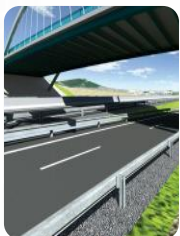
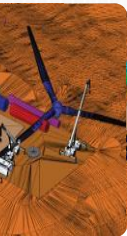




3D Cadastre - Bentley Systems' Perspective on Today's Motivations and Opportunities

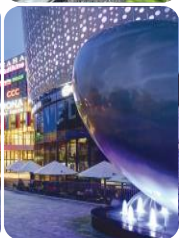
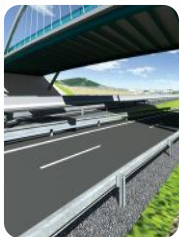
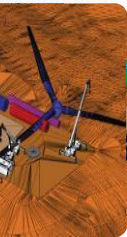
Benoit Fredericque, PhD. Senior Product Line Manager



Infrastructure

Serving People





Urbanization

Incredible Population Growth In Cities

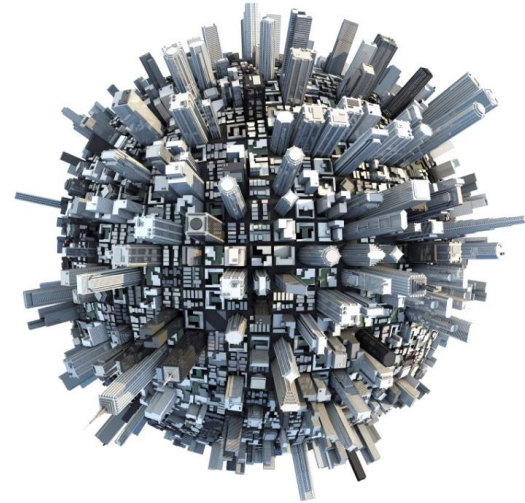
7,000,000,000



3,500,000,000



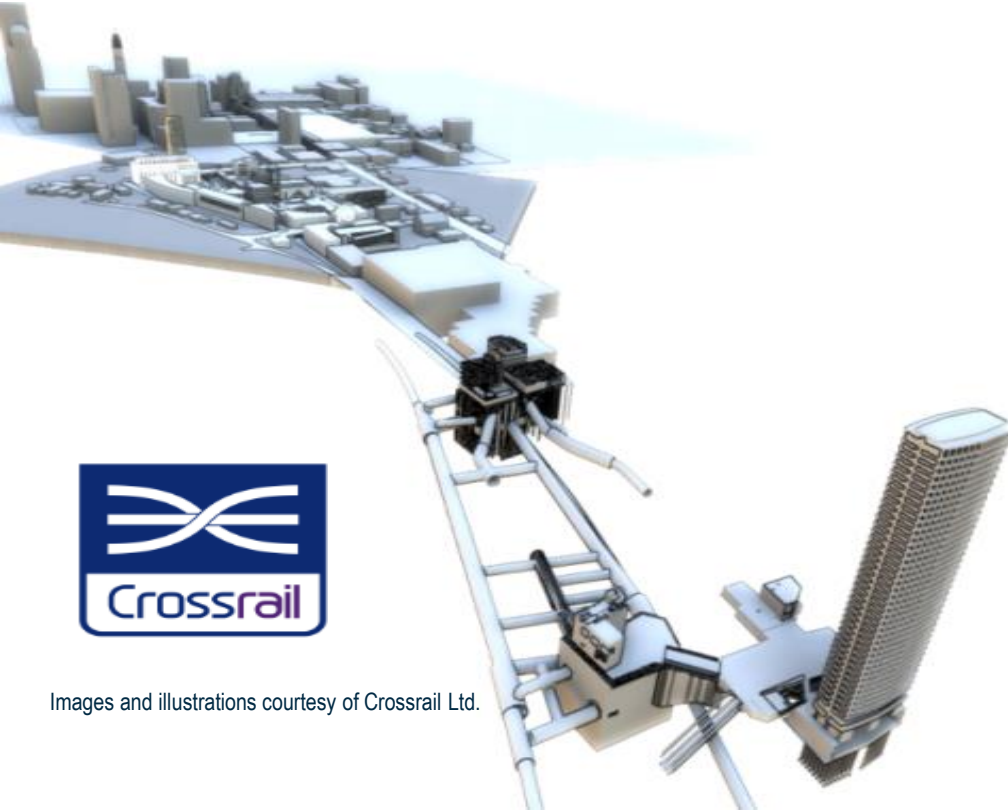
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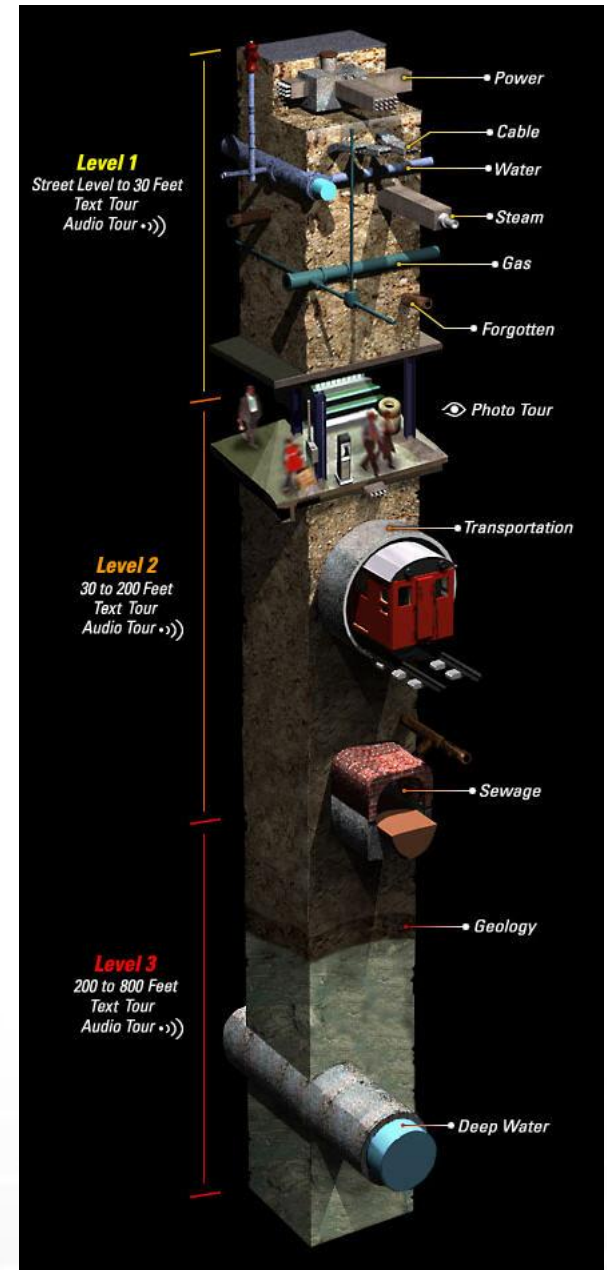


Urbanization and Infrastructures

Increasingly Complex Infrastructure



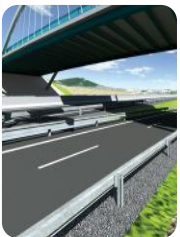
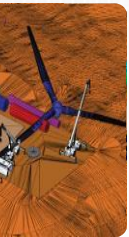
Images and illustrations courtesy of Crossrail Ltd.



