Integrating Emerging Technology Into Transportation Planning

Georgia Planning Association, 2019 Spring Conference
March 27, 2019, Decatur, GA

Daniel Studdard, AICP, ARC Principal Planner
Maria Roell, ARC Senior Planner
Kofi Wakhsisi, AICP, ARC Senior Principal Planner
Facilitate data sharing and integration amongst public agencies and between the public and private sectors.

Investments in transportation infrastructure and technologies to take advantage of new and emerging technology.

Actively manage travel demand and optimize system performance.
Implementation Mechanisms

- Fund pilot programs to advance technology deployment
- Develop an on-going regional forum or task force around transportation technology innovation.
- Develop partnerships and visionary concepts to help prepare the region to compete for potential future federal discretionary grants or secure private sector funding.
Regional Forum: ConnectATL

How should the Atlanta Region prepare for technology changes that will impact transportation, logistics, and much more?

• One-Day Summits in September 2017 and 2018

• Brought together
  • City and county government leaders
  • Local transportation officials
  • Industry Leaders

• Organized by ARC
Incorporate technology scenarios into future regional, corridor, and local transportation and land use planning efforts:

- LCI Program
  - Georgia Smart Communities Challenge
- Partnership with Georgia Tech
- Comprehensive Transportation Plans (CTPs)
- Freight Cluster Plans
- Other Plans?
Pilot Implementation: Mobileye

Visual and Audible Alert

- Headway/Following Time Monitoring & Warning
- Forward Collision Warning
- Lane Departure Warning
- Speed Limit Indicator
- Identifies vehicles, cyclists, pedestrians, lane markings, etc.
Connected Vehicles: DSRC vs. 5G

Competing Technologies

• Vehicle version of VHS vs. Beta
• DSRC (Direct Short Range Communication)
  • Primarily backed by government
  • Supported by General Motors, Toyota, and more
  • Focused on vehicle safety
• 5G
  • Primarily backed by private sector
  • Supported by Ford, Audi, and more
  • Connected vehicle support, faster internet, and IOT connectivity
Toyota Has Big Plans To Get Cars Talking To Each Other And Infrastructure In The U.S.

Forbes, Sam Abuelsamid, Apr 16, 2018

Ford Will Roll Out a 5G Connected-Car Network across the Lineup by 2022

Car and Driver, By Clifford Atiyeh, Jan 8, 2019
ARC’s Regional TSMO Plan

TSMO today

New data sources

New modal options and business models

Connected and automated vehicles

2040 Vision
ARC’s Regional TSMO Plan

Key Visions

• Optimizing Safety
  – Applying technology and context-sensitive approaches to achieve zero fatalities

• Reliable Travel Times
  – Managing planned and unplanned disruptions to reduce unexpected delays

• Efficient Travel
  – Coordinated systems across jurisdictions and modes; accessible, real-time travel information

• Equitable Access
  – People of all ages, abilities, languages, backgrounds, and incomes have access to safe, reliable, efficient mobility options

Foundational Elements

Operations philosophy focuses on moving people and goods, rather than vehicles

Collaboration across jurisdictional boundaries, public and private sectors, and service providers

Data sharing across public and private data providers and users

Fostering a culture of innovation and adaptability to change
## State 2018 Safety Totals

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Crashes</td>
<td>477,105</td>
</tr>
<tr>
<td>Injury Crashes</td>
<td>98,996</td>
</tr>
<tr>
<td>Total Injured</td>
<td>146,539</td>
</tr>
<tr>
<td>Fatal Crashes</td>
<td>1,490</td>
</tr>
<tr>
<td>Total Fatalities</td>
<td>1,682</td>
</tr>
<tr>
<td>Work Zone Crashes</td>
<td>4,500</td>
</tr>
</tbody>
</table>
Reliability & Mobility

- Bottlenecks
- Throughput
- Traffic Incidents
- Work Zones
- Weather
- Traffic Control Devices
- Special Events

Georgia DOT opens up its playbook to keep Super Bowl traffic moving

By David Wickert - The Atlanta Journal-Constitution

Jan 29, 2019

In a second-floor room overlooking a two-story bank of enormous video monitors, a group of Georgia traffic engineers spent a
Reliability & Mobility

• Integrated Corridor Management
  – Active Traffic Management
  – Managed Lanes
  – Real-Time Traveler Information
    • Lane Closures
    • Incidents
    • Work Zones
    • Transit Connections
    • Weather
    • Parking
    • Charging Stations
Equity & Accessibility

Percent Population without Any Internet in the U.S.

