3D City GIS

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Bentley
Sustaining Infrastructure

Agenda

- Why 3D City GIS?
- What does 3D City GIS mean?

Why 3D City GIS?

I like

3D !!!

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For sustaining Infrastructure

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Infrastructure defined

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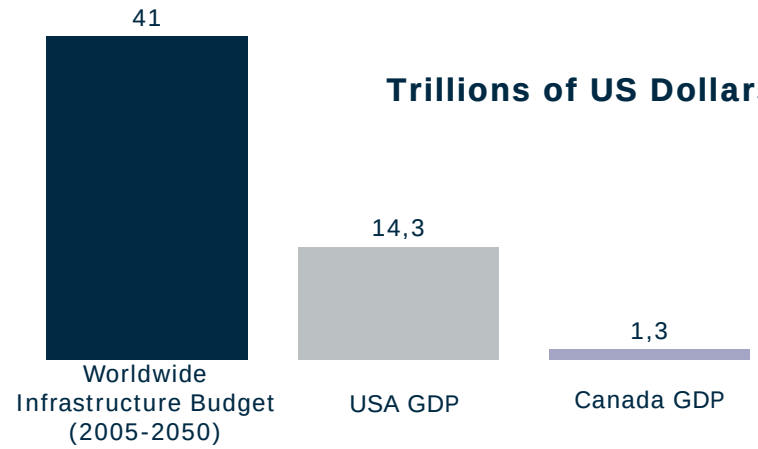
Addressing Infrastructure needs…

…a challenge for our economy



Sources: Booz Allen Hamilton, Global Infrastructure Partners, World Energy Outlook, Organization for Economic Co-operation and Development (OECD), Boeing, Drewry Shipping Consultants, U.S. Department of Transportation

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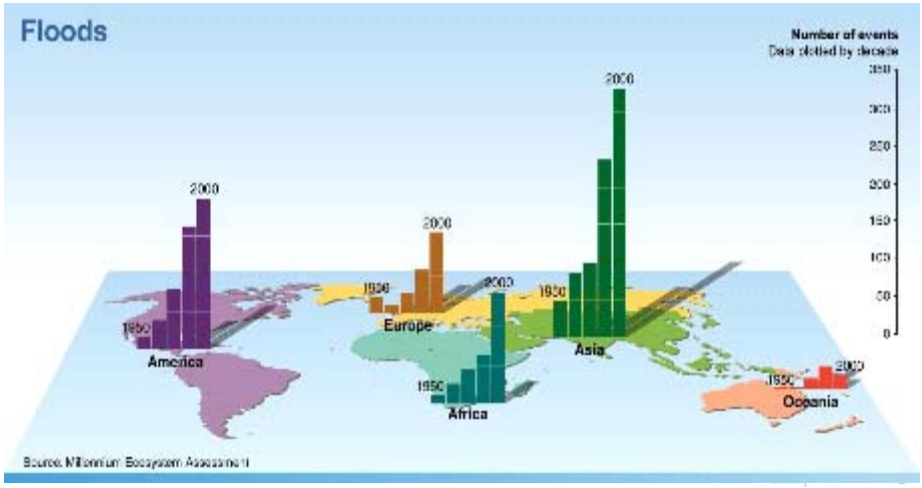
Better infrastructure for Public safety

