

An aerial photograph of a city skyline, likely Norfolk, Virginia, featuring several prominent skyscrapers. A semi-transparent white rectangular box is centered over the image, containing the title and event information. The background shows a mix of modern glass skyscrapers and older brick buildings, with a body of water visible in the distance under a hazy sky.

Transportation and the Smart City

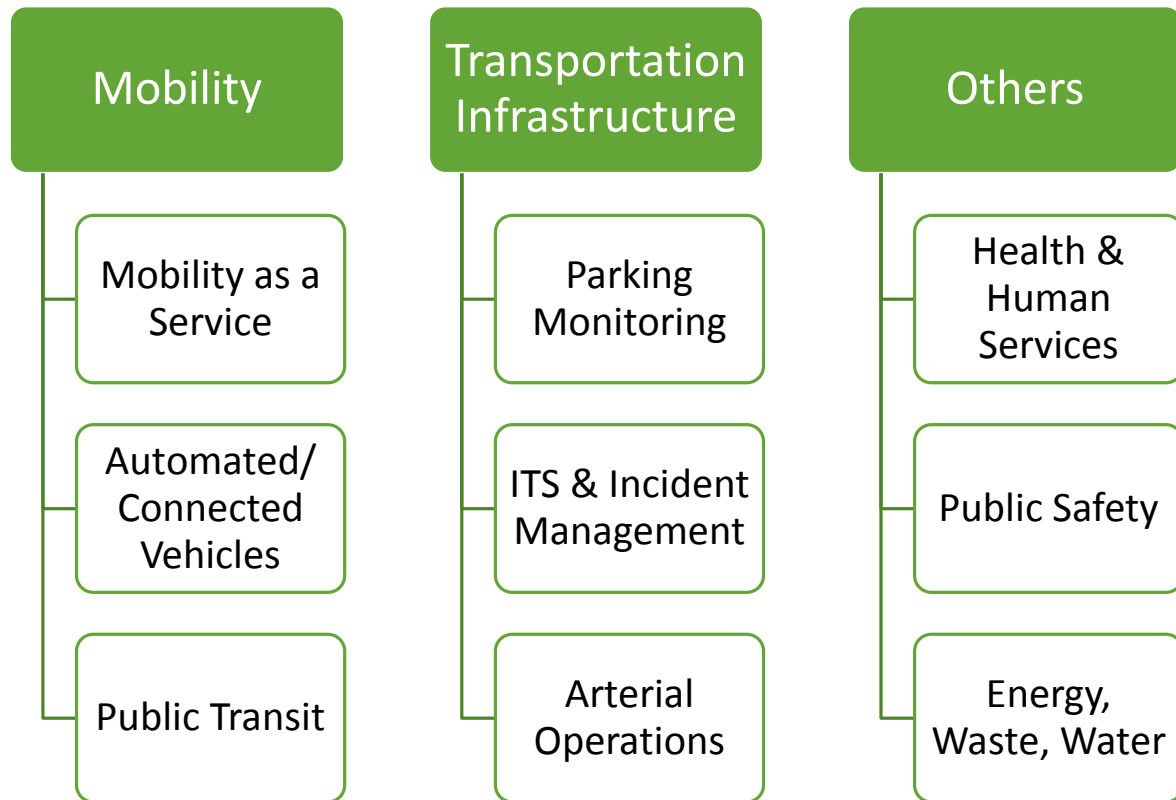
ASHE GREATER HAMPTON ROADS
NOVEMBER 15, 2016



