

MundoGEO

#connect

LatinAmerica 2012



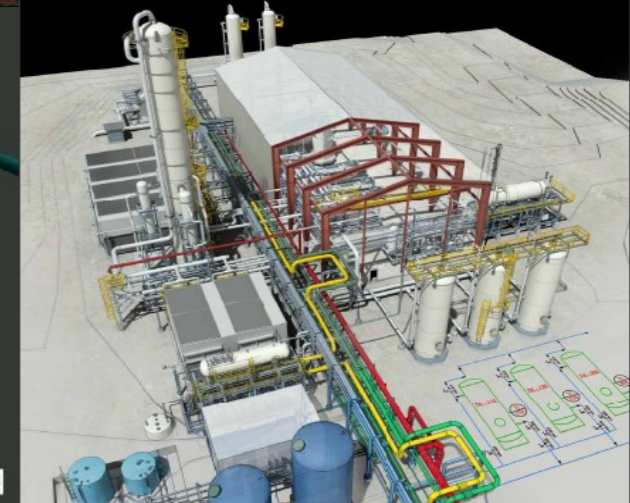
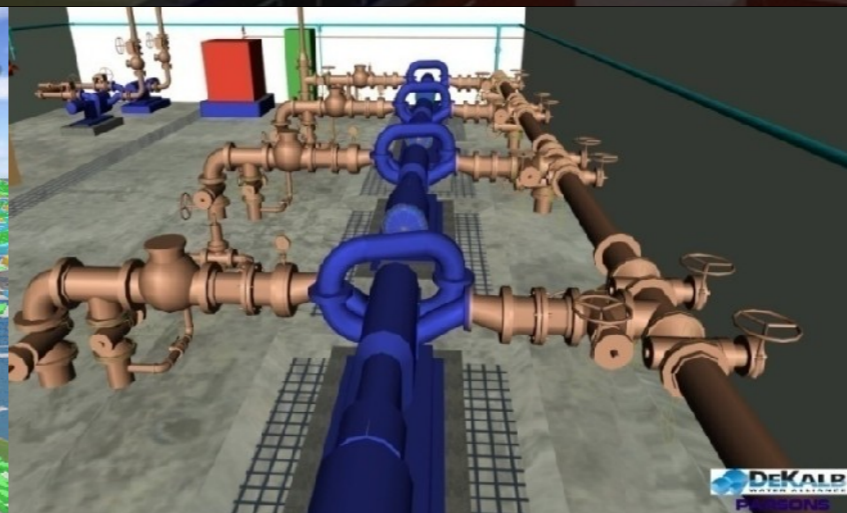
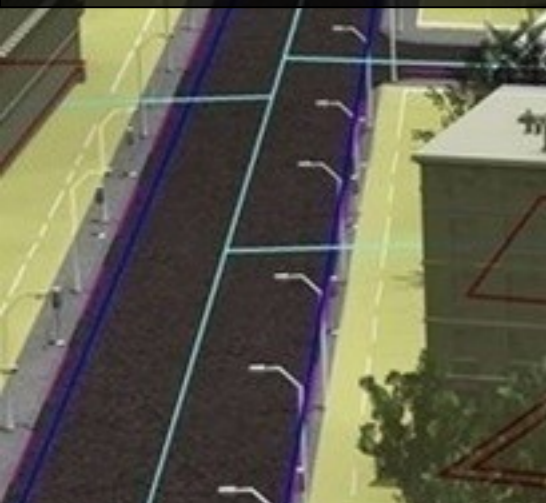
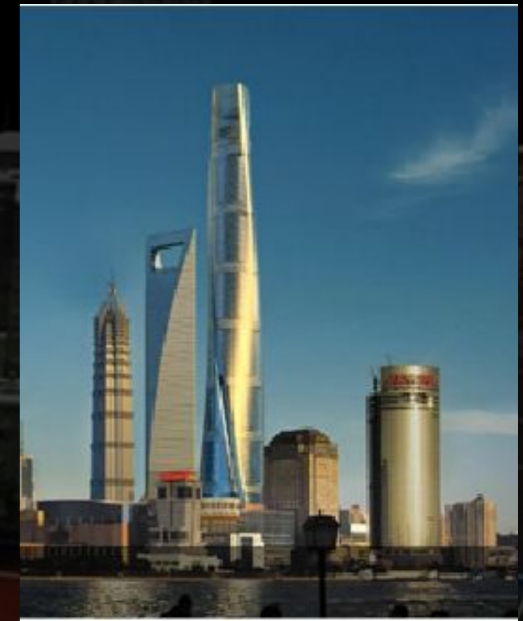
What is the future of GIS ?

