

An aerial photograph of the Atlanta skyline, featuring several prominent skyscrapers. The EverBank building is clearly visible on the right side. The city is surrounded by greenery and water bodies in the distance.

# Transportation and the Smart City

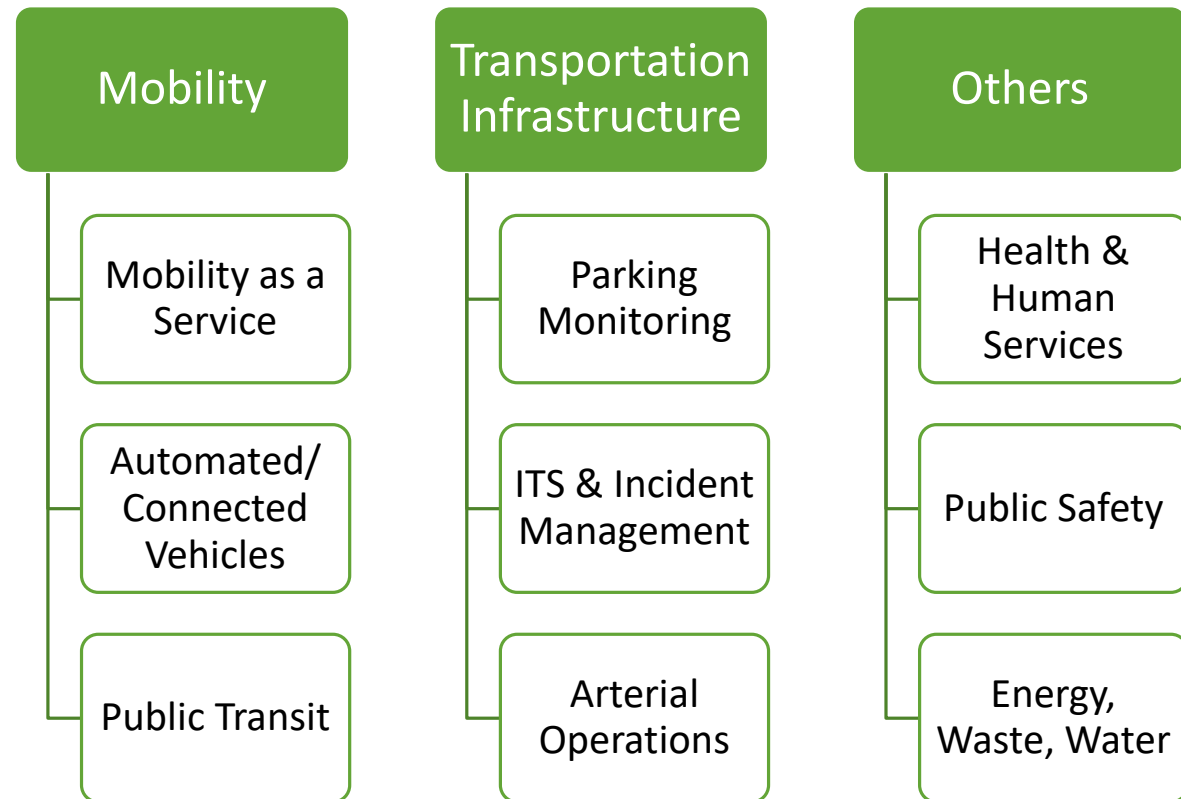
ITS GEORGIA ANNUAL MEETING  
SEPTEMBER 23, 2016

