City of Tampa Florida

Smart Cities Update

Jean Duncan, P.E.

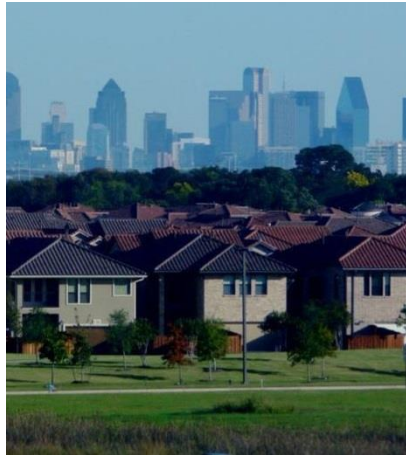*Director, Transportation & Stormwater Department*

Tampa Bay - Transportation Challenges

Growing Traffic Congestion

Urban Sprawl

Few Public Transit Options

Bike & Pedestrian Safety

Environmental Quality

12th Worst in US

Long Commutes

Lack of Funding

#7 least safe City

A City on the Bay

Smart City Tampa : ACES

- Context
- Framework
- Current Projects
- Future Concepts

Smart Tampa Bay : Context

- Urbanization
- Demographics
- Climate Change
- Safety
- Technology

Key Technologies

- IoT Sensors
- 5G Communications
- Faster Processors
- Artificial Intelligence
- Shared Mobility Services
- Battery & Solar Tech

CONTEXT

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Mobility as a Service (MaaS)

- Significant Investment in Mobility Services

- **Cost/mile - $0.35 AV vs $0.7 personal cars**

- User-focused mobility packages – more choices

- Safer, more efficient, greener roads

CONTEXT
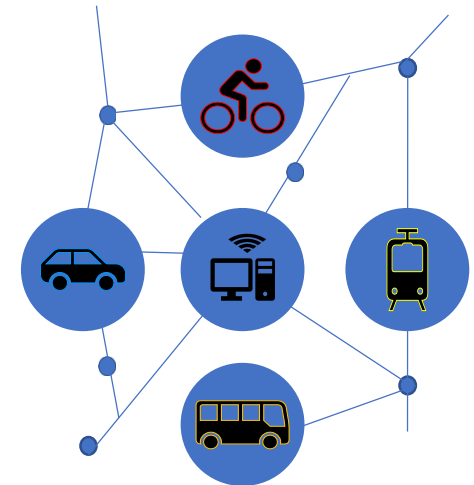
Developing a Framework

- Clear Benefits Narrative

- Leverage Generalists

- Commit to PPP

- City as a Lab Approach

- Deploy Pilot Projects, Take Calculated Risks

- Vulnerable Communities

- Tackle Big Needs First
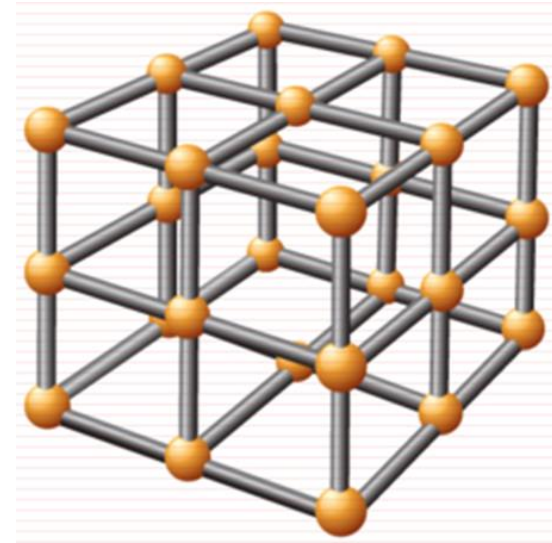
FRAMEWORK

Goals

- Competitive Advantage
- Quality of Life
- Pedestrian & Bicycle Safety
- User-Focused Services
- Congestion Mitigation
- Vulnerable Communities
- Resiliency
- Port & Airport Operations & Security

