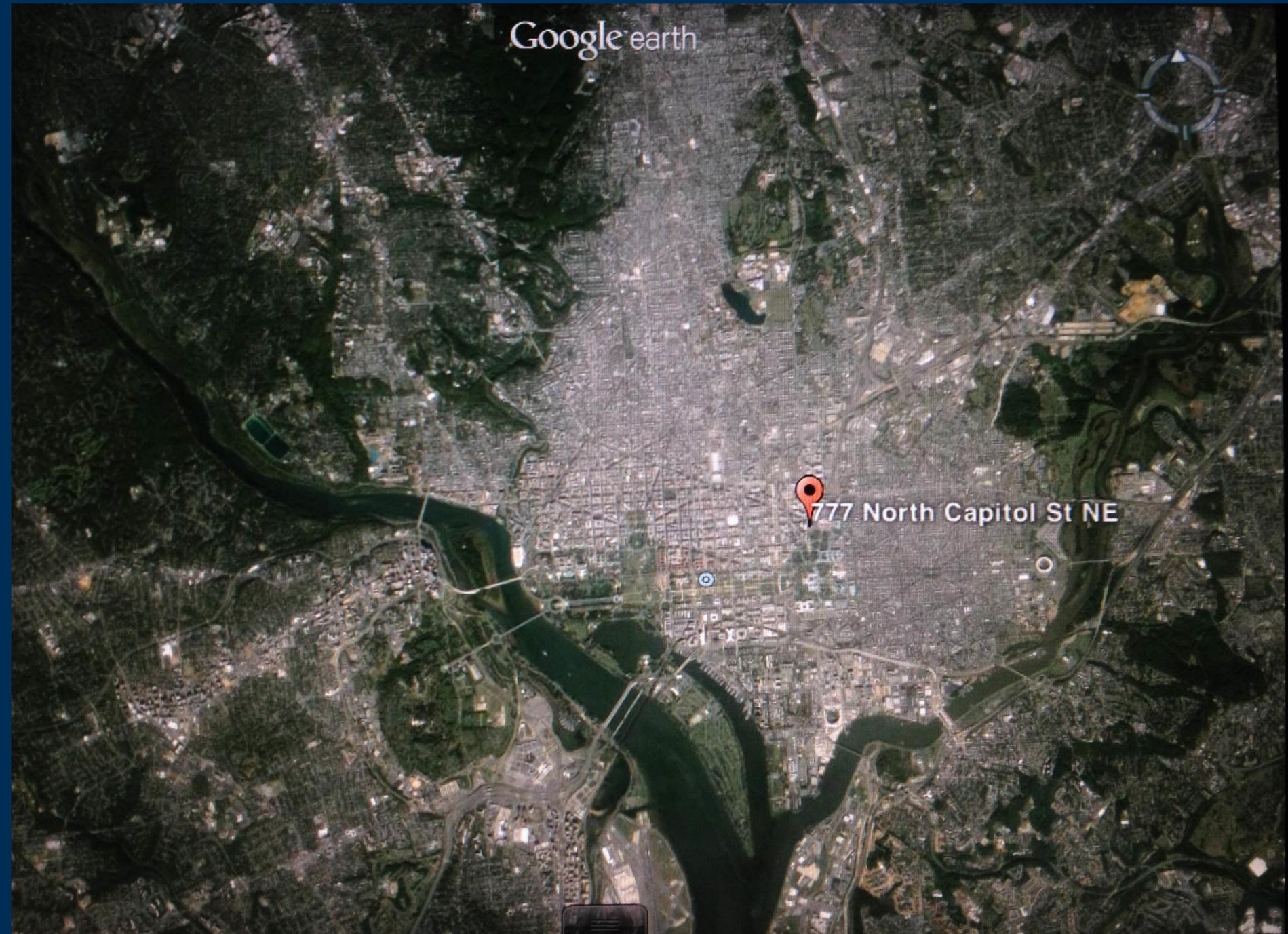


# Smart Cities Universal Principles

Smart Cities Council  
Brandi Martin



Smart**Cities**Council  
LIVABILITY | WORKABILITY | SUSTAINABILITY

# Traditional

vs.

# Smart Cities

The Problem	
<b>Planning</b>	<ul style="list-style-type: none"><li>• Ad hoc</li><li>• Decentralized</li><li>• Limited scalability</li><li>• Cost savings not realized</li></ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"><li>• Runs inefficiently</li><li>• Increasing costs to run and maintain</li></ul>
<b>System Operators</b>	<ul style="list-style-type: none"><li>• Lack access to real-time conditions</li><li>• Reactive to problems</li><li>• Can't efficiently deploy resources to address problems</li></ul>
<b>ICT investments</b>	<ul style="list-style-type: none"><li>• Siloed and piecemeal</li><li>• Economies of scale not realized</li></ul>
<b>Citizen Engagement</b>	<ul style="list-style-type: none"><li>• Limited, scattered online connection</li><li>• Difficult for citizens to use/find city services effectively</li></ul>
<b>Data Sharing</b>	<ul style="list-style-type: none"><li>• Departments and functions are siloed</li><li>• Departments rarely share data or collaborate on initiatives</li></ul>

