



# Location Powers; Our Urban Environment

## Spatial Technologies, Standards and Interoperability for the Urban Environment; where are we now?

Name: Scott Simmons

Title: Executive Director Standards Program

Organisation: OGC

Email: [ssimmons@opengeospatial.org](mailto:ssimmons@opengeospatial.org)



# Agenda

- Something from me
- **MOST IMPORTANT:** the next 12 speakers!



# What is OGC's interest?

- OGC enables the Power of Location
- Honest broker amongst stakeholders
- Long history with interoperability



# Today

- Why do we need standards?
- Who are the stakeholders?
- How do the stakeholders drive standards?
- What standards are available?



# Modern times call for modern tools

**LETA 911**  
Larimer Emergency Telephone Authority

IT'S NOT A JOB...  
IT'S A RESPONSIBILITY

QUESTIONS? 970-962-2170 | f | t

Search

HOME ABOUT LETA911 9-1-1 INFORMATION MAPS NEWSROOM BOARD EMD CONTACT US

IF WE CAN'T **REACH** YOU, WE CAN'T **ALERT** YOU

**EMERGENCY ALERTS**

**SIGN UP NOW**

ALREADY A MEMBER? SIGN IN VIEW RECENT ALERTS

**EMERGENCY ALERTS** **9-1-1 EDUCATION** **TEXT TO 9-1-1** **RESOURCES**

**WELCOME TO LETA**  
Larimer Emergency Telephone Authority, LETA911, is the Governing Authority for 9-1-1 in Larimer County Colorado.

**LATEST FROM THE NEWSROOM**  
**Wildfire Update**  
Friday, September 14th, 2018

**OGC®**  
Making location count.

**This Issue**Views **14,470** | Altmetric **389**

Download PDF



More ▾



Cite This



Permissions

**Original Investigation** | Health Informatics

ONLINE ONLY



August 31, 2018

# Use of Deep Learning to Examine the Association of the Built Environment With Prevalence of Neighborhood Adult Obesity

Adyasha Maharana, MS<sup>1</sup>; Elaine Okanyene Nsoesie, PhD<sup>2</sup>[» Author Affiliations](#) | [Article Information](#)*JAMA Network Open.* 2018;1(4):e181535. doi:10.1001/jamanetworkopen.2018.1535



Why do we need standards?