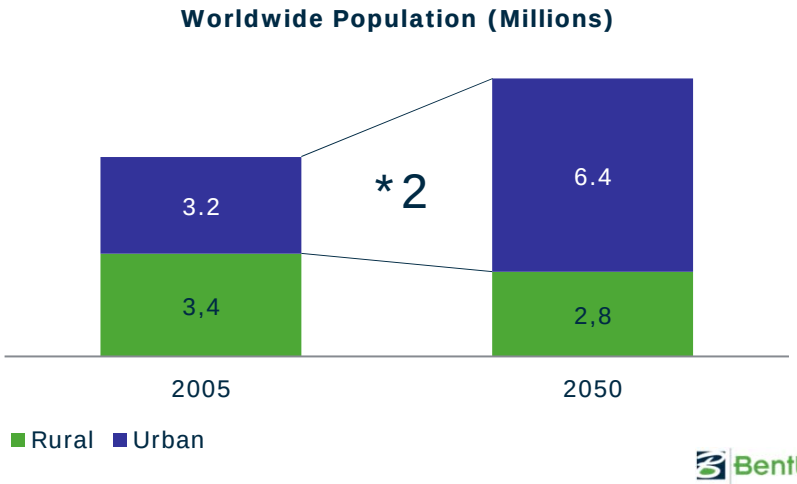
Better infrastructure for Public safety

Needs are growing…

…Climate changes



Needs are in Cities



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Infrastructure needs are

- Important for people security & well being
- Worldwide
- Increasing
- Important for our Economy
- Going to increase mainly in Cities

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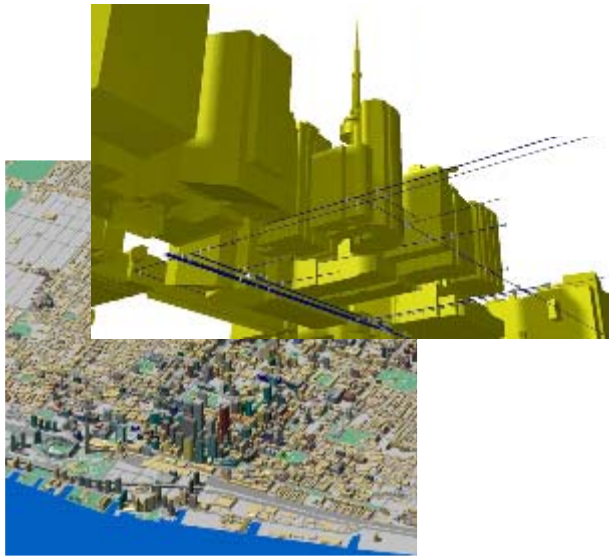
3D City GIS for sustaining infrastructure



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What does 3D City GIS mean?

3D City GIS

- It's an information management systems using **3D City model as a platform**

3D City GIS aims at

- Optimizing infrastructure data management across city territory
  - *"Towards seamless integration between geo and engineering content"*

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3D City GIS Components

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3D City GIS Components

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3D City GIS allows

- Taking benefits of 3D City visual simulation :
  - Urban planning simulation
  - Tourism promotion
  - Project communication with citizens/media
  - Team collaboration
  - ...

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Examples of virtual images rendered with MicroStation

3D City GIS allows

- Doing more than Visualization
  - Integrating different assets in a same 3D environement
  - Analyzing and Designing in 3D at the City/Campus Scale

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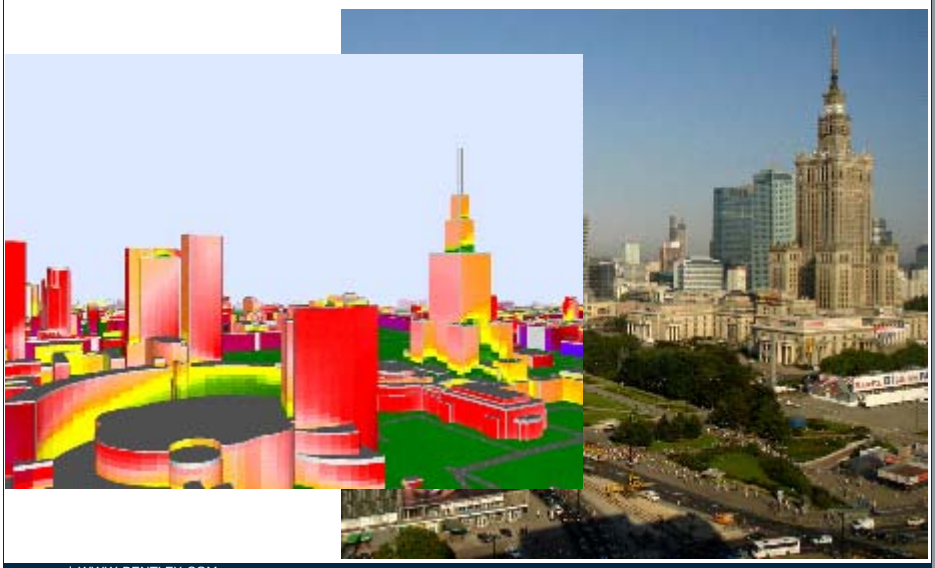
3D reality sometimes needs …