Level 1
Street Level to 30 Feet
Text Tour
Audio Tour >>>

Level 2
30 to 200 Feet
Text Tour
Audio Tour >>>

Level 3
200 to 800 Feet
Text Tour
Audio Tour >>>



Being Smarter ...

There is a drive towards Smart Cities & Smart Nations

SMART CITY
ISKANDAR MALAYSIA

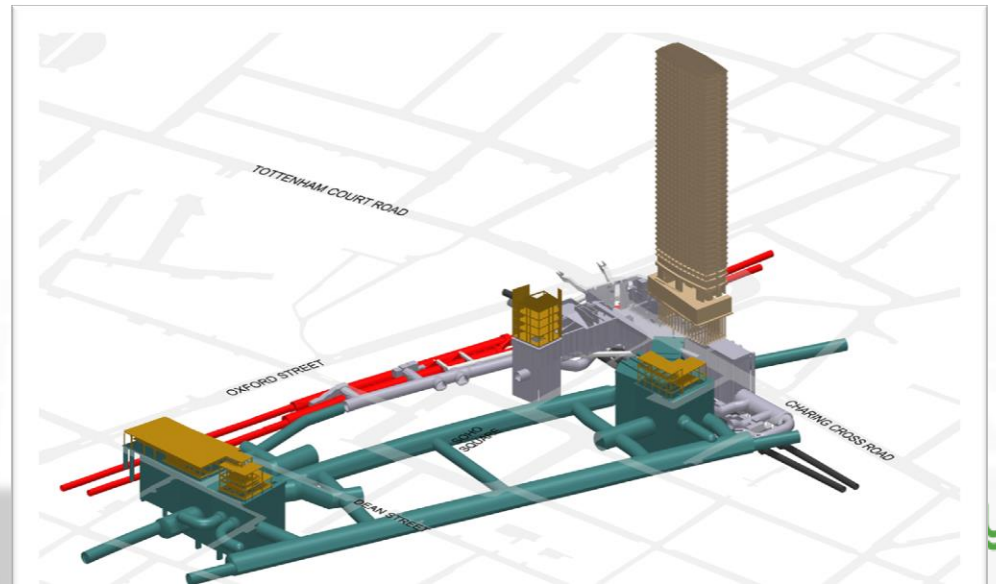
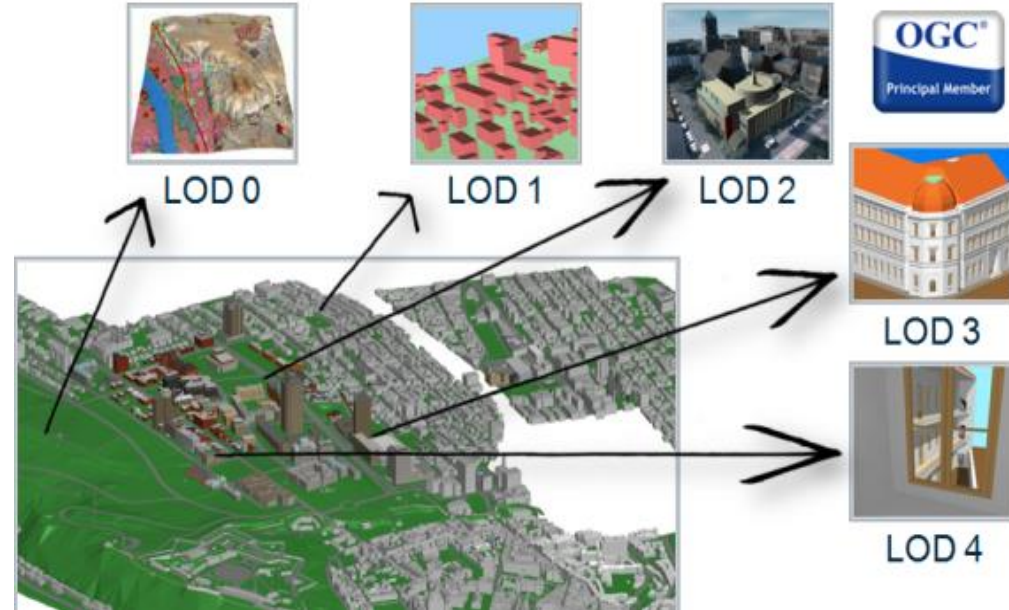
Smart Singapore



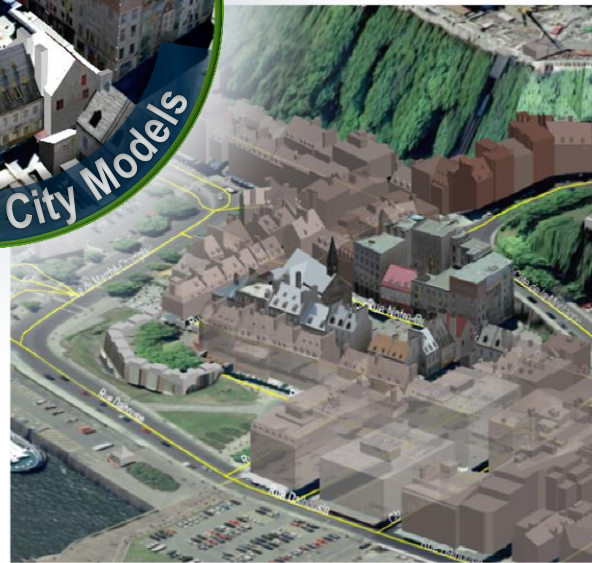
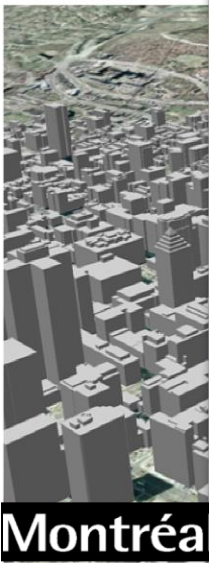
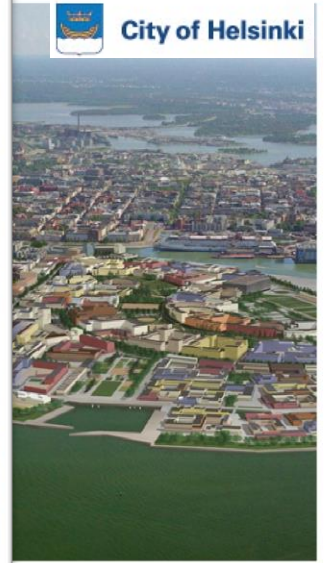
smart
Island