# To provide consistency







# To provide context



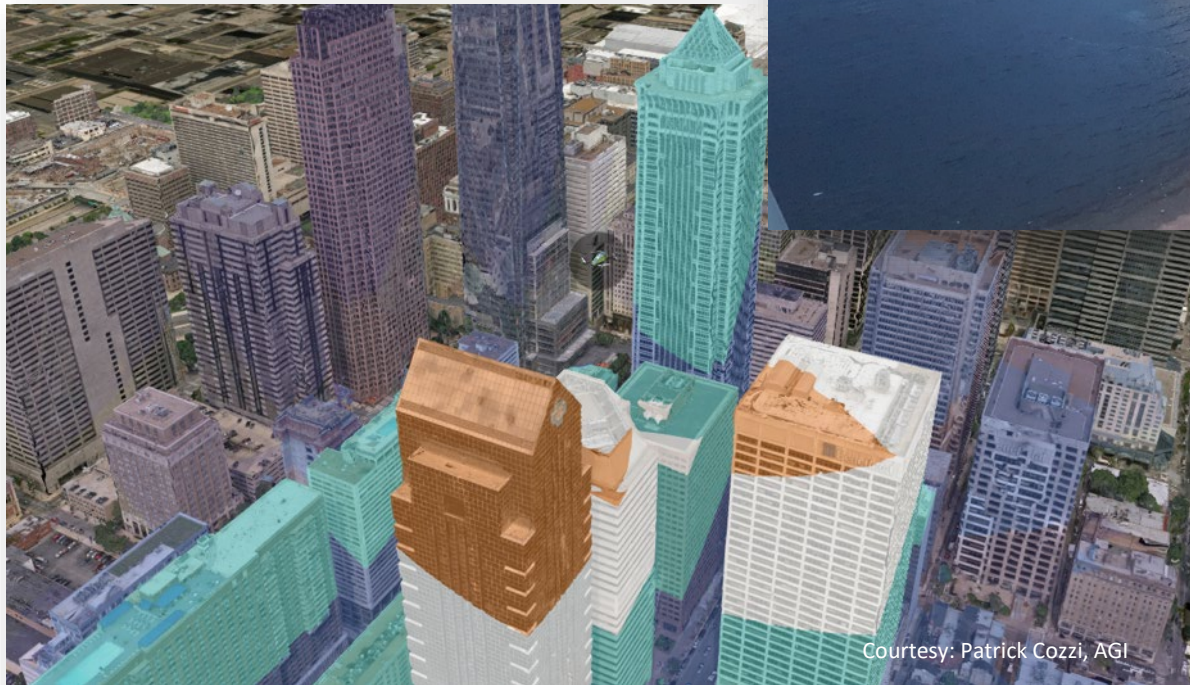
Copyright Billings Gazette



Sylvain Pedneault: CC-BY SA 3.0



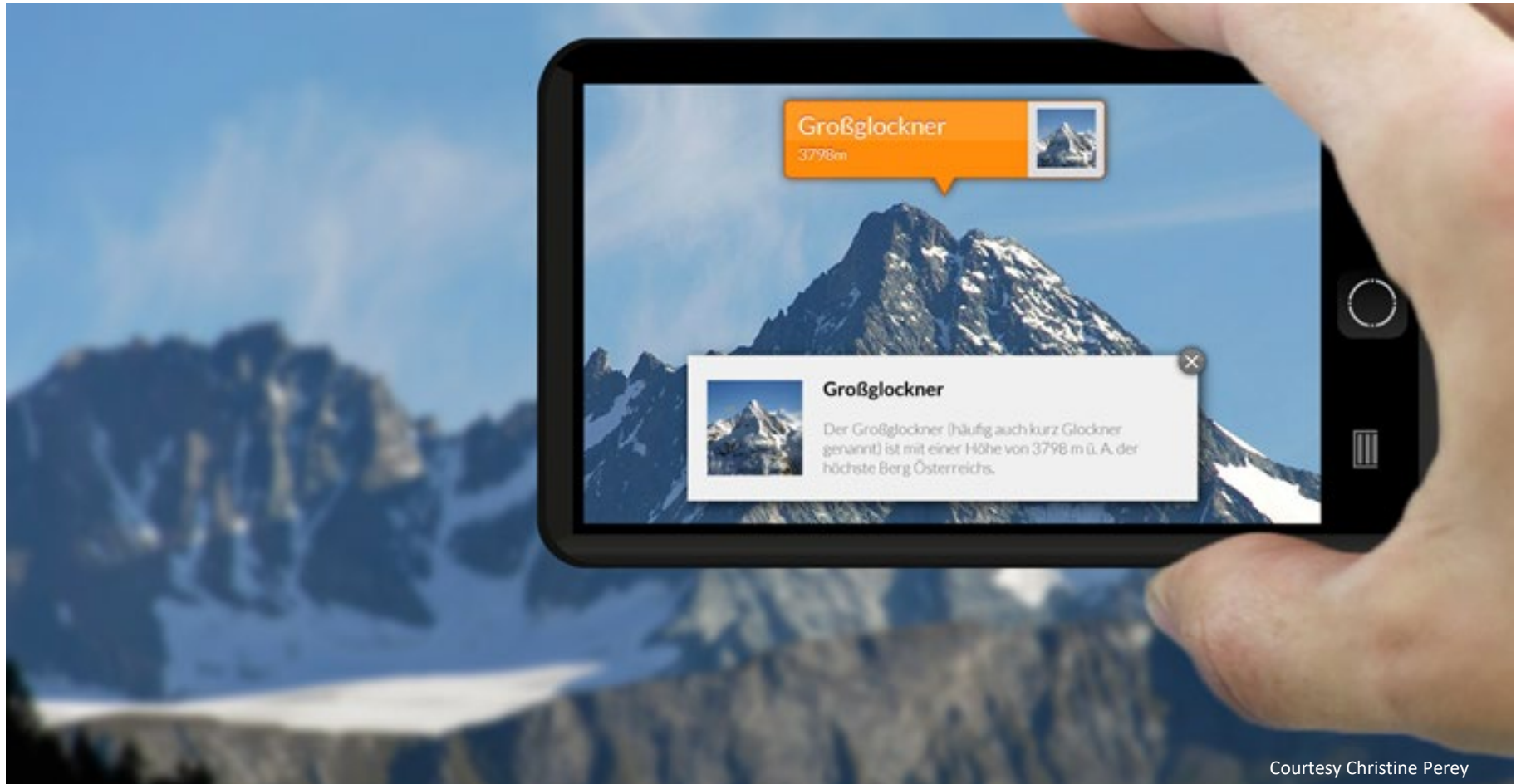
# To satisfy our citizens



Courtesy: Patrick Cozzi, AGI



# To excite visitors





# To enable business





Who are the stakeholders?



# City management



City of Los Angeles, CA USA



# City service providers



heart beat,  
breathing rate

wearable cam

location,  
acceleration,  
headings

equipment status



# Citizens



Singapore National Parks





# Engage your citizens



## COBWEB Dyfi Biosphere Reserve Portal (Beta)

This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 308513.



[Home](#) [Q Search](#) [Map](#) [About](#) [Sign in](#) [Register](#)



## Find a survey and start contributing



Featured surveys

Take a tour

Calendar

**Snowdonia National Park Japanese Knotweed Survey - poly**

Survey to record the distribution of Japanese Knotweed within the boundaries of the Snowdonia

[Read more](#)

**COBWEB**  
Citizen Observatory Web

**Gemmas Tutorial**

Describe your survey here

[Read more](#)

**APCE-ymlledol**

Mae prosiect Awdurdod Parc Cenedlaethol Eryri i gasglu gwybodaeth am rywogaethau ymlledol fel Llysiau'r Dial, Jac y Neidwr a Rhododendron...

[Read more](#)

○○○○



# Businesses





How do stakeholders drive standards?



# Not optimal

- Historical fire fighting in the US – and its lingering legacy
  - Started as volunteer organizations, often part of the social setting of neighborhood
  - Insurance companies began selling “fire insurance marks” to indicate which houses had insurance and pays responders
  - This leads to a business opportunity – cities get multiple fire companies who respond for profit – sometimes they fight over the job (see “Gangs of New York”)
  - Fire companies begin installing hydrants with specific connectors to their hoses, specifically non-standardized to keep other companies away
  - 1853: Cincinnati, Ohio starts the first city-wide municipal fire department and develops a standard for connectors based on one of the local patterns
  - Even today, most cities have standard connectors only for their city or parts of the city, few share the standards across boundaries

# Thread Charts

The following charts list many commonly used threads. Red Head Brass manufactures products with any thread required. In fact, our special thread codes number in excess of **2,200 different thread configurations**. Call Red Head Customer Service for assistance.

## Commonly Used Threads

Note: NPT threads are not available on female swivels.

SIZE	NATIONAL STANDARD NH (NST)		STRAIGHT IRON PIPE NPSH (IPT)		GARDEN HOSE GHT		BRITISH STD PIPE BSP		NEW YORK CORP NYC		NEW YORK CITY FD FDNY		PACIFIC COAST PCT		CHICAGO HOSE		CHICAGO FIRE DEPT CFD		NAVY HOSE	
	ODM	TPI	ODM	TPI	ODM	TPI			ODM	TPI	ODM	TPI	ODM	TPI	ODM	TPI	ODM	TPI	ODM	TPI
3/4"	1.375	8	1.035	14	1.062	11.5	1.041	14					1.062	11	1.081	11.5				
1"	1.375	8	1.295	11.5			1.309	11			1.660	8	1.312	11.5	1.295	11.5				
1½"	1.990	9	1.878	11.5			1.882	11	2.093	11	2.100	8	2.100	11	1.946	11.5	1.933	11.5		
2"	2.515	8	2.352	11.5			2.347	11	2.547	11	2.530	8	2.550	10	2.522	8				
2½"	3.068	7.5	2.841	8			2.960	11	3.000	8	3.030	8	3.035	7.5	3.043	7	2.990	7.5		
3"	3.623	6	3.470	8			3.460	11			3.630	8								
3½"	4.243	6	3.970	8			3.950	11			4.070	8					4.052	8		
4"	5.010	4	4.470	8			4.450	11			4.610	8	4.828	6			5.011	4	4.908	6
4½"	5.760	4	4.970	8							5.800	4								
5"	6.260	4					5.450	11			6.260	4								
6"	7.025	4					6.450	11			7.025	4								