**HNTB**

# Introduction – What are Smart Cities?

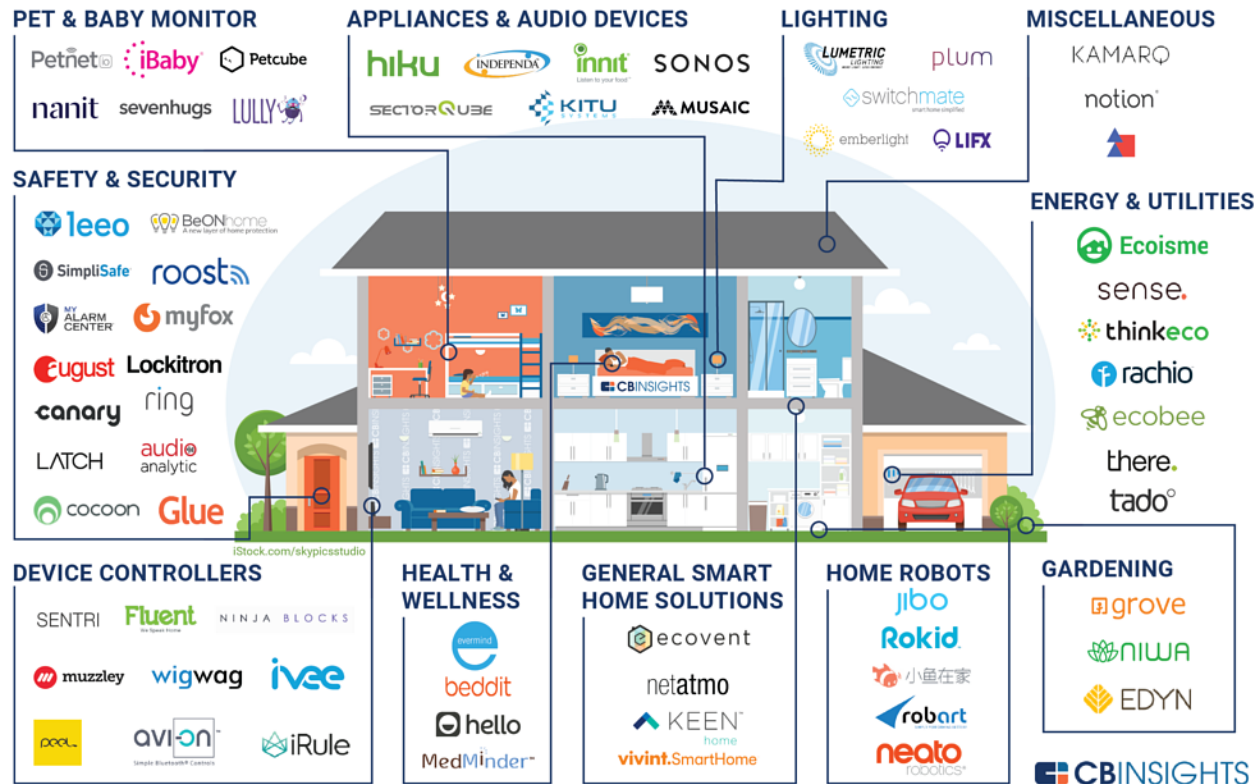
A **Smart City** utilizes **innovative and emerging technologies and concepts** to collect, analyze, and utilize data from many sources to enhance the city's livability.

**Smart City** concepts are easily extrapolated to **Smart Region** concepts.



# Smart Starts at the Home...

## 67 STARTUPS MAKING YOUR HOME SMARTER



# ...and Grows from There



# Broad Industry Context

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## US DOT Smart City Challenge (2016)

- \$40 Million from U.S. DOT
- 78 Applicants, 7 Finalists, 1 Winner
- Jacksonville Submitted Application