Sharing information for a better world

Geoff Zeiss

Director Utility Industry Program

Autodesk



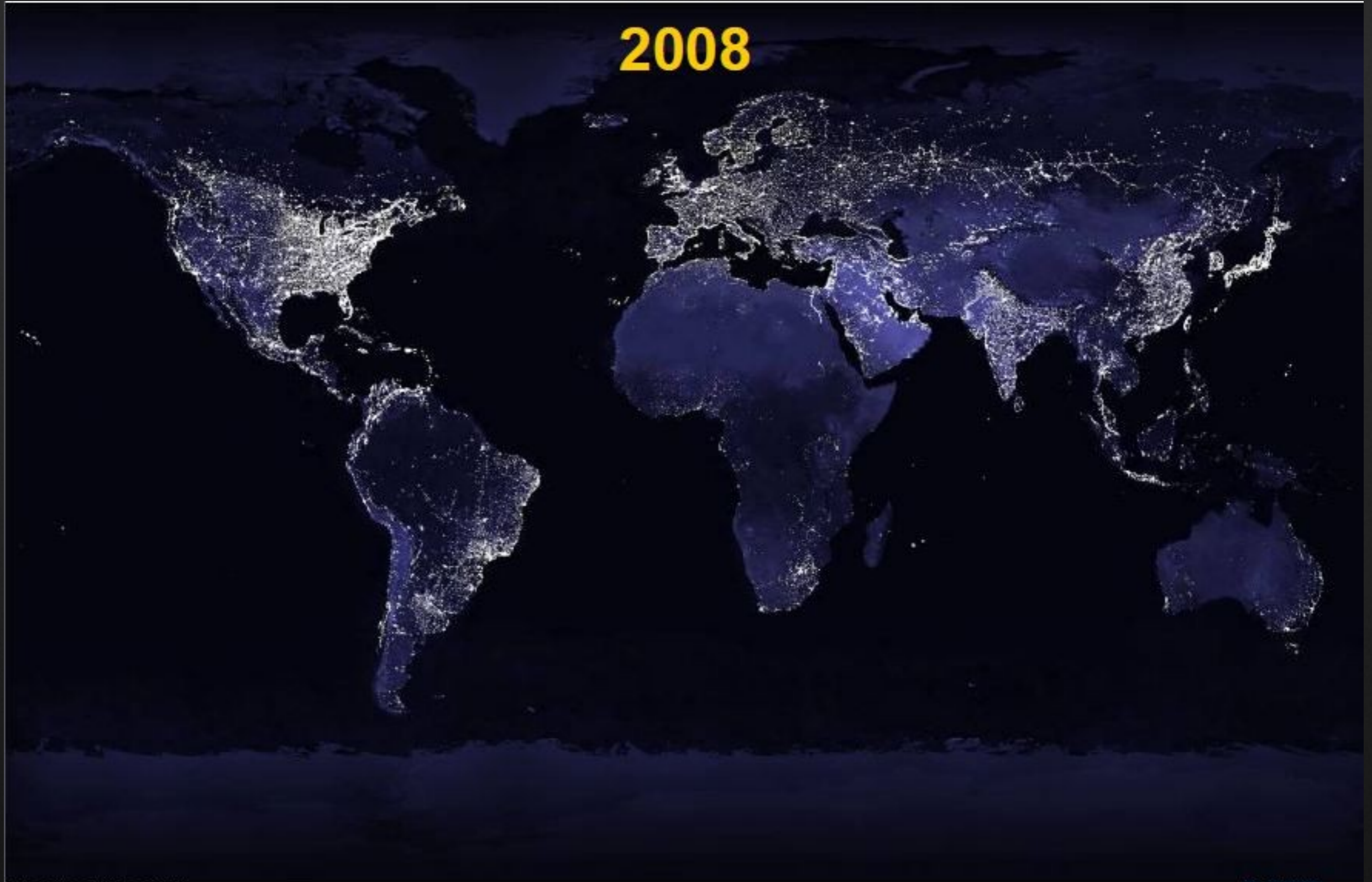
Autodesk

The world is changing

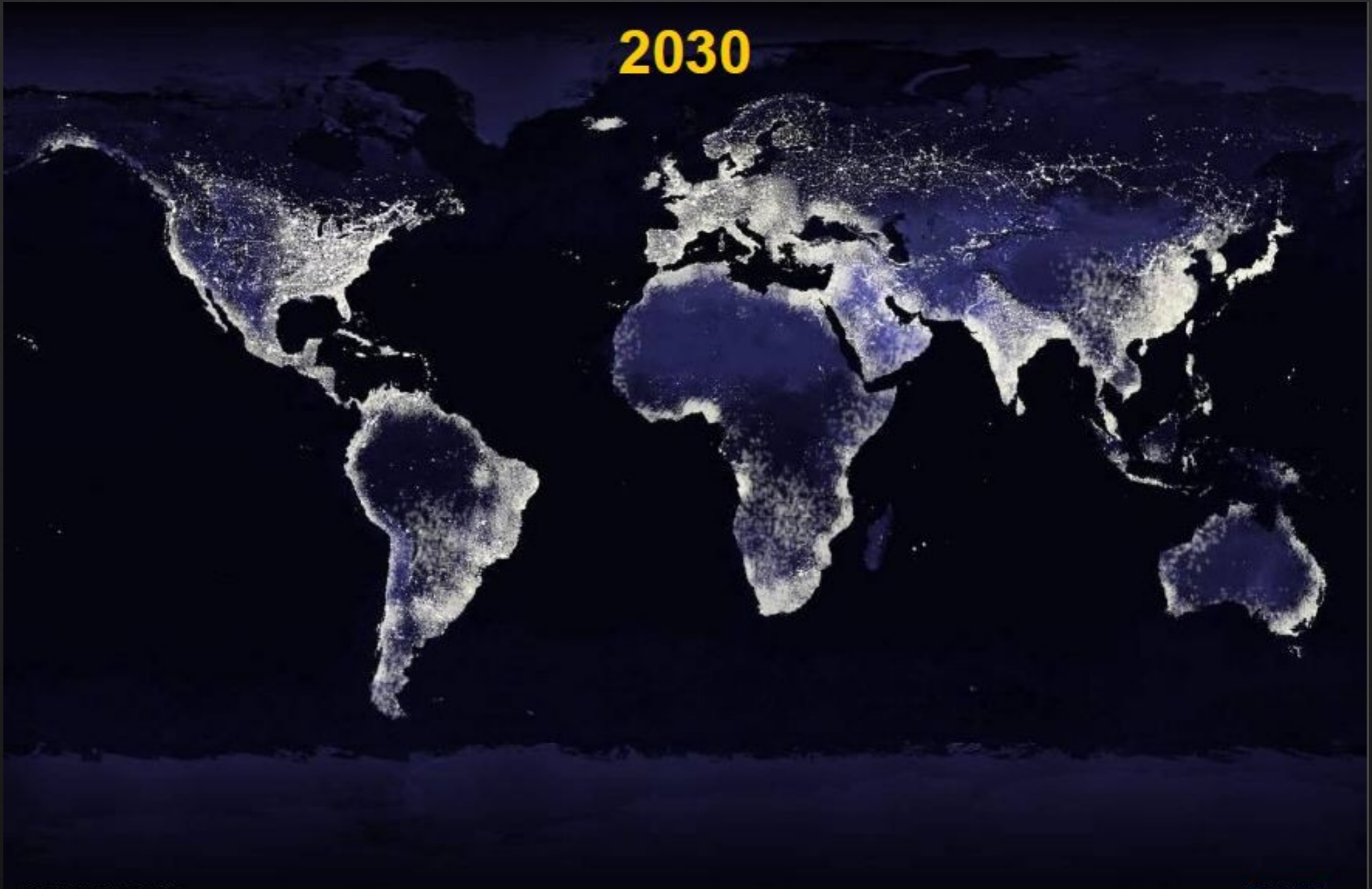


The world economy is expanding at an unprecedented rate

2008



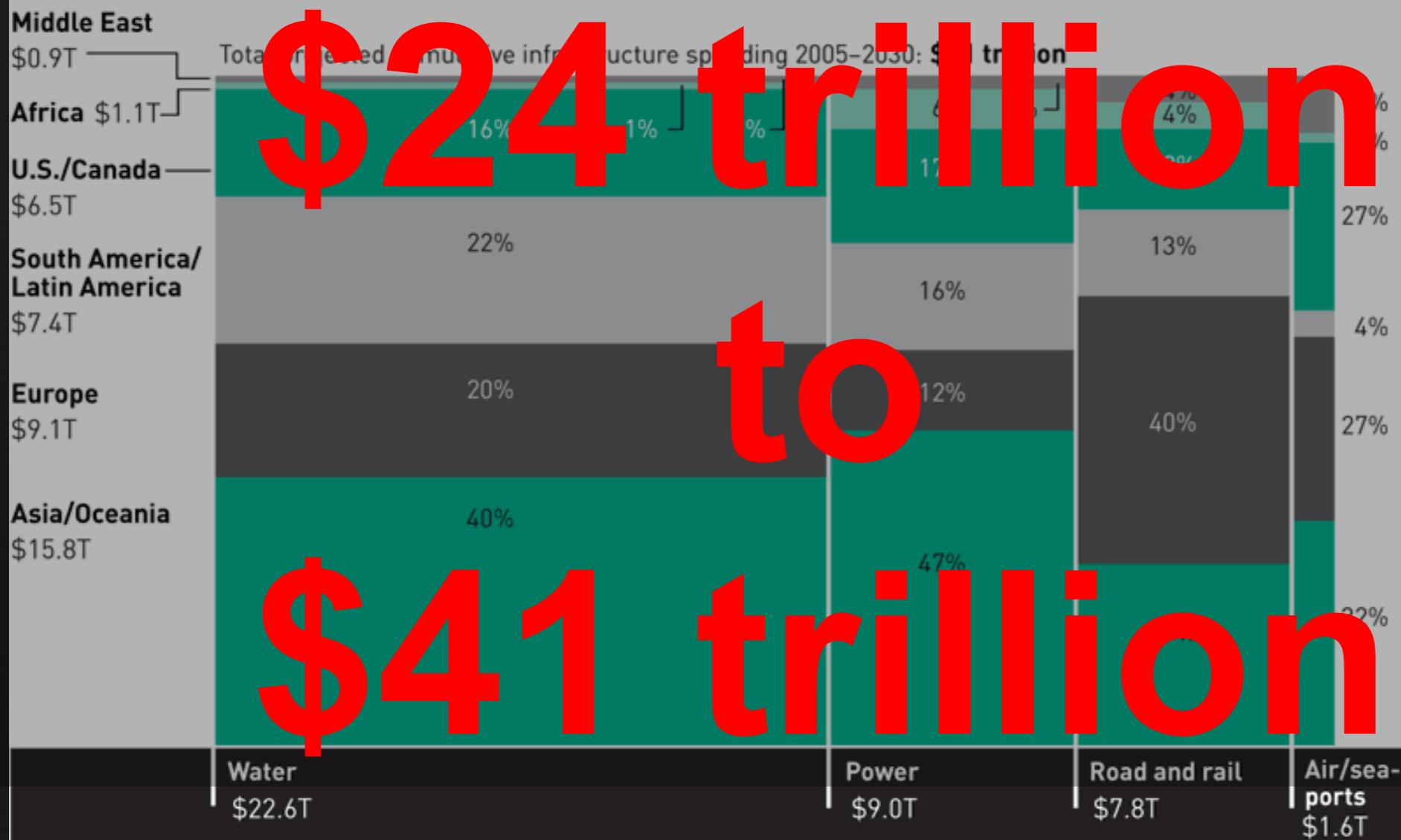
The world economy is expanding at an unprecedented rate



Global infrastructure expenditure 2005-2030

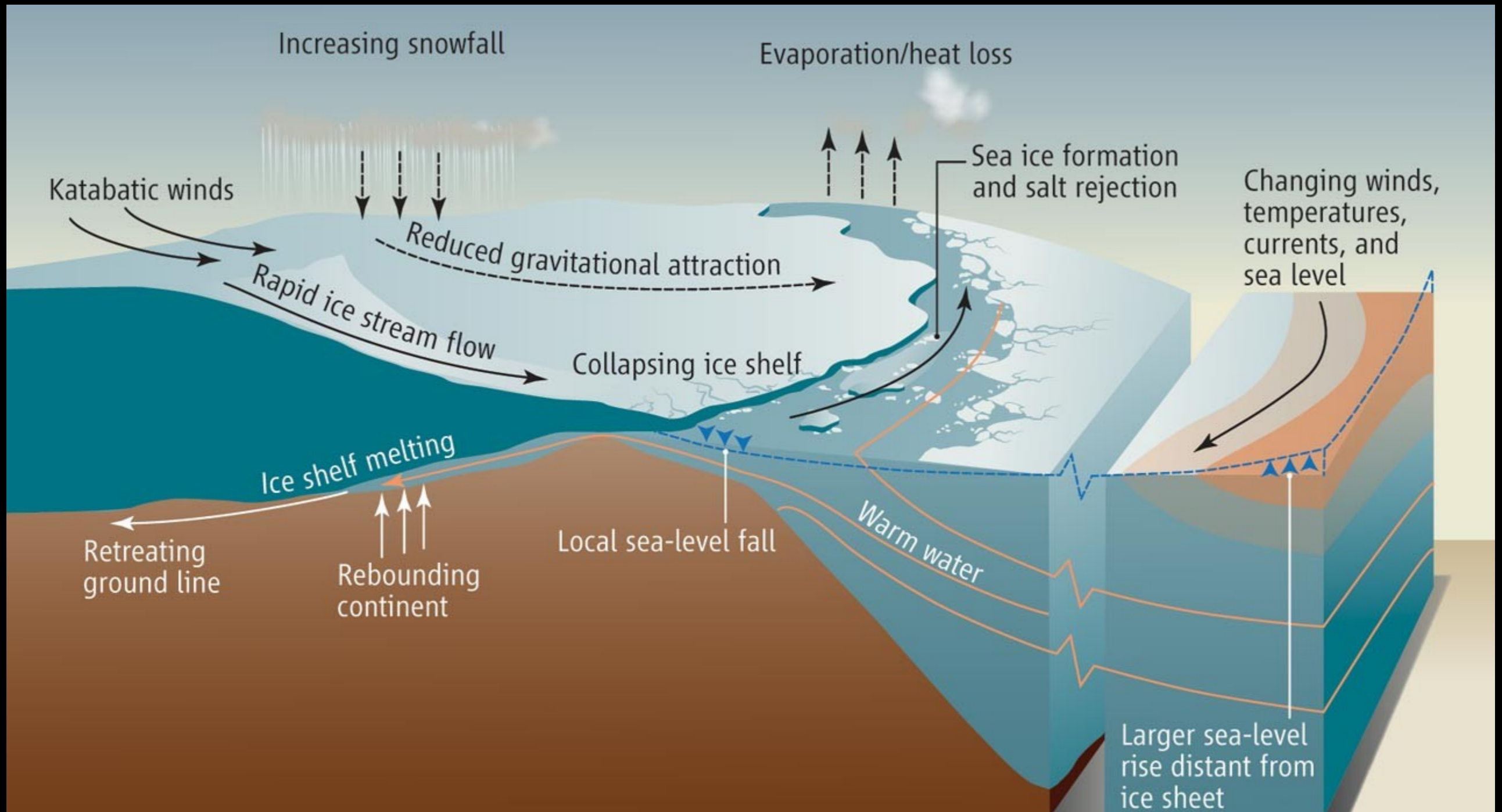
Exhibit 1: The Infrastructure Challenge

Percentages of total projected cumulative infrastructure investment needed during the next 25 years to modernize obsolescent systems and meet expanding demand, broken down by region (rows) and sector (columns).



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

Climate change



Greening construction

Globally \$6-7 trillion annually

Today 6% qualifies as “green”

By 2020 75% will be “green”

Green buildings and infrastructure driven by regulation, owner and investor demands, resource cost, security concerns, and third party standards.