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

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

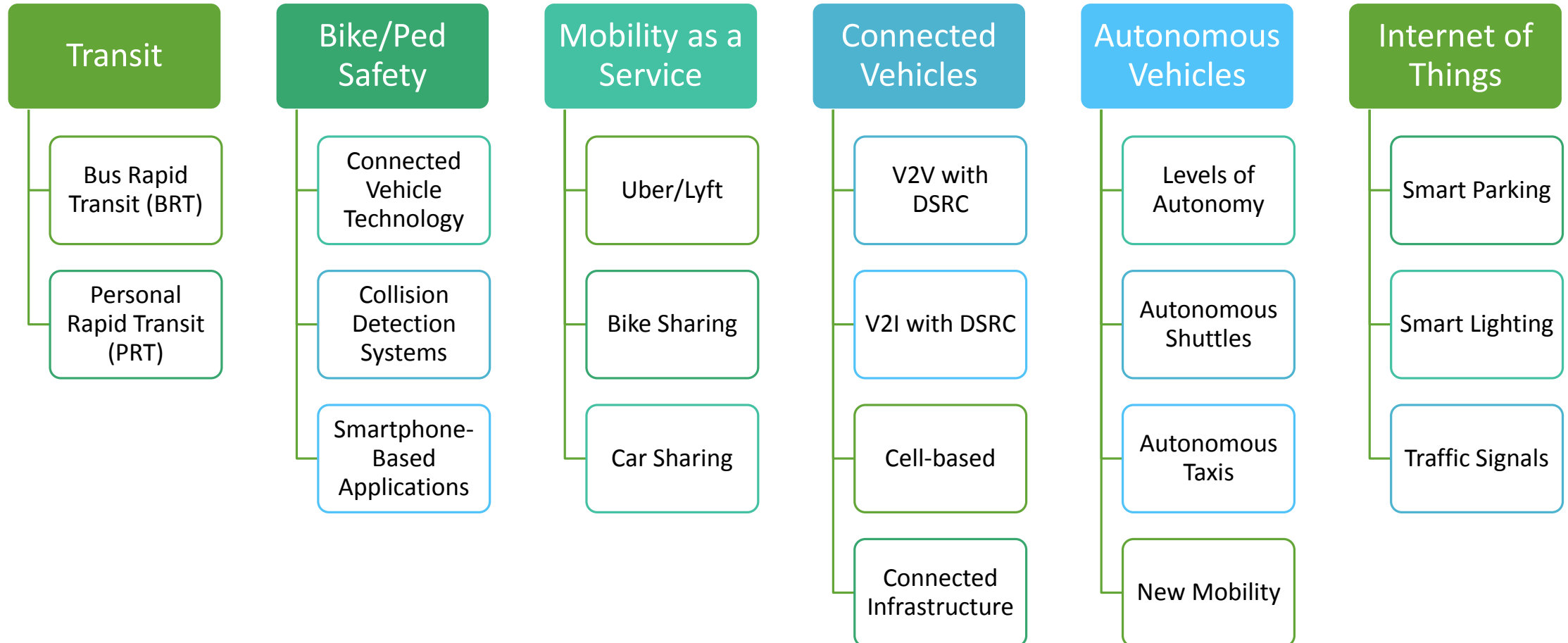
Smart City Challenge Winner:

- 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

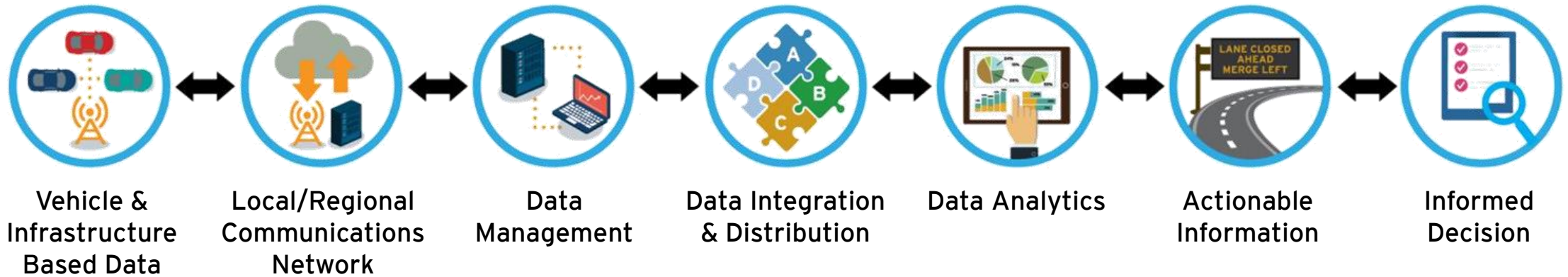


Our Challenge?



