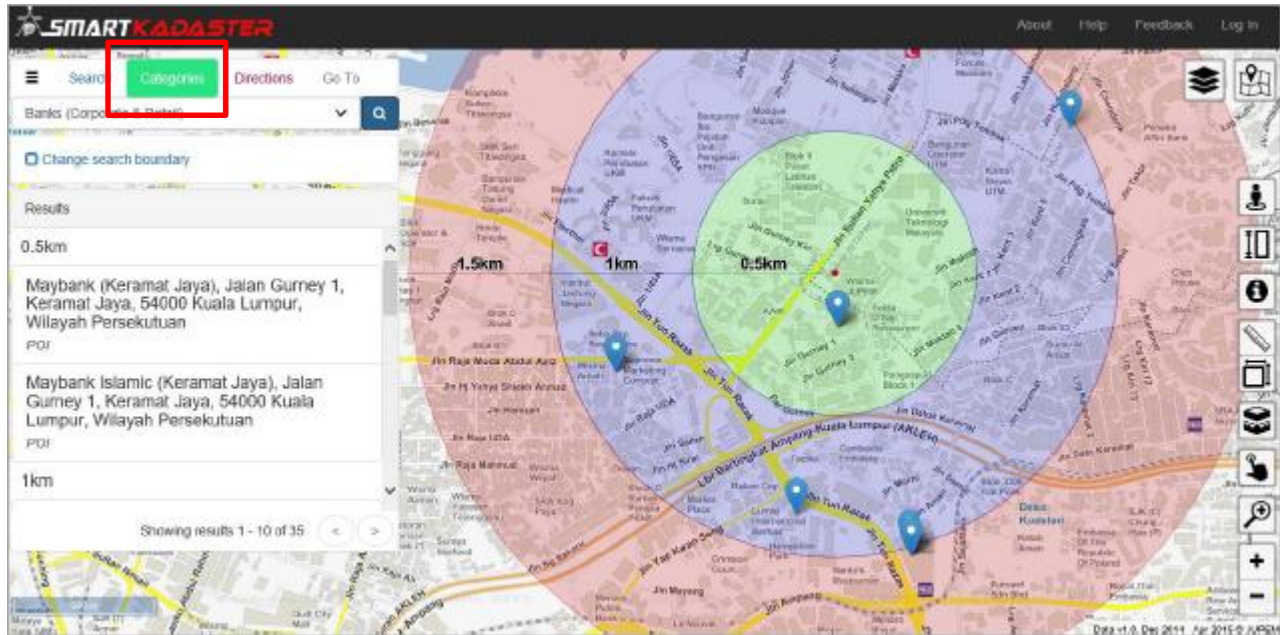
Point B

Data v1 0, Dec 2014 - Apr 2015 © JUPEM

SmartKADASTER Interactive Portal (SKiP)

2D Map Tools – Search by Categories

Search using the categories that has been provided. Provide information of selected categories within certain radius from user's location

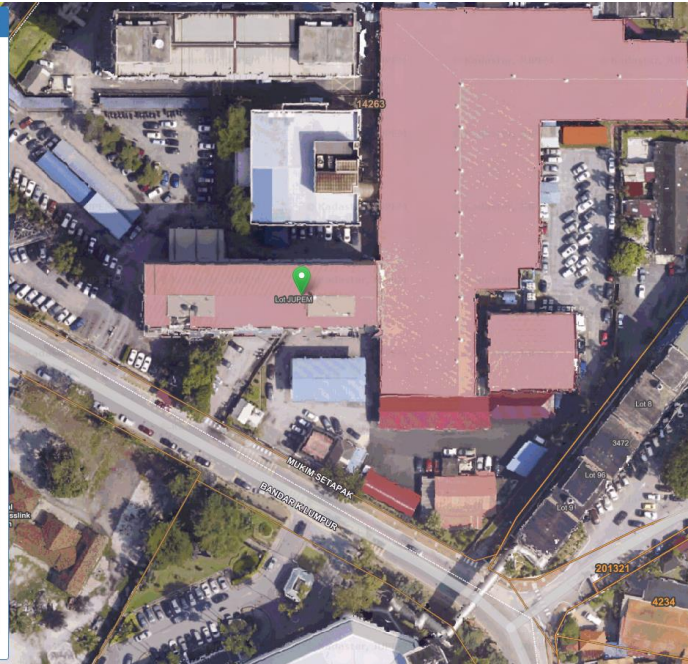


SmartKADASTER Interactive Portal (SKiP)

