U.S. Department of Transportation

Beyond Traffic: The Smart City Challenge

Brian Cronin

Intelligent Transportation Systems Joint Program Office (ITS JPO)

Team Lead, Research

Transportation Research Board (TRB) Annual Meeting

January 13th, 2016

“Beyond Traffic 2045”

The USDOT’s new 30 Year Framework for the Future addresses many of the issues around Smart Cities and provides additional food for thought

Source: USDOT

- How will we move?
- How will we move things?
- How will we move better?
- How will we adapt?
- How will we align decisions and dollars, and invest the trillions of dollars our transportation system needs in the smartest way possible?

http://www.dot.gov/BeyondTraffic

In 30 years, our population is expected to grow by about 70 million

Source: USDOT

Older Americans are Redefining Longevity

Millennials – Shaped by Technology

Source: USDOT

Real-Time Travelers

90% of American adults own a mobile phone

Source: USDOT

On average, Americans spend over 40 hours stuck in traffic each year

Source: USDOT

The Cost of Congestion

Truck congestion wastes $27 billion in time and fuel annually

The transportation sector is the second biggest source of greenhouse gases (GHGs)

Source: USDOT

Estimates indicate that 30% of traffic in business districts is attributable to drivers looking for parking

Source: USDOT

Opportunities exist to use big data and analytics to drive decision making

Source: USDOT

The Sharing Economy

Car sharing, bike sharing, ridesharing, and pop-up bus services

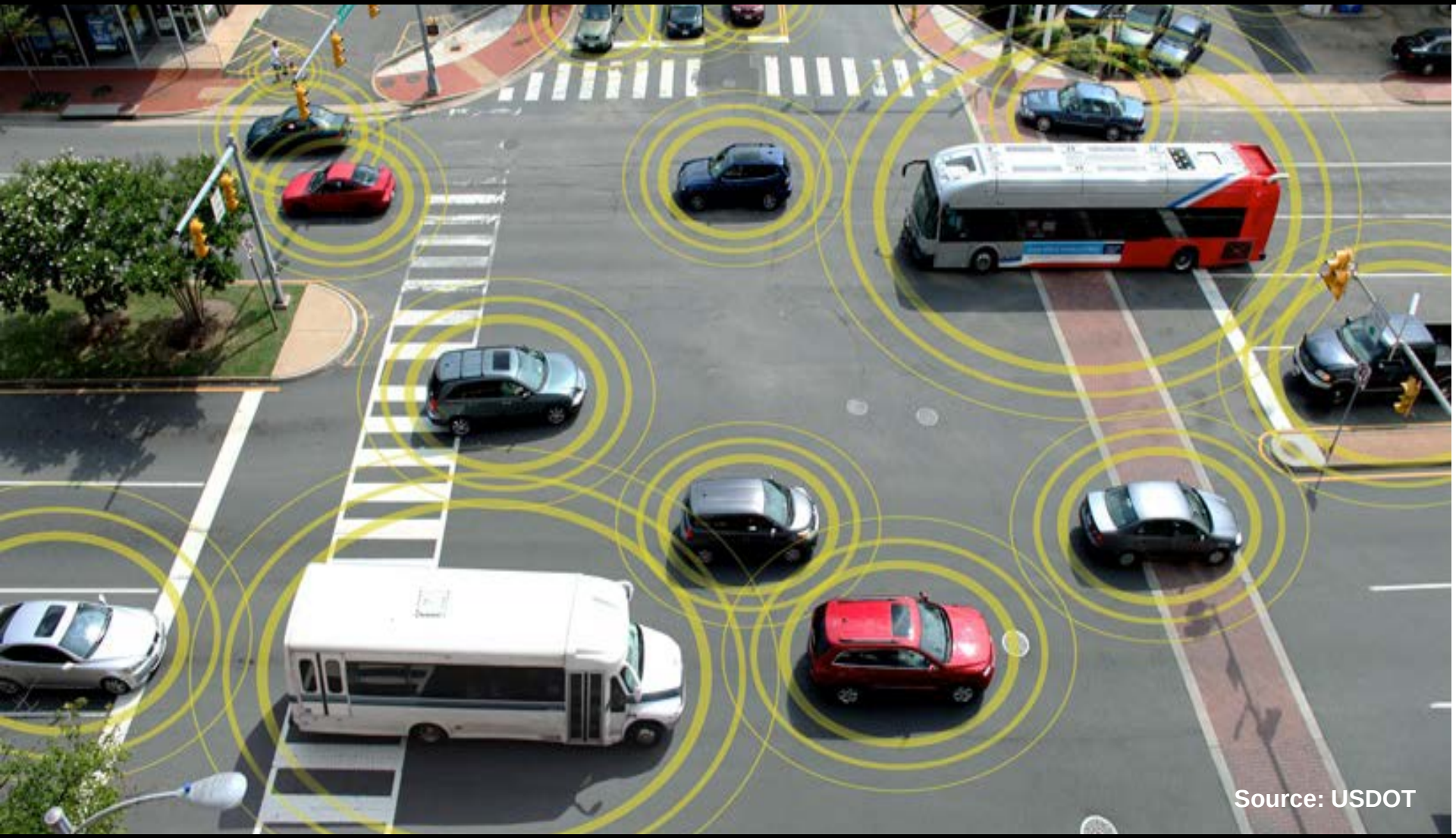
Source: USDOT

Opportunities for Urban Automation

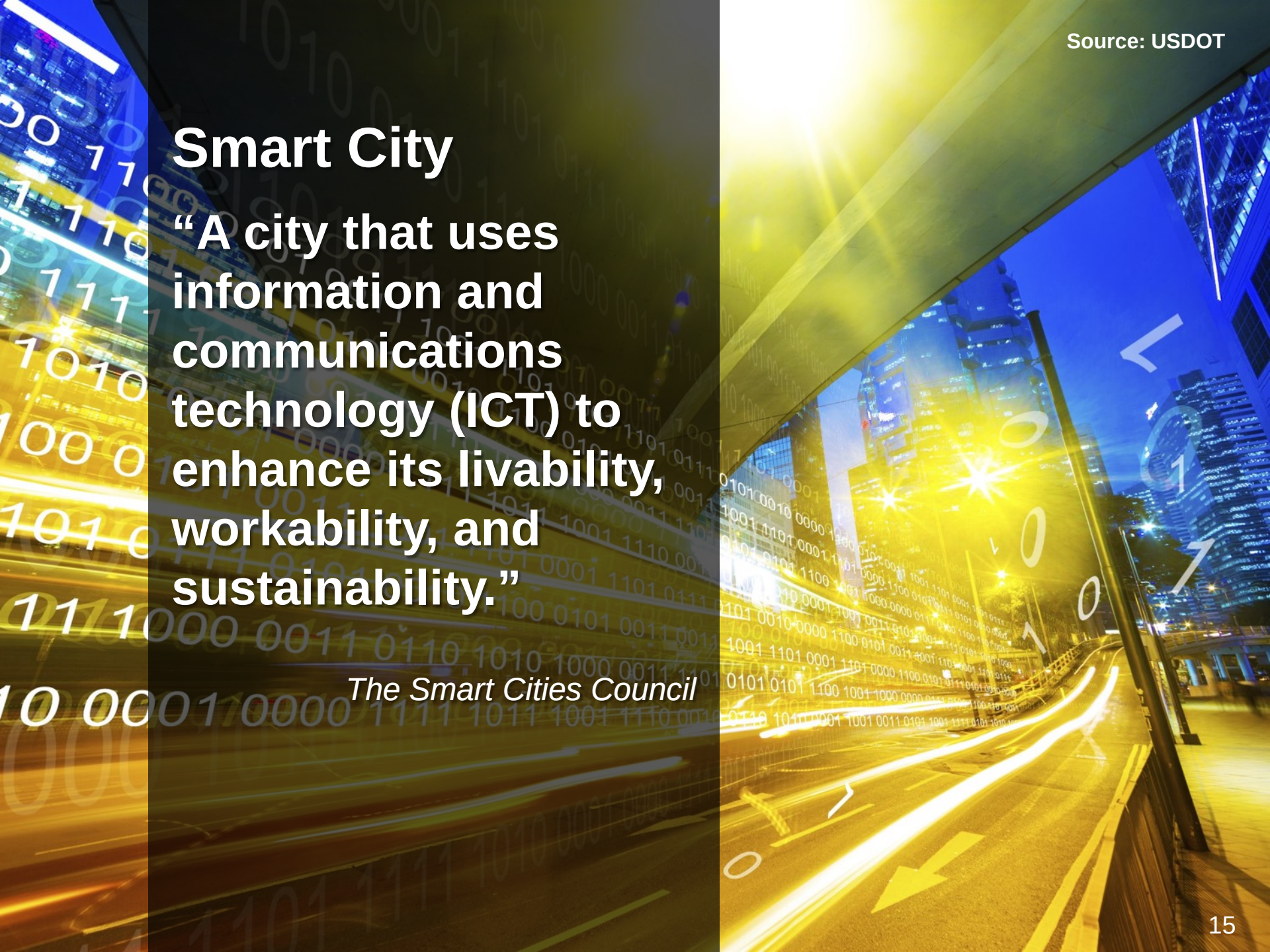
- Automated transportation offers tremendous possibilities for enhancing safety, mobility, accessibility, equity, and the environment
- Opportunities for automation include:
  - Self-driving vehicles coupled with smart infrastructure;
  - Self-driving shuttles could operate at low speeds enabling new mobility options for services such as first/last mile travel to local destinations and access to public transportation; and
  - Fully automated trucks and buses may also be used in intermodal facilities, such as ports, depots, and maintenance facilities