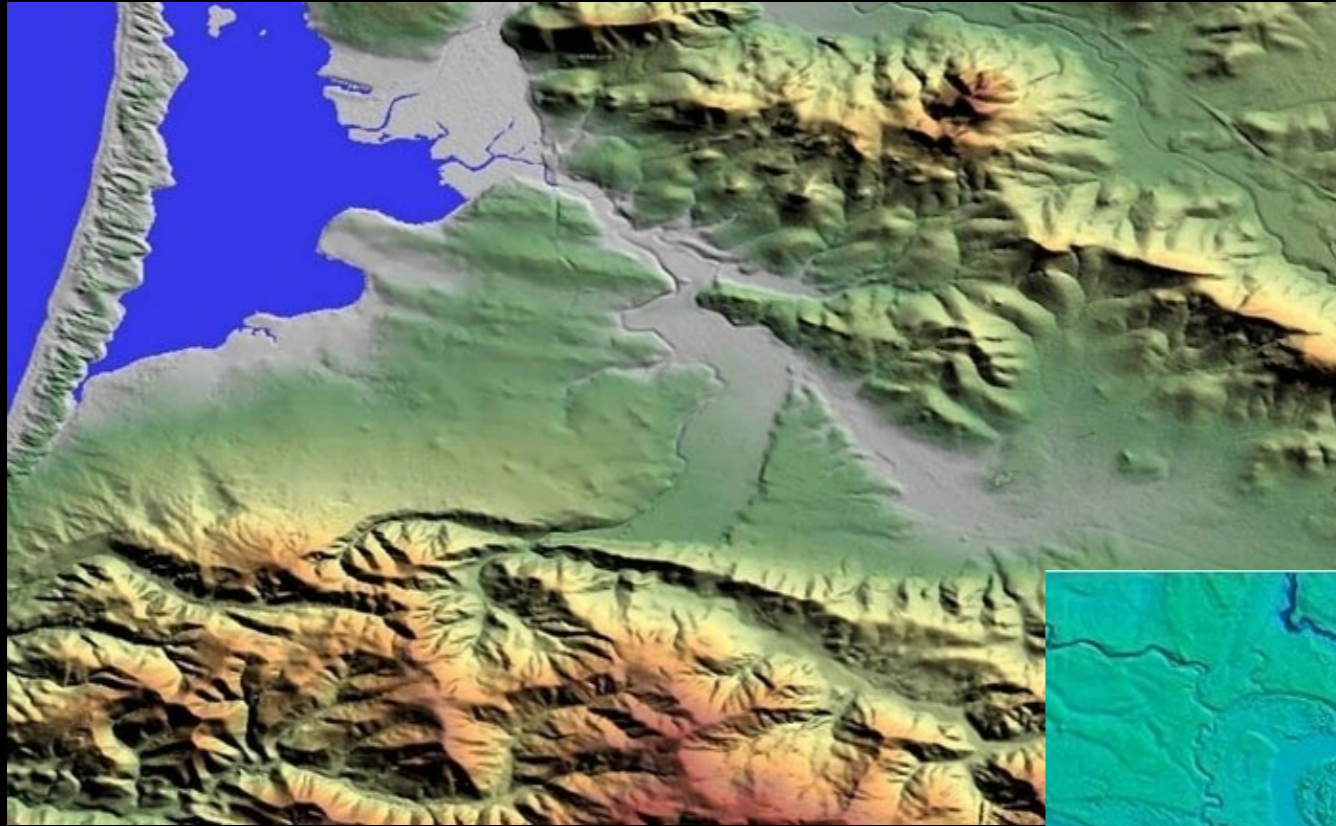
Source: Global Insight



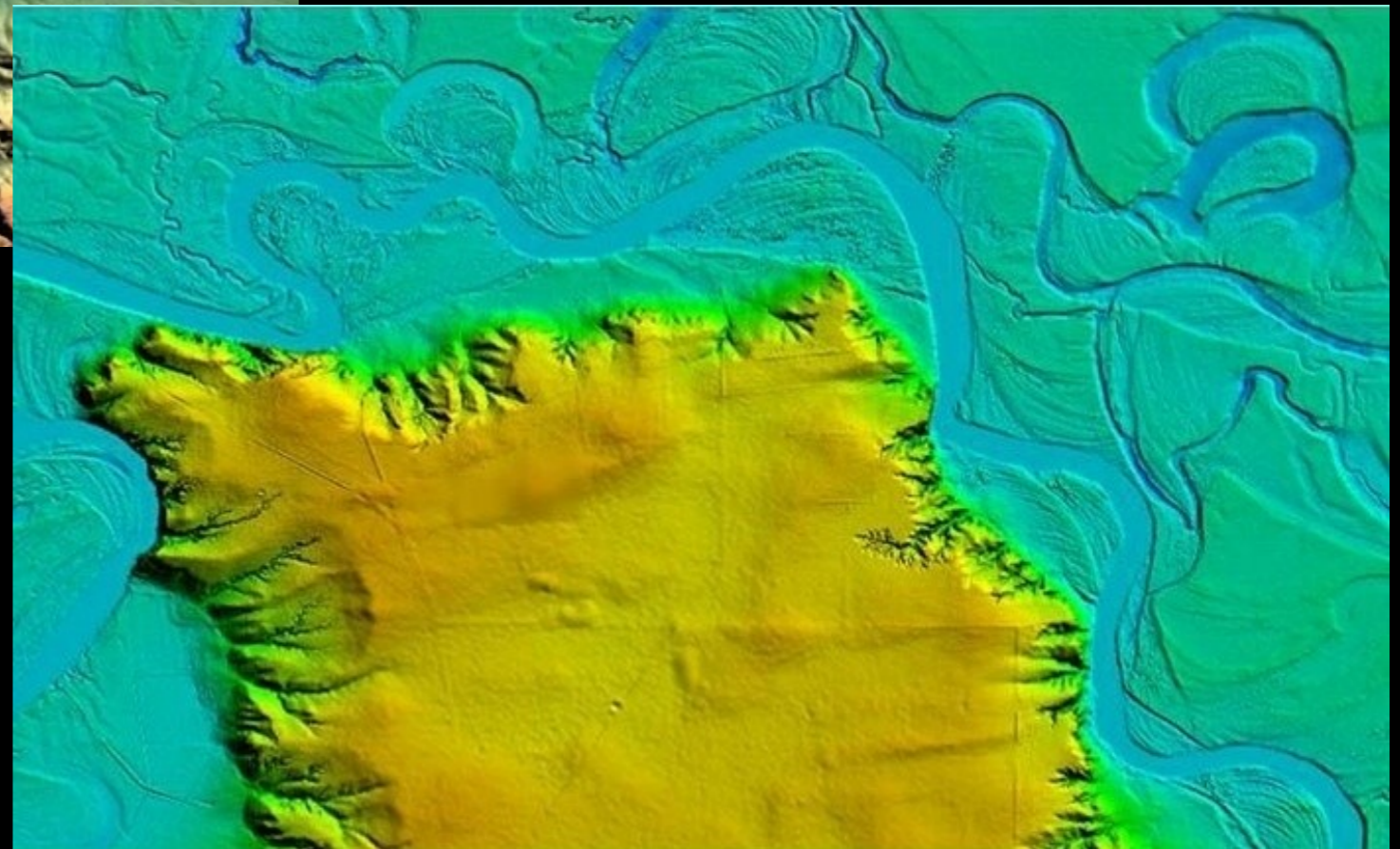
Explosion in geospatial data – new data acquisition technology, licensing and sharing



New geospatial data sources

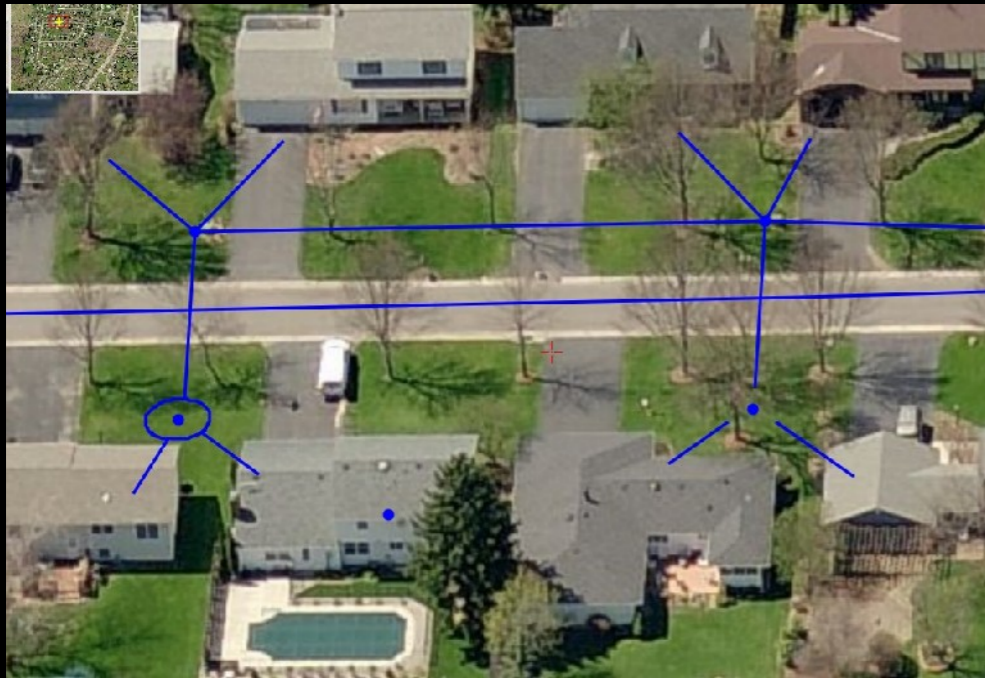


Radar-derived
High-resolution digital terrain models

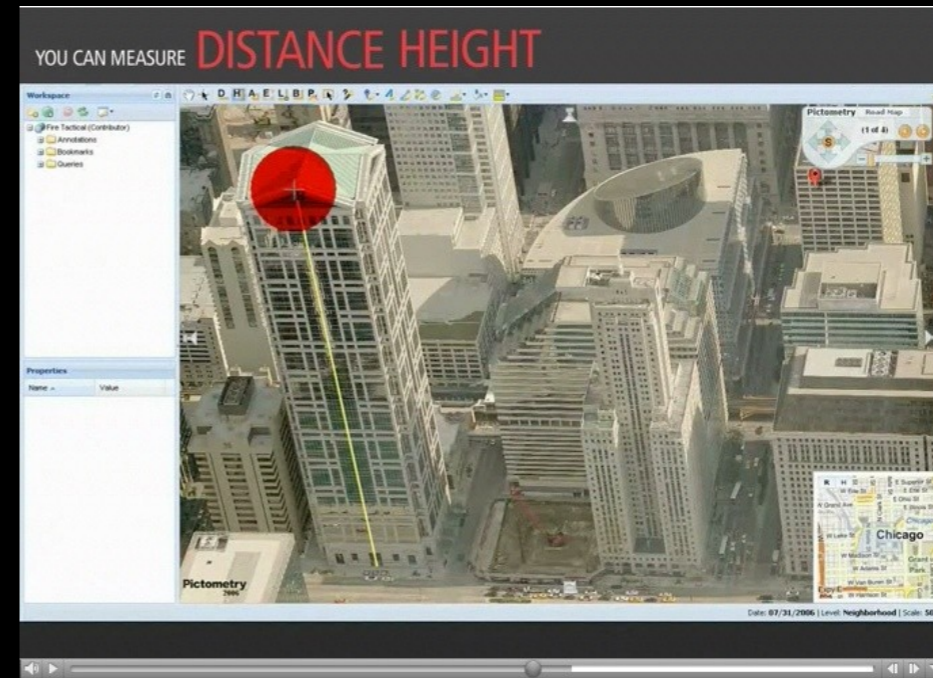


New geospatial data sources

High resolution aerial photogrammetry



Oblique aerial photogrammetry



“Streetview”