Abbreviation for Tapered Iron Pipe Thread is NPT (National Pipe Tapered) or TIPT. NPT threads are not available on female swivels. Standard threads for Red Head are National Standard (NH or NST), Straight Iron Pipe (NPSH, IPT or SIPT), Garden Hose (GHT)

### OTHER U.S. STANDARD 2 1/2" HOSE THREADS

CITY	IDM	TPI
Buffalo, NY	3.0625	8
Cincinnati, OH (New)	3.0580	6
Cleveland, OH	3.0781	8
Denver, CO	3.0920	8
Detroit, MI	3.1250	7.5
Omaha, NE	3.0781	8
Phoenix, AZ (Old)	3.0620	6
Pittsburgh, PA	3.0625	6
Salt Lake City, UT	3.2500	6
Toledo, OH	3.0000	8

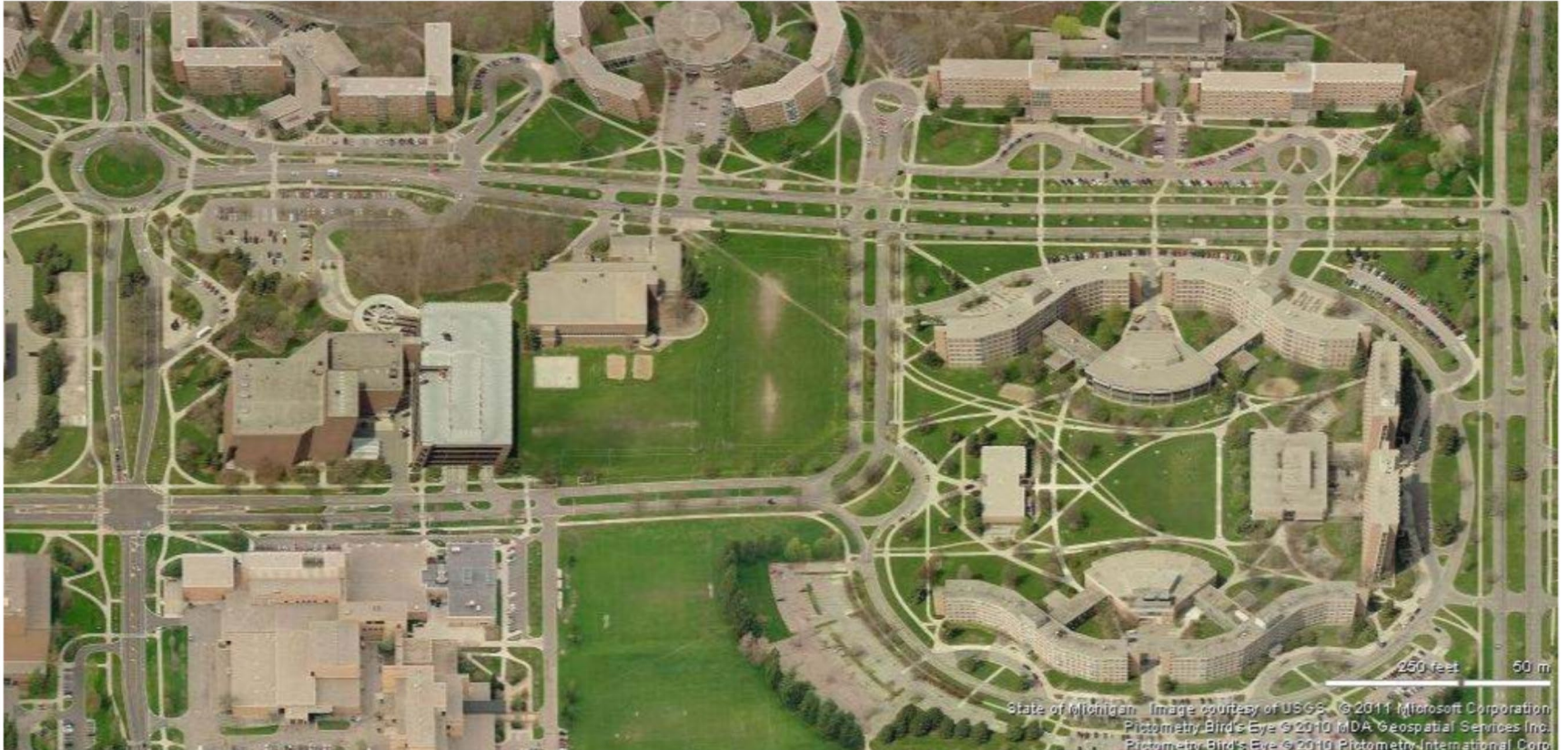
### OTHER CANADIAN STANDARD 2 1/2" HOSE THREADS

		ODM	TPI
AMA	Alberta Mutual Aid	2.990	8
BCT	British Columbia	3.000	8
CSA	Canadian Standards Assoc.	3.125	8
QST	Province of Quebec Std.	3.031	7
WCT	Western Canada Fire Under	3.250	6
NOVA	Nova Scotia- Zone 1	3.234	5
QMT	Quebec/Montreal Combination	3.031	7