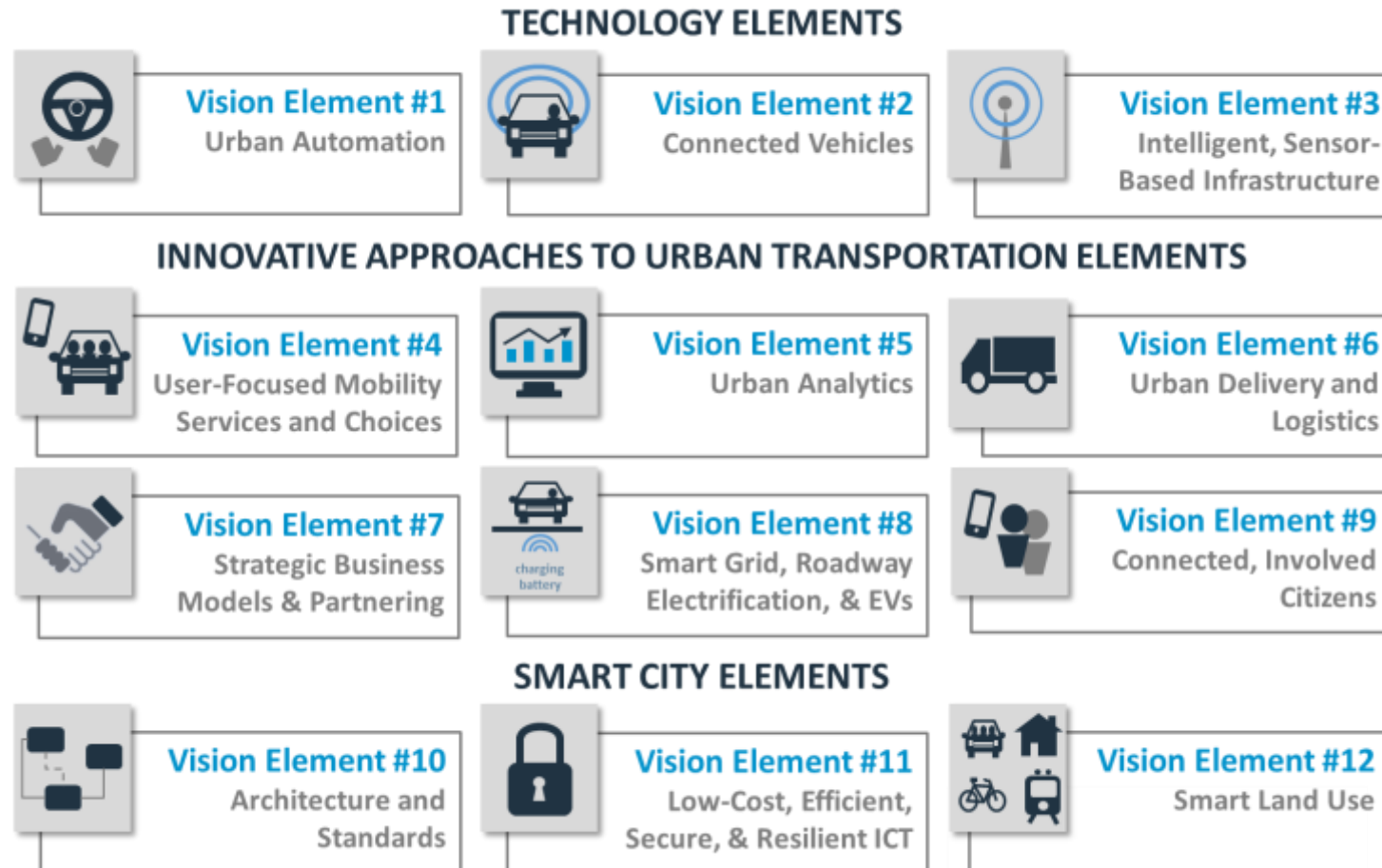
Embrace the Disruption
But
Manage the Risk