## Industry Efforts

- AT&T
- Cisco
- IBM
- Leidos

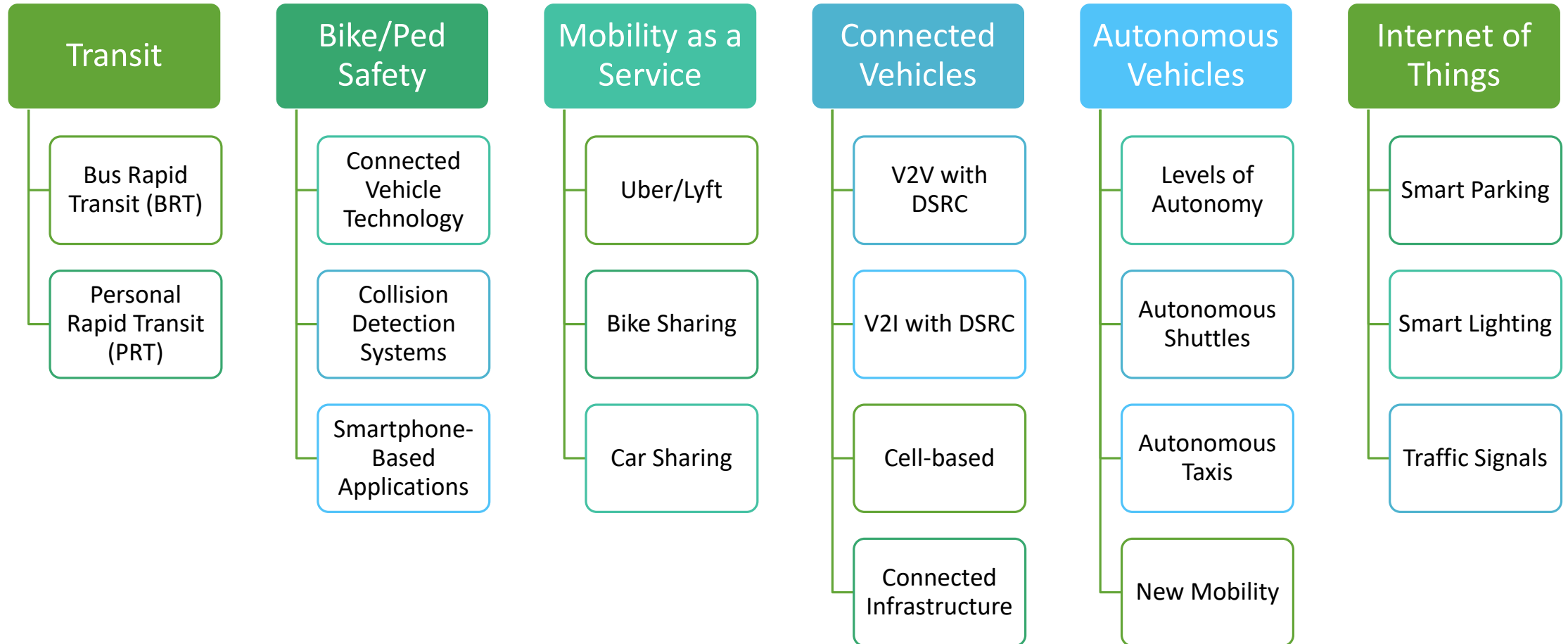
### Smart City Challenge Winner:

- Columbus, OH

### Smart City Challenge Finalists:

- Austin, TX
- Denver, CO
- Kansas City, MO
- Pittsburgh, PA
- Portland, OR
- San Francisco, CA

# State of the Practice - Transportation



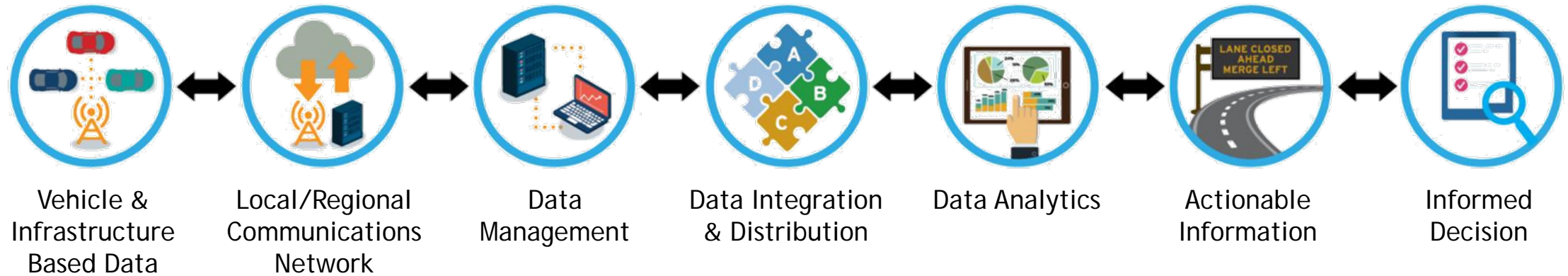
# Our Challenge?