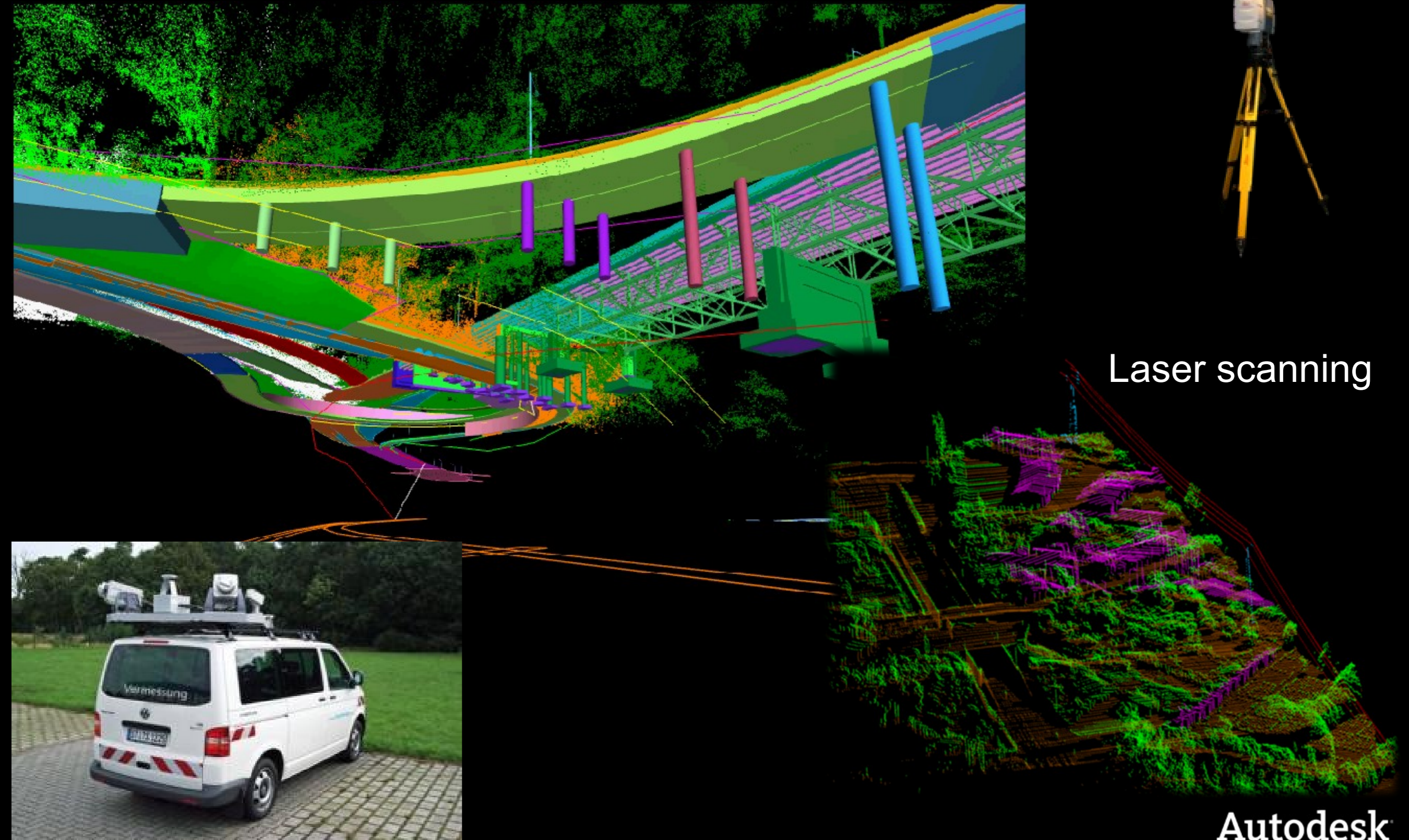


New geospatial data sources



Laser scanning

Autodesk



Transportation Planning

SF Presidio Parkway Project

Laser Scanning to Models for ROW, Planning, Design, Construction and O&M



Crowd-sourced/volunteered

OpenStreetMap

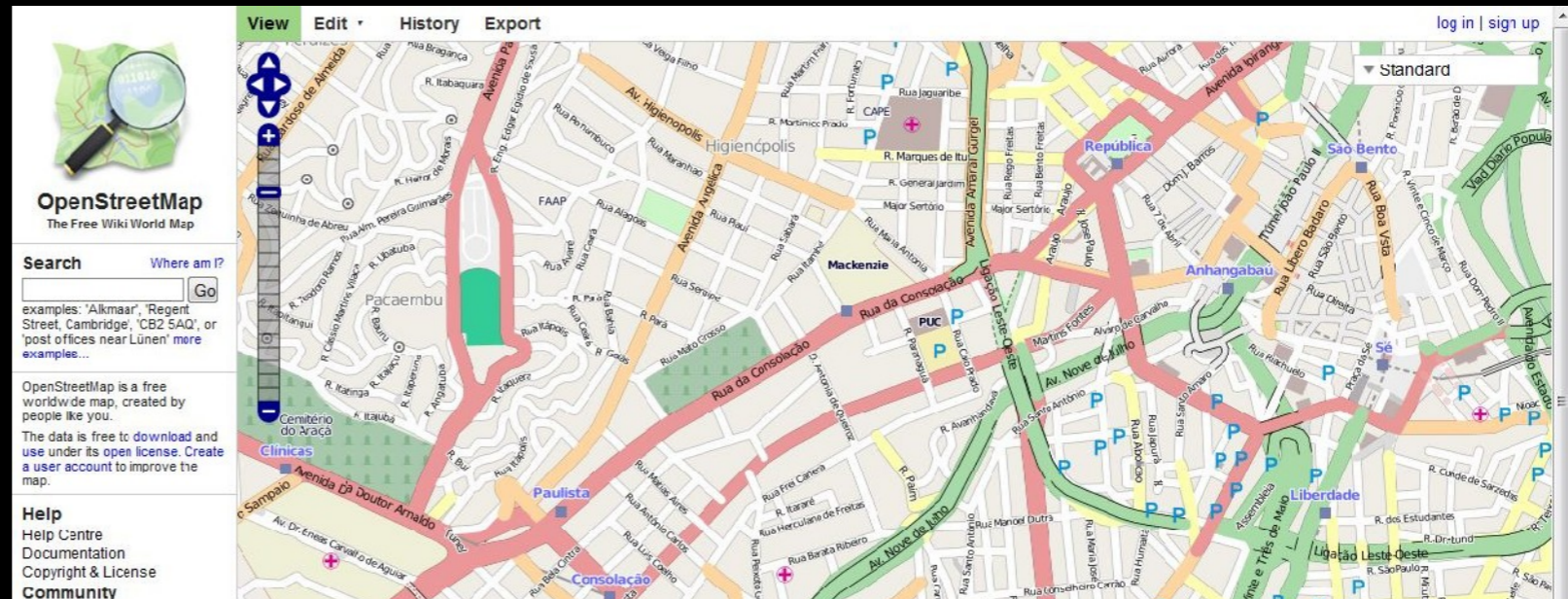
malsingmaps.com

msm
malsingmaps.com
马新卫星导航地图

SITE INFO

10 MSM years
2001 - 2011

Membership
Latest: lurun321
New Today: 78
Total: 166265



Google

Map Maker

You must sign in with your Google Account to edit.

New! Map Maker now is live in France and Monaco !

Enrich Google Maps with your local knowledge

Use Google Map Maker to improve the map of places that matter to you. Update the actual map as seen by millions of people on Google Maps.

What's new in Google Map Maker

- Getting started guide - a step-by-step guide to mapping with Google Map Maker.
- Revised toolbar - Add, Edit, and Browse options together on one toolbar.
- Left hand panel - a more compact view when looking at data details.
- Improved shape editing - add multiple shapes in a single edit.

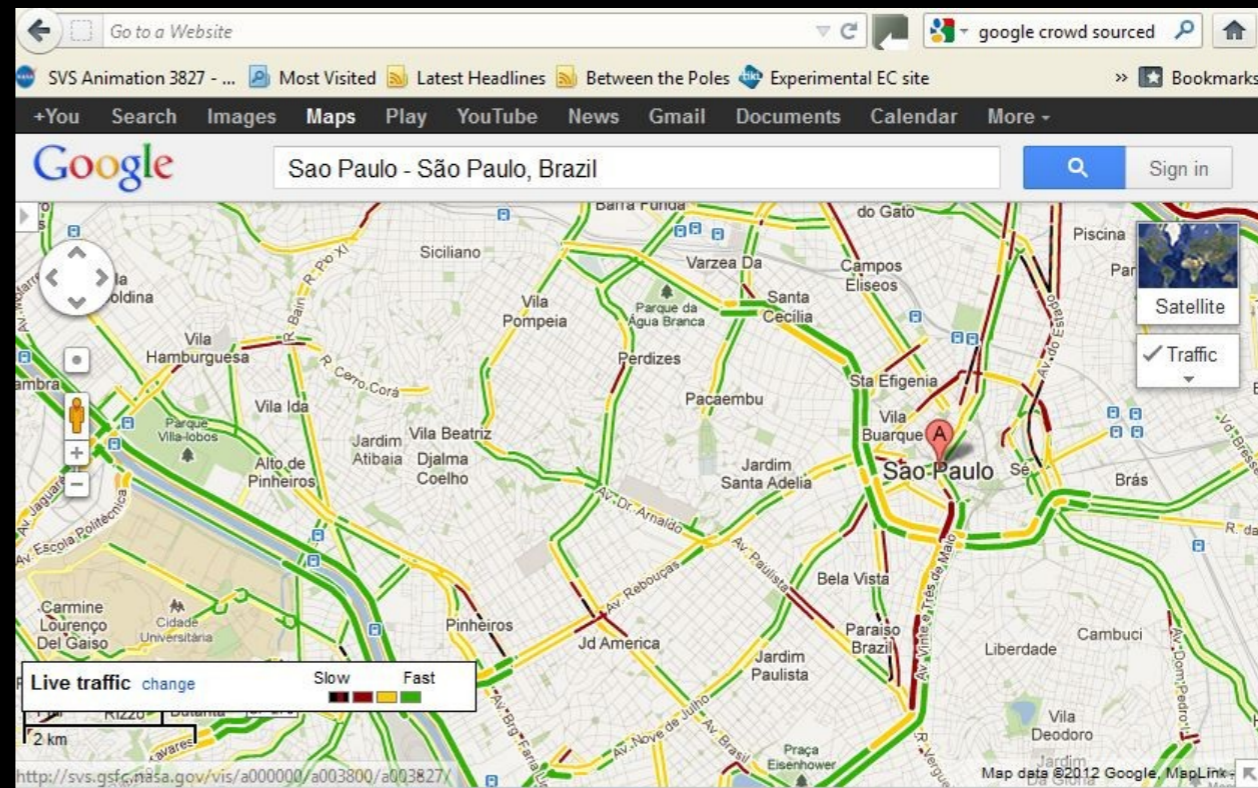
Google Map Maker

Access for sharing data is being revolutionized

Google

“Data creation is not information use”

Ed Parsons, Google



Green Button

One-click access to personal electricity usage

Aneesh Chopra, US CTO




Access to objects in the Internet of things

- Everything has an internet address or URI.
- Allows single-click access to individual objects, e.g., a utility pole, power transformer, or water valve.
- Example - accessing a particular property parcel in Nanaimo, BC with a single click.