FRAMEWORK

Tampa Bay Smart Cities Alliance

- Public, Private, Academic Alliance
- Focus Areas
  - *Mobility as a Service*
  - *Regional Data Platform*
  - *Reimagining Infrastructure*
- USF - Tampa MOU
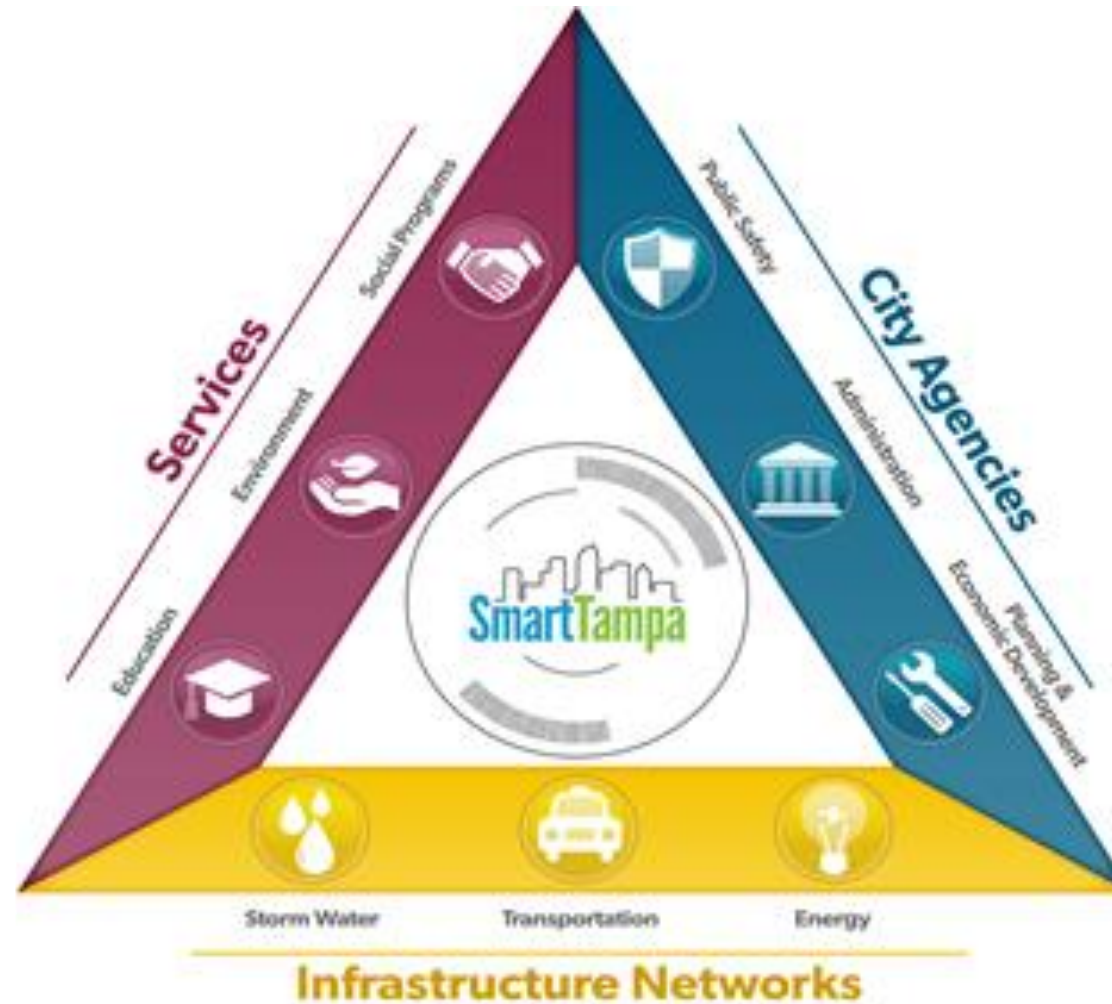- CUTR - Smart Mobility Lab
- MetroLab Network

Partners

PUBLIC

City
FDOT
Hillsborough
Pinellas
Pasco
HART
PSTA
MPOs
Port Tampa
TBARTA
THEA
TIA
USF/CUTR

