CitySmart

Uniting the World on Urban Management Challenges

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An open, freely available, integrated web-based framework for Smart City data management and visualization

Image source: https://uber.github.io/deck.gl
Design Requirements

- 3D Virtual Globe interchangeable or simultaneous with 2D Map with Projection Choices
- Imagery & Elevation Import
- Extensible Architecture (Modular Componentry)
- Data Retrieval via REST, WMS, WCS, WFS, GML, User-Defined
- OpenStreetMap (OSM) PlaceNames, Boundaries and Roads
- Picking and Decluttering
- Shapefile and KML Import
- Measurement Tools
- Calculation for Flooding and Line-of-Sight
- Subsurface Visualization (water, sewer, gas, etc.)
- Shapes: Placemarks, Path, Polygon, Extruded Polygon, Custom, HTML5-able Balloons
- Volumes (i.e., buildings), follow terrain or maintain constant elevation above terrain while moving

Source: https://wiki.osgeo.org/wiki/Opencitysmart
Data sources

The project aims to be compatible with open standards-compliant geospatial data sources, be it public or private. It is crucial, however, to have compatibility for openly available urban map data.

OpenStreetMap (OSM) is a collaborative project to create a free editable map of the world. The creation and growth of OSM has been motivated by restrictions on use or availability of map information across much of the world, and the advent of inexpensive portable satellite navigation devices. OSM is considered a prominent example of volunteered geographic information.

CitySmart aims to have full integration with OSM data.

Source: http://suite.opengeo.org/
Partners

- Del Bianco Foundation
- Politecnico di Milano
- GeoforAll.info
- GODAN
- Sinergise.com
- Trillium Learning
- HUNAGI
- World Bridge
GeoServer is an open source server for sharing geospatial data. Designed for interoperability, GeoServer publishes data from any standards-based spatial data source.

Source: http://geoserver.org/
Tile cache

**GeoWebCache** is a Java web application used to cache map tiles coming from a variety of sources such as OGC Web Map Service (WMS).

It implements various service interfaces (such as WMS-C, WMTS, TMS, Google Maps KML, Virtual Earth) in order to accelerate and optimize map image delivery.

Database

PostgreSQL is a powerful, open source object-relational database system. It has more than 15 years of active development and a proven architecture that has earned it a strong reputation for reliability, data integrity, and correctness.

PostGIS is a spatial database extender for PostgreSQL object-relational database. It adds support for geographic objects allowing location queries to be run in SQL.

Source: http://gisvm.com/gisvm-postgis/
Server Deployment

Quick deployment of server stack (maps, database, web management console)

https://hub.docker.com/r/beakman/ubuntu-opengeo/
ESA - NASA Web World Wind Front-end
Web WorldWind

A solid foundation...

...integrating new tools

React

node.js

HTML5

WebGL™

ES6
3D Buildings
3D Buildings
Descriptive Pop-Up
Springfield City WMS service

- A unified data warehouse with the city geospatial data
- WMS service for data/maps visualization
Springfield WMS (Fire Stations)
- Springfield WMS (Schools)
Springfield WMS (Fire Reporting Areas)
Kodiak, Alaska
OpenCitySmart

- Case study of an open source urban management system
- Energy grid, waste disposal, communications, parcel division, land register
- Wind farm proposal, financial details, operation reports

Kodiak OpenCitySmart
Kodiak OpenCitySmart
Kodiak OpenCitySmart
FTAA Data Collection

Energy budget is one of important planning steps for "City Smart" Project. With energy budget established, we can have full picture of fundamental demand of energy requirement. Energy budget helps well plan ahead renewable energy.
Integrating new ESA-NASA Web WorldWind developments

NASA WorldWind Server Kit (WWSK)
How to participate?

- Data gathering/formatting (WMS, WMTS, WFS)
- Install server stack (Docker)
- Download and install CitySmart (node)
- Share your solutions with the world (GitHub)
Collaborate

https://github.com/NASAWorldWindResearch/CitySmart

https://hub.docker.com/r/beakman/ubuntu-opengeo/

Kodiak OpenCitySmart

http://aworldbridge.com
CitySmart

Thank you