2323 ROSSTOWN ROAD - PROPERTY REPORT

CITY OF NANAIMO
THE WASHINGTON CITY

Home > Tools > Catalog > 2323 ROSSTOWN ROAD

GENERAL INFORMATION		PARCEL MAP
Address:	2323 ROSSTOWN ROAD, NANAIMO, BC	
Code:	R5038 L31	
Plan:	27884	
Site:	28 ACRES	
Legal Description:	LOT 7, SECTION 18 R4S 26, RANGE 7, INTERIM REPORT, PLAN 27884	

EXTENDED INFORMATION	
Soil:	IC-1 SANDY SILTY CLAYSTONE (SCL)
Water Table:	None - 10' to 15' (10' to 15' from ground)
Groundwater:	None
GIS Link:	GIS/27884
Location:	R5 18012 - 18 0000

View other parcels at [2323 ROSSTOWN ROAD](#), or [view all parcels in this area](#)

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Jason Birch, City of Nanaimo

Ed Parsons, Google

Sharing government data: Open licensing

DATA.GOV
EMPOWERING PEOPLE

Site search

HOME DATA APPS COMMUNITY METRICS OPEN DATA SITES GALLERY WHAT'S NEW

Data.gov Catalogs

Use the Data.gov catalog below to access U.S. Federal Executive Branch datasets. Click on the name of a dataset to view additional metadata for that dataset. By accessing the data catalogs, you agree to the [Data Policy](#). Data.gov offers data in three ways: through the "raw" data catalog, using tools and through the geodata catalog. The "Raw" Data Catalog provides an instant download of machine readable, platform-independent datasets while the Tools Catalog provides hyperlinks which may lead to agency tools or agency web pages that allow you to mine datasets.

 **GEODATA**

OS **OpenData**TM

 **Government of Canada** / **Gouvernement du Canada**





Open Data
www.data.gc.ca

De wegwijzer naar informatie en diensten van alle overheden

Overheid.nl

Home Particulieren Ondernemers Overheidsinformatie Open data Over deze site

Zoeken

Open uw data

Open data
Home open data >
Nieuws >

 **dados.gov.br**

 **ckan** *The open source data portal software*

 **TORONTO**


How can we help you?

toronto.ca/open

-- building a city that thinks like the web

 **CITY OF VANCOUVER**

Open Data Catalogue Beta v2

Montréal 

**PORTAIL
DONNÉES OUVERTES**

Sharing government data: Global licensing standard

- 2007 Creative Commons (CC) licensing for all government data recommended in Queensland, Australia
- 2012 OpenStreetMap adopted ODbL (Open Database License)
- Trend for each country to adopt its own
 - Geo Shared (Netherlands), Musterlizenzvereinbarung (Germany), GILF (Queensland), GeoGratis (Canada), and Ordnance Survey (UK)
- Researchers at TU Leiden proposing common global license for all government geospatial data.



As a result, the role of government is changing



What is the role of government in geospatial ?

National mapping agencies are asking

- Could the private sector and crowd-sourcing be the only producers of geospatial data ?
- What is the role and responsibility of government ?
- What is the relationship between the private sector including crowd-sourced orgs and government ? As regulator ? As competitor ?
- Do we need a collective voice among governments ?



GGIM: A Global Initiative

- An Inter-Governmental Mechanism to make joint decisions and set directions on the production and use of geospatial information within national and global policy frameworks;
- Working with Governments to improve policy, institutional arrangements, and legal frameworks;
- Addressing global issues and contributing collective knowledge as a community with shared interests and concerns;
- Developing effective strategies to build geospatial capacity in the developing countries;

 **GGIM** | United Nations Initiative on
Global Geospatial Information Management <http://ggim.un.org>

What is the role of government in geospatial ?

For example, a possible role for government

Authority - defines authoritative spatial data

- Ex, geodetic grid systems, core reference structure, administrative boundaries, census boundaries

Regulator - rather than a source, of data

1. First choice for data source – private sector including commercial and crowd-sourced
2. Second choice - government, if not financially viable or data is too sensitive

Data access for sharing - alternatives

- Commercial , e.g., Google, Bing (contracted or with advertising ?)
- Government, e.g., data.gov
- Both



Realizing a Vision

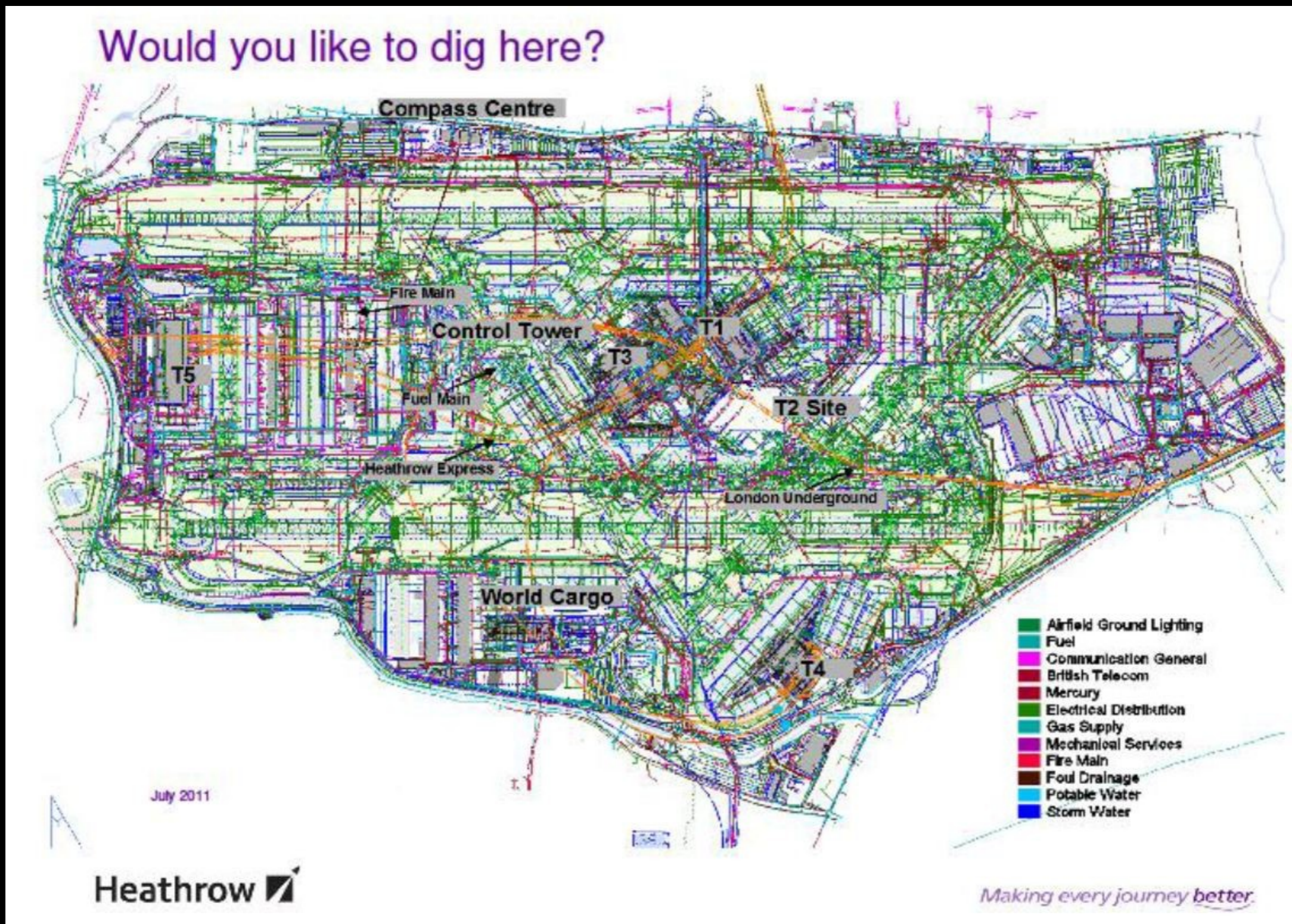
- Private sector has an important role, but cannot do it all. Similarly, Governments cannot do it all either;
- Need a global regulatory framework to safeguard the interests of Governments and the public, and to promote continual investment by the private sector;
- Need to work together - GGIM, Governments, international organizations, and the private sector - to improve technology, quality, and management;
- **Realizing a Vision: To make accurate, authoritative, reliable geospatial information readily available to support national, regional and global development.....**

GGIM | United Nations Initiative on
Global Geospatial Information Management <http://ggim.un.org>

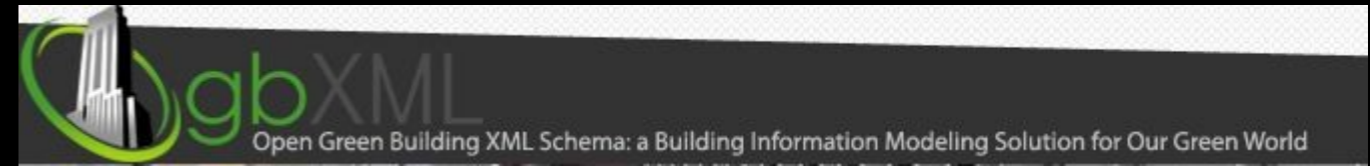
Standards for interoperability
expanding beyond traditional GIS



Sharing geospatial information about infrastructure is essential



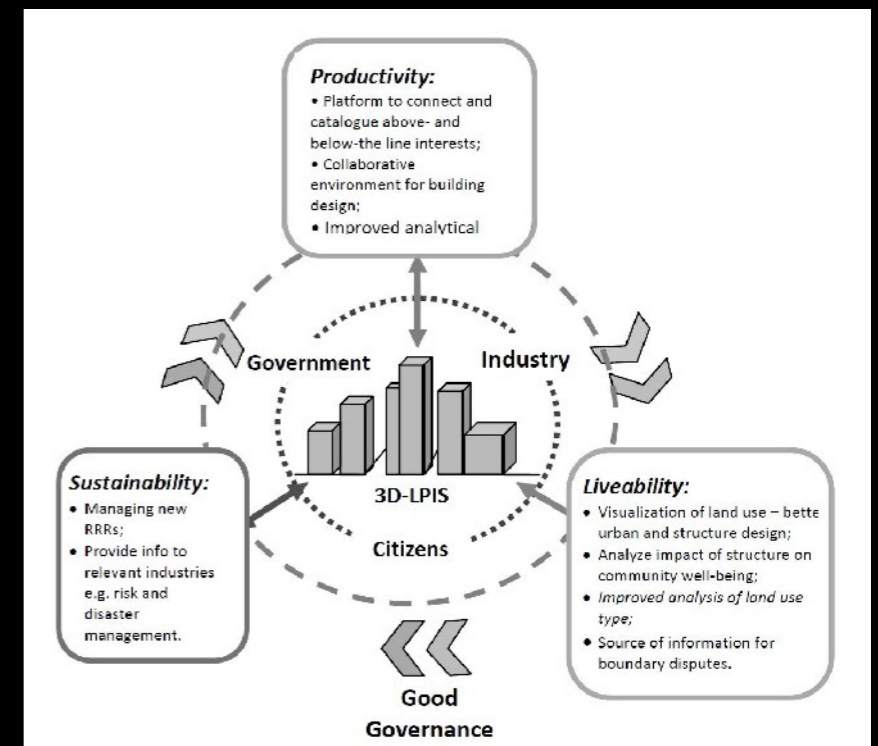
Standards for interoperability reaching beyond spatial



