

SMART CITIES

Andrew Barbeau
President, The Accelerate Group

*Senior Clean Energy Consultant to
Environmental Defense Fund*

SMART CITIES

The integration of large-scale data and communication technologies with the urban environment.

DATA FOR PLANNING

MONTHLY / ANNUAL
COORDINATE MULTIPLE GOALS
SCENARIO-PLANNING

DATA FOR OPERATIONS

REAL-TIME
TRANSACTIVE
PREDICTIVE

HISTORY OF SMART CITY APPROACHES

The first use of urban modeling tools
Transport planners began to use rapidly developing computer technologies to model transport flows in cities.



1950



1990

e-Government
Cities provide public information, streamline processes and conduct transactions online.

<http://co.cook.il.us>

Building pop-up Smart Cities
Songdo, South Korea
Masdar, UAE



2000 2010

OpenData
Cities make datasets available to the public for transparency, to improve multi-agency planning, and to tap into civic app interest



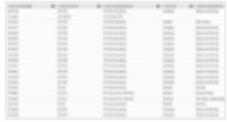
Citizen-driven initiatives
Citizens and companies leverage city platforms to engage in new business models.



Central Station Monitoring
Cities invest in network operations centers to monitor public safety, transportation, and conditions in real-time



OPEN DATA



Transportation Department Permits

Applications to the Chicago Department of Transportation for permits under its jurisdiction, which typically are permits to block or otherwise affect public streets in some way.



Budget - 2016 Budget Ordinance - Appropriations

2016 budget appropriations, as passed by the city council.



Chicago Energy Benchmarking - 2014 Data Reported in 2015 - Map

Energy consumption and building information for existing municipal, commercial, and residential buildings larger than 50,000 square feet to track whole-building energy use. For more details, including ordinance text, rules and regulations, and timing, please visit www.CityofChicago.org/EnergyBenchmarking.



Food Inspections

This information is derived from inspections of restaurants and other food establishments in Chicago from January 1, 2010 to the present. Recently, the City announced a predictive statistical model which uses this data to help protect the safety of restaurant patrons <http://chicago.github.io/food-inspections-evaluation/>

Search

Search & Browse Datasets and Views

Most Accessed This week

Name	Popularity	Type
1. Current Employee Names, Salaries, and Position Titles Administration & Finance personnel This dataset is a listing of all current City of Chicago employees, complete with full names, departments, positions, and annual salaries. For hourly employees the annual salary is estimated. Data Ow	605,678 views	PDF
2. Crimes - 2001 to present Public Safety crime, police This dataset reflects reported incidents of crime (with the exception of murders where data exists for each victim) that occurred in the City of Chicago from 2001 to present, minus the most recent seven	210,911 views	PDF
3. Building Permits Buildings permits Permits issued by the Department of Buildings in the City of Chicago from 2006 to the present. The dataset for each year contains more than 65,000 records/rows of data and cannot be viewed in full	288,894 views	PDF
4. Affordable Rental Housing Developments Community & Economic Development housing The affordable rental housing developments listed below are supported by the City of Chicago to maintain affordability standards. For information on rents, income requirements and availability, cont	235,413 views	PDF
5. Food Inspections Health & Human Services food, inspections This information is derived from inspections of restaurants and other food establishments in Chicago from January 1, 2010 to the present. Inspections are performed by staff from the Chicago Depart	173,246 views	PDF
6. Business Licenses - Current Active Community & Economic Development business, licenses, current This dataset contains all current and active business licenses issued by the Department of Business Affairs and Consumer Protection. This dataset contains a large number of records /rows of data a	158,348 views	Table
7. Building Violations Buildings violations, inspections Violations issued by the Department of Buildings from 2006 to the present. Lenders and title companies, please note: These data are historical in nature and should not be relied upon for real estate t	49,129 views	PDF
8. Chicago Street Names Transportation streets, gis List of all Chicago streets with suffixes and minimum and maximum address numbers.	129,985 views	PDF
9. 311 Service Requests - Graffiti Removal Service Requests graffiti All open graffiti removal requests made to 311 and all requests completed since January 1, 2011. The Department of Streets & Sanitation's Graffiti Blasters crews offer a vandalism removal service to	42,130 views	PDF
10. Crimes - 2001 to present Public Safety This dataset reflects reported incidents of crime (with the exception of murders where data exists for each victim) that occurred in the City of Chicago from 2001 to present, minus the most recent seven	30,932 views	Table

View Types

- Data Lens pages
- Datasets
- Charts
- Maps
- Calendars
- Filtered Views
- External Datasets
- Files and Documents
- Forms
- APIs

Categories

- Administration & Finance
 - Buildings
 - Community & Economic Development
 - Education
 - Environment & Sustainable Development
- [View All](#)

Topics

- gis

SMART ENERGY CITIES

The interface displays a map of Amsterdam with various energy data overlays. The control panel on the left includes:

- Maps:** Electricity kwh, Opacity, Legend.
- Solar potential per m2:** Opacity, Legend.
- Select entities:** Home, Building, Facebook, Edit, Delete, Close.
- Rapid impact analysis:** District Cold Grid.