PRIVATE

SPP, TECO, Tech Data, Waze, Verizon, Cisco, Waycare, Microsoft, Uber, Lyft, CycleHop, Econolite, Miovision, TDP, Westshore Alliance, Traffic Cast, TTS, AARP, ZipCar, …. and many more
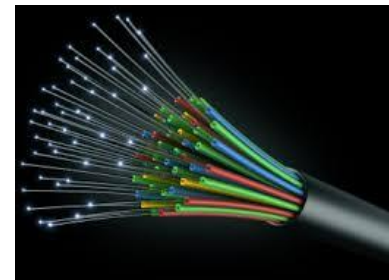

FRAMEWORK

Advanced Traffic Management System (ATMS)

- Traffic management system upgrade
- Three phases total
- Over 400 traffic signals
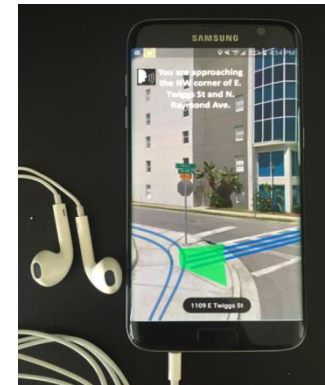- $40 million funding

Tampa Smart Paint Project

- PPA Effort

- Enhances Pedestrian Safety

- Paint w/ Embedded Messaging

- Downtown, USF Campus, South Tampa

- Future Applications
  - *Place Call on Traffic Signal*
  - *CV Notifications*
  - *Indoor Ped Navigation*
  - *AV Guidance*
  - *Work Zone Safety*

Mobility Services for the Blind via "Smart Paint"

ID of Bus Stops & Intersection Corners (NE/SE/NW/SW)

Intersection Markings for Vehicles and Pedestrians

Safe Passageways for Visually-Impaired

PROJECTS

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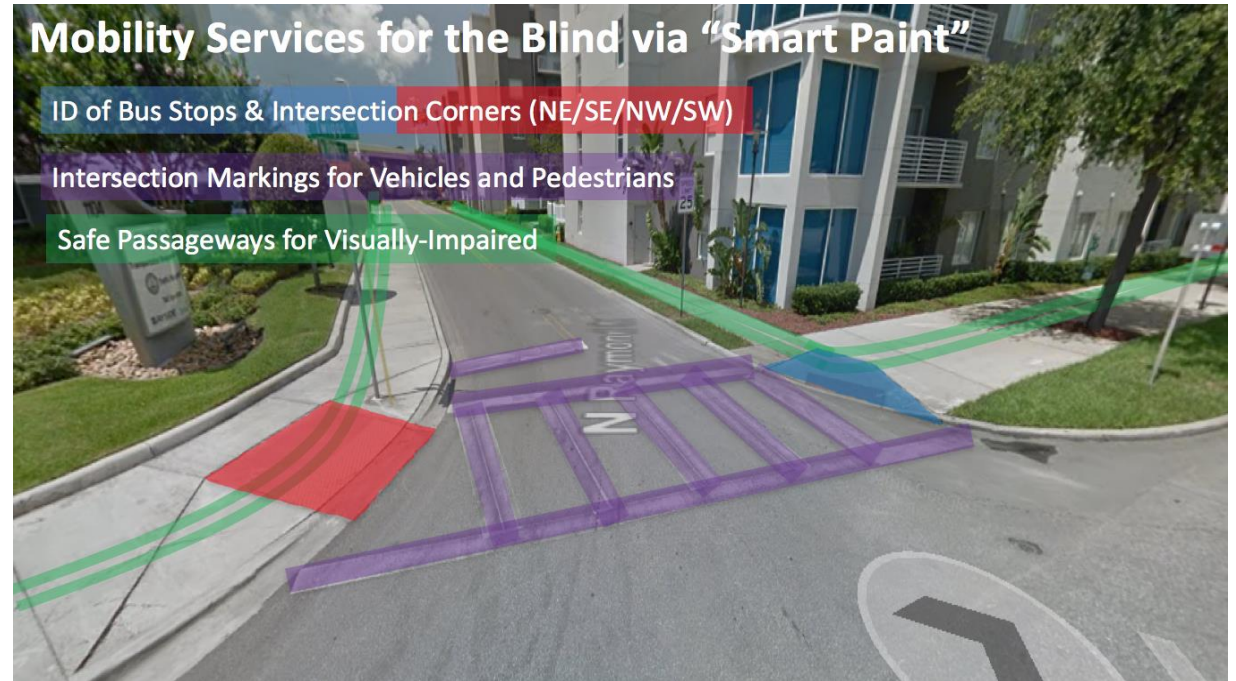
Solar Traffic Signal Pilot