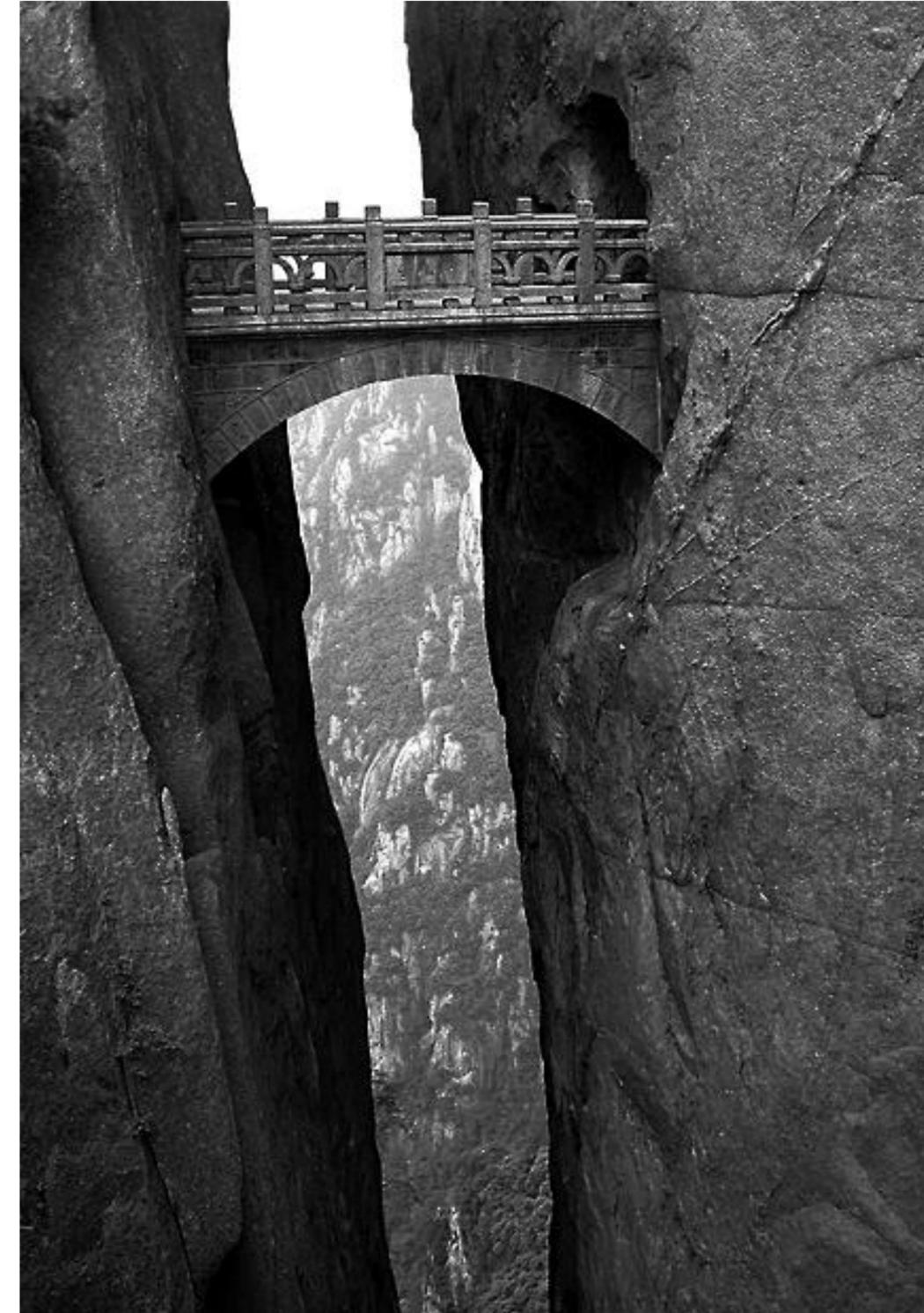


The Smart City Solution	
<ul style="list-style-type: none"><li>• Coordinated and holistic</li><li>• Resources are shared</li><li>• Cost savings fully realized</li><li>• Investments are scalable</li><li>• Improved city planning and forecasting</li></ul>	<b>Planning</b>
<ul style="list-style-type: none"><li>• Optimized with technology</li><li>• Money and resources saved</li><li>• Improved service-level agreements</li></ul>	<b>Infrastructure</b>
<ul style="list-style-type: none"><li>• Enjoy real-time infrastructure reporting</li><li>• Proactively prevent problems</li><li>• Deploy resources more efficiently</li><li>• Save money</li></ul>	<b>System Operators</b>
<ul style="list-style-type: none"><li>• Centrally planned</li><li>• Deployed across city departments and projects</li><li>• Provide maximum value and savings</li></ul>	<b>ICT investments</b>
<ul style="list-style-type: none"><li>• Complete online presence</li><li>• Two-way communications between gov't and people</li><li>• Citizens can contribute to and access real-time intelligent city data</li></ul>	<b>Citizen Engagement</b>
<ul style="list-style-type: none"><li>• Data is shared between departments</li><li>• Results are improved and costs reduced</li></ul>	<b>Data Sharing</b>