Many components to make Smart Cities.. Here are some

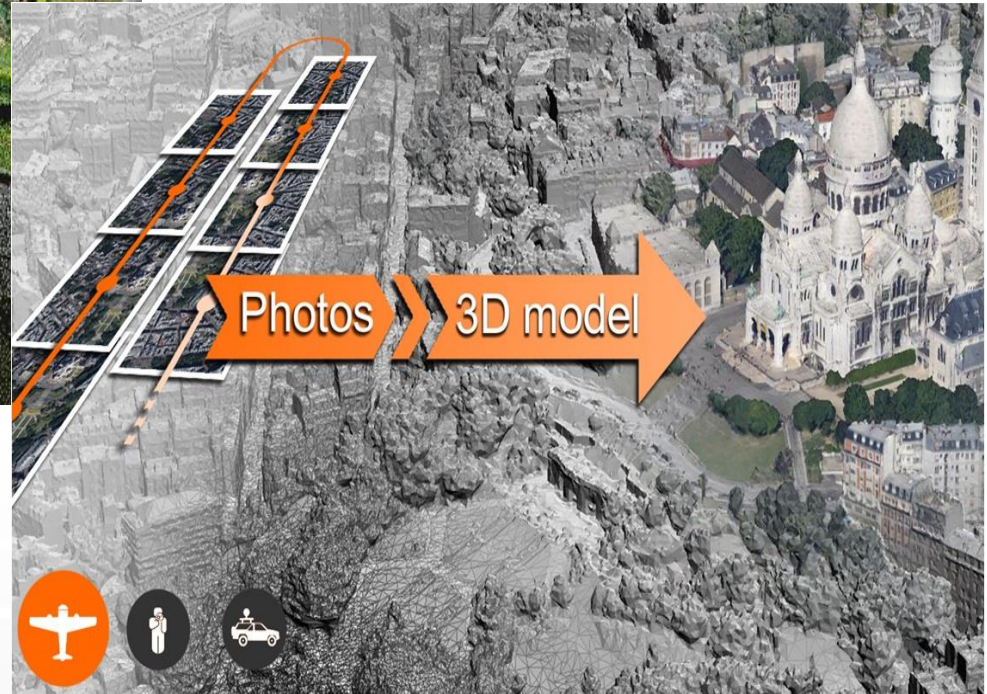
- 3D City Modeling
- Reality Modeling
- Information mobility & CAD/GIS/BIM Integration



3D City Model



Smarter... Better context understanding leads to better decisions

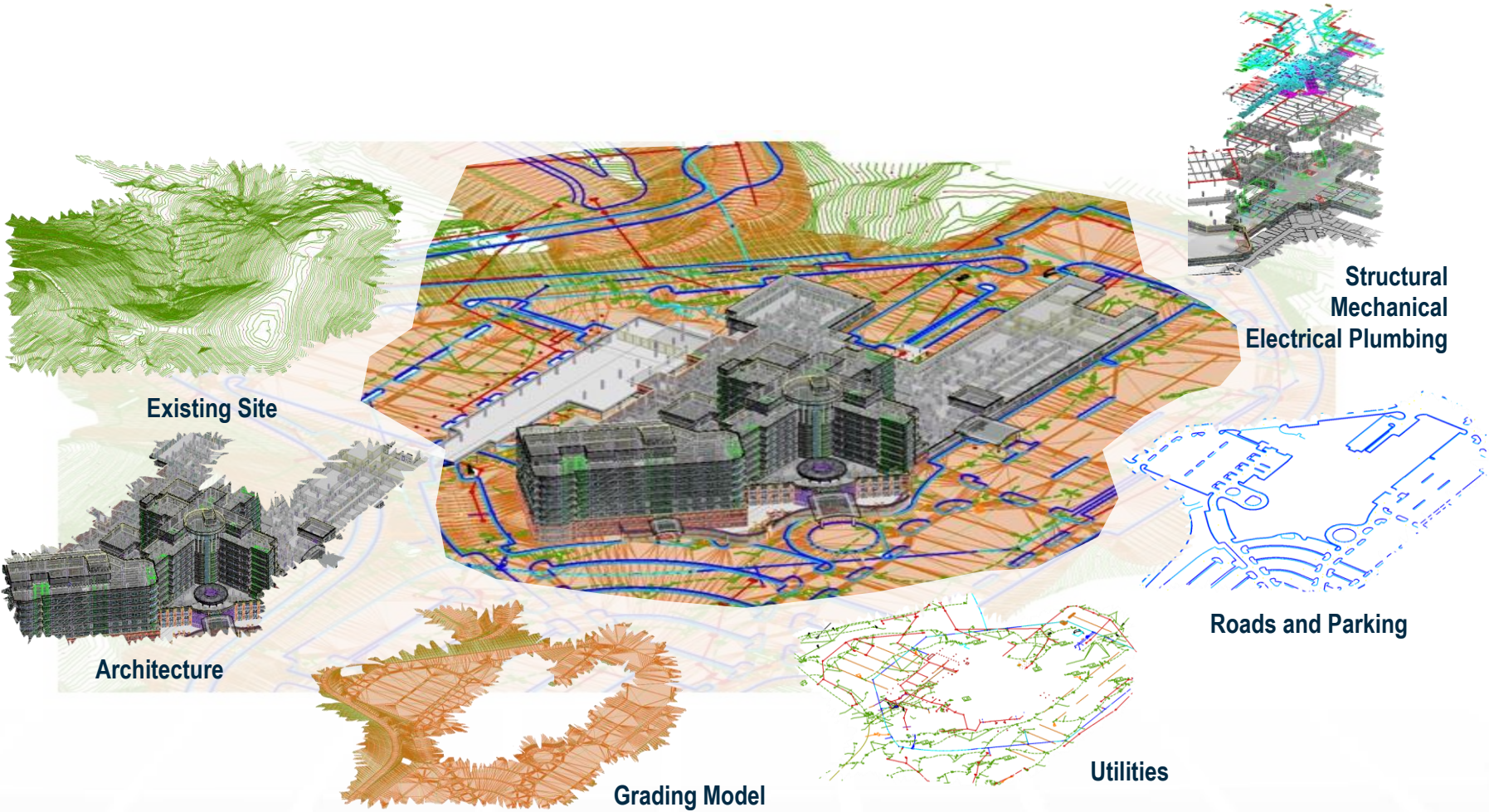


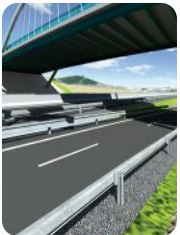
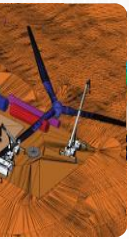
An aerial view of a city rendered as a complex wireframe mesh, showing buildings, streets, and green spaces in a grayscale, technical style. A large red curved line sweeps across the left side of the image.

aero 3D pro TM

your world in true 3D

Being Smarter with infrastructure information mobility





The Role of Cadastre ?

Tenure Mission

Banks

Property owners

business

Property rights infrastructure and sustainable development

Sustainable development

Economic Mission

Fasten property transactions

Encouragement of investments

Ensure an efficient land market

Individuals

Government

Taxation Mission

Transparency of taxation

Equitable property assessment

Better public services

Better land use and management

Reduced vulnerability to natural disaster

Better land use protection

Reducing risk of conflicts over land use

Reduced risks from conflicting rights

Better access to credit

Improved social climate

Environmental Mission

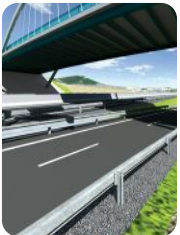
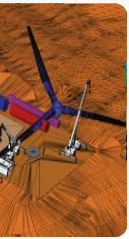
Development - Property rights infrastructure and sustainable development

Individuals

Government

Business

Municipalities



The Role of Cadastre in Urban environment.. and Smart Cities ?