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Embrace the Disruption  
But  
Manage the Risk

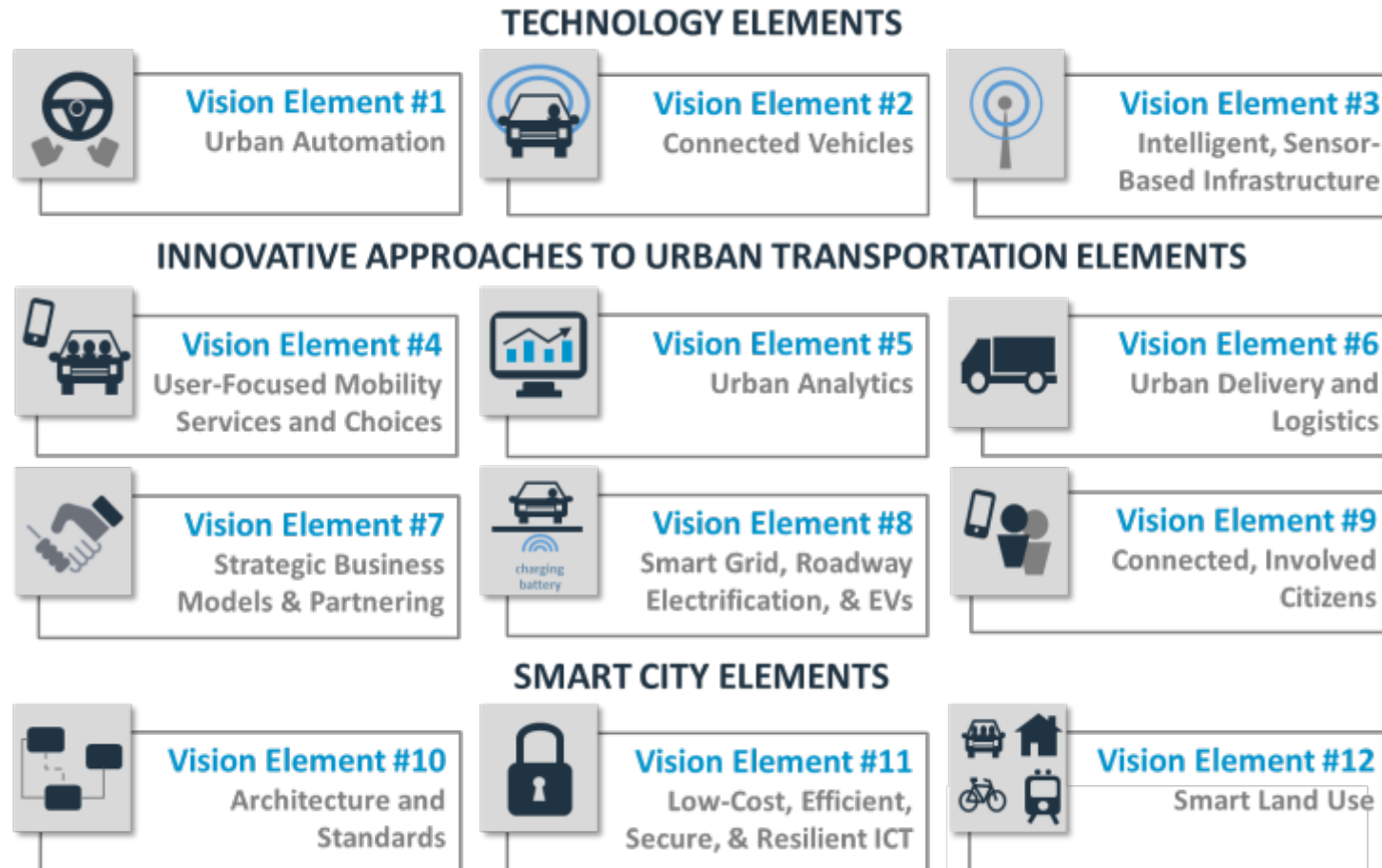
# Current Smart City Components



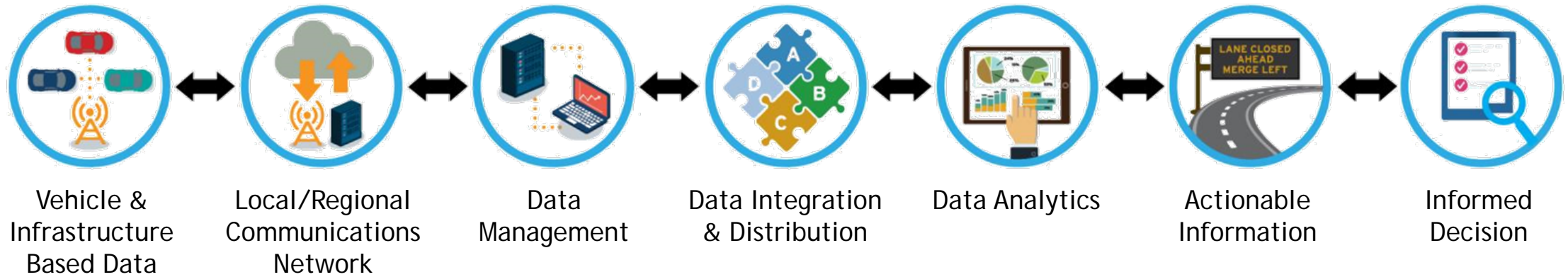
Description	Vehicle & Infrastructure Based Data	Local/Regional Communications Network	Data Management	Data Integration & Distribution	Data Analytics	Actionable Information	Informed Decision
	<ul style="list-style-type: none"> <li>• Roadway sensors</li> <li>• Cell data</li> <li>• Community input (ie. Waze)</li> </ul>	<ul style="list-style-type: none"> <li>• Radio towers</li> <li>• Fiber network</li> <li>• Cell network</li> </ul>	<ul style="list-style-type: none"> <li>• Advanced Traffic Management Systems</li> <li>• ISTEAs Management Systems</li> </ul>	<ul style="list-style-type: none"> <li>• ATMS data repositories</li> <li>• Typically closely held</li> </ul>	<ul style="list-style-type: none"> <li>• Travel Time reporting</li> <li>• Parking space availability</li> <li>• Traffic adaptive signal systems</li> </ul>	<ul style="list-style-type: none"> <li>• Modified signal timings</li> <li>• Updated travel time info</li> <li>• Suggested alternate routes</li> <li>• Dispatched emergency vehicles</li> </ul>	<ul style="list-style-type: none"> <li>• Common congestion times and locations</li> <li>• Frequent crash locations</li> </ul>



# US DOT Smart City Challenge



# Smart City Components of Tomorrow



Description	Vehicle & Infrastructure Based Data	Local/Regional Communications Network	Data Management	Data Integration & Distribution	Data Analytics	Actionable Information	Informed Decision