# Universal Principles of a Smart City

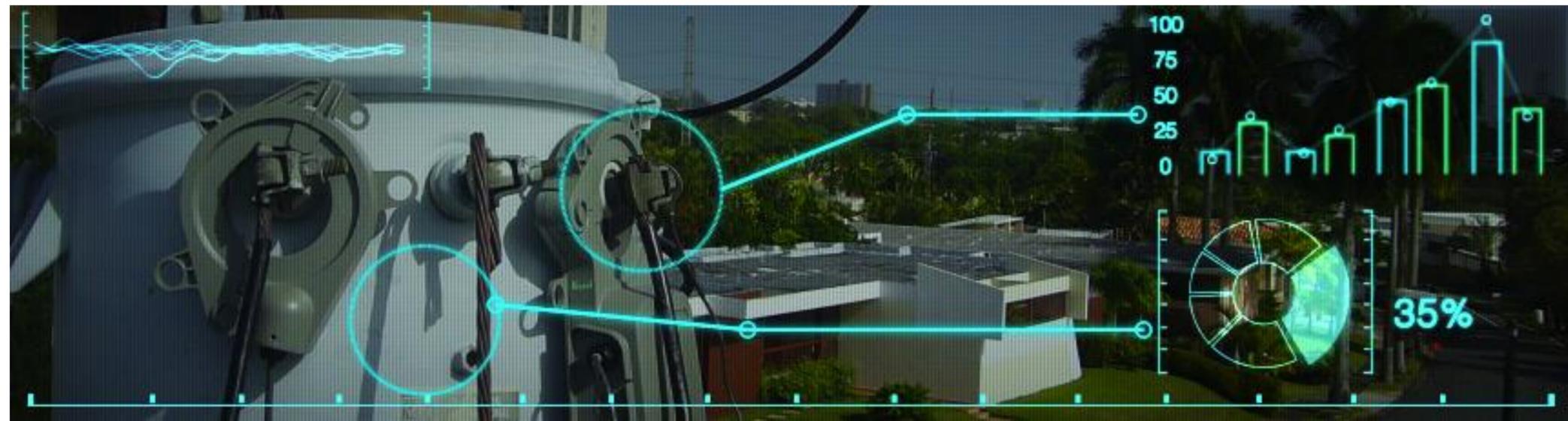
## Bridging the Divide with Technology Enablers

- Devices and Control
- Citywide connectivity
- Interoperability
- Security and Privacy
- Data management
- Computing resources
- Analytics



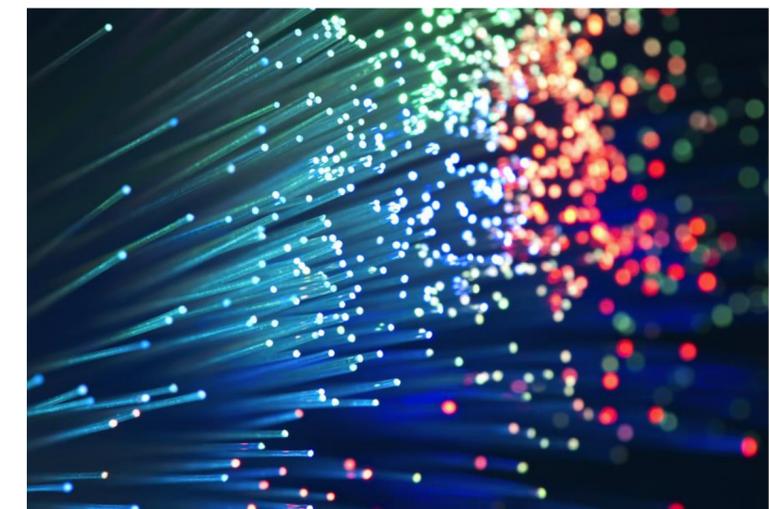
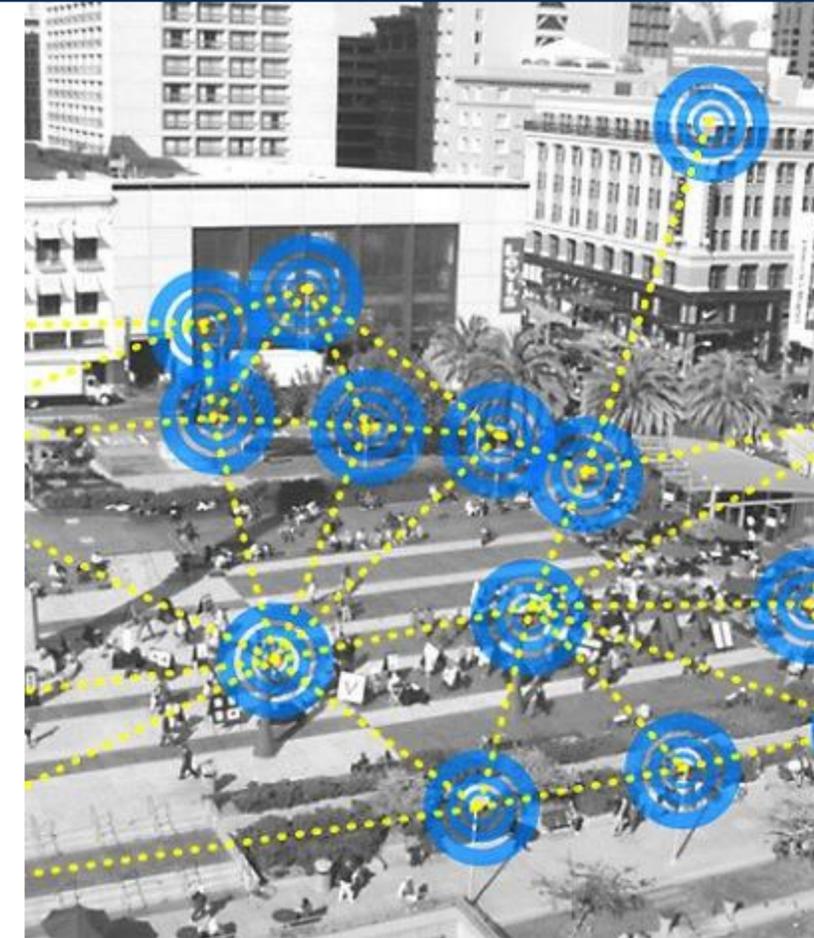
# Devices and Control