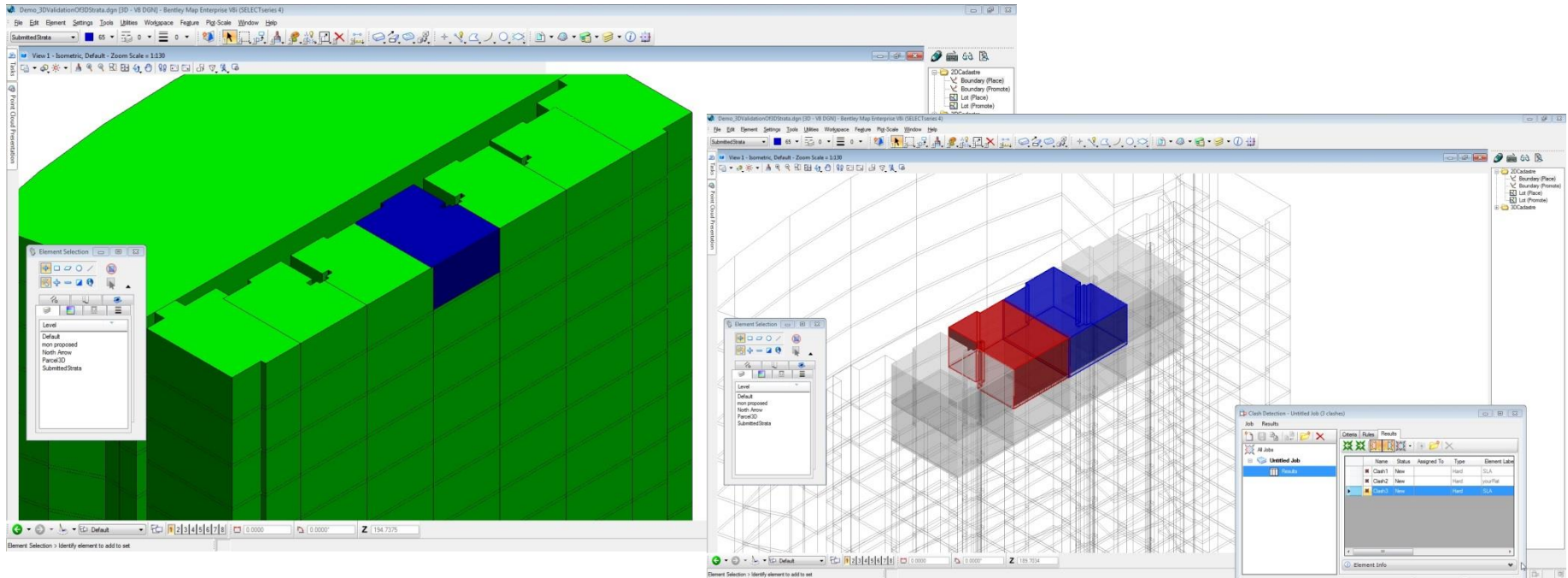
AG5
Copenhagen Council



AG5
New York Apartments



3D Stratas for a single building



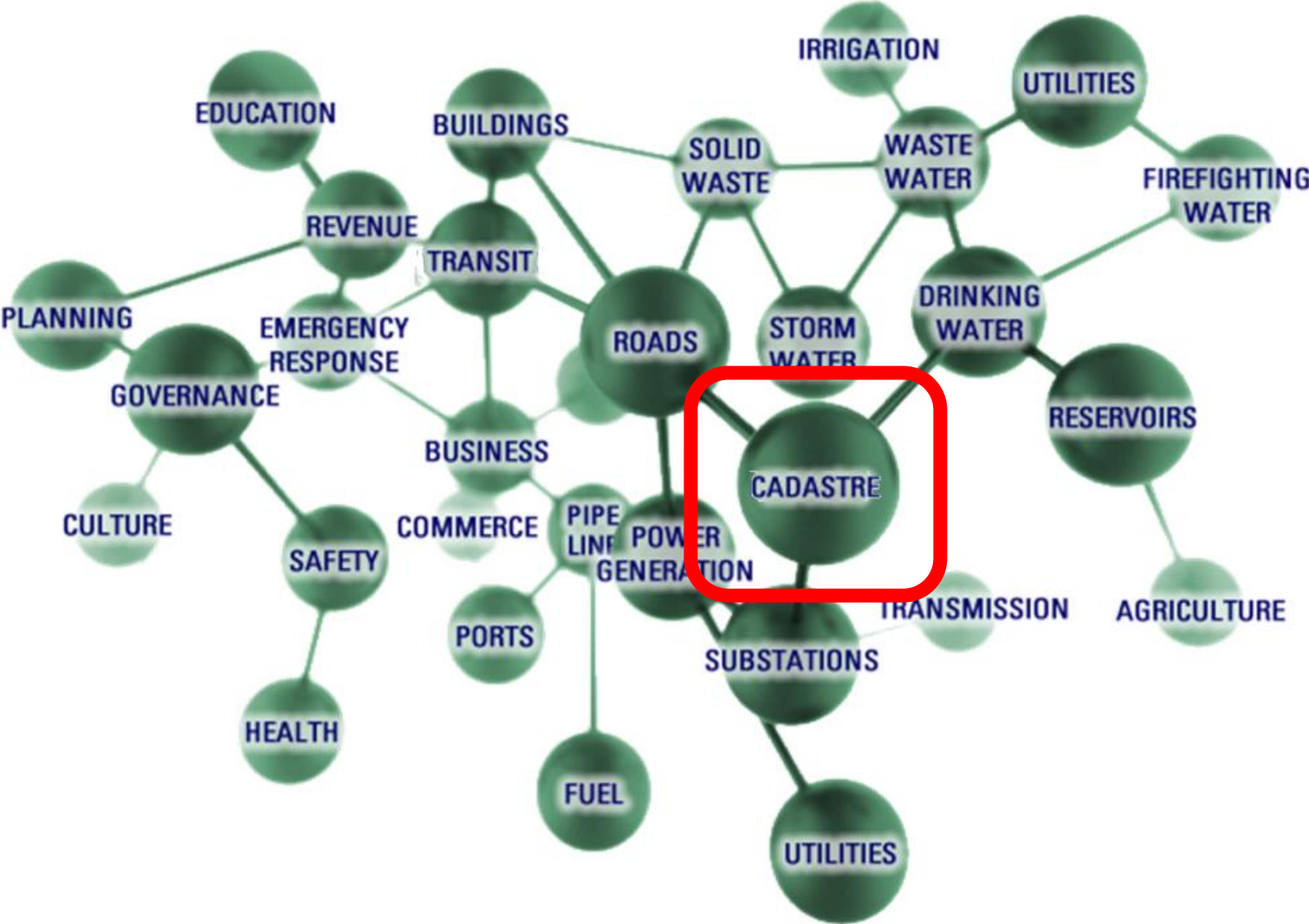
- Assess encroachment between lots

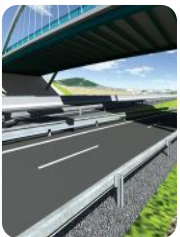
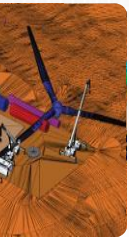
3D Cadastre and Smart Cities