…3D Analysis & Designs

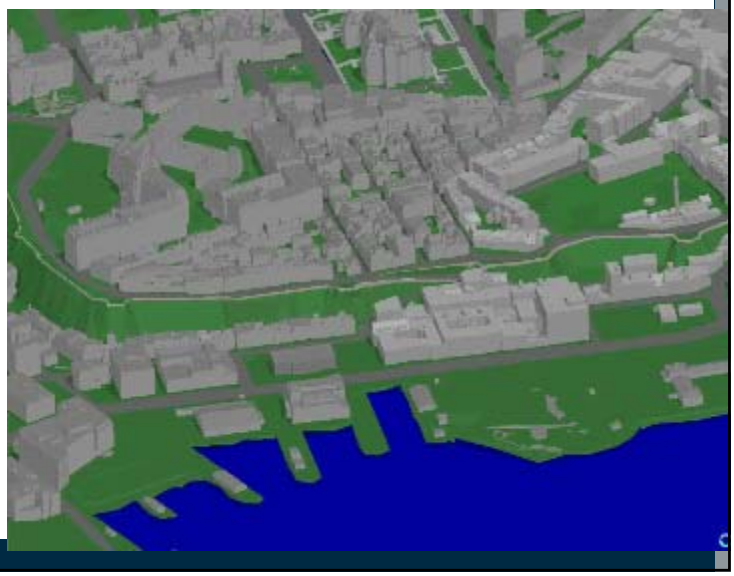
3D reality sometimes needs …

…3D Analysis & Designs

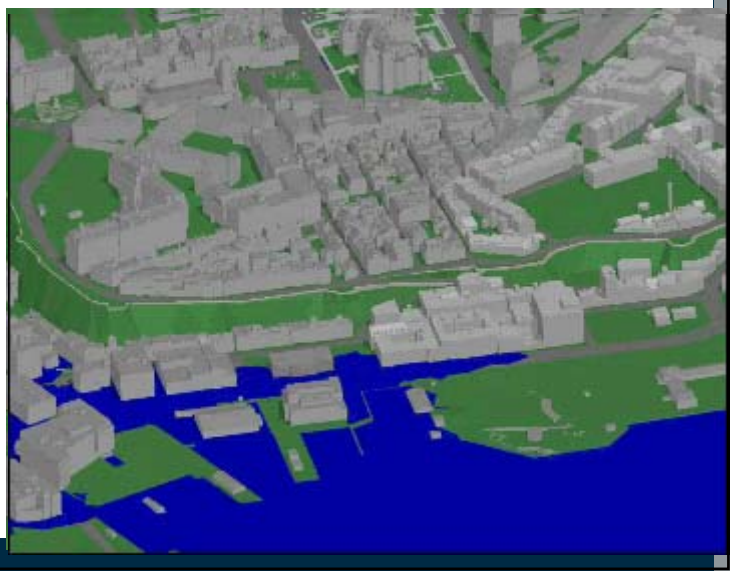
Noise simulation -Warsaw



Flood simulation

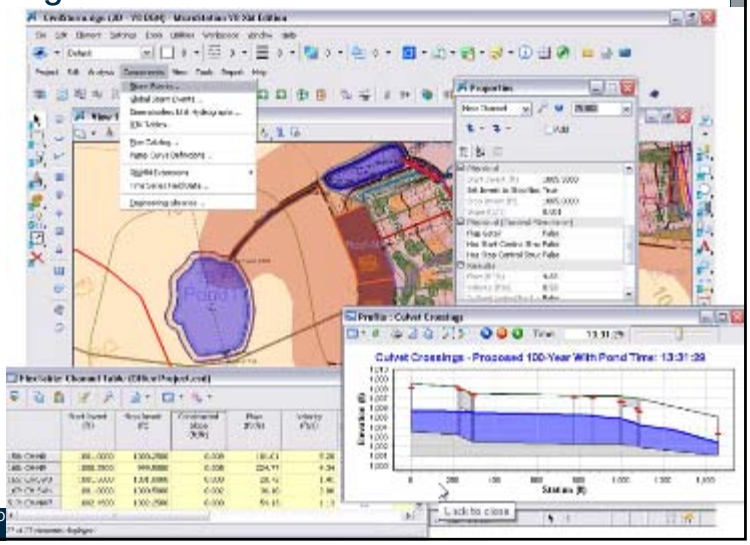


Flood simulation



Designing

- Improving storm water infrastructure



3D City GIS Components

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Persist, Serve and Manage ?

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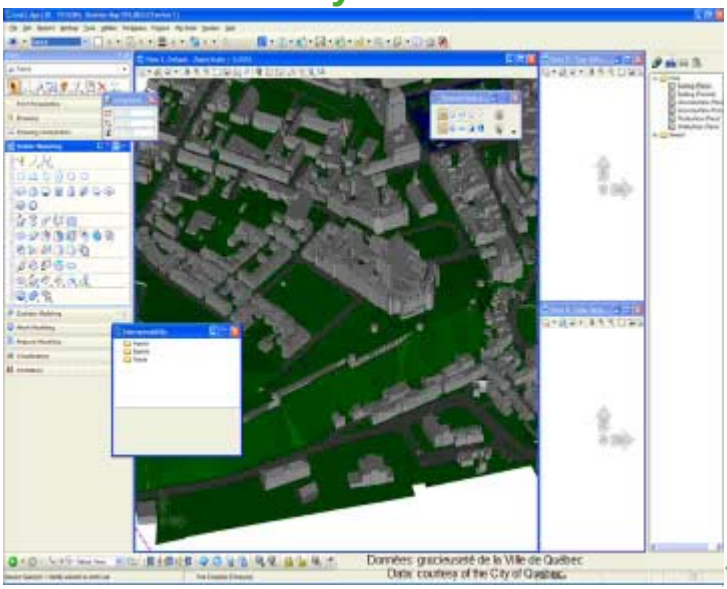
Persist, Serve and Manage ?

- Support for different repository types:
  - Files: Standards (CityGML, IFC, PDF, KML, ...) or Proprietary (DGN, DWG, SHP,...)
  - Databases: Oracle Spatial, SQL Server
  - Web Services: WMS, WFS,...

How to Persist, Serve and Manage ?

- Example of strategy:
  - 3D City Model overview
    - Database for covering large areas
    - Files for smaller areas and for exchanging (ex: CityGML, IFC)
  - Detailed engineering and architectural designs
    - Files, with an association to overview model and indexing of content (ex: DGN, DWG, IFC,...)