Current Smart City Components

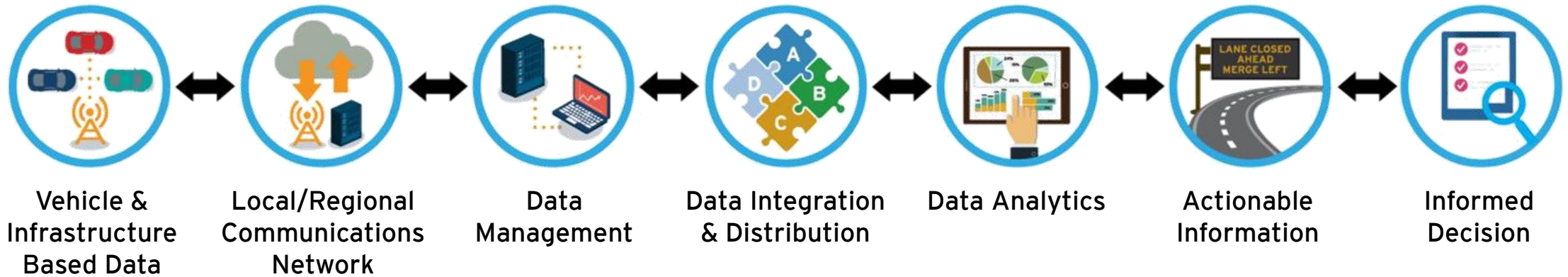


Description	Vehicle & Infrastructure Based Data	Local/Regional Communications Network	Data Management	Data Integration & Distribution	Data Analytics	Actionable Information	Informed Decision
	<ul style="list-style-type: none"> • Roadway sensors • Cell data • Community input (ie. Waze) 	<ul style="list-style-type: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

US DOT Smart City Challenge



Smart City Components of Tomorrow



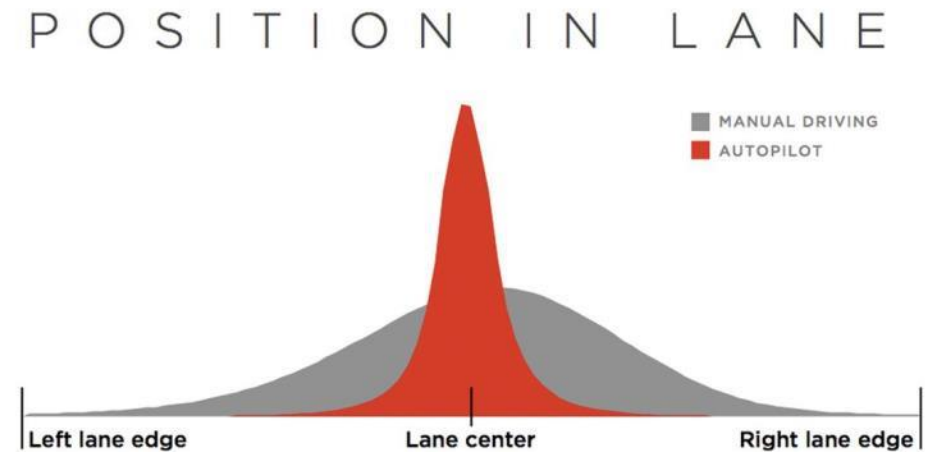
Description	Vehicle & Infrastructure Based Data	Local/Regional Communications Network	Data Management	Data Integration & Distribution	Data Analytics	Actionable Information	Informed Decision
	<ul style="list-style-type: none"> • Connected Vehicles (DSRC) • Cell data • Community input (ie. Waze, Uber)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