“ 3D Enabled Cadastre is a pillar of SmartCities, a fundamental element to implement Smart Nation initiatives. There are no SmartCities without Smart Cadastres ”

Your speaker - Benoit Frédéricque, PhD, Senior Product Line Manager at Bentley Systems

3D Cadastre and Smart Cities



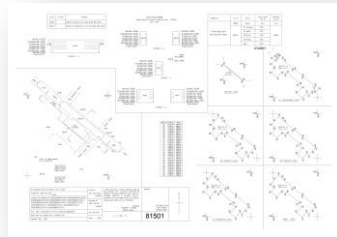


Enabling 3D Cadastre

3D Cadastre

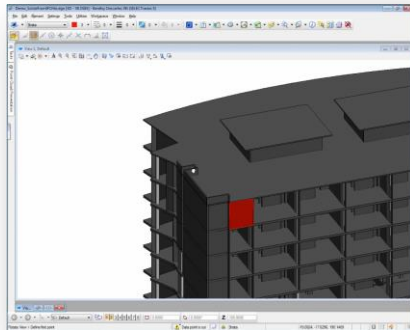
- Integrate with existing 2D Cadastre Paradigms such as LADM and allow dealing with both 2D and 3D
- Accurately represent the ownerships and rights associated to Land & property ownership..in 2D and 3D
- Represent the past, the present and the future
- Communicate effectively Cadastre information with Citizens and Infrastructure planners, designers, operators
- Integrate Cadastre data with Infrastructure data

Extend 2D Cadastre paradigms with 3D Stratas

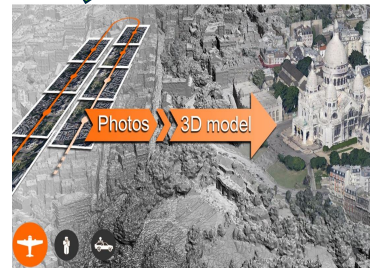
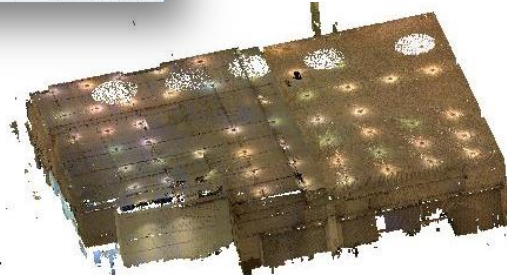


Existing 2D Drawings
or 2D GIS Data

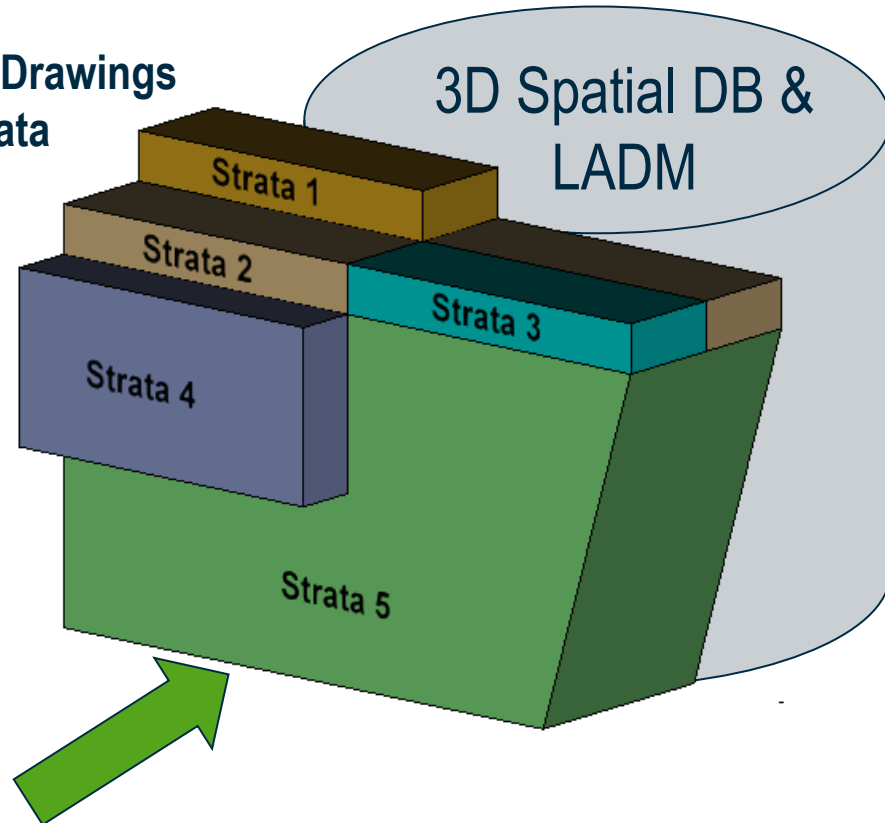
**LAND
xml**



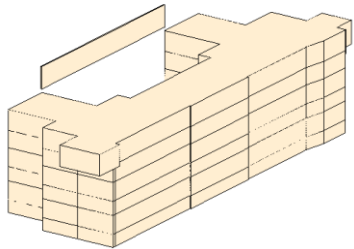
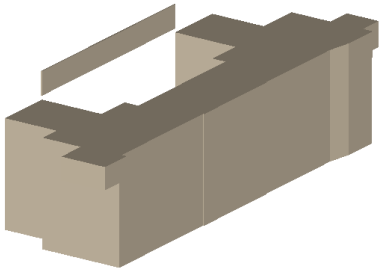
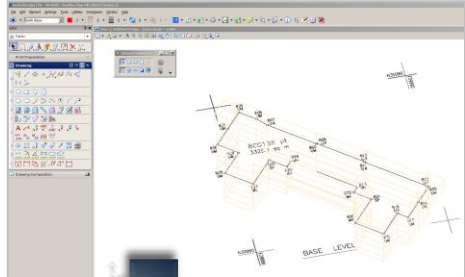
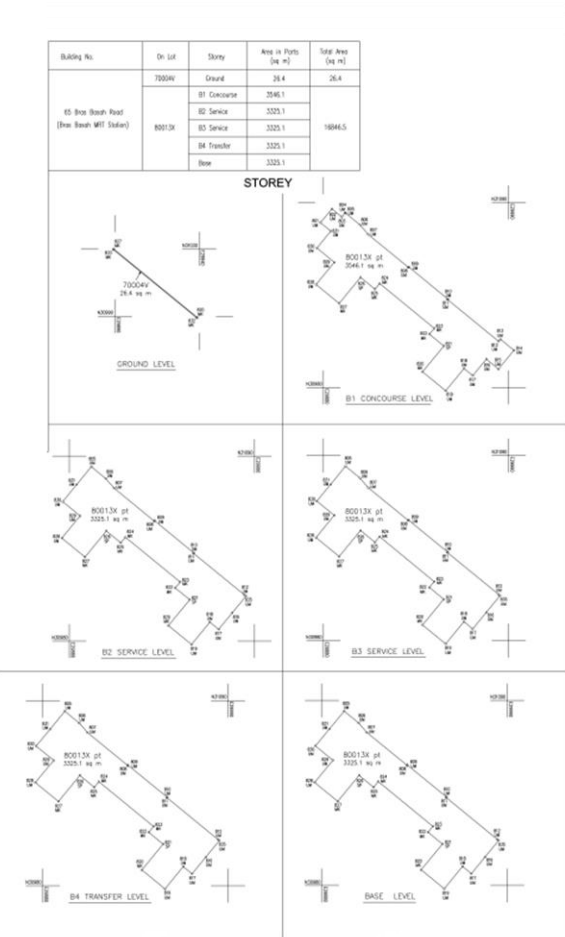
3D BIM Model