- Limited English Proficiency
- Hispanic
- African American
- < $25,000 Income
- $25,000-$49,999 Income

Source: American Community Survey 2016, 5-Year
Flexibility

• Curbside Management
• Disruptors
• New Technologies
Efficiency

Data Governance: exercise of decision-making and authority for data-related matters.
Name That Phrase!
What are These?
“Automated vehicles are those in which at least some aspect of a safety-critical control function (e.g., steering, throttle, or braking) occurs without direct driver input. Automated vehicles may be autonomous (i.e., use only vehicle sensors) or may be connected (i.e., use communications systems such as connected vehicle technology, in which cars and roadside infrastructure communicate wirelessly). Connectivity is an important input to realizing the full potential benefits and broad-scale implementation of automated vehicles.”

- USDOT ITS-JPO
Automated/Connected Vehicle

“Connected vehicle technology will enable cars, trucks, buses, and other vehicles to "talk" to each other with in-vehicle or aftermarket devices that continuously share important safety and mobility information.”

- USDOT ITS-JPO
Visible C/AV Infrastructure

DSRC Roadside Unit (RSU)

5G Antenna / Small Cell

Credit: RCR Wireless News
What is This?

Credit: engadget.com
What is This?

Lincoln Journal Star
What are These?
Dockless / E-Scooter Management

Metro Atlanta Documentation

- City of Atlanta ordinance
- 02.08.19 – Curbed Atlanta
- 02.07.19 - Midtown Alliance News Center
What is This?

Credit: arsTECHNICA
How it Works

How Musk’s Supertrain Could Work

1. Rail gun technology: Electric current flows up positive rail.
2. Current flows across armature and down negative rail.
3. Magnetic force is directed towards end of rails which pushes armature and train forward.

Maglev technology: Levitates the train eradicating rail friction.

- Reduced air pressure in tunnel cuts wind resistance.
- Top speed: 750 mph.

San Francisco
Los Angeles
350 miles

Credit: ARCH20
Comparison to Existing Modes

- Hyperloop train is the brainchild of billionaire Elon Musk, former boss of PayPal and founder of electric car company Tesla.

**Scale of Hyperloop vs. London Tube:**
- Pods carry passengers or cargo at 670mph.
- High-powered electromagnets on the side of the tube lift train above track and guide it.
- Hyperloop tube supported above ground on columns or tunneled below ground to avoid dangerous crossings and wildlife.

**How Speeds Compare:**
- **Hyperloop One:** 670mph
- **HS2:** 250mph
- **Virgin trains:** 125mph
- **Eurostar:** 186mph
- **Bullet train:** 275mph
- **Boeing 737:** 485mph
- **Hyperloop One Concorde:** 670mph
- **Concorde:** 1,354mph

**Top Speeds:**
- **London to Edinburgh:**
  - Hyperloop One: 50min
  - HS2: 3hr 30min
  - Virgin trains: 4hr 30min
- **London to Birmingham:**
  - Hyperloop One: 12min
  - HS2: 40min
  - Virgin trains: 1hr 31min
- **London to Manchester:**
  - Hyperloop One: 14min
  - HS2: 49min
  - Virgin trains: 1hr 22min
  - Train is propelled by electromagnets on the central rail.

**Credit:** Evannex.com/IQS Directory
Is this Really for Real?
Is this Really for Real?
Is this Really for Real?
What is This?

Uber Air/ Uber Elevate Video

Credit: The Verge
What is This?

“Link & Fly” Video

Credit: Bloomberg