	<ul style="list-style-type: none"> <li>• Connected Vehicles (DSRC)</li> <li>• Cell data</li> <li>• Community input (ie. Waze, Uber)</li> <li>• Internet of Things (IoT) devices – smart everything</li> </ul>	<ul style="list-style-type: none"> <li>• Radio towers</li> <li>• Fiber network (100-Gig)</li> <li>• Cell network (5G)</li> </ul>	<ul style="list-style-type: none"> <li>• Big Data systems</li> <li>• Financial Data for MBUF and Tolling</li> </ul>	<ul style="list-style-type: none"> <li>• No silos</li> <li>• Traffic, weather, asset and other data integrated</li> <li>• Raw data freely available to the world</li> <li>• PII data protection</li> <li>• Enhanced cyber security risks</li> </ul>	<ul style="list-style-type: none"> <li>• Fully integrated transportation system – parking, traffic signals, travel times, transit, etc.</li> <li>• Integration with non-transportation systems (smart grid, trash, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Weather &amp; vehicle specific signal timings</li> <li>• Predictive travel time info</li> <li>• Active AV Route guidance</li> <li>• Enhance emergency vehicle dispatch</li> <li>• First/Last Mile</li> </ul>	<ul style="list-style-type: none"> <li>• Updated regional planning data</li> <li>• Real-time system-wide information</li> <li>• Crash avoidance</li> <li>• Congestion avoidance &amp; rerouting</li> <li>• Unleashed potential</li> </ul>