2D Map Tools – Info Tools



Info	
POI	
Name	Pos Malaysia Keramat Jaya, 54000 Kuala Lumpur, Wilayah Persekutuan
POI	
Name	Jabatan Ukur Dan Pemetaan Malaysia (JUPEM) Keramat Jaya, 54000 Kuala Lumpur, Wilayah Persekutuan
Building	
Name	Wisma JUPEM
NCCDBLOT	
Negeri	14
Daerah	00
Mukim	07
Seksyen	000
Lot	14263
UPI	14000700014263
PA	PA1109744
No. Fail Ukur	PUWPS7_2015
Keluasan (m ²)	Refer to JUPEM
Tarikh Kemaskini	2015-10-16
Mukim	
Name	Mukim Setapak



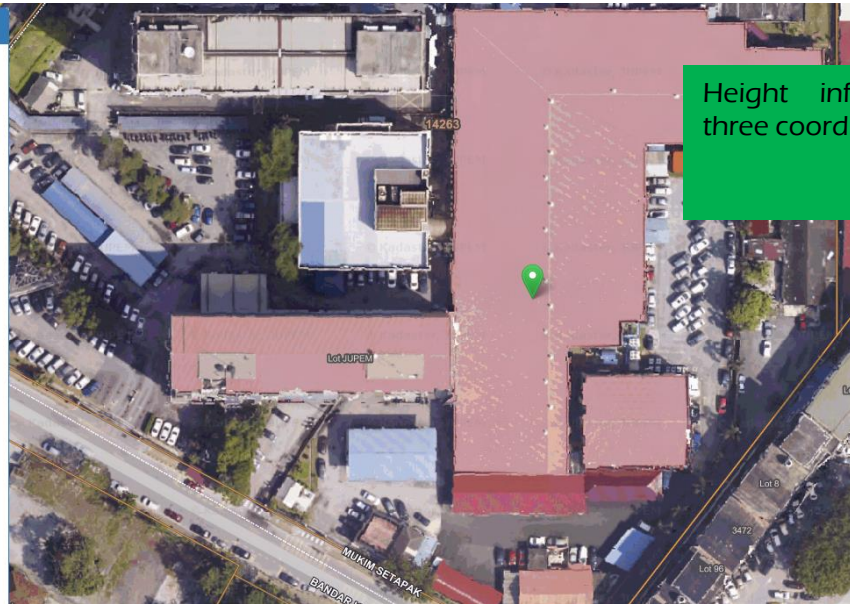
Provide information of Point of Interest and Cadastral Information of selected item.

SmartKADASTER Interactive Portal (SKiP)

2D Map Tools – Height



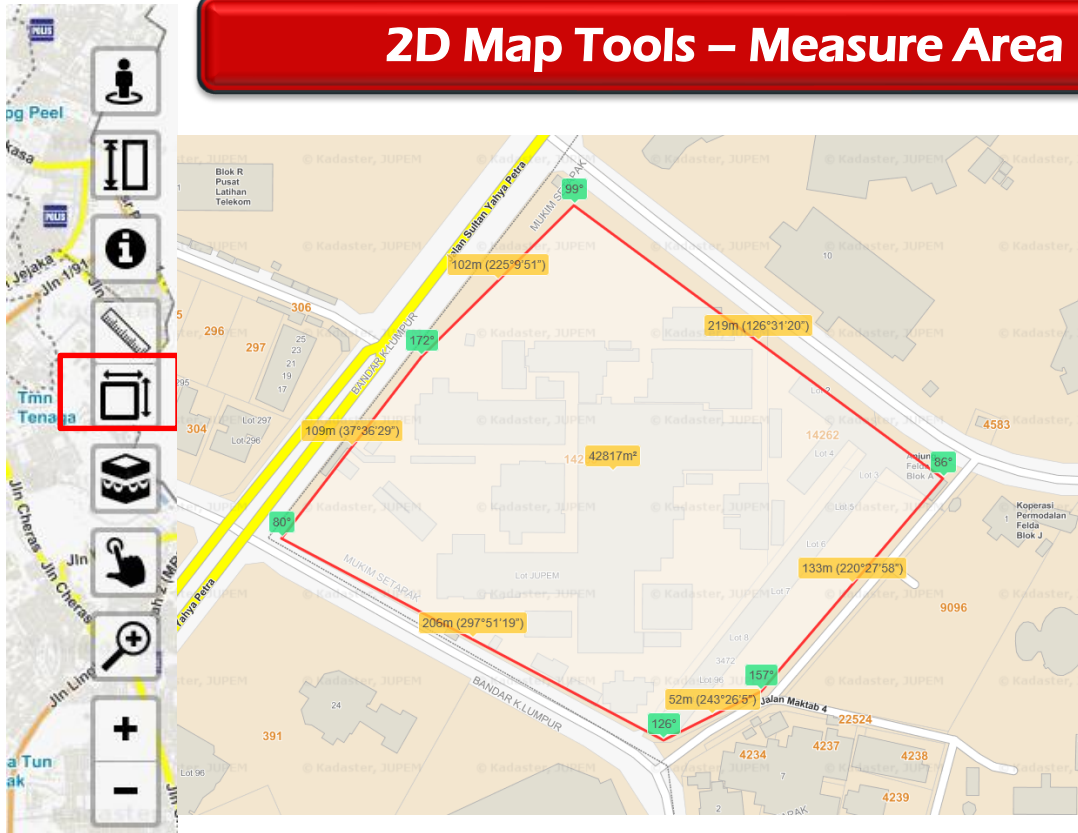
Height	
Coordinates	
WGS 84 (EPSG:4326)	
Latitude	3.166667 3° 10'
Longitude	101.716667 101° 43'
GDM2000 Peninsular RSO (EPSG:3375)	
Northing (m)	350853
Easting (m)	413575
GDM2000 Cassini KL / Selangor	
Northing (m)	-56361
Easting (m)	23512
Height	
DTM Height (m)	38
DSM Height (m)	45