- Smart devices gather real-time information on city conditions
- Control devices and switches take action
- **Good data** gives cities the ability to:
  - Make informed decisions
  - Lower costs
  - Allocate funding
- Starting point
  - Determine what should be measured and device frequency



# Connectivity

- City networks today
  - Lots of communications channels: cellular, wifi, powerline, mesh & fiber
  - More and more devices being connected
- Goal - Citywide multi-service network
  - Smart devices can communicate
  - Data is seamlessly collected, analyzed and utilized
  - Network is secure, reliable, fast
- Starting point
  - Minimize # of networks supported at city's expense
  - Evaluate cellular networks before building new
  - Prioritize technologies/tools that manage both the old and the new
  - Offer incentives for private sector to build and maintain citywide networks



# Interoperability – “Let’s Work Together”

## ■ Open Standard Benefits

- Prevents cities from being locked into product/vendor with proprietary
- Allows for choice and flexibility
- Simplifies and reduces maintenance costs
- Decrease lifecycle cost / Future proof

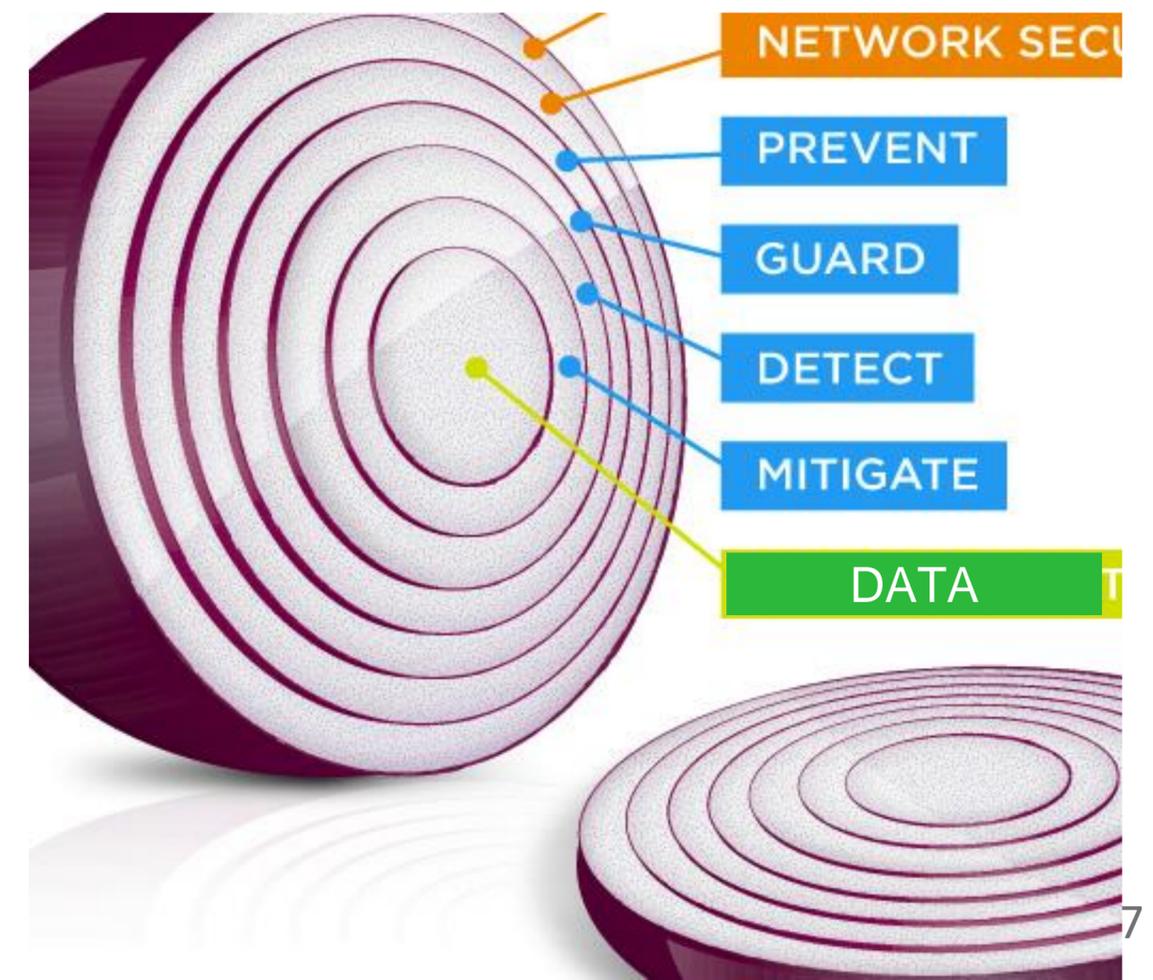


## ■ Starting point

- Build applications with “reuse” in mind
- Require vendors use open standards

# Security

- Create a risk management framework – protect data *and* physical assets
- Starting point
  - Research requirements and regulations
  - Assess your infrastructure