The Potential of Connected Vehicles

Vehicle-to-Vehicle and Vehicle-to-Infrastructure Communications



Source: USDOT



Source: USDOT

Smart City

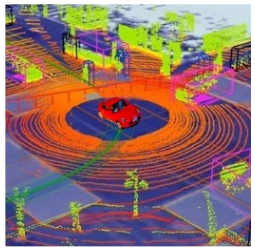
"A city that uses information and communications technology (ICT) to enhance its livability, workability, and sustainability."

The Smart Cities Council

Advanced Technologies and Smart Cities

Technology convergence will revolutionize transportation, dramatically improving safety and mobility while reducing costs and environmental impacts

- Connected Vehicles
- Vehicle Automation



Connected-Automated Vehicles

- Internet of Things
- Machine Learning
- Big Data
- Sharing Economy

Smart Cities

Benefits

- Order of magnitude safety improvements
- Reduced congestion
- Reduced emissions and use of fossil fuels
- Improved access to jobs and services
- Reduced transportation costs for gov't and users
- Improved accessibility and mobility

Beyond Traffic: The Smart City Challenge

- Encourage cities to put forward their **best and most creative ideas for innovatively addressing the challenges** they are facing.
- The Smart City Challenge will **address how emerging transportation data, technologies, and applications can be integrated with existing systems** in a city to address transportation challenges.
- Demonstrate how advanced data and intelligent transportation systems (ITS) technologies and **applications can be used to reduce congestion, keep travelers safe, protect the environment, respond to climate change, connect underserved communities, and support economic vitality**.

Beyond Traffic: The Smart City Challenge

Phase 1 (Deadline February 4, 2016):

- Support concept development and planning activities
- Estimated five Smart City Challenge Finalists
- $100K each

Phase 2 (Solicitation and Deadline TBD):

- Smart City Challenge Finalists
- Support implementation of their proposed demonstration
- $50 Million+
  - U.S. Department of Transportation: $40 Million
  - Vulcan Foundation: $10 Million
  - Mobileye: Installation of Mobileye's Shield +™ on every bus

Beyond Traffic: The Smart City Challenge

- **Attributes of the Ideal Candidate**
  - Mid-sized city with a population between approximately 200,000 and 850,000 people;
  - A population density typical of a mid-sized city;
  - Represents a significant portion (more than 15%) of the overall population of its urban area;
  - An established public transportation system;
  - An environment that is conducive to demonstrating proposed strategies; and
  - Leadership and capacity to carry out the demonstration;
  - A commitment to integrating with the sharing economy; and
  - A clear commitment to making data open to fuel entrepreneurship and innovation.