Height information and three coordinate systems

SmartKADASTER Interactive Portal (SKiP)

2D Map Tools – Measure Area



Measure area from point to point.
Provide information such as distance, angle, bearing and the area in meter square.


SmartKADASTER Interactive Portal (SKiP)

3D Analysis Tools – Contour Map



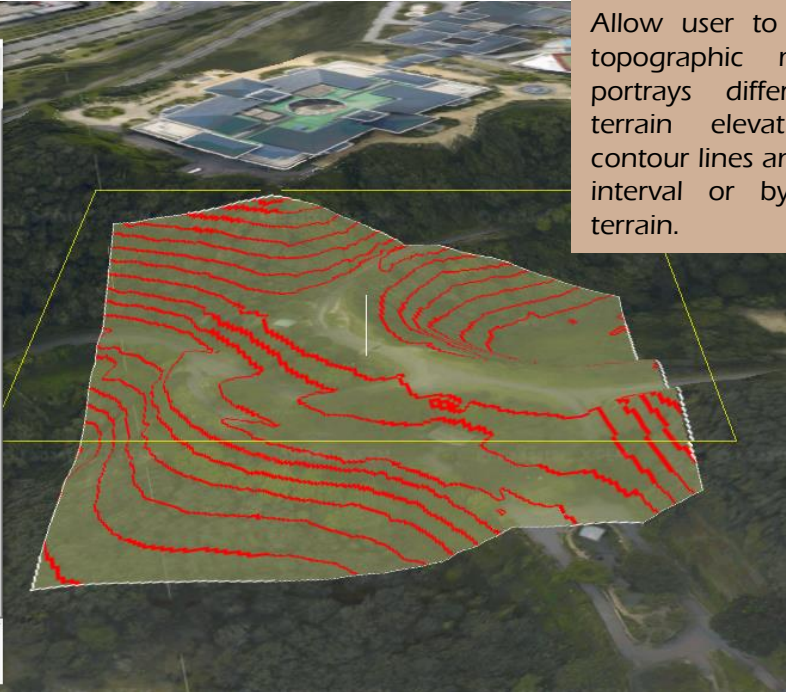
A sidebar menu on the left side of the interface. The menu items are: MEASURE, ANALYZE, Info Tools, Contour Map (highlighted with a red border), Slope Map, Best Path, Terrain Profile, Flood, Slope Query, Line Of Sight, Viewshed, Dynamic Viewshed 3D, and Threat Dome.