3D land and property information systems

Several countries are working on 3D cadastre and property IS

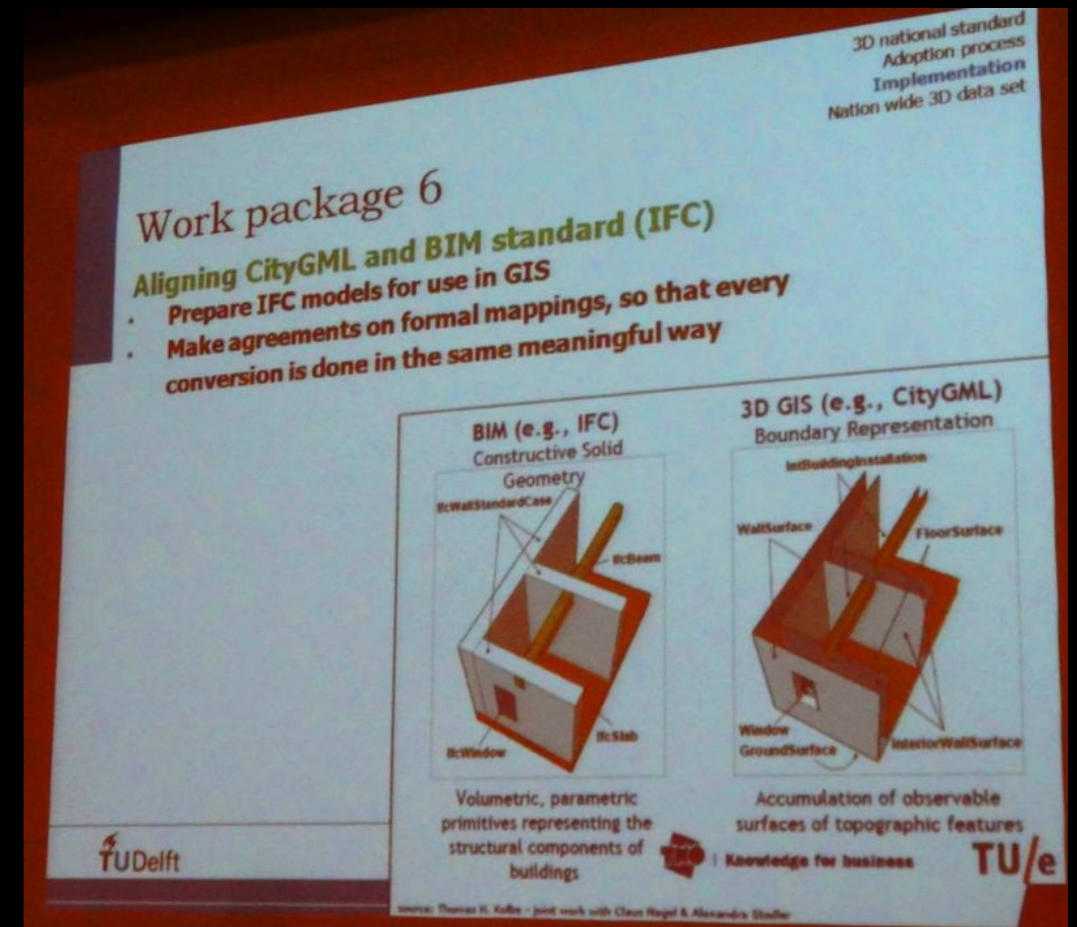
- Germany - 3D cadastre model by 2013
- Singapore, Malaysia, Australia, ...
- Netherlands – developing a 3D standard for cadastres



Dutch 3D standard as basis for 3D cadastre

Dutch 3D standard integrating

- CityGML - OGC standard for city information
 - everything outside of buildings
- IMGeo - Dutch standard for large scale geography
 - roads, tunnels, water bodies, and land use
- Geonovum - responsible for NSDI (National Spatial Data Infrastructure)
- In pilot by 100 organizations in the Netherlands.

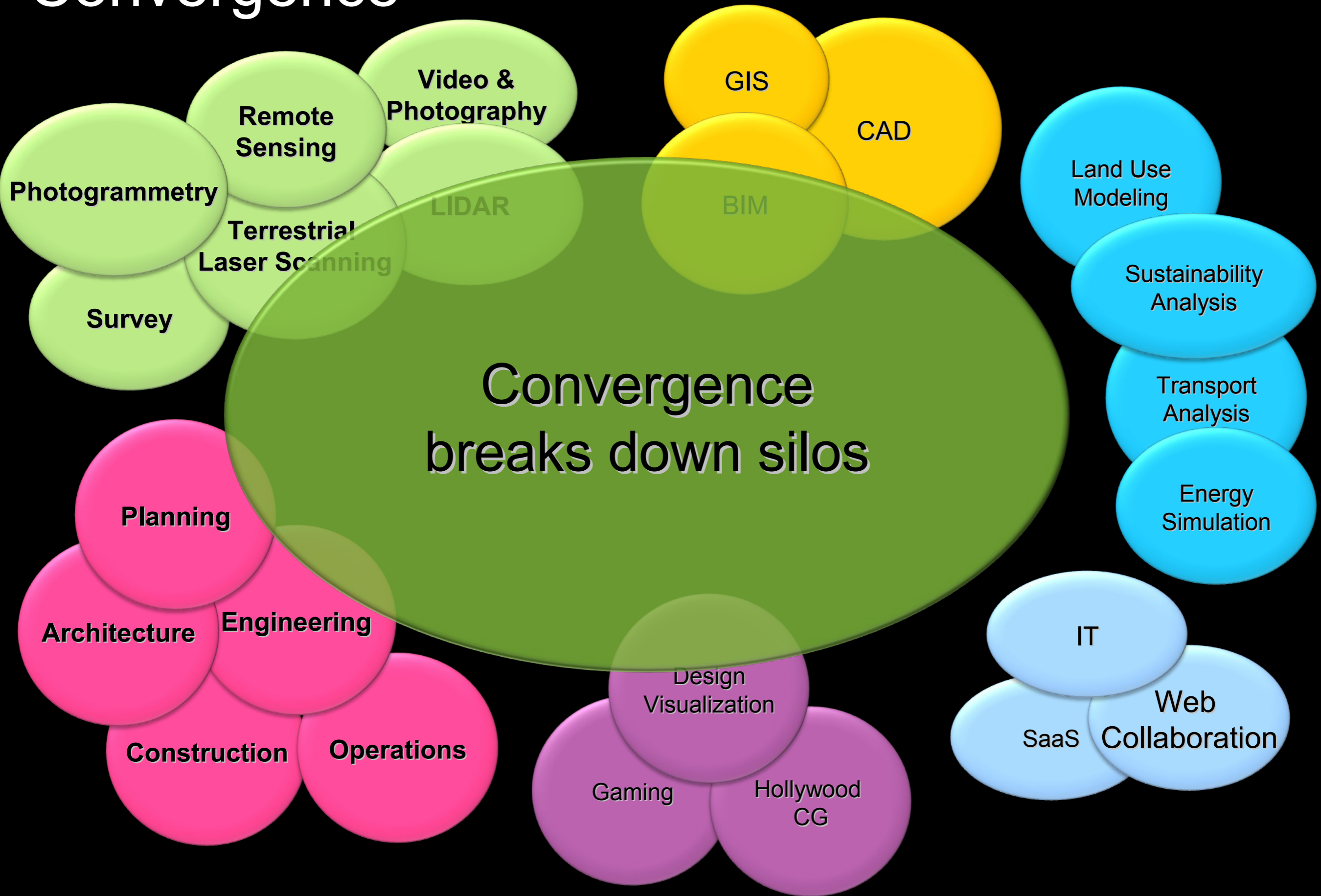


Inside buildings

Working Group 6 intends to define a standard mapping between

- GeoBIM (a CityGML extension)
- IFC (Industry Foundation Classes) BIM standard maintained by BuildingSmart.

Convergence

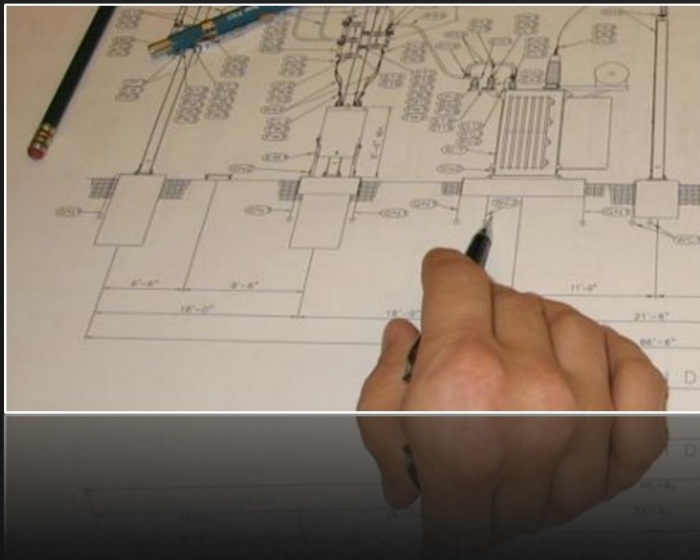


Engineering design is evolving too: CAD to BIM

CAD

- Graphics only
- Lacks intelligence
- Lacks domain knowledge

Deliverable is paper



Model based design or BIM

- Integrates geospatial and engineering design data
- Enforces business and engineering rules
- Automates clash detection
- Automates change propagation
- Reduces data redundancy
- Improves collaboration among design teams
- Automates bill of materials and job costing
- 3D visualization involves non-technical stakeholders in design process

Benefits

- Increases productivity
- Reduces risk
- Reduces costs
- Improves design quality