The bottom panel shows a list of experiments:

Created	Scenario	Portfolio	Start	End
22/09/2015	Empty scenario	Amsterdam deel	24/09/2015	25/09/2015
09/09/2015	Fossil fuel favou.	Amsterdam port	09/09/2015	10/09/2015
09/09/2015	Fossil fuel favou	Amsterdam port	09/09/2015	10/09/2015
09/09/2015	Empty scenario	Amsterdam deel	09/09/2015	10/09/2015
09/09/2015	Empty scenario	Amsterdam deel	09/09/2015	10/09/2015
31/08/2015	Gas price fluctu.	Amsterdam deel	01/07/2015	31/12/2018
31/08/2015	Gas price fluctu.	Amsterdam deel	01/07/2015	31/12/2018
31/08/2015	Gas price fluctu.	Amsterdam deel	31/08/2015	01/10/2018
31/08/2015	Gas price fluctu.	Amsterdam deel	31/08/2015	01/10/2018

LESSONS LEARNED

1. Cities failed when they started with technology, rather than starting by identifying challenges to address.
2. Cities have viewed this from a top-down approach – how to “manage”
3. Successful cities have cultivated a bottom-up approach – how to “empower”

TOP-DOWN

Command Centers
Situational Awareness
Traffic Management
Safety and Security

BOTTOM-UP

Open-Source / Open-Access
Citizen-driven
Enable Third-Parties

AS A PLATFORM

As we create a new internet overlay across the physical world, we can either adopt a command-and-control scheme, or an empowerment platform.

Example: Amsterdam Smart City



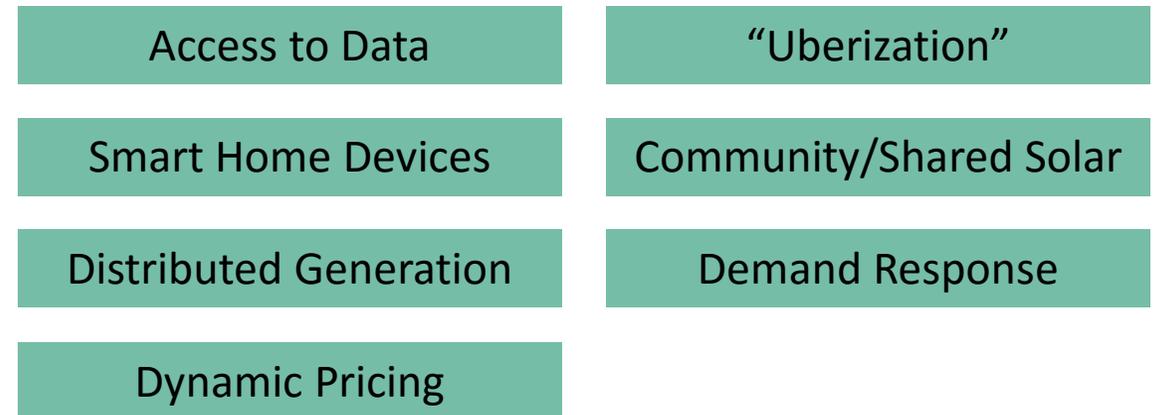
EXAMPLE: SMART GRID AS A PLATFORM

What could you do if you could measure, manage and communicate energy use in real-time?

TOP-DOWN APPROACH



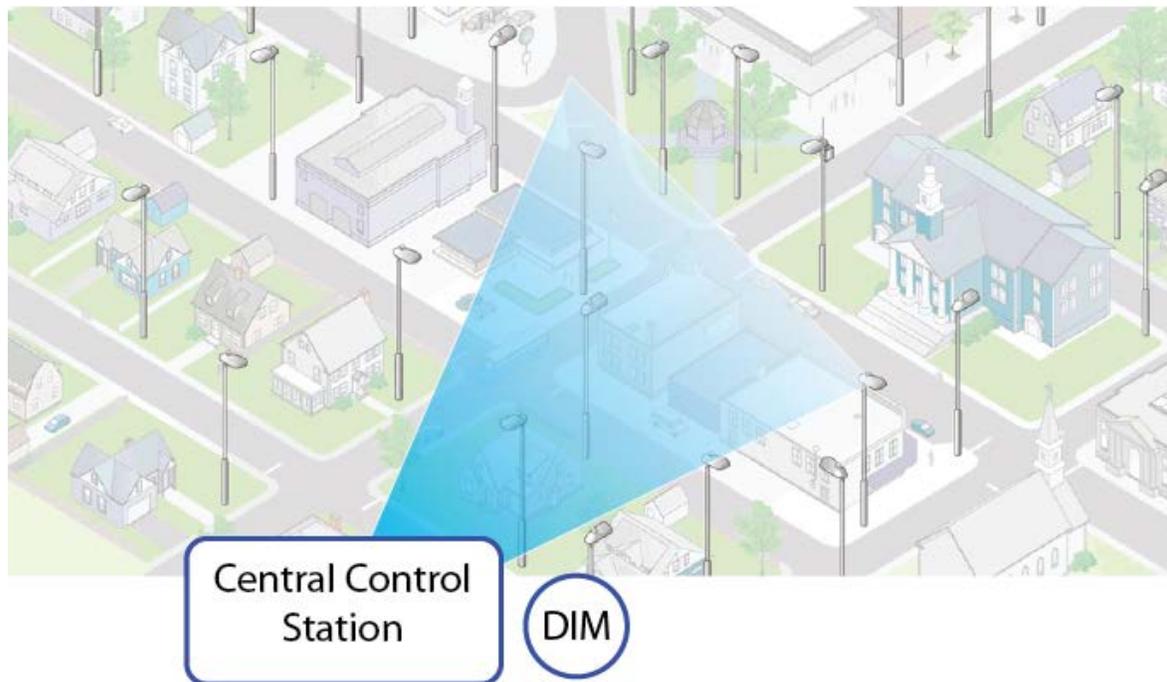
BOTTOM-UP APPROACH



EXAMPLE: SMART STREETLIGHTS AS A PLATFORM

What could you do if you had a power source, network connection, and real estate every 100 feet in the urban environment?

TOP-DOWN APPROACH



BOTTOM-UP APPROACH