Contour Map Properties

Navigation icons: 

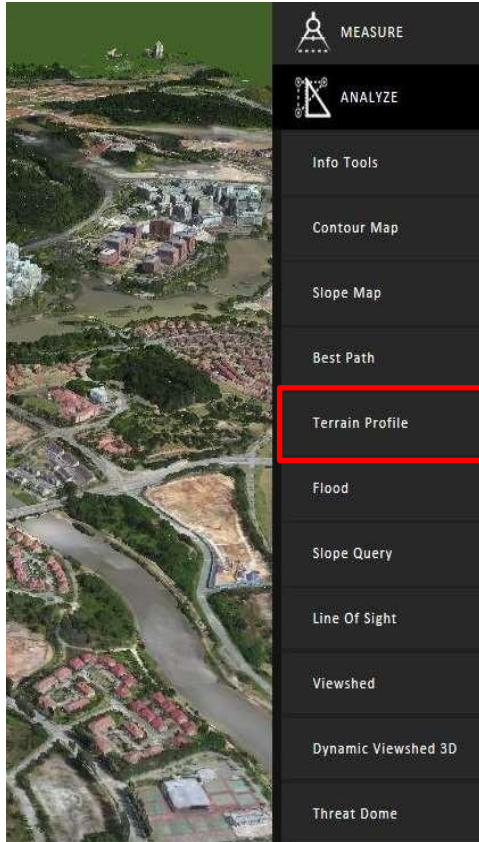
Min/Max values	
Use Min/Max	No
Minimum value	0.0
Maximum value	0.0
Color outside of range	Transparent
Appearance	
Name	New Contour ##49C
Activation Action	Fly To
Line Opacity	100%
Display Style	Contour lines and co
Coverage Area	Rectangle
Contour Palette	Grape
Fill Opacity	50%
Contour Lines Color	0000ff
Contour Lines Interval	3.0
Timespan	
Position	
X	101°41'34.257"
Y	2°55'40.835"
Yaw	191.6141
Geometry	
Length	190.95124
Width	177.82883

Palette selection for contour colors



Allow user to creates a topographic map that portrays differences in terrain elevation with contour lines and contour interval or by coloring terrain.

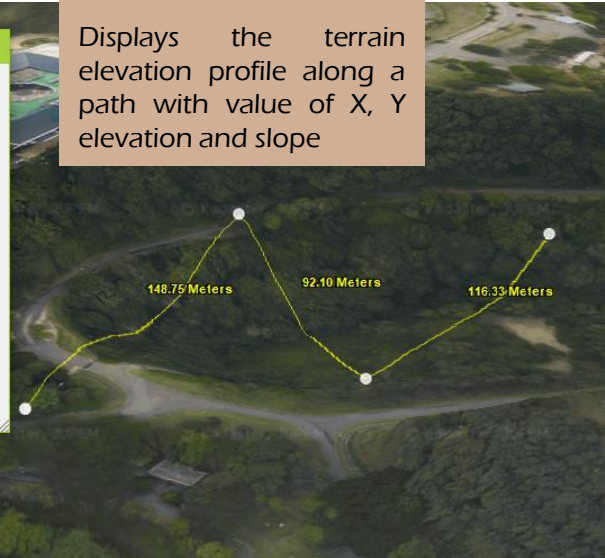
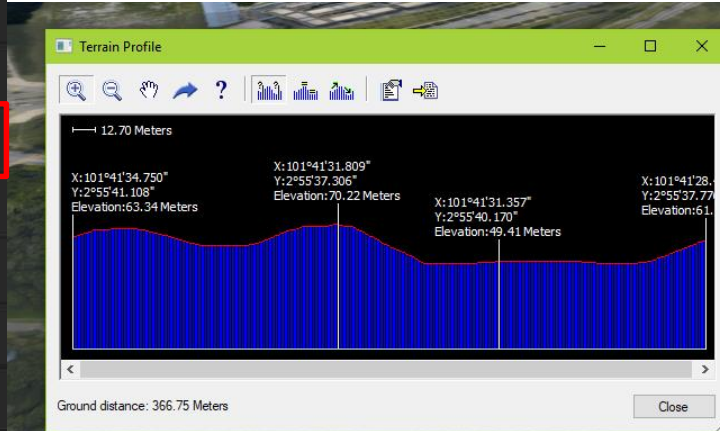
SmartKADASTER Interactive Portal (SKiP)