Beyond Traffic: The Smart City Challenge

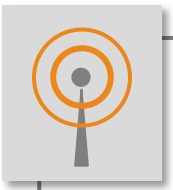
- The USDOT recognizes that each city has unique attributes, and each city's proposed demonstration will be tailored to their vision and goals.
- The USDOT's vision for a Smart City Challenge is "to identify an urbanized area where advanced technologies are integrated into the aspects of a city and play a critical role in helping cities and their citizens address challenges in safety, mobility, sustainability, economic vitality, and address climate change."
- To assist cities, the USDOT identified twelve vision elements that are intended to provide a framework for Applicants to consider in the development of a city's proposed demonstration without making each item a requirement for award.

Beyond Traffic: The Smart City Challenge

Technology Elements *(Highest Priority)*

Vision Element #1
Urban Automation

Vision Element #2
Connected Vehicles



Vision Element #3
Intelligent, Sensor-Based Infrastructure

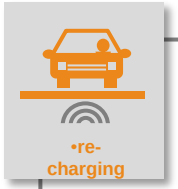
Innovative Approaches to Urban Transportation Elements *(High Priority)*

Vision Element #4
User-Focused Mobility Services and Choices

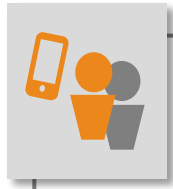
Vision Element #5
Urban Analytics

Vision Element #6
Urban Delivery and Logistics

Vision Element #7
Strategic Business Models & Partnering

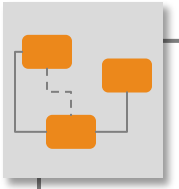


Vision Element #8
Smart Grid, Roadway Electrification, & EVs



Vision Element #9
Connected, Involved Citizens

Smart City Elements *(Priority)*



Vision Element #10
Architecture and Standards

Vision Element #11
Low-Cost, Efficient, Secure, & Resilient ICT

Vision Element #12
Smart Land Use

Beyond Traffic: The Smart City Challenge
Past Information Sessions

Data, Architecture, and Standards (Virtual)
12/16/2015 (1:00 to 2:30 pm EST)

Connected Vehicles and Automation (Virtual)
12/17/2015 (1:00 to 2:30 pm EST)

Sharing Economy, User-Focused Mobility, and Accessible Transportation (Virtual)
12/18/2015 (1:00 to 2:30 pm EST)

The Smart City Challenge Application and Selection Process (Virtual)
12/21/2015 (1:00 to 2:00 pm EST)

Urban Freight Delivery and Logistics (Virtual)
1/6/2016 (11:30 am to 1:00 pm EST)

To access presentations and recordings, visit:
https://www.transportation.gov/smartcity/infosessions

Beyond Traffic: The Smart City Challenge
Upcoming Information Sessions

Link Between Beyond Traffic and The Smart City Challenge (Virtual)
1/14/2016 (1:30 to 2:30 pm EST)

Smart City Challenge Application Homestretch – An Open Q&A Session (Virtual)
1/19/2016 (12:00 to 1:00 pm EST)

Understanding Dedicated Short Range Communications (DSRC) (Virtual)
1/21/2016 (12:00 to 1:00 pm EST)

For More Information and RSVP Information on upcoming webinars, visit:
https://www.transportation.gov/smartcity/infosessions

For More Information and Questions

Department of Transportation

https://www.transportation.gov/

Smart City Challenge

www.transportation.gov/smartcity

Questions?

SmartCityChallenge@dot.gov