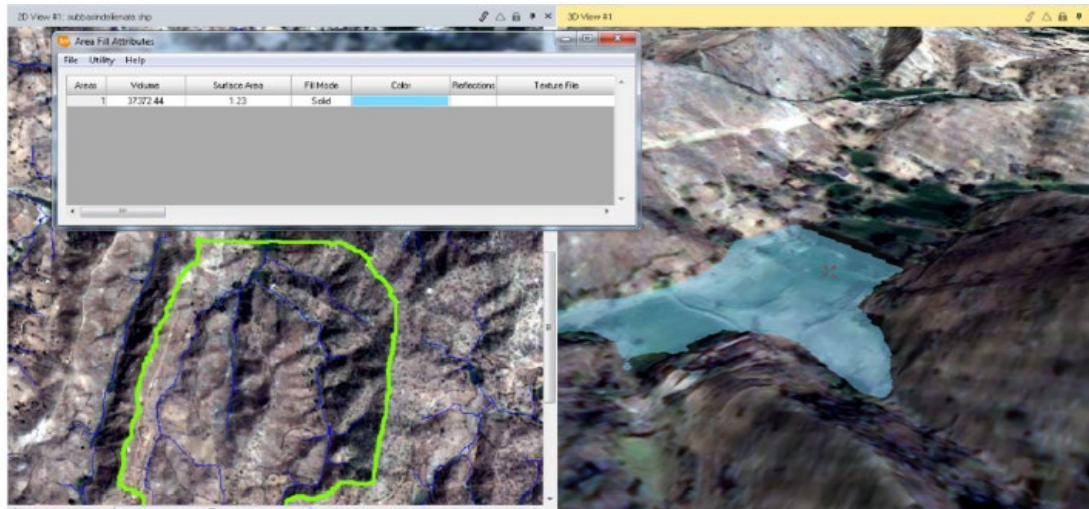
# By going about their business





# Work to cooperate

- **Example:** The OGC Indian Plugfest was developed to prove the value of the standardization efforts of NSDI at the Dept of Science and Technology for their Smart Cities Mission.
  - To create an **environment for Public Private Partnership (PPP)** for applying the benefits of OGC standards.
  - To actively test the **ability and governance for seamless exchange of information** among various stakeholders using different technology platforms in support of the Smart Cities Mission.
  - To **learn from local industry participants' experiences and knowledge** in collaboration.
  - To identify **areas of improvement in the content and use of specific OGC standards.**





# Join standards organizations







# Standards Coordination for Smart Cities

- ISO/IEC JTC 1/SG 1 Smart Cities
- ISO TMB Task Force on Smart Cities
- ITU Focus Group on Smart Sustainable Cities
- ISO ISO/TC 268 - Sustainable development and resilience of communities
- British Standards Institute
- DKE/DIN German standards
- Others: IEC, ANSI, CEN/CENELEC, ETSI, etc.

DKE/DIN ROADMAP Version 1.0  
THE GERMAN STANDARDIZATION ROADMAP SMART CITY  
Concept  
DIN DKE VDE

bsi. The Role of Standards in Smart Cities Issue 2 (August 2014)  
The Role of Standards in Smart Cities  
...making excellence a habit!  
Page 1 of 10

ISO 37120 briefing note: the first ISO International Standard on city indicators  
Sustainable development in communities:  
City indicators for service delivery and quality of life  
Currently 70 percent of global GDP is now generated by cities and 53 percent of the total world's population resides in cities. It is estimated that 70 percent of the world's population will be living in cities by 2050. This means the role of cities in enabling more sustainable future is now more important than ever. Cities are the cultural and economic centers of the world whose progress depends upon effective management and evidence-based policy making.  
Why is this International Standard on city indicators important?  
In this age of urbanization, city indicators can be used as critical tools for city managers, politicians, researchers, business leaders, planners, designers and other professionals to help ensure policies are put into practice that provide livable, tolerant, inclusive, sustainable, resilient, economically attractive and prosperous cities globally.  
Cities need indicators to measure their performance for improving quality of life and sustainability globally. Existing indicators are often not standardized, inconsistent, or comparable over time or across cities. As part of a new series of International Standards being developed for a holistic and integrated approach to sustainable development and resilience under ISO/TC 268, Sustainable development of communities, ISO 37120 establishes a set of standardized indicators that provide a common language to what is measured, and how that measurement is to be undertaken. This International Standard does not provide a new judgement, or metrics livable in what a particular city should choose as appropriate targets for the indicators.  
This International Standard defines and establishes definitions and methodologies for a set of indicators to assess and measure the performance of city services and quality of life.

IEC Orchestrating infrastructure for sustainable Smart Cities  
White Paper

INTERNATIONAL TELECOMMUNICATION UNION  
ITU-T FG-SSC (102014)  
An overview of smart sustainable cities and the role of information and communication technologies  
ITU-T Focus Group on Smart Sustainable Cities  
Focus Group Technical Report

European Innovation Partnership on Smart Cities and Communities  
Strategic Implementation Plan  
14.10.2013



# Integrated Digital Built Environment

- Interoperation across the AEC / Civil / Geospatial domains
  - Building Information Modeling (BIM)
  - Infrastructure data management
  - 3D City Models
  - 3D Visualization and Portrayal Services
  - Location Services
  - Indoor Location / Navigation



*Adapted from buildingSmart Alliance presentation*



Share use cases because one use case satisfies another...





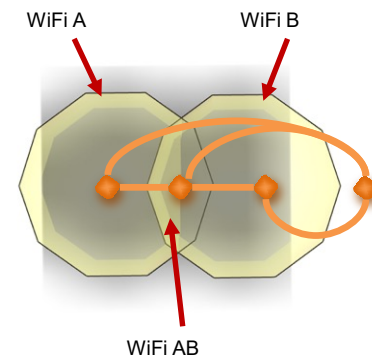
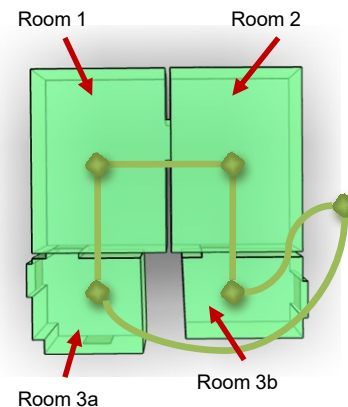
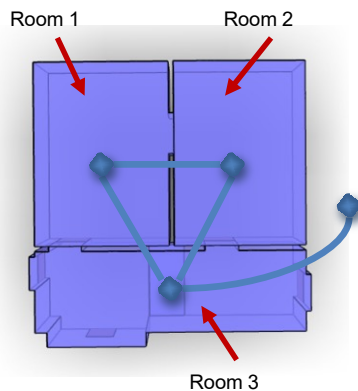
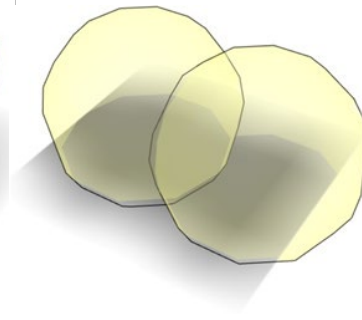
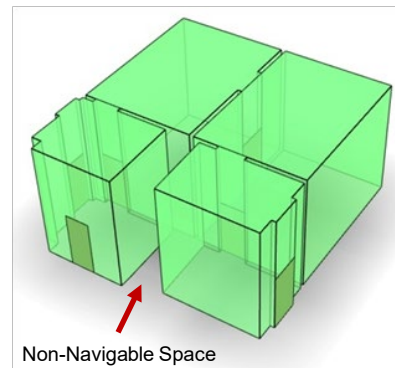
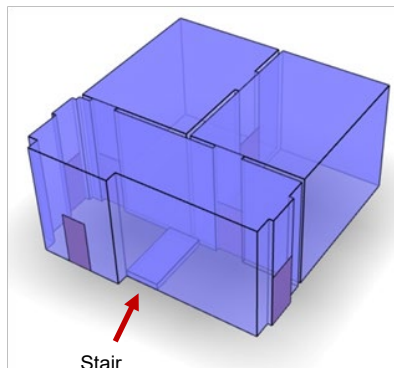