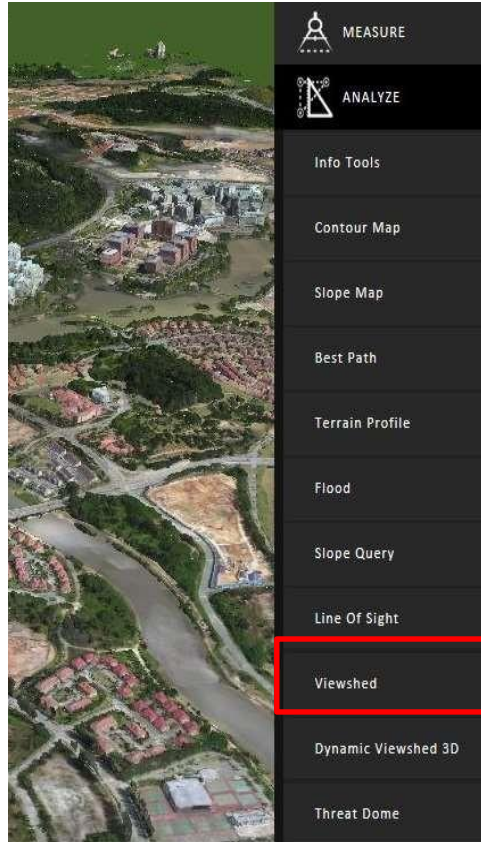
3D Analysis Tools – Terrain Profile

Allow the user to get terrain elevation profile of selected points/area.

Displays the terrain elevation profile along a path with value of X, Y elevation and slope



SmartKADASTER Interactive Portal (SKiP)

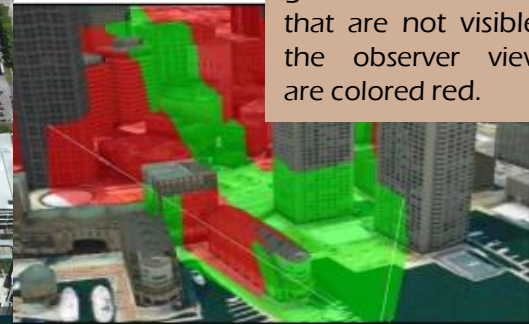


3D Analysis Tools – Viewshed



Allow the user to mark all the visible segments, within a field of view, from a given viewing point.

Target points that are visible from the observer viewpoint are colored green, whereas points that are not visible from the observer viewpoint are colored red.



SmartKADASTER Interactive Portal (SKiP)

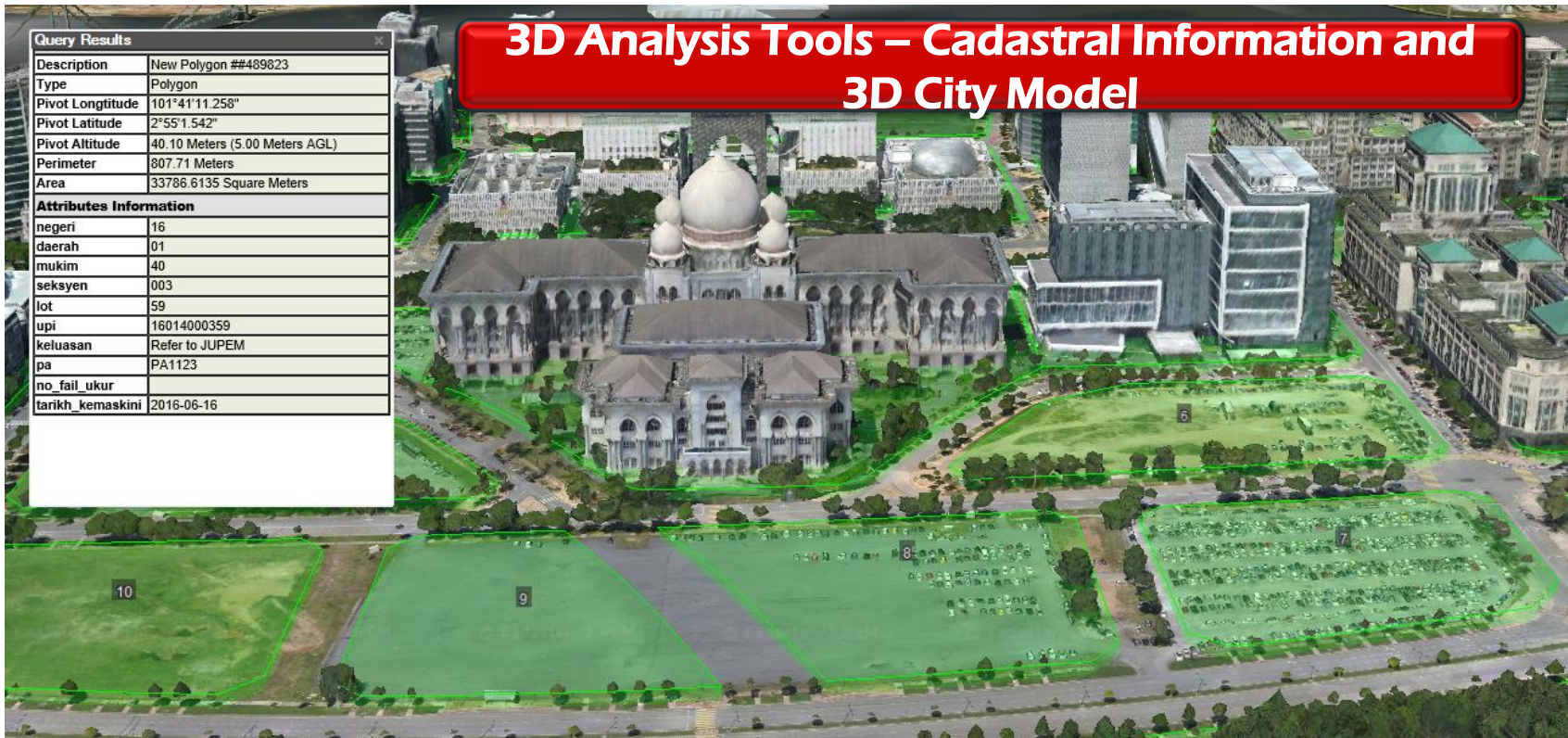
3D Analysis Tools – Cadastral Information and 3D City Model