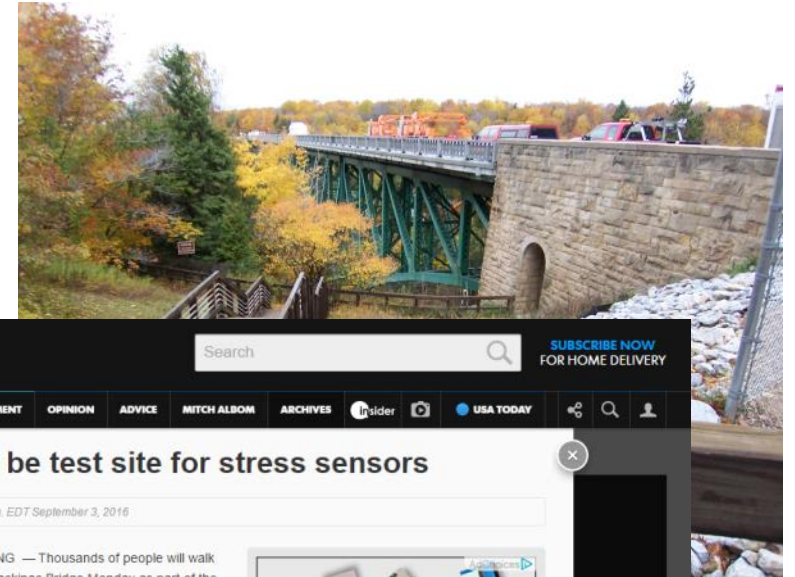
# US DOT Smart City Challenge - Columbus



Source: Columbus, OH Smart City Application

# Example: Bridge Stress and Strain

- Real-Time Stress/Strain monitoring of bridges
- Objective is to Identify/Prevent I-35W in the future
  - Over 600,000 bridges in the US
  - 65,000 in need of repair
- Every Element of Smart City is needed to address:
  - Multiple sensors
  - Communications
  - Data Management
  - Data Analytics
  - Need to take action

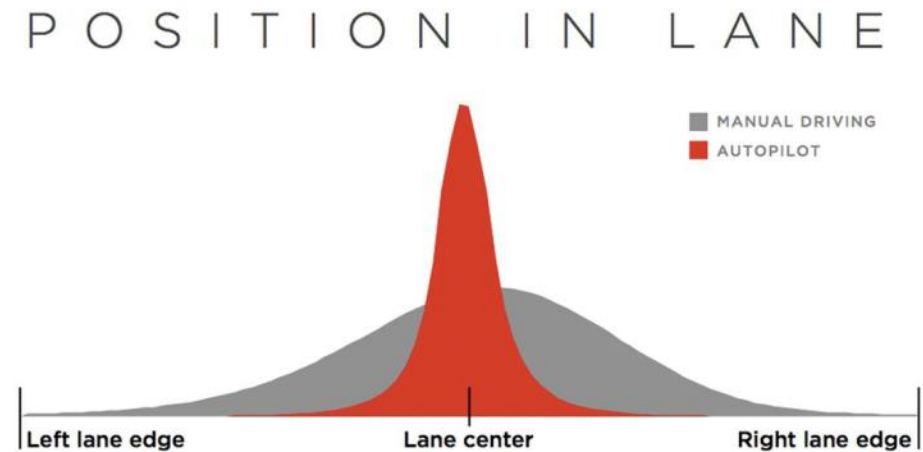


A screenshot of a news article from the Detroit Free Press titled "Mackinac Bridge to be test site for stress sensors". The article is by Kathleen Lavey from the Lansing State Journal, dated September 3, 2016. The text mentions that thousands of people will walk across the Mackinac Bridge for a Labor Day bridge walk, and that MSU professor Nizar Lajnef will be testing sensors on the bridge. Below the article is a USA Today article titled "Report: Over 65,000 U.S. bridges in need of repair". The USA Today article has a social media share count of 2388. There are also some ads and navigation elements visible on the page.