Reality Modeling Data

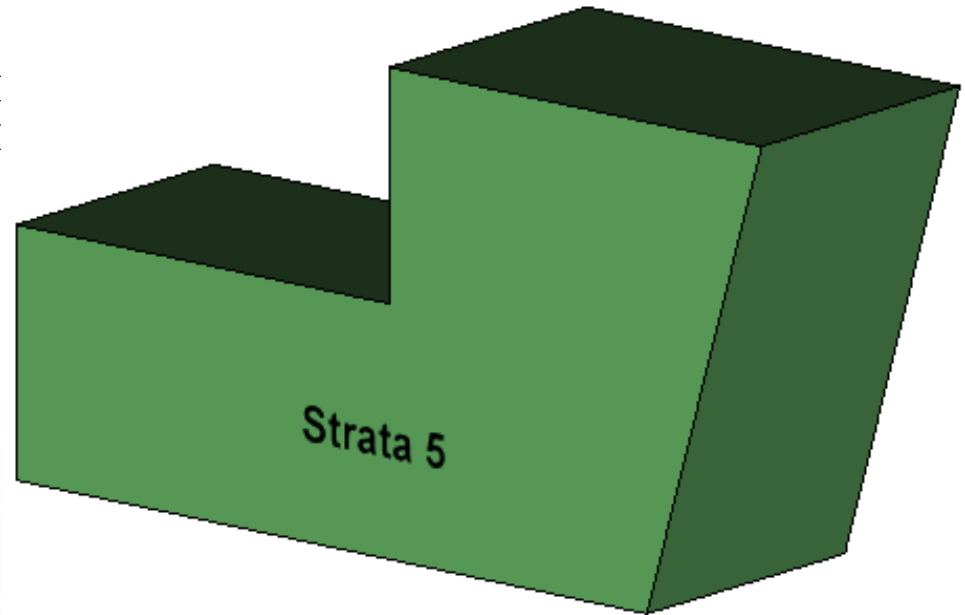


3D Strata Volumes from 2D PDF

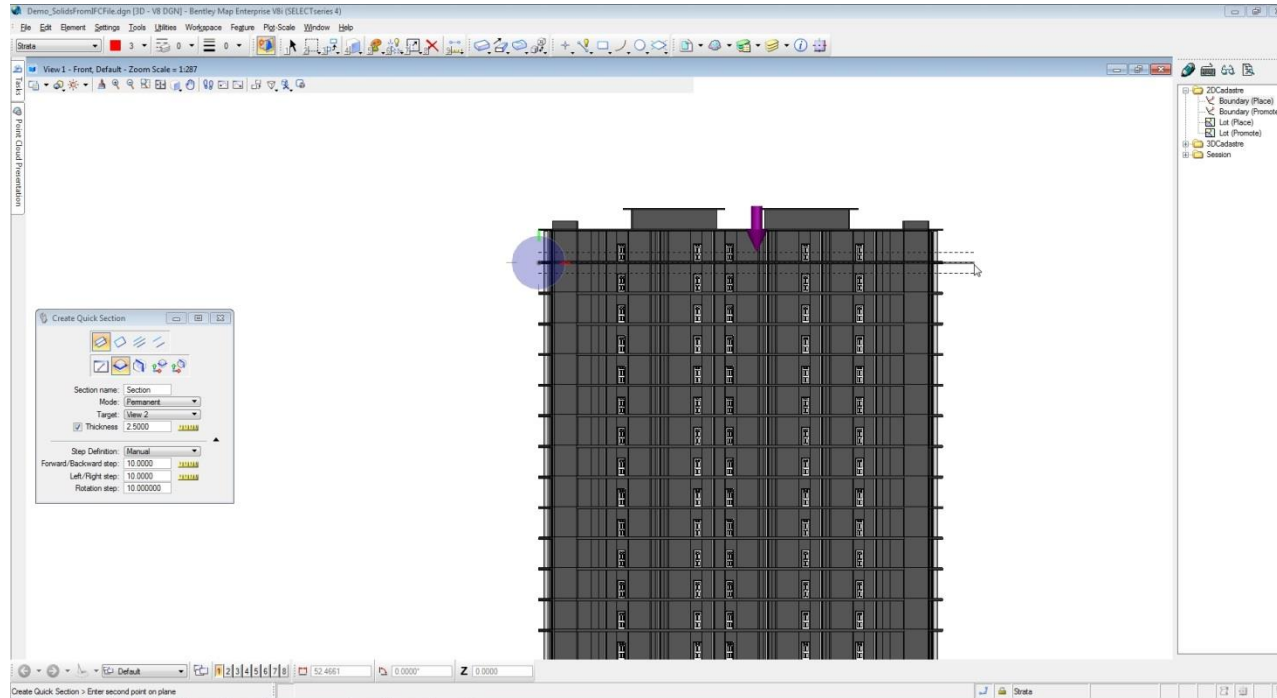


3D LandXML

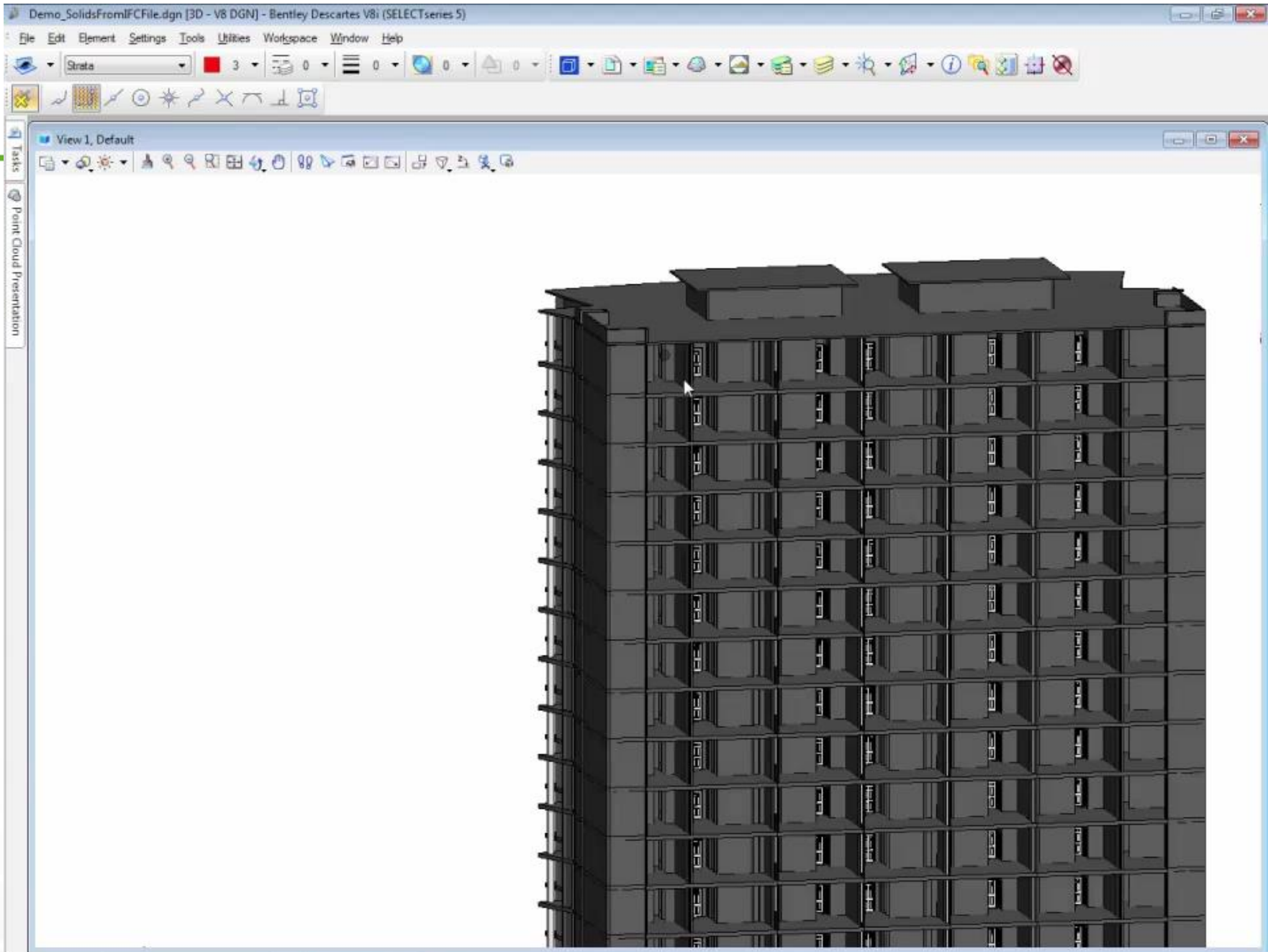
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E:\6.0 User\SLA\LandXML\3D-AirspaceLot.dgn.XML - Notepad++
File Edit Search View Encoding Language Settings Macro Run Plugins Window ?
singapore.osm-aeroways.prj | street_lights.vrt | asbuilt | As-buil | importLandUse.imp | 3D-AirspaceLot.dgn.XML
1 <?xml version="1.0"?>
2 <LandXML xsi:schemaLocation="http://www.landxml.org/schema/LandXML-1.1 http://www.landxml.org/schema/landXML-1.1/LandXML-1.1.xsd" xmlns:xsi="http://www.w3.org/2001