Query Results

Description	New Polygon ##489823
Type	Polygon
Pivot Longitude	101°41'11.258"
Pivot Latitude	2°55'1.542"
Pivot Altitude	40.10 Meters (5.00 Meters AGL)
Perimeter	807.71 Meters
Area	33786.6135 Square Meters

Attributes Information

negeri	16
daerah	01
mukim	40
seksyen	003
lot	59
upi	16014000359
keluasan	Refer to JUPEM
pa	PA1123
no_fail_ukur	
tarikh_kemaskini	2016-06-16



ROAD TO CADASTRE 4.0

Cadastre For People Made By People
CADASTRE 4.0



Establishes **links** between the **virtual** and **real world** securing **interests** of **landowners, society, governments** and **economy**. It sets the **scene** for permanent communication **between people, procedures** and **products**. The **Internet of Things** is amended by a social aspect.

Leverages on the Web 4.0
Read-Write-Execution-Concurrency Web

IN THE PIPELINE

3D City Model

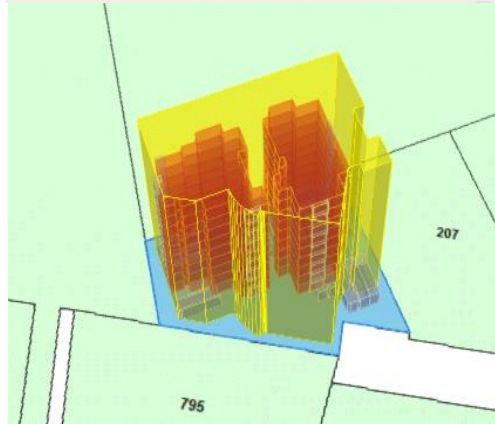
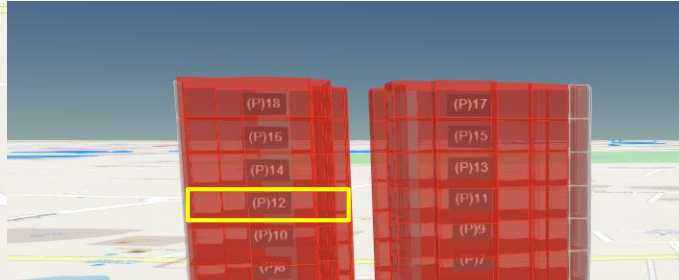
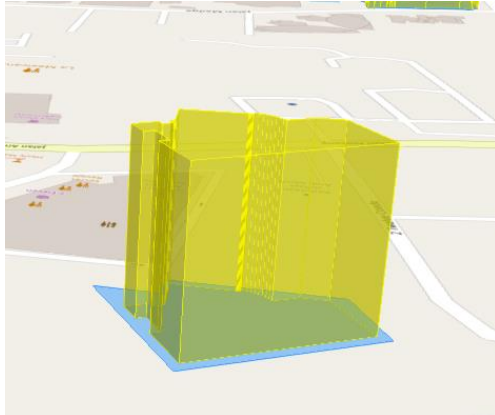