  - Determine what infrastructure is critical



# Privacy

Private? Public? Shared?

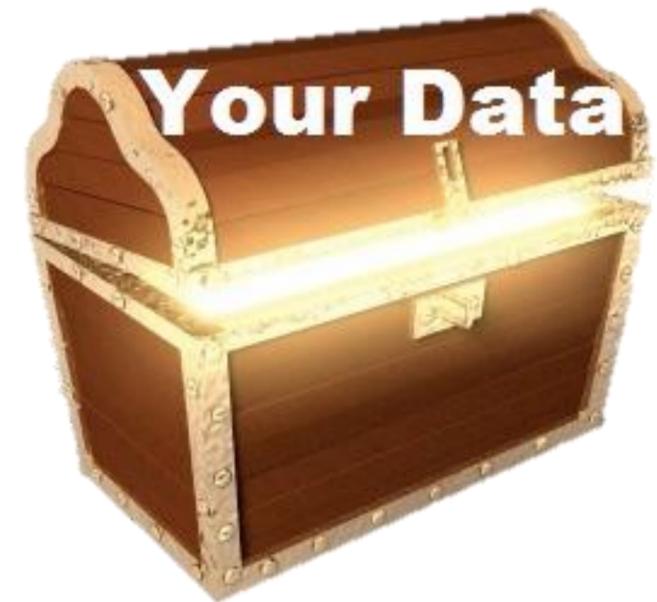
- Assure residents their rights and data are being respected and protected
  - Be proactive – save time, money and headaches
- Starting point
  - Define the who/what/when/where of privacy rules :
    - Data set ownership
    - Sharing authorizations
    - Rights and protection
  - Publish the comprehensive policy



# Data Management

Management includes: storing /protecting/processing data while guaranteeing its accuracy/timeliness /accessibility

- Benefits of well managed data
  - Improved deployment of citizen facing services
  - Improve accuracy
  - Lower costs and reduction of errors
- Starting Point
  - Create a citywide data management master plan
    - Define how public / private data is
      1. Governed
      2. Stored
      3. Shared



**A smart city's most precious resource is the data it produces.**

# Open Data – Unleash the Power of the People

Open your data!

## ■ Benefits

- Improves government accountability, transparency, and responsiveness
- Promotes citizens self-empowerment, social participation and engagement
- Builds the next generation of empowered civil servants
- Fosters innovation, efficiency and effectiveness in government services
- Creates value for the wider economy

## ■ Starting point

- Develop an open data policy
- Pick a first project – start small
- Look at existing projects like New York's Open Data portal