# Example: Roadway Design

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- Tesla data from 780 million miles of data
  - Opportunity to collect new data
  - Need to work with new partners
  - New insights into how we design roads for the future



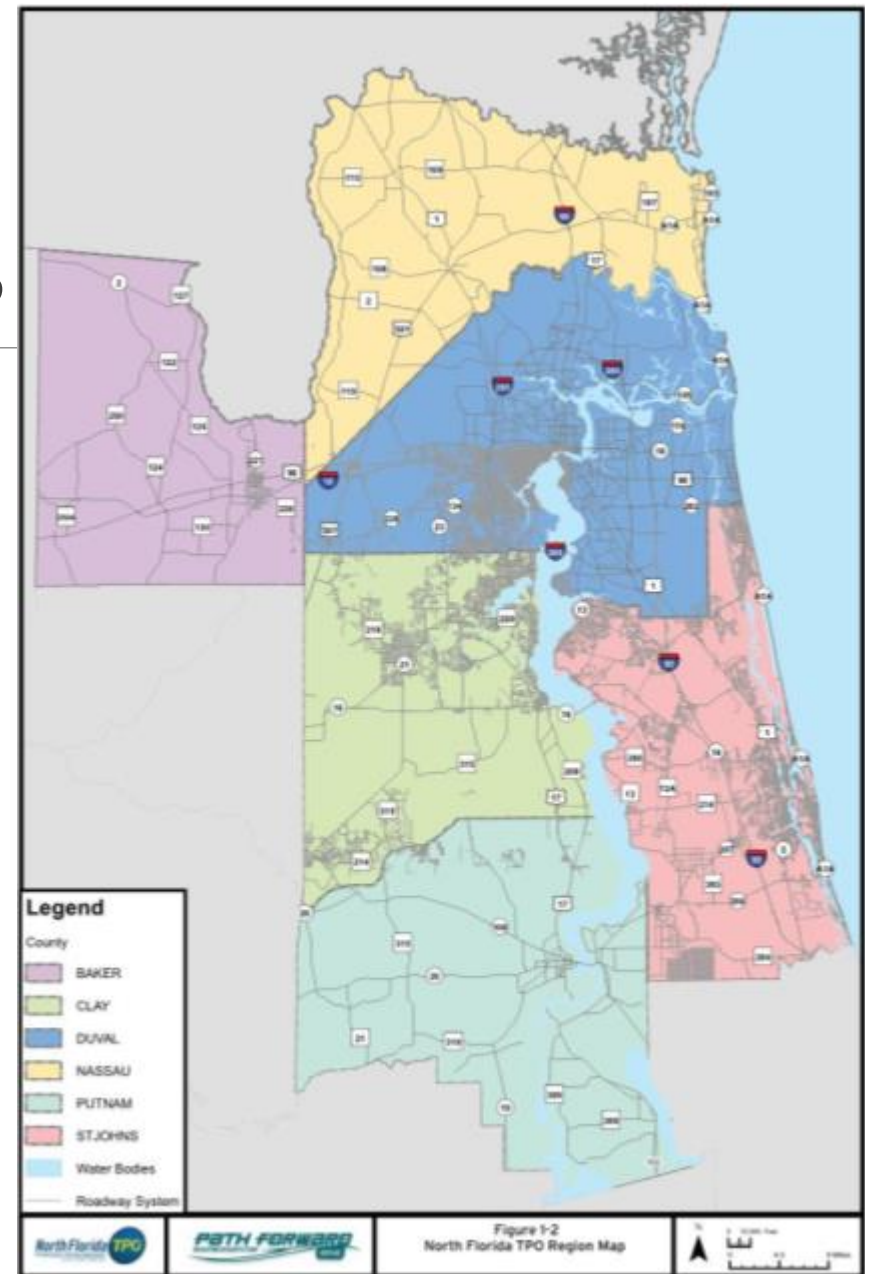
# Update ITS & TSM&O Plans

## Focus on TSM&O

- Develop **Smart City or Region Master Plans** for the deployment of new transportation systems management and operations (TSM&O) strategies and technologies.