3D Strata



IN THE PIPELINE

3D Strata & Attribute



No. Petak	(P)12
Petak UPI	14004488A206(S)5031(B)M1(M)0(T)7(P)12
No. Fail Ukur	PUBLWPB31_2016
No. PA(B)	PA(B)200032
Bil. Folio PA(B)	3
Keluasan	284
Keluasan JP	284
Unit Luas	M
Tinggi (m)	3.2
Ketinggian dari Aras Tanah (m)	21.3
Kod Kegunaan Petak	REU1
Nama Petak	
Kos Rendah	N
Tarikh Kemaskini	7/09/2017 12:22:03 PTG

Negeri	14 - Wilayah Persekutuan Kuala Lumpur
Daerah	00 - Kuala Lumpur
Mukim	44 - Bandar Kuala Lumpur
Sekyen	88A - <u>Seksyen</u> 88A
No. Lot	206
UPI	14004488A206
No. Skim	(S)5031
No. PA	PA110340
No. Fail Ukur	PUBLWPB31_2016
No. Hakmilik	GRN3951
Keluasan Lot (m ²)	1668
No. Sijil Akuan LIT	C286322
No. Ruj. LIT	050500014
No. Ruj. JTB	G15008W

No. Fail PTG	PTG/WP/20/6/200032/2015
No. Fail Ukur <u>Semula</u>	PUBLWP55_2016
Diukur Oleh	WONG YEE KONG
Bil. Petak Tanah	0
Bil. Petak	18
<u>Bil. Petak Aksesori</u>	64
<u>Bil. Petak Kos Rendah</u>	0
Bil. Petak Aksesori Kos Rendah	0
No. PA(B)	PA(B)200032
Bil. Folio PA(B)	5
No. Jadual Petak	200032
Bil. Folio Jadual Petak	0
No. Buku Kerja Luar	60032
Bil. Folio Buku Kerja Luar	1

IN THE PIPELINE

3D Underground Utilities



IN THE PIPELINE

Augmented Reality For Underground Utility Mapping System (ARUUMS)

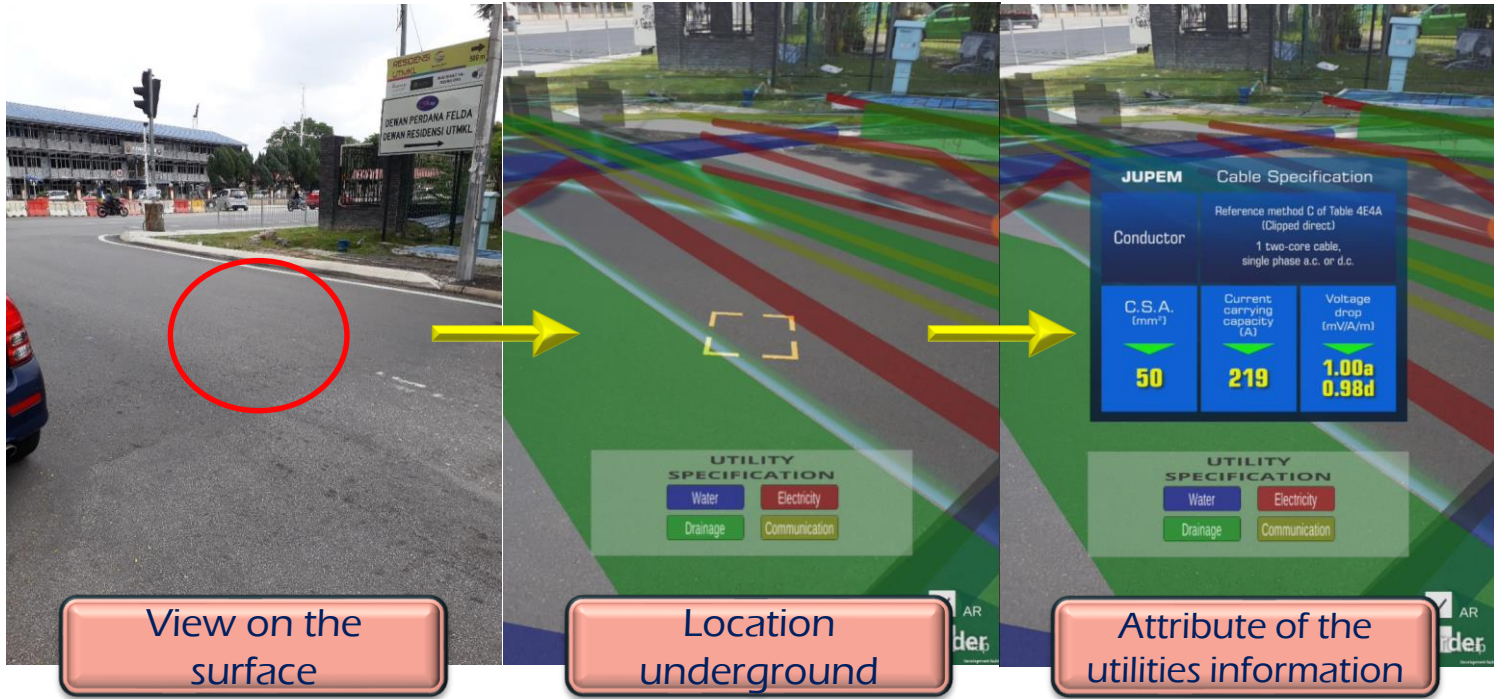
- 📍 **Combination of technologies**
- 📍 **Interoperable**