What standards are available?



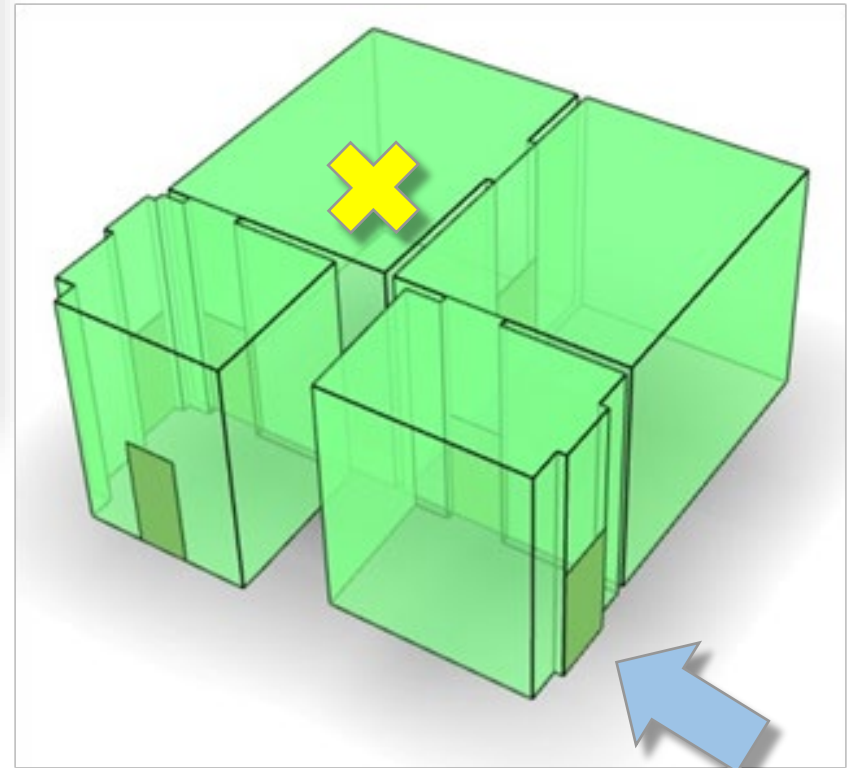
# Some of the standards you need

- Information Models/Encodings
  - Geospatial Data
    - Simple Features
    - Coverages
    - CityGML
    - IndoorGML
  - Dynamic Data
    - Moving Features
  - Sensor Web Data
    - Observation and Measurement
    - Sensor Model Language
    - WaterML
- Web Service Interfaces
  - Sensor Observation Services
  - Sensor Planning Services
- RESTful API
  - SensorThings API