- Sidewalk Mounted Panels
- Daytime Power/ Net-Metered
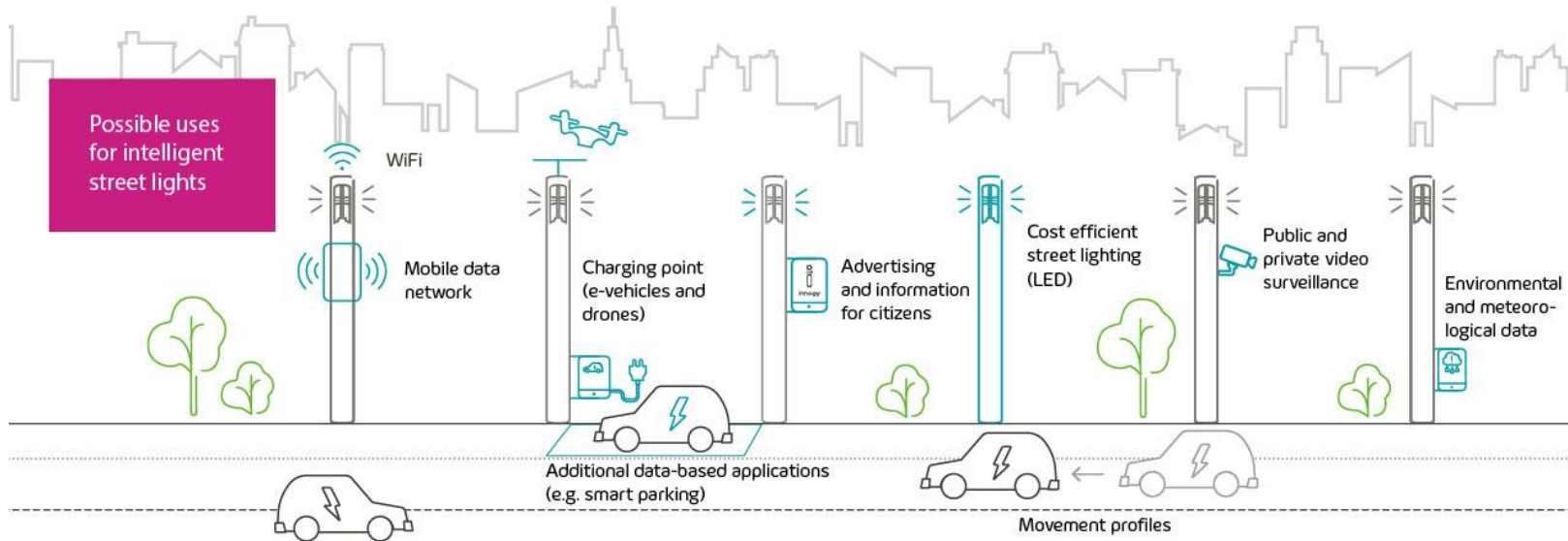- Ped/Bike Friendly
- Enhances Sustainability
- Storm Resilience
- Emergency Management (post-storm)
- Future Applications
  - *Downtown solar grid*
  - *ITS devices*
  - *Solar roadways*

PROJECTS

Resiliency is not a Choice

Tampa LED Streetlight Program

Possible uses for intelligent street lights

WiFi

Mobile data network

Charging point (e-vehicles and drones)

Advertising and information for citizens

Cost efficient street lighting (LED)

Public and private video surveillance

Environmental and meteoro-logical data

Additional data-based applications (e.g. smart parking)

Movement profiles

- **5-year LED Upgrade Program**
- **Secure Smart Grid**
- **Enables Smart City Initiatives**