# Computing Resources

Processing power, data storage and specialized capabilities

- Cloud computing Benefits

- Highly cost effective
- Quickly scalable
- Improved citizen services

- Starting point

- Evaluate cloud platforms



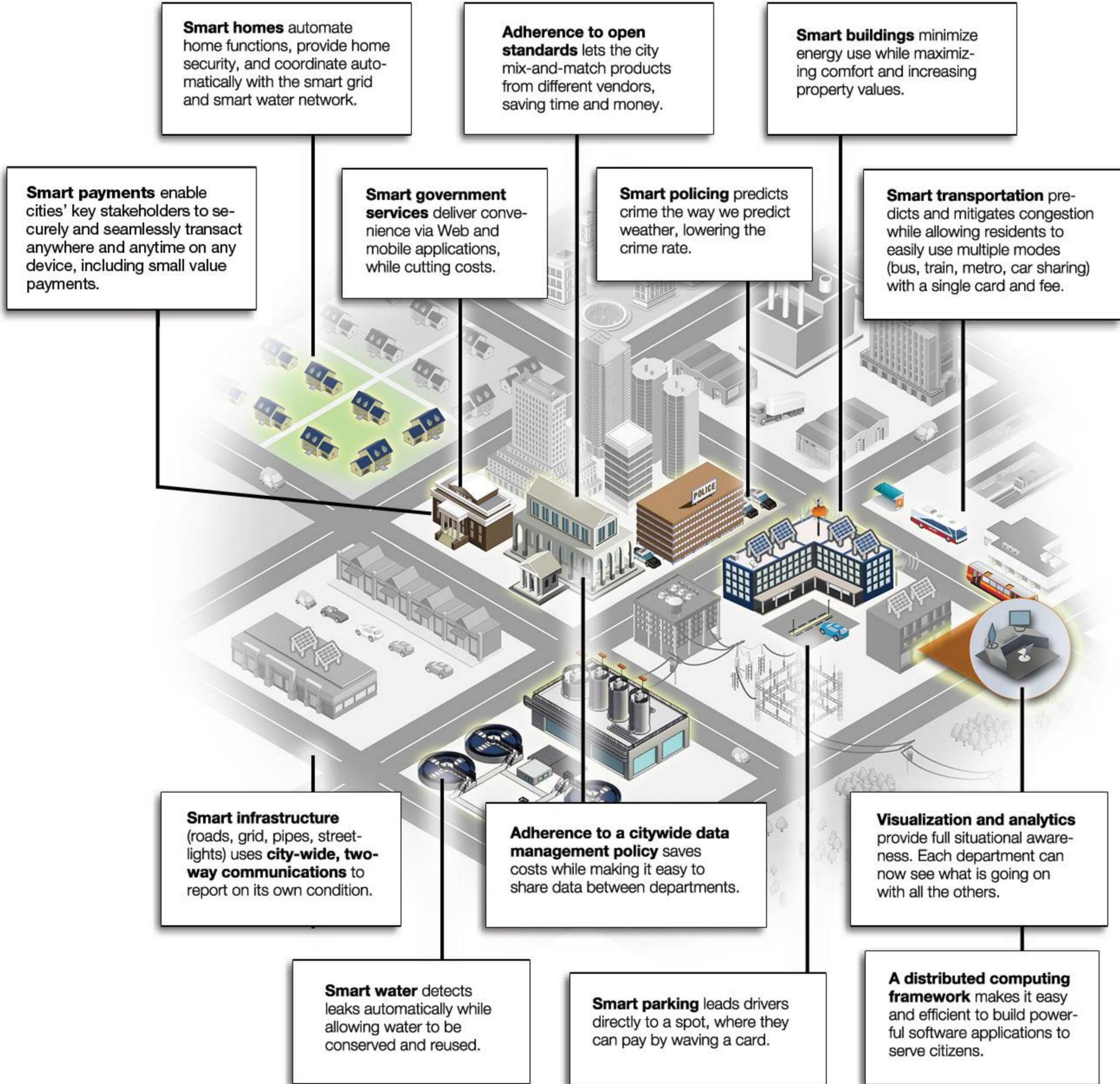
# Analytics – *the* “Super Enabler”

Create value from collected data

- Gain a holistic view of the city
  - Get the full picture in real-time
- Decisions based on real-time information lead to
  - Better decisions
  - Full utilization of assets
  - Optimized and efficient processes
- Predicative Capability
  - Use patterns and behaviors to forecast city conditions in advance