3 <Parcels>
4   <VolumeGeom>
5     <CoordGeom>
6       <IrregularLine>
7         <Start>
8         </Start>
9         <End>
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11        <PntList3D>30253.571 29576.854 101.62 30251.242 29538.369 101.62 30258.5 29537.953 101.62 30290.801 29536.016 101.62 30290.729 29534.819 101
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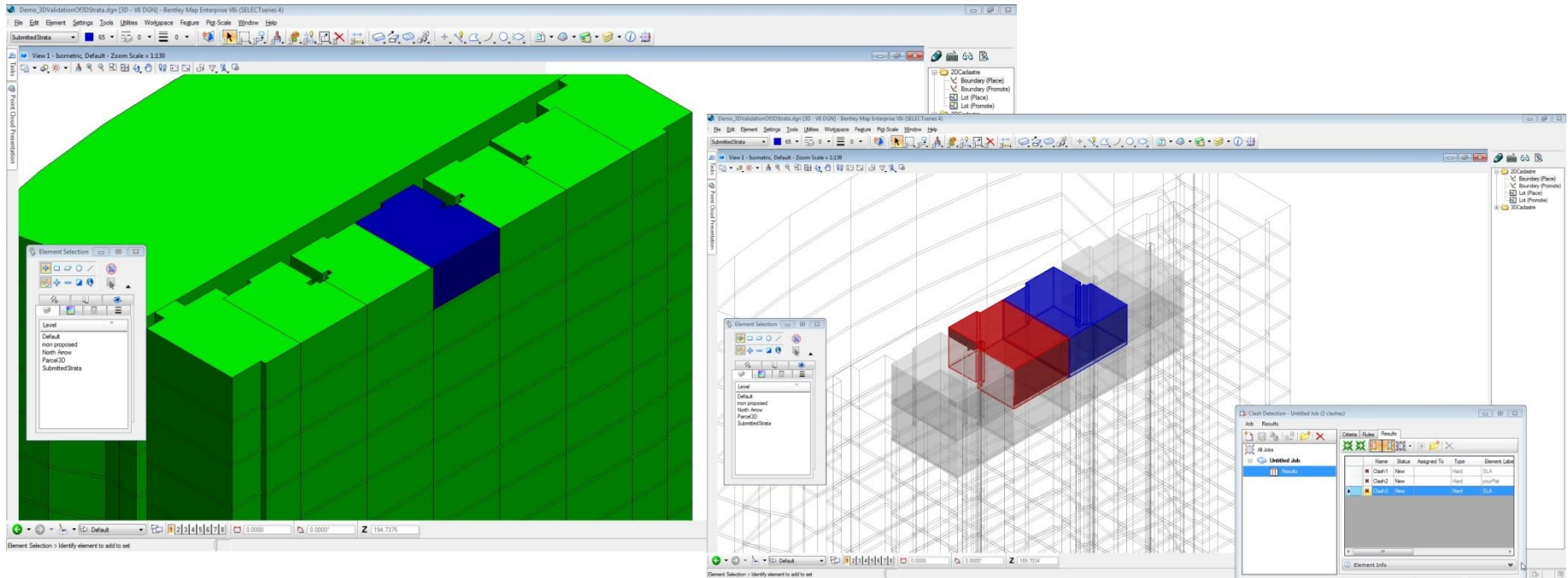
3D Lots Creation from BIM model (1)



- BIM model is interoperable in Bentley Map using the industry standard format, namely IFC.
- Section can be created to display the floor plan at the desirable area of the building.