US DOT Smart City Challenge - Columbus



Example: Roadway Design

- 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



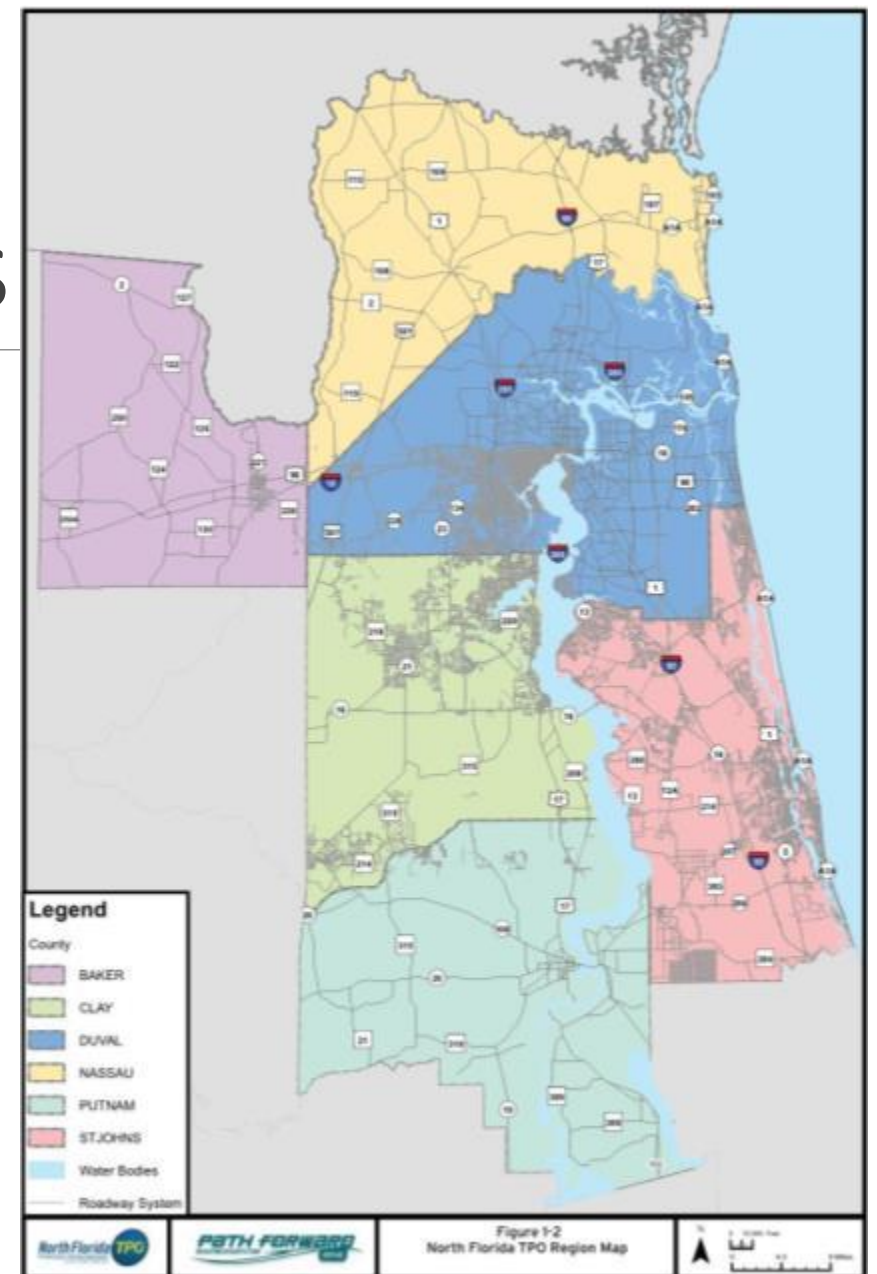
Example: Update ITS & TSM&O Plans

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.



Example: Autonomous Vehicles

- Need to begin consideration of Autonomous Vehicles in plans
 - 2030 – 4.5 million Level 5 in the US
 - Impact on Operations?
 - Impact on Parking?
 - Impact on Transit? Vehicle Ownership?
- Many unknowns and diverging opinions demand flexibility



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!



Thank You!

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