# Geometry matters







# Position matters

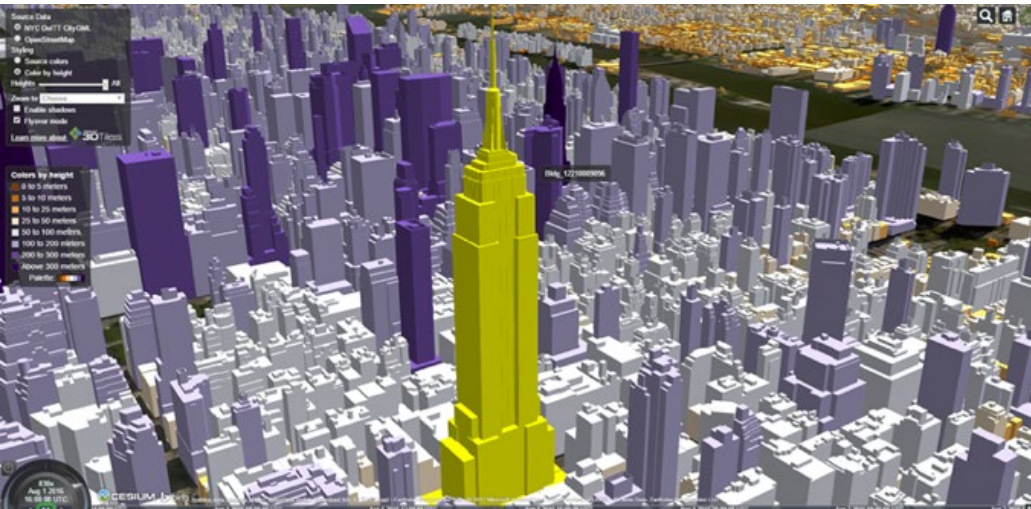


Definitely not flying over a sphere: GNSS coordinates

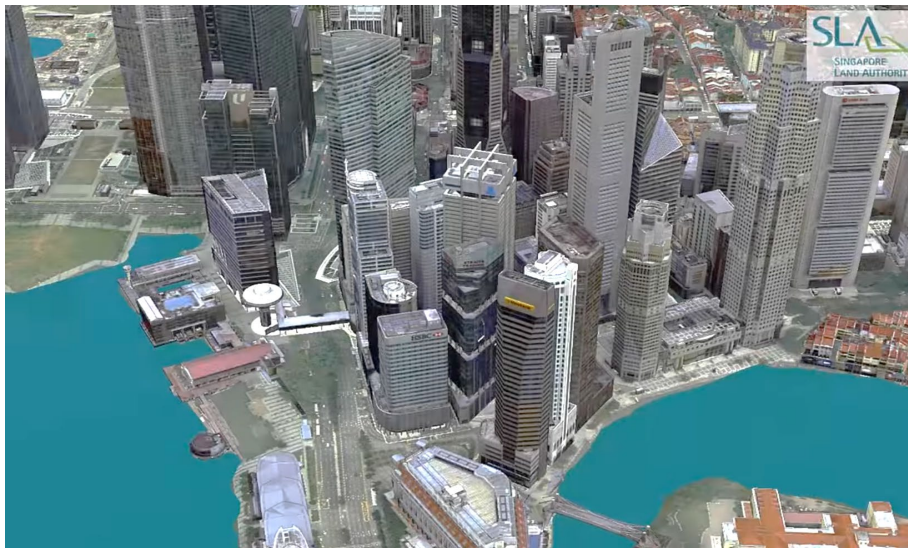
OpenStreetMap  
Web Mercator projection  
(assumes spherical earth)



# CityGML



Source: <http://www1.nyc.gov/site/doitt/initiatives/3d-building.page>



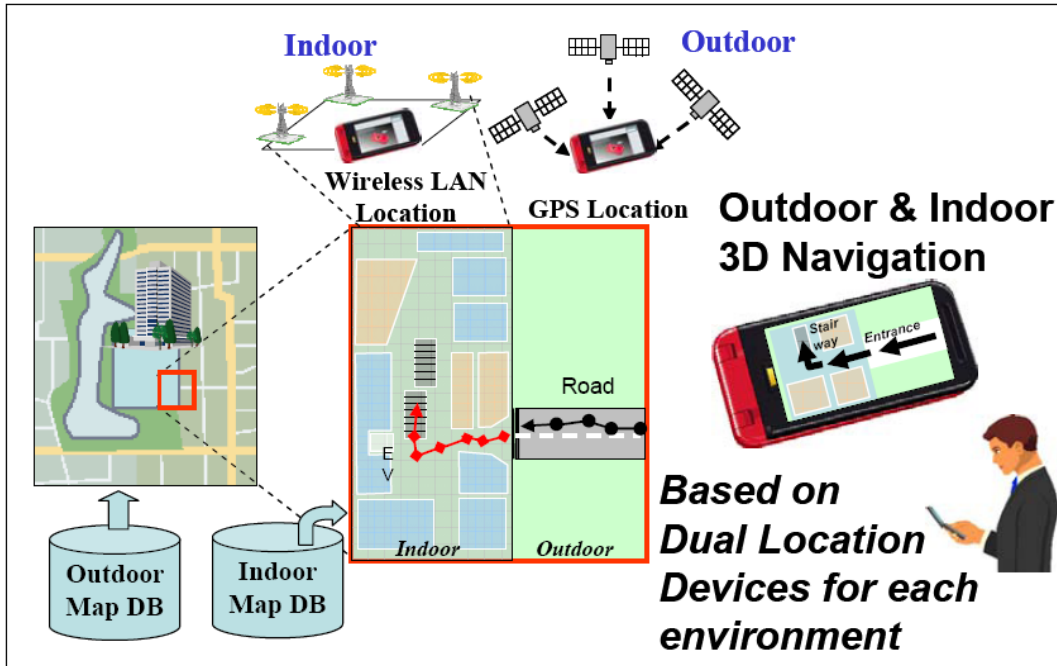
Source: Singapore Land Authority, and Geospatial Media

CityGML models for 3D visualization and analysis based on semantics

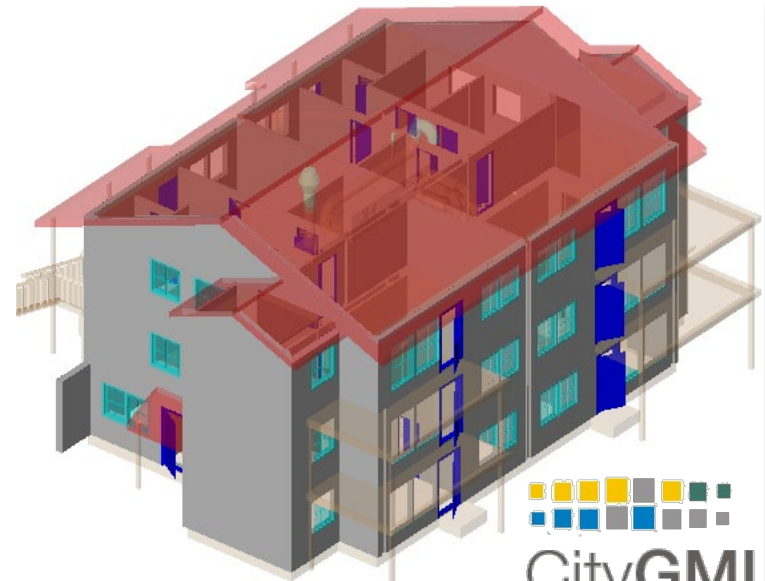
- Urban Planning / Operations
- Emergency Mgt / Response
- Transportation / Routing / Logistics
- Indoor navigation
- Retail Site analysis
- Sustainable / Green Communities
- City Services Management
- Noise abatement
- Telecommunications placement
- Many other uses...