Demo–Post 3D City Model in Oracle



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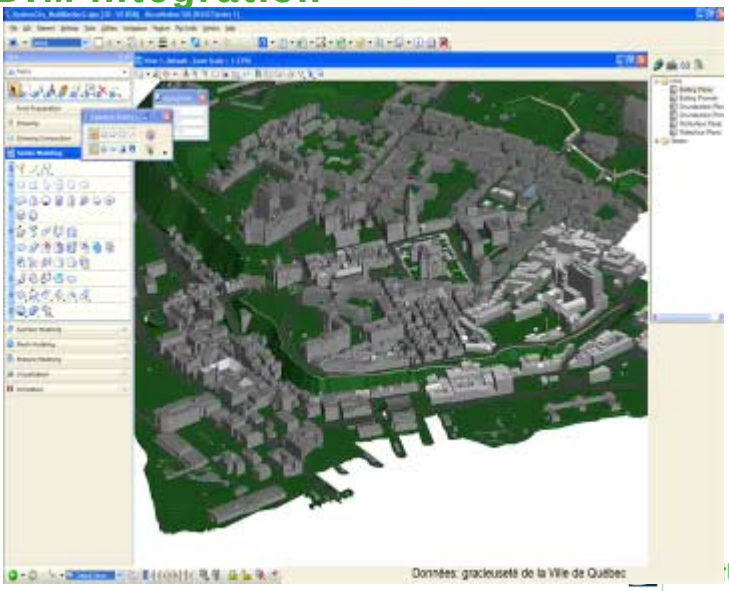
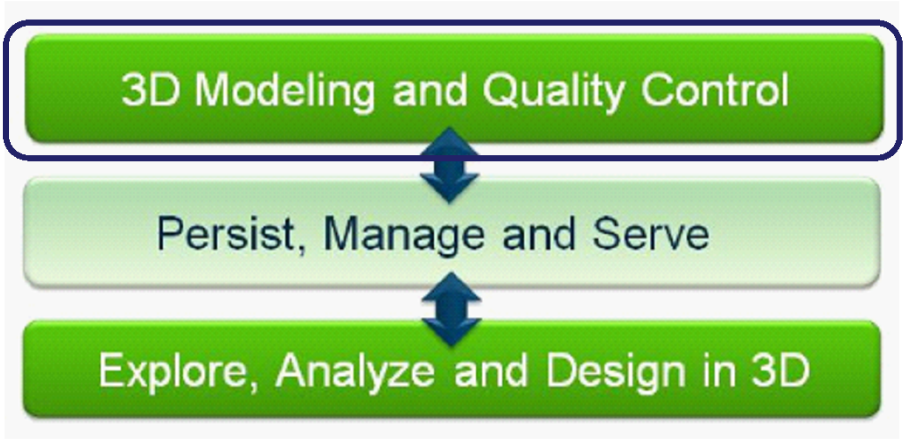
GIS\BIM integration



How to create and update a 3D City Information Model?



3D Modeling Techniques

	Aerial		Terrestrial			ETL
	Photogrammetry	LiDAR	Mobile LiDAR & Photogrammetry	Static LiDAR & Photogrammetry	Land Surveying	
0-DTM						
1- Blocks						
2-Textures, roof						
3- Detailed						
4-Interior						

We can help…

- 3D Modeling
  - **MicroStation, Bentley Map**
- Aerial Photogrammetry
  - Leica LPS-PRO600 for **PowerMap**; Intergraph ISFE for **MicroStation;** DVP; DATEM; ESPA; KLT atlas/DSP; Photomod Racurs; Usmart; VirtuoZo; MSMapper; BOEING IDS / Softplotter
- Aerial LiDAR
  - **Bentley and Terrasolid eSeminar on April 29th.**
- Terrestrial LiDAR
  - PHIDIAS, **CloudWorx**
- Survey
  - **GEOPAK Survey, InRoads Survey, PowerSurvey**

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Bentley and Partners can help…

Model / QC	Manage / Serve	Explore / Analyze
MicroStation / Bentley Map / Bentley Descartes Capture smart 3D data (Laser Scanning, Photogrammetry) Integrate data (ETL) Quality Control Create 3D textures/material Rendering **InRoads, GeoPAK, MX** Integrate survey data Create surfaces	**Bentley Geospatial Server** Manage 3D models Manage workflows Manage 3D images **Bentley Geo Web Publisher** Publish 3D data **Oracle Spatial 3D 11G** Store 3D data	**MicroStation / Bentley Map** Design 3D Scenes Visualize 3D model Create maps, reports 3D spatial analysis Photo realistic rendering Animations **InRoads, GeoPAK, MX** Line of sight analysis Compute volumes **ProjectWise Navigator** Visualize 3D model Collaborate on 3D model Review **KML Client** Public 3D model visualization Casual 3D model visualization

Questions?

Visit our booth!

Benoit.fredericque@bentley.com

http://www.bentley.com/en-us/promo/3D%20city%20gis

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