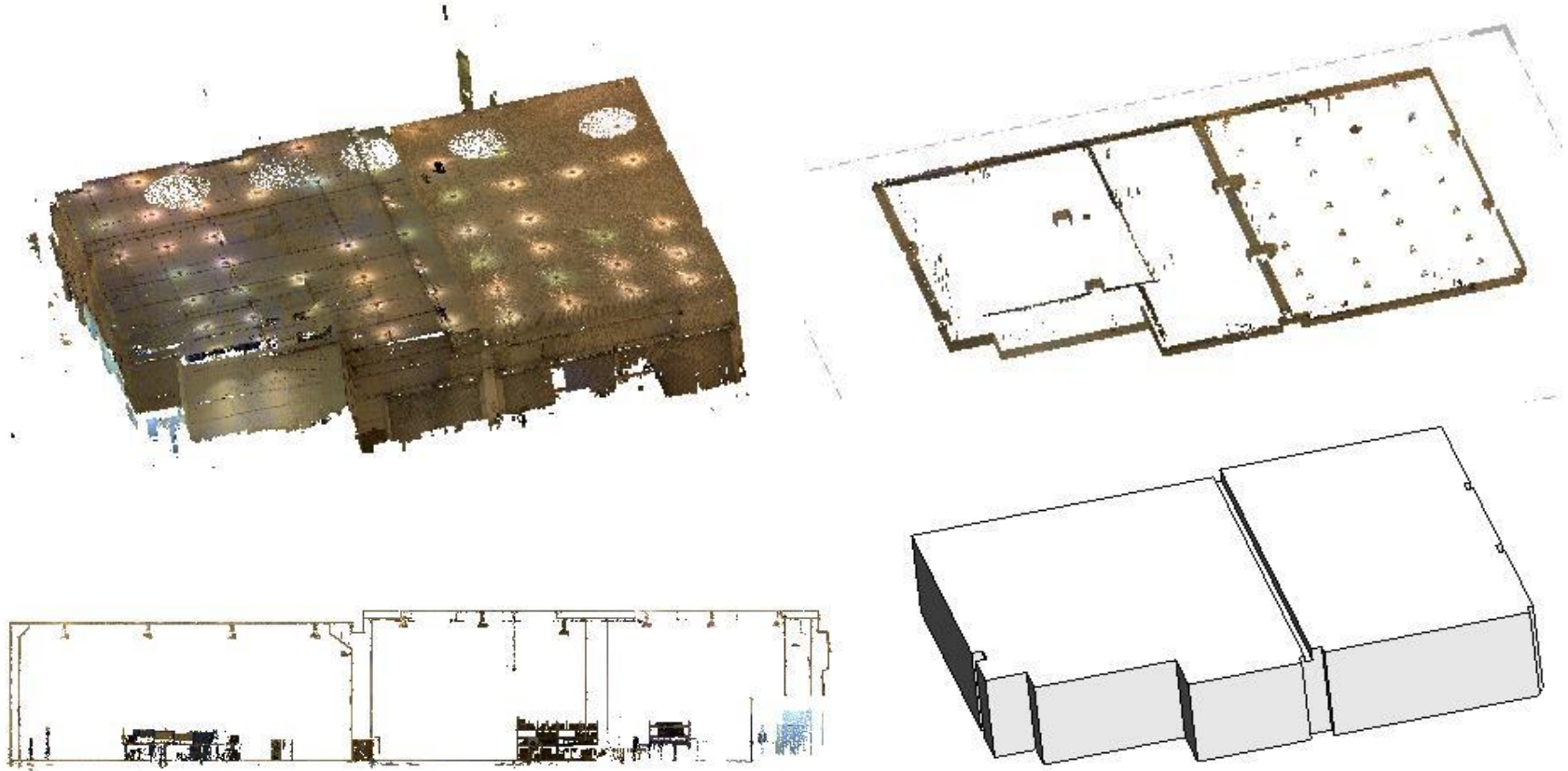


3D Stratas for a single building

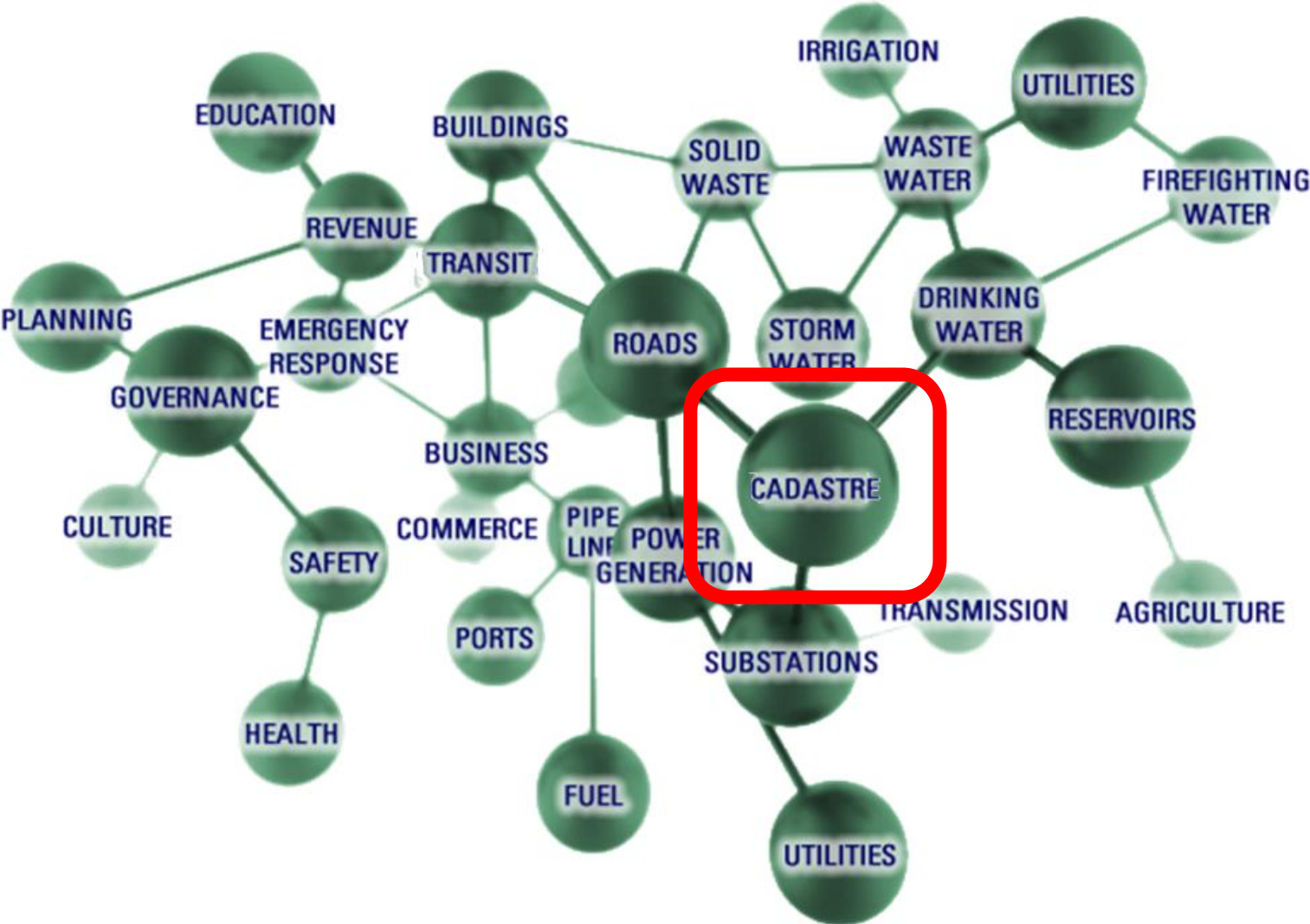


- Assess encroachment between lots

3D Volumes from Reality Model



3D Cadastre and Smart Cities



For More Information...

- Benoit.fredericque@bentley.com
- www.bentley.com