# IndoorGML



<http://www.opengeospatial.org/projects/groups/indoorgmlswg>



CityGML

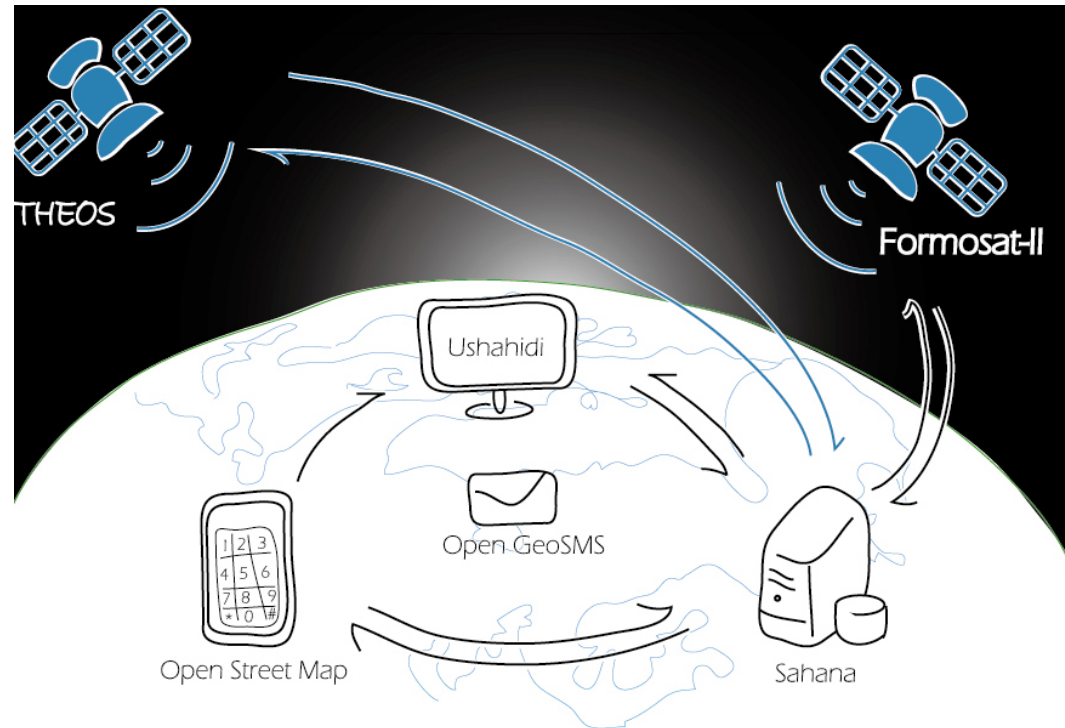
OGC<sup>®</sup>  
Making location count.



# Open GeoSMS



Doesn't need to describe your location



Open GeoSMS Disaster Management Platform  
Courtesy: GeoThings



# Geospatial User Feedback

+ Data Access Conditions [?]  
+ Earth Observation Catalogs [?]  
Start Date [?] End Date [?]  
CLEAR SEARCH

Legend Total Results: 81206 1 2 3 4 NEXT LAST

Search Granule

- Interacting effects of CO2 partial pressure and temperature on photosynthesis and calcification in a scleractinian coral, 2003**  
We show here that CO<sub>2</sub> partial pressure (pCO<sub>2</sub>) and temperature significantly interact on coral physiology. The effects of increased pCO<sub>2</sub> and te  
[Click to read more...](#) [User Feedback](#)
- Regional Temperature at 1000 hPa (48hrs) - Regional ETA Model - South America**  
The RT2 is a numeric forecasting regional ETA Model (20x20km). This model is a weather forecast 48 hours for temperature at 1000 mbar. Frequen  
[Click to read more...](#)
- Seawater carbonate chemistry and photosynthetic response of *Emiliania huxleyi* (CS-369) to UV radiation and elevated temperature during experiments, 2011**  
Changes in calcification of coccolithophores may affect their photosynthetic responses to both, ultraviolet radiation (UVR, 280-400 nm) and te  
[Click to read more...](#)

Courtesy GUF SWG, Joan Masó



More than standards...



- As much as standards, we need guidance
  - Architectures
  - Best Practices to share
  - Forums like this to discuss
  - Standards to form the backbone of interoperability

**Open Geospatial Consortium**  
Submission Date: 2014-11-26  
Approval Date: 2014-12-05  
Publication Date: 2015-01-21

External identifier of this OGC® document: <http://www.opengis.net/doc/WP/smart-cities-sif>  
Internal reference number of this OGC® document: 14-115  
Category: OGC® White Paper  
Editor: George Percivall

**OGC Smart Cities Spatial Information Framework**

**Copyright notice**  
Copyright © 2015 Open Geospatial Consortium  
To obtain additional rights of use, visit <http://www.opengeospatial.org/legal/>.

**Warning**

This document is not an OGC Standard. This document is an OGC White Paper and is therefore not an official position of the OGC membership. It is distributed for review and comment. It is subject to change without notice and may not be referred to as an OGC Standard. Further, an OGC White Paper should not be referenced as required or mandatory technology in procurements.

Document type: OGC® White Paper  
Document stage: Approved for Public Release  
Document language: English