Deliverable is an intelligent digital model

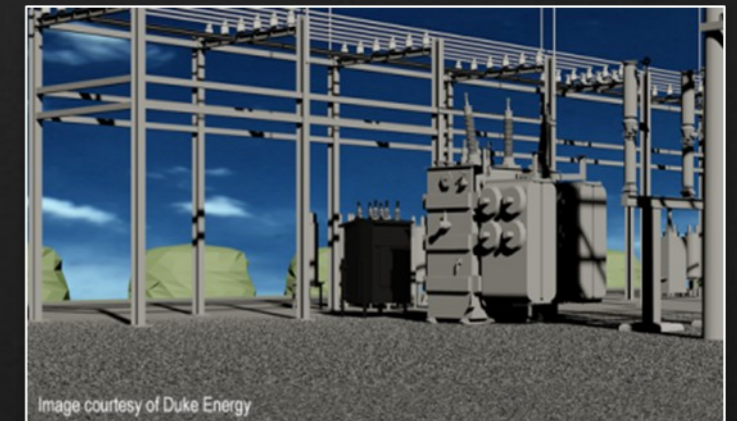


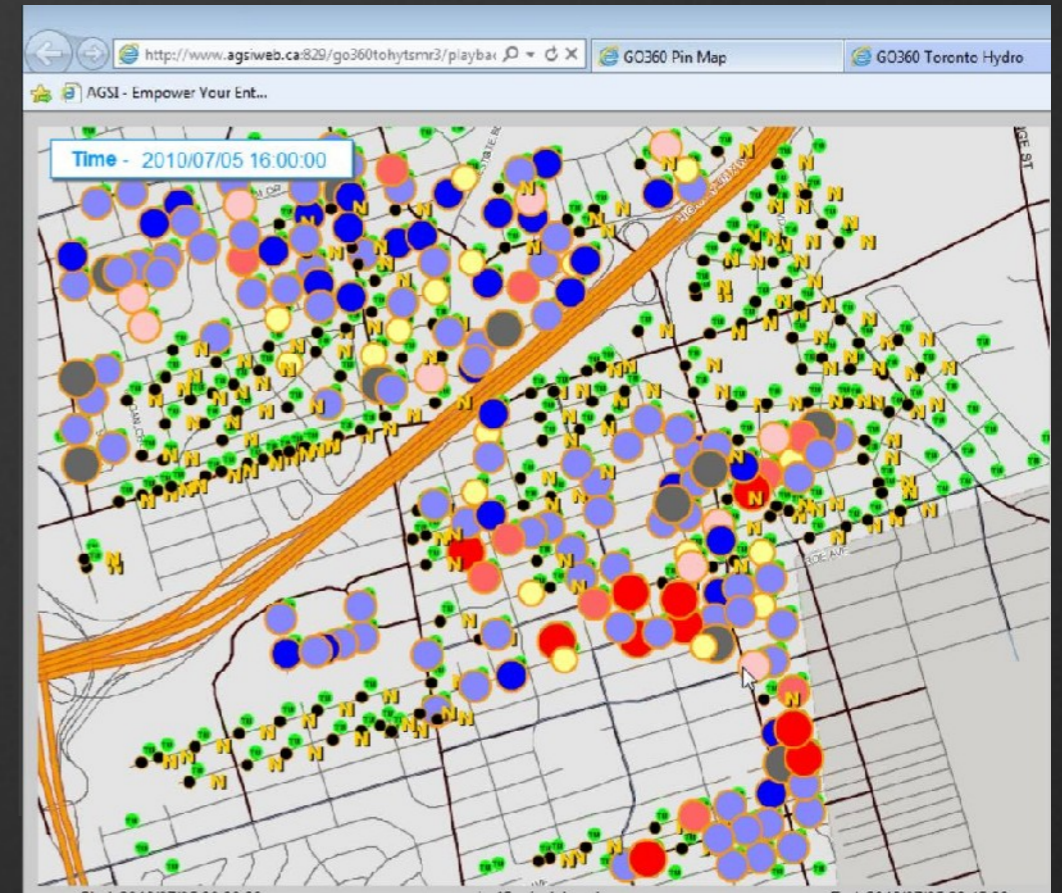
Image courtesy of Duke Energy

Image courtesy of Duke Energy

Real-time smart grid monitoring and analysis

Typical smart grid (Burlington Hydro)

- Self-healing distribution network
- Smart meters and AMI
- Distributed generation (mostly solar PV)
- Electrical vehicle charging
- Factory ride-through
- Battery-based electricity storage

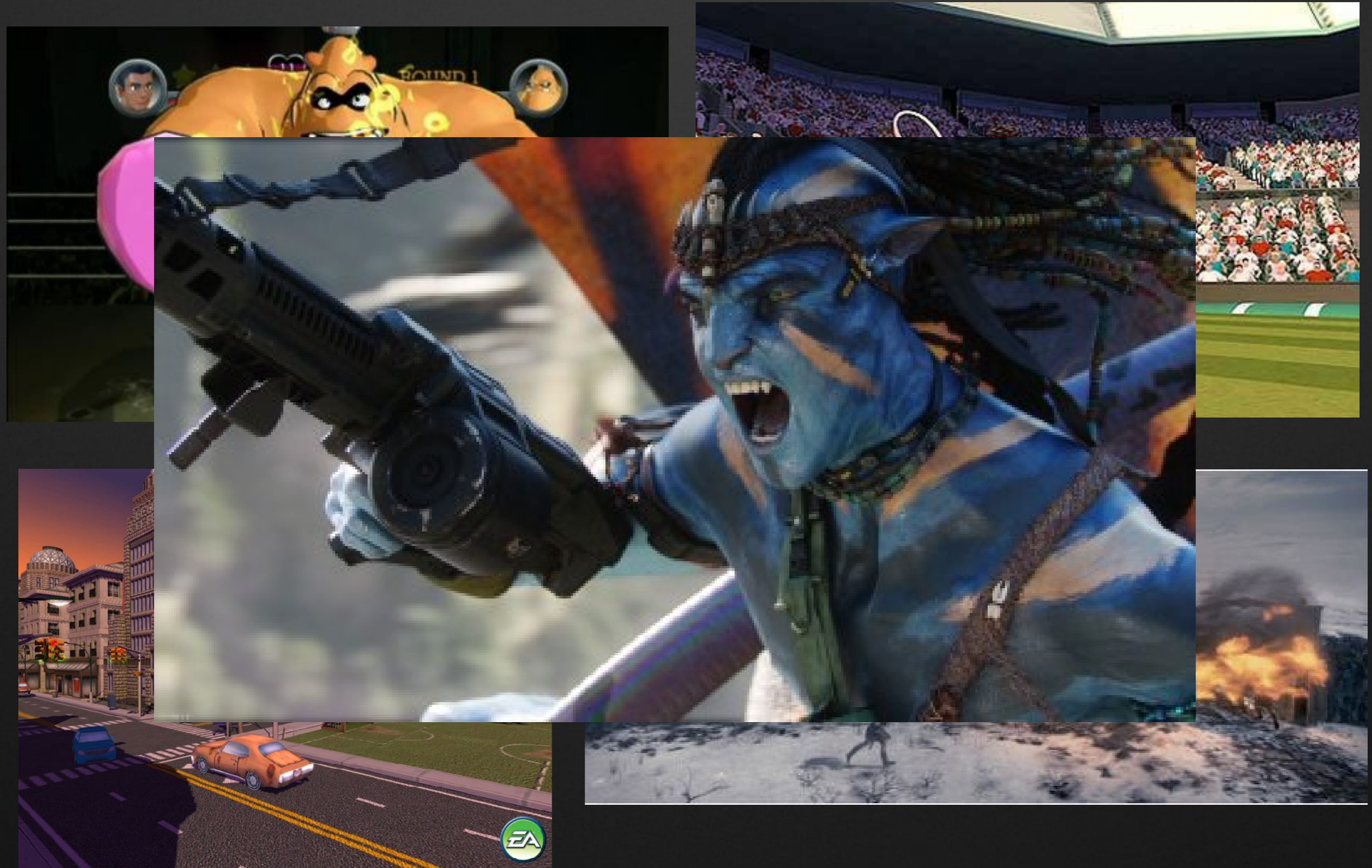


Smart Grid for Operations and Asset Analytics

Transformer Weekly Summary Report (July 5 to July 9, 2010)

Transformer Number: GT3979		Report Period: 05/07/2010 to 09/07/2010 in 2 hour Intervals	
Formula			
Transformer Rating:	50.0 KVA	Peak Interval Reading (kW/15min) * 4 / 0.9 (kVA)	
Peak Demand:	91.93 KVA	Max. Instantaneous Demand (since meter register was reset)	
Peak Demand:	82.74 KWh		
Overload:	74 %	Overload: 74% of the time	
Load Factor Rating:	0.65	Ratio of Avg. Demand to Max. Demand	
Use Factor Rating:	1.84	Ratio of Peak Demand (kVA) to Installed Capacity	
Outage Count:	2	Derived from AMRDEF daily outage summary values	
Outage Duration:	30.0 Minutes	Derived from AMRDEF daily outage summary values	
Loss of Life:	6.7 %	Loss of Life: 6.7%	
Coincidence Factor:	1.0	Max. simultaneous demand (in kVA) divided by sum of maximum demands of each device (in kVA)	
Throughput:	6481.07 KWh		

Gaming and 3D visualization



Visualizing a design

Lighting Design & Analysis

SF Presidio Parkway Project



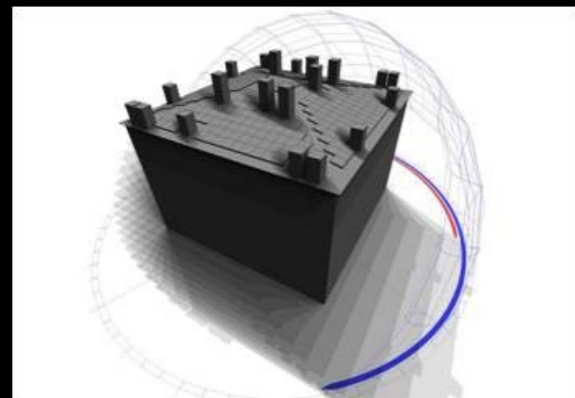
5D for financial control of construction projects