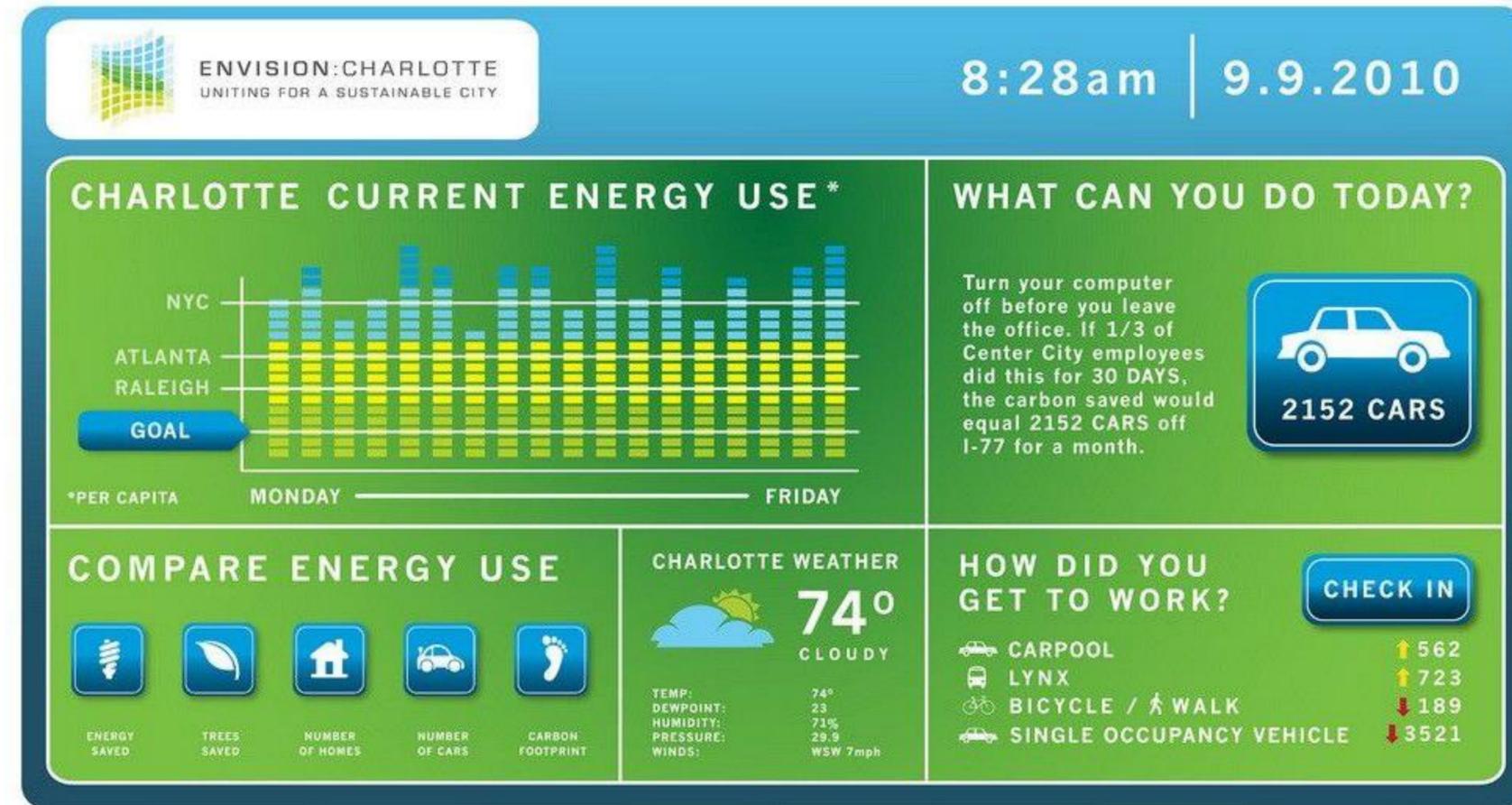


# Arriving at the Smart City



# Envision Charlotte

- Benchmark
- Plan
- Act
- Reward



Questions?