- 📍 **See visible information in real time**



IN THE PIPELINE



View on the surface

Location underground

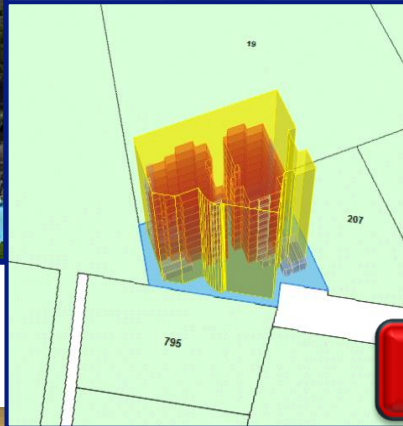
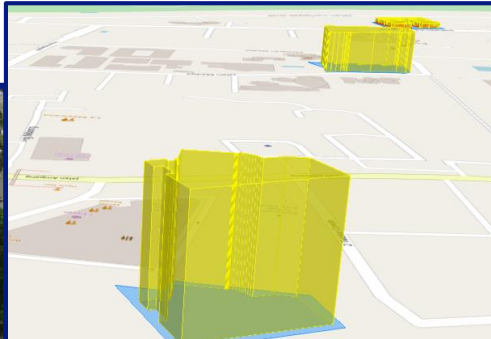
Attribute of the utilities information

IN THE PIPELINE

3D City Model + 3D Strata & Attribute + 3D Underground Utilities



3D City Model



Skim Attribute

Negeri	14 - Wilayah Persekutuan Kuala Lumpur	No. Fail PT	
Daerah	00 - Kuala Lumpur	No. Fail PTG	PTG/WF/20/6/200032/2015
Mukim	44 - Bandar Kuala Lumpur	No. Fail Ukur Semula	PUBLWP55_2016
Sekyen	88A - Sekyen 88A	Diukur Oleh	WONG YEE KONG
No. Lot	206	Bil. Petak Tanah	0
UPI	14004488A206	Bil. Petak	18
No. Skim	(S)5031	Bil. Petak Aksesori	64
No. PA	PA110340	Bil. Petak Kos Rendah	0
No. Fail Ukur	PUBLWP831_2016	Bil. Petak Aksesori Kos Rendah	0
No. Hakmilik	GRN3951	No. PA(B)	PA(B)200032
Keluasan Lot (m ²)	1668	Bil. Folio PA(B)	5
No. Sijil Akaan LIT	C286322	No. Jadual Petak	200032
No. Ruj. LIT	050500014	Bil. Folio Jadual Petak	0
No. Ruj. JTB	G15008W	No. Buku Kerja Luar	60032
		Bil. Folio Buku Kerja Luar	1

3D Strata & Attribute



3D Underground

CONCLUSION

- The building blocks for smart cities enablement is available.
- DSMM is planning to prolong the value of SmartKADASTER to new and bigger area of interest.
- DSMM is planning to take a step further to expand the current SmartKADASTER to **3D City Model + 3D Strata + 3D Underground Utility.**
- This is to ensure the readiness towards the enablement of smart cities.

Thanks!

Contact us:

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