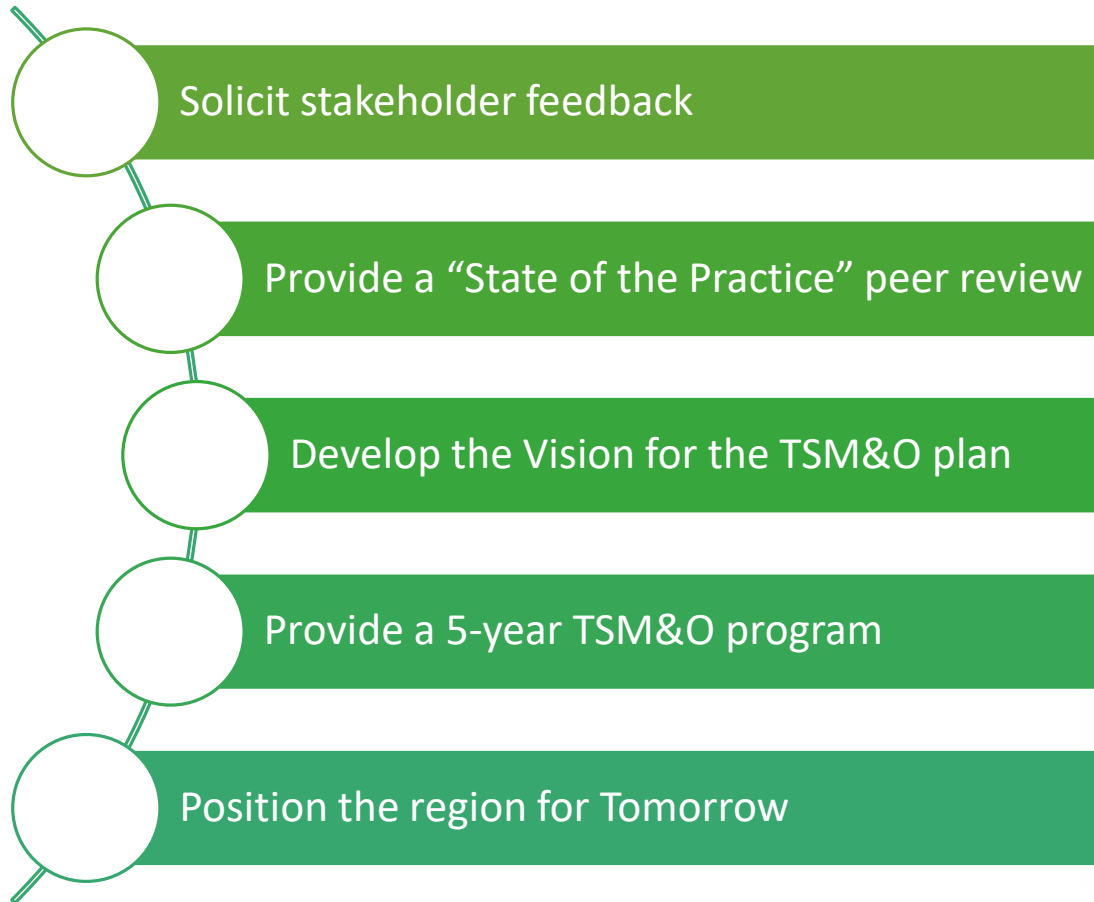
## Primary Objective

- Transportation and how it is integrated with other public assets and needs, and to define a regional vision for information technologies and communications.



# An Example TSM&O Smart Region Project Goals

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# Smart Cities are Coming

- Smart City components need to be added to the current ITS planning process
  - The world just got bigger for the ITS professional
  - Communications, data management, advanced analytics are keys
- New Partners are Critical
  - From Start-ups to Mature Companies
  - Be open to the potential and look beyond today
- Take the (safe) leap!

Remember – Everything is Awesome!





# Thank You!

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