SF Presidio Parkway Project



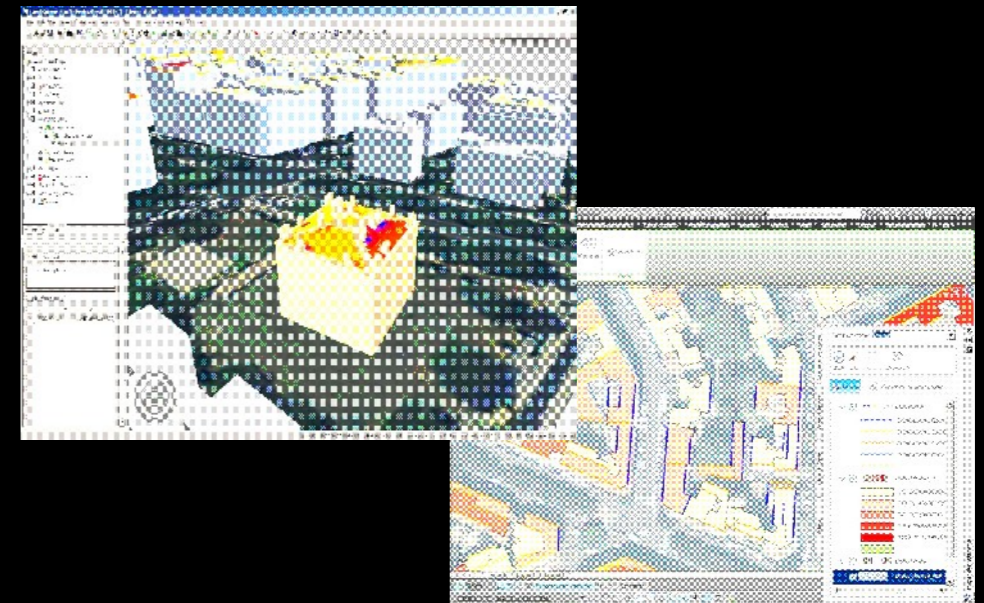
Vision for sustainable city design

Reality Capture → Energy Modeling → Mapping

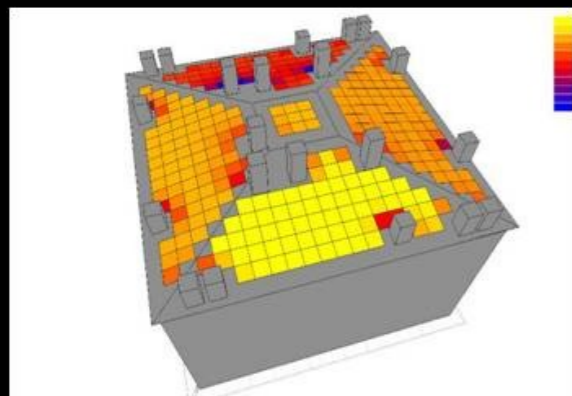


Architect's BIM model

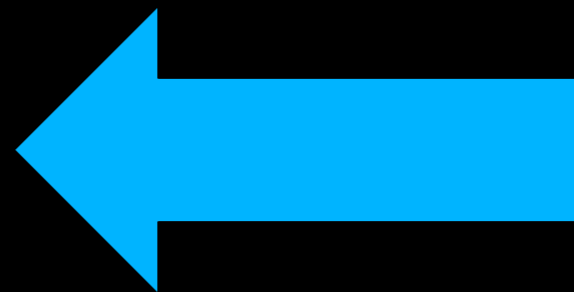
City 3D Model



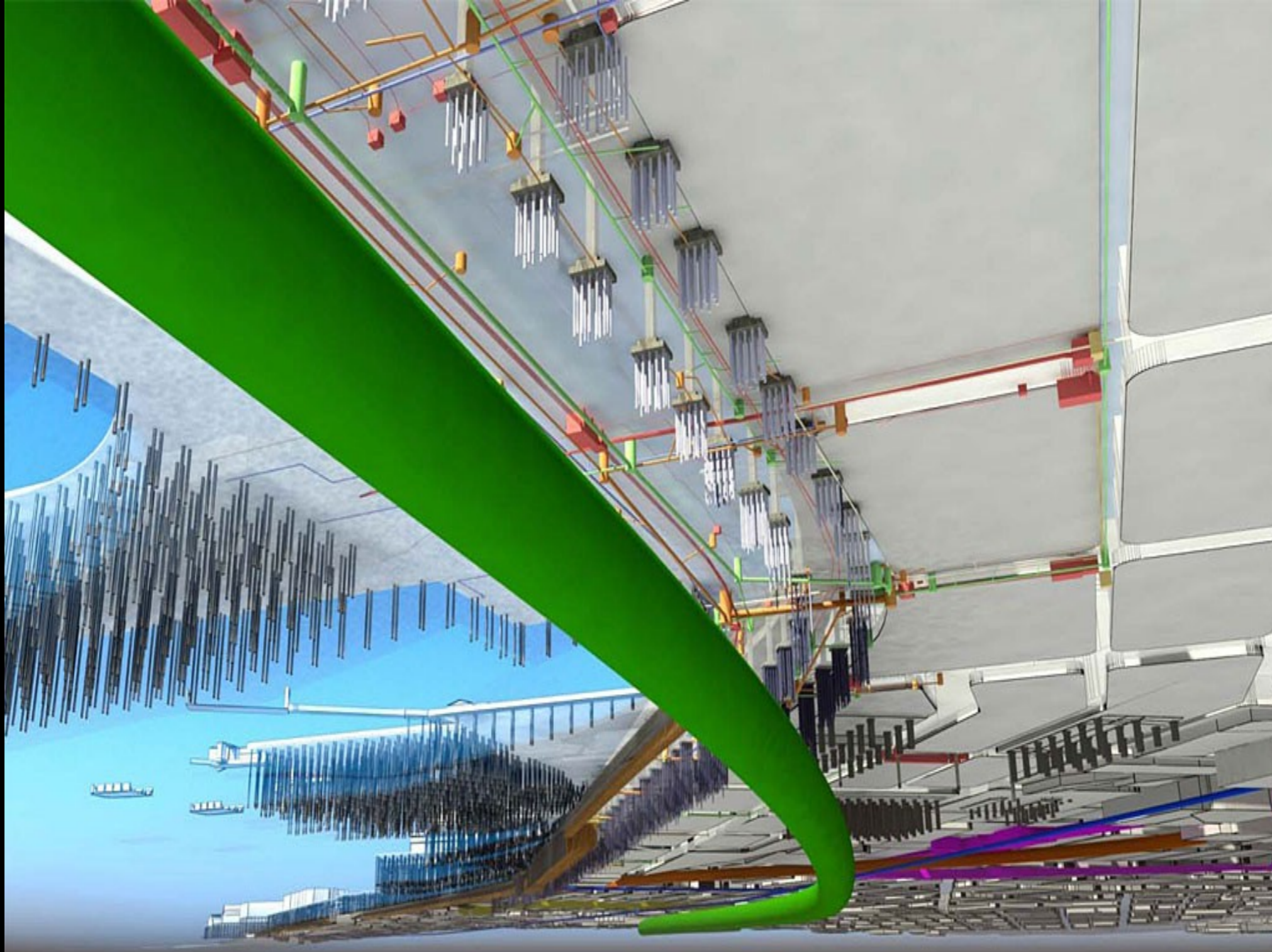
Conceptual design – integrate architectural and engineering designs and city 3D model



Environmental impact



Modeling urban underground infrastructure



Enables intelligent 3D city models

Los Angeles

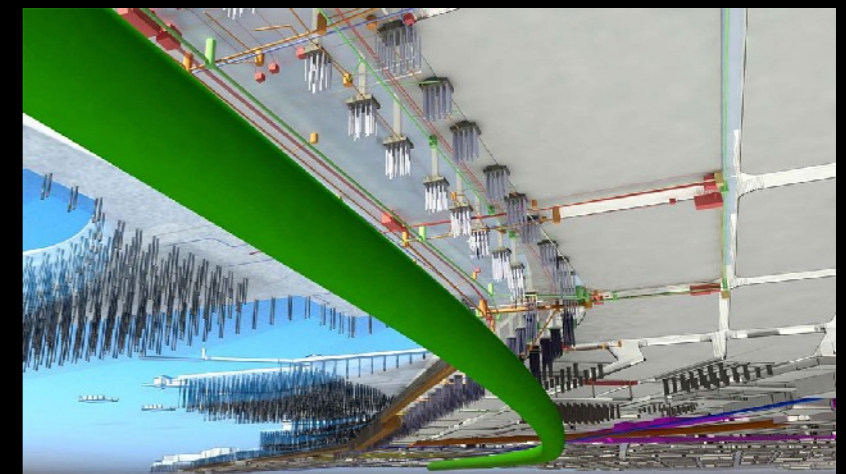
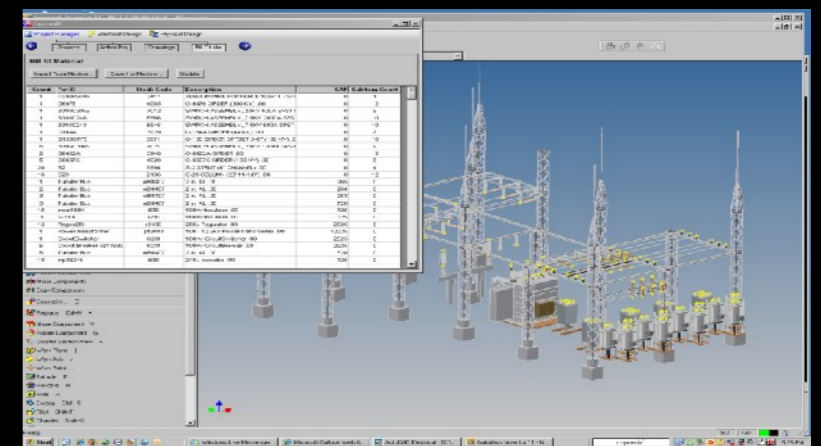
Planning, Design, Visualization, Collaboration, Public Outreach, Agency Approvals

LACMTA_baseline_animation



Some takeaways

- New geospatial data acquisition technology, licensing, and access for sharing
- Role of government in geospatial is changing
- Some countries are already developing 3D cadastres
- Standards for interoperability are expanding beyond traditional GIS
- Interoperability enables convergence of geospatial, BIM, and 3D visualization
- Makes possible new ways to solve problems in an increasingly urbanized world



geoff.zeiss@autodesk.com

<http://geospatial.blogs.com>

Designing for a sustainable future



Summary

- Geospatial data
 - New data capture technologies
 - Volume rising exponentially
 - Crowd-sourced/volunteered data
 - Data access is being revolutionized
 - Open data
 - Commercial access
- Role of government is changing
 - UN GGIM redefining role of government
 - Authoritative, but many sources of data
 - commercial, crowd-sourced, government
 - Global licensing standard
- 3D cadastres, land and property information systems
 - Germany - model for 3D cadastre by 2013
 - Singapore
 - Australia
 - Netherlands) working on a 3D standard for cadastres
- Standards for interoperability expanding beyond traditional GIS
 - City models - CityGML
 - Utility networks - CityGML Utility ADE
 - Inside buildings - Geonovum integrating IFC and CityGML
 - Industry geospatially-aware interoperability standards
 - Transportation - LandXML
 - Electric utilities T & D - IEC CIM
 - Buildings (BIM) – IFC, COBie, Omniclass
 - Green buildings – gbXML
 - Smart grid - NIST, SGIP, and OGC
- Convergence - geospatially-aware vertical applications are penetrating all sectors of the economy
 - 80% or 100% ?
 - Ex Construction and infrastructure
 - Ex Smart grid