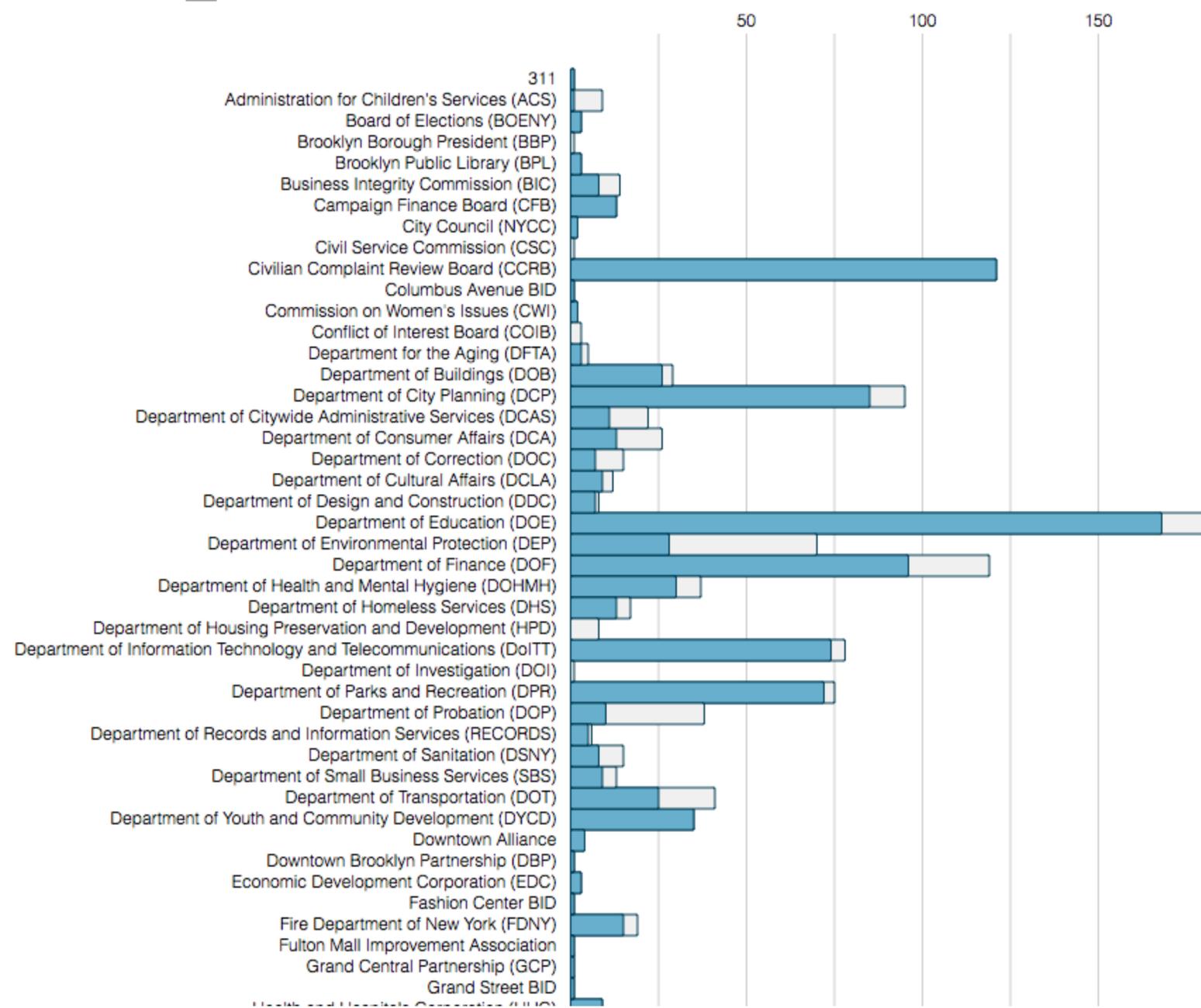


# Open Data Example

## NYC 1200+ Datasets available

View planned and released data sets by Agency

Sort by Agency  Sort by Available Data Sets



Name	Popularity	Type	RSS
<b>Open Data Plan Update 2014</b> This inventory includes all datasets scheduled for release between July 2014 and December 31, 2018.	14,297 views		
<b>ECB Notice of Violations</b> The Environmental Control Board Notice of Violations dataset contains information about violations that are being adjudicated through the court and provides information about the infraction decision and dismissal reason, payments, amounts and fees relating to the violation	12,019 views		
<b>Parking Violations Issued - Fiscal Year 2014 (August 2013 - June 2014)</b> Parking Violations Issued during Fiscal Year 2014 (August 2013 - June 2014)	7,054 views		
<b>Demographic Statistics By Zip Code</b> Demographic statistics broken down by zip code	10,753 views		
<b>ACRIS - Real Property Master</b> Document Details for Real Property Related Documents Recorded in ACRIS	4,023 views		
<b>City-owned and Leased Property</b> City-owned and Leased Property	2,505 views		
<b>Quality Of Life Indicators</b> Statistics on NYC quality of life	8,519 views		
<b>1 foot Digital Elevation Model (DEM)</b> NYC 1 foot Digital Elevation Model	3,096 views		
<b>DSNY Monthly Tonnage Data</b>	1,100 views		
<b>Parking Violations Issued - Fiscal Year 2015</b> Parking Violations Issued - Fiscal Year 2015 Past violations can be found in the archived dataset. <a href="https://data.cityofnewyork.us/City-Government/Parking-Violations-Issued-Fiscal-Year-2014-August-/t7v-77ml">https://data.cityofnewyork.us/City-Government/Parking-Violations-Issued-Fiscal-Year-2014-August-/t7v-77ml</a>	756 views		
<b>Borough Boundaries</b> GIS data: Boundaries of Boroughs (water areas excluded)	2,315 views		
<b>Primary Land Use Tax Lot Output (PLUTO)</b> Extensive land use and geographic data at the tax lot level in comma-separated values (CSV) file format. The PLUTO files contain more than seventy fields derived from data maintained by city agencies.	3,651 views		
<b>Neighborhood Tabulation Areas</b> data: Boundaries of Neighborhood Tabulation Areas as created by the NYC Department of City Planning using whole census tracts from the 2010 Census as building blocks. These aggregations of census tracts are subsets of New York City's 55 Public Use Microdata Areas (PUMAs).	1,812 views		
<b>Neighborhood Names GIS</b> GIS data: neighborhood labels as depicted in New York City: A City of Neighborhoods	4,393 views		

# Open Data Example

Search Results

Type: All | Category: City Government | Agency: All | Source: Official Data | Search

Most Accessed | This week

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