Smart Cities are focused on developing a holistic, integrated approach to improving transportation performance, taking advantage of emerging technologies and big data applications, then integrating it with other city services.
Our World is Changing

- Transportation
- People
- Land Use
- Funding
- Internet of Things
Transportation is Changing

- TSM&O
- Agency Partnerships
- Performance Measures
- Big Data Applications
- TMC of the Future
People are Changing

- Baby Boomers, GenX, Millennials
- Different Travel Behaviours
- Flexible Mode Combinations
- Internet of Things / Big Data
- Mobile Apps
Land Uses are Changing

- Redevelopment of Cities
- Joint Development
- Road Diet (Cars, Bikes, Peds)
- Uber / Lyft / Zipcars
- Community Planning
Funding is Changing

- Managed Lanes
- Mileage-Based User Fees
- Gamification
- Auto Manufacturers
- Public-Private Partnerships
Internet of Things

- Internet Protocol
- 75M Servers 1.2B Cars
- Unused Capacity
- Share Transport Resources
- Connected & Automated Vehicles
- Designated Pickup/Dropoff
- Packets of People & Cargo
- Decentralize Car Ownership

The Internet of Things

Share Transport Resources

Unconnected & Automated Vehicles

Designated Pickup/Dropoff

Packets of People & Cargo

Decentralize Car Ownership

The Institute of Transportation Engineers

AECOM
Built to deliver a better world
Innovative Programs

- ROADX (Colorado)
- Road To Tomorrow (Missouri)
- I-270 Progressive DB (Maryland)
- USDOT Smart City Challenge
USDOT Smart City Challenge

$50 Million Grant
Innovations
Fully Integrated
Mid-Size Cities
Scalable / Repeatable

<table>
<thead>
<tr>
<th>Technology Elements</th>
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<tbody>
<tr>
<td>1. Urban Automation</td>
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<tr>
<td>2. Connected Vehicles</td>
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<tr>
<td>3. Intelligent, Sensor-Based Infrastructure</td>
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<table>
<thead>
<tr>
<th>Innovative Approaches to Urban Transportation Elements</th>
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<tr>
<td>4. Urban Analytics</td>
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<tr>
<td>5. User-Focused Mobility Services and Choices</td>
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<td>6. Urban Delivery and Logistics</td>
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<tr>
<td>7. Smart Business Models and Partnering Opportunities</td>
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<td>8. Smart Grid, Roadway Electrification, Electric Vehicles</td>
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<td>9. Connected and Involved Citizens</td>
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<table>
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<tr>
<th>Smart City Elements</th>
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<tr>
<td>10. Architecture and Standards</td>
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<tr>
<td>11. Low Cost, Efficient, Secure, Resilient Communications</td>
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<tr>
<td>12. Smart Land Use</td>
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</table>
USDOT Smart City Challenge

1,400 local officials, companies, academics and non-profits joined our webinars

800 people participated in our Smart City Forum

300 companies have expressed interest in partnering

78 applications received for the Smart City Challenge

7 Smart City Challenge Finalists to be announced in March at SXSW

1 Smart City Challenge Winner announced in June

#DOTSmartCity www.transportation.gov/smartcity
USDOT Smart City Challenge
Smart City Components

- Technology Marketplace
- Smart Parking Systems
- Integrated Mobility
- Electric Vehicle Recharging Lanes
- Enterprise Data Management System
- Smart Streetlights
- Smart Mobility Hubs
- Connected Vehicles
- Mobility on Demand Apps
- Intelligent Freight Management
- Connected Citizens (Crowd Sourcing)
- Shared Driverless Vehicles
Similarities

- Data Management Platforms
- Mobile Traveler Apps
- C/AV Applications
- EVs / Smart Grids
- Connected Citizens

Smart City applications include common solutions to address USDOT’s 12 vision elements.
## Smart City Highlights

<table>
<thead>
<tr>
<th>City</th>
<th>Features</th>
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<tbody>
<tr>
<td>Columbus, Ohio</td>
<td>Driverless vehicles to access city jobs and day care</td>
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<tr>
<td></td>
<td>Smart grid to support electric vehicles</td>
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<tr>
<td>Portland, Oregon</td>
<td>Safety in moving people around the City</td>
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<td></td>
<td>UB Mobile PDX to link all connected modes of transportation</td>
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<tr>
<td>Pittsburgh, Pennsylvania</td>
<td>Real time adaptive signal control with smart transit priority</td>
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<tr>
<td></td>
<td>Intelligent freight management</td>
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<tr>
<td>Kansas City, Missouri</td>
<td>Smart WiFi kiosks</td>
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<tr>
<td></td>
<td>Driverless shuttles</td>
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<tr>
<td>Denver, Colorado</td>
<td>Integration of CV data into TMC</td>
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<tr>
<td></td>
<td>Data management platform accessible to anyone</td>
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<tr>
<td>San Francisco, California</td>
<td>Integrated mobility app</td>
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<tr>
<td></td>
<td>Collision avoidance systems and vehicles</td>
</tr>
<tr>
<td>Austin, Texas</td>
<td>Automated / Connected / Electric shuttles (Airport, Downtown)</td>
</tr>
<tr>
<td></td>
<td>Intelligent sensor based infrastructure</td>
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</tbody>
</table>
And the Winner is – “Columbus”

- $90M Local Match
- Low Income Access to Jobs
- Driverless Vehicles
- Electric Vehicles / Charging
- Multimodal Transit Pass
Future Directions

- Smart City Deployments
- Scalable Expansion
- Replicate in Other Cities
- Leverage Other USDOT Programs
- Smart City Command Center

Smart Cities will need to leverage the “Internet of Things” in connecting city services to operate more efficiently.
Smart City Command Center

TMC of the Present

TMC of the Future

Smart City Command Center

Active Traffic Management

Managed Lanes Network Management

Incident Management

Traffic Management

Work Zone Management

Special Event Management

Traveler Information

Performance Management

Transit Management

Integrated Corridor Management

Web Interface Systems

Emergency Management

Connected Vehicles Applications

Security Systems

Air Quality Management

Smart Building Monitoring

Public Safety Systems

Smart Parking

Predictive Modeling

Water & Wastewater Management Systems

Decision Support Systems

Smart Electric Grid & Vehicle Charging Systems

AECOM
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Summary

- Technology Partnerships
- Attract Innovations
- TSM&O / Internet of Things
- Higher and Best Land Use
- LRTP Integration

Smart Cities will integrate innovative transportation management strategies with emerging technology applications.