Integrated Platform for Smart Transportation

Farhad Pooran, Ph.D, P.E.
VP, Smart Infrastructure
What is a Smart City?

A **Smart City** uses collaboration and stakeholder engagement to create an **aligned vision** and uncover **synergies** that reduce costs, increase operational efficiencies, improve safety and quality of life, mitigate environmental impacts, and provide **stewardship of resources** for future generations.
Becoming a Smart City is a Long-Term process...
...and a step-by-step approach

Measurable
- Pervasive sensor networks throughout city

Networked
- Node connections through low-cost communications

Managed
- Real-time analysis & control of city systems

Integrated
- Integration of isolated systems and across cities

SaaS based Citizen Services

Technology Evolution to a Smart City
Five areas of expertise

Smart Grid
- Network Automation & Flexible Distribution
- Smart Metering Mgt & Demand Response
- Renewables Integration & Management
- Real-Time Smart Grid Software Suite
- Connected buildings, facilities & homes

Smart Mobility
- EV Charging Infrastructure & Supervision Services
- Traffic Management
- Public Transit & Tolling Management
- Traveler Information

Smart Water
- Smart Water Networks • Distribution mgmt
  • Leak detection
  • Water quality
- Power, Control & Security Systems Integration
- Stormwater Mgmt / Urban Flooding

Smart Public Services
- Emergency Management
- Public Safety & Video Systems
- Smart Street Lighting
- eGovernment & City Administration

Smart Buildings & Homes
- Energy & Carbon Dashboards & Monitoring
- Energy Efficiency & Security Equipment • office buildings
  • datacenters • industrial facilities • hospitals
- Home Energy Controls & Home Area Networks

Capabilities & Services
- Integrated SmartCity Platform
  - Weather Intelligence
  - EcoStruxure

Energy Management & Carbon Management Services
Telecommunications & IT Integration
to local priorities…

History, culture, size, geography, economy make each city unique.
Madrid Mobility Management Center, Spain

• Integrated platform managing 3 urban traffic control systems, one tunnel management and City access control
• Real-time traffic adaptive system to control 739 intersections
• Speed Enforcement system
• CCTV system to detect incidents and traffic congestion,
• web-based traveler information
• Air quality and weather information systems for the airport
• Stormwater management
AQ Monitoring Stations – Madrid Airport
Integrated Mobility Management platform improves efficiency of multimodal transportation, sharing information between agencies and supporting decision-making in the management of major city corridor.
Dallas - US 75 Corridor Networks

- Freeway with continuous Frontage Roads
- Managed HOV lanes
- Dallas North Tollway
- 167 Miles of Arterials
- DART Bus Network
- DART Light Rail
- Multiple TMCs
- Regional ATIS
Signals Optimized for East-West Flow

Greenville Ave. Flow is not priority
Signals Optimized for Frontage Road Flow

Greenville Ave. Flow is priority
Smart Mobility

Integrated Management
Situation Awareness
Coordination

Decision Support
Business Intelligence

Traffic
Public Transport
Events & Emergencies Management
Weather and Emissions
Security

Actions
Data
Events
Support
Alerts
Events
Real-time Traffic Operation
Integrated Corridor Management

Collection & Fusion platform

- C2C
- Publish Data into C2C
- AVL
- DART GTFS
- Weather
- NAVTEQ Traffic Data
- Parking Management
- TxDOT XML (HOV)

EcoTrafiX

- GUI
- Performance Measures

Data Mart

Users

511DFW

- Public Web
- IVR
- Public XML
- Trip Planner
- Social Media
- My511 - Alerts
- Mobile Application

Asset MGM. SubSystem

Video MGM. SubSystem

Data Fusion Subsystem

Traffic Signal/ATMS Subsystems
Integrated Traffic Management platform, traffic adaptive control system, advanced detection technologies, fiber optic backbone, air quality monitoring system, weather alerts and forecast, Bluetooth system for travel time, DMS & CCTV
Pinellas Smart Tracs Project

- Densely populated area
- Seasonal tourism variations

- Lack of limited access highways
- Signalized arterial is the only N-S route serving the entire county

A corridor-based traffic network
Pinellas Smart Tracs: Integrated Platform

- Dynamic Message Signs
- Cameras
- Roadside Detectors
- Bluetooth System
Air Quality Monitoring System
Weather Integration

- **Roadway Specific** - Current roadway weather data, geo-located, by roadway segment

- **Predictive weather information** for roadway segments looking out 30 to 60 minutes

- **Weather Sentry** – web page with user setup alerts, weather data, current and forecasted

- **Pavement Forecasting** - with roadway treatment recommendations
Tangible Benefits: Air Quality & Adaptive System

Optimizing signal timings at the corridor level will improve traffic flow and may facilitate mitigating environmental effects.
Going Forward

● Smart Transportation should provide a comprehensive holistic approach to the broader issue of managing an urban environment by sharing and leveraging data to proactively manage traffic.

● Performance measures provide quantified evidence of the consequences of deployed strategies or technologies as well as identifying traffic bottlenecks and air pollution hot spots.

● Autonomous and connected vehicle technologies is expected to revolutionize traditional traffic management and operations to further reduce traffic crashes and congestion.
Thank you!

Farhad Pooran, PhD, PE
Vice President, ITS Solution Architect
Schneider Electric Smart Infrastructure
farhad.pooran@schneider-electric.com
301-354-1376