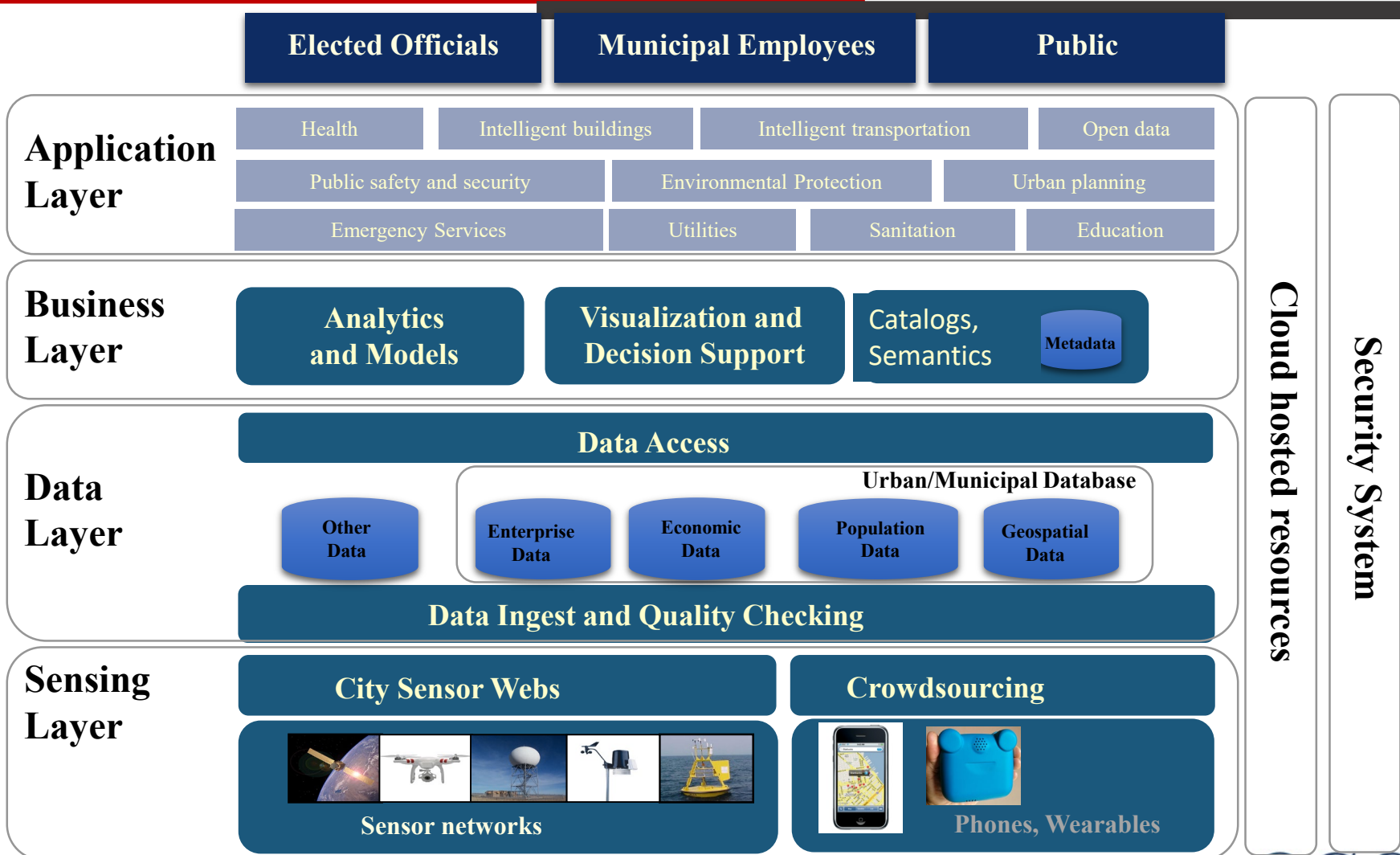
1

Copyright © 2015 Open Geospatial Consortium



# Spatial Smart City Enterprise Components

## Based on ITU Focus Group on Smart Sustainable Cities



Cloud hosted resources

Security System





# OGC Services Architecture

Visualization / Decision Tools and Applications



GeoAPI

OpenLS

Data Models and Encodings

- GML
- IndoorGML
- NetCDF
- GMLJP2
- GeoSparql
- SLD
- KML
- WMC
- Moving Features
- CityGML
- CDB
- WaterML
- GeoXACML
- FE
- SE
- OpenGeoSMS
- GeoPackage

Other Services  
Workflow, Alerts

Processing Services

- TJS
- WPS
- WCPS
- OpenMI

Discovery Services

- CSW
- OpenSearch Geo
- ebRIM

Access Services

- 3DPS
- WFS
- WMTS
- I3S
- Simple Features Access
- WCS
- WMS

Geospatial Feature Data

Geospatial Browse/Maps

Geospatial Coverage Data

Other Data

Sensor Web Enablement

- SPS
- SensorML
- O&M
- SOS
- Sensor Things

Geospatially Enabled Metadata

Discover Task Access



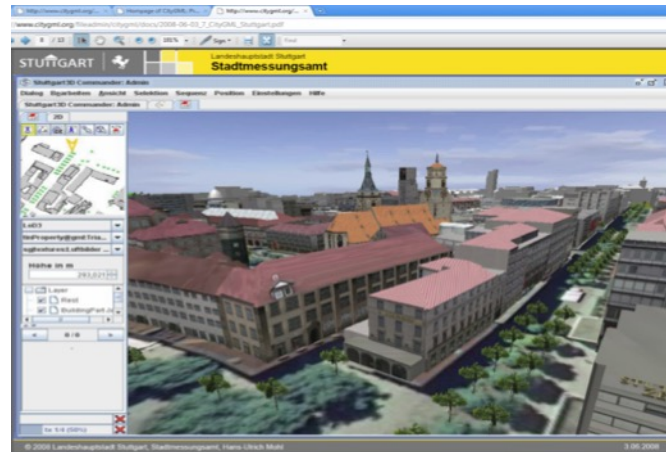
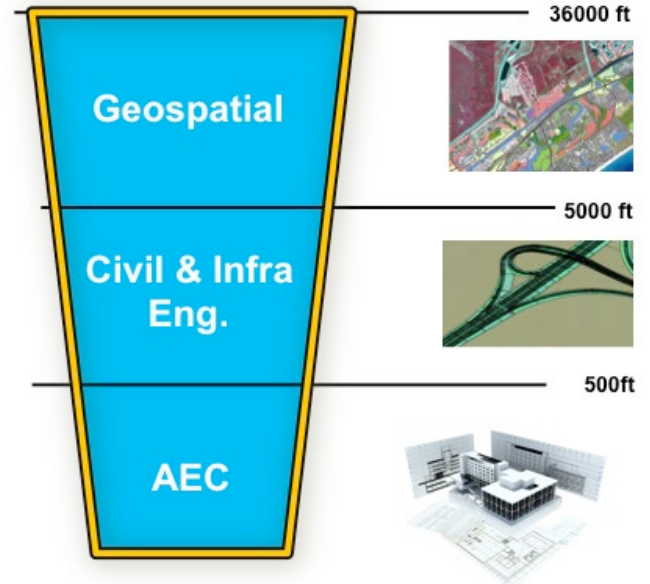
Puck

Sensors



# Location services for Smart Cities

- **Citizen Services**
  - Location-aware municipal services using open data and standards
- **Energy and Utilities management**
  - Smart Energy
  - Smart Water Management
- **Disaster and Emergency Response**
  - Common Operational Picture
- **Urban Maps**
  - 3D City Models
  - Indoor Venue Maps
  - Interoperability with BIM
- **Sensor Webs**
  - Situational awareness from fusion of sensor observations



Source; Thomas Kolbe, Berlin TU



# Thank you

Scott Simmons

[ssimmons@opengeospatial.org](mailto:ssimmons@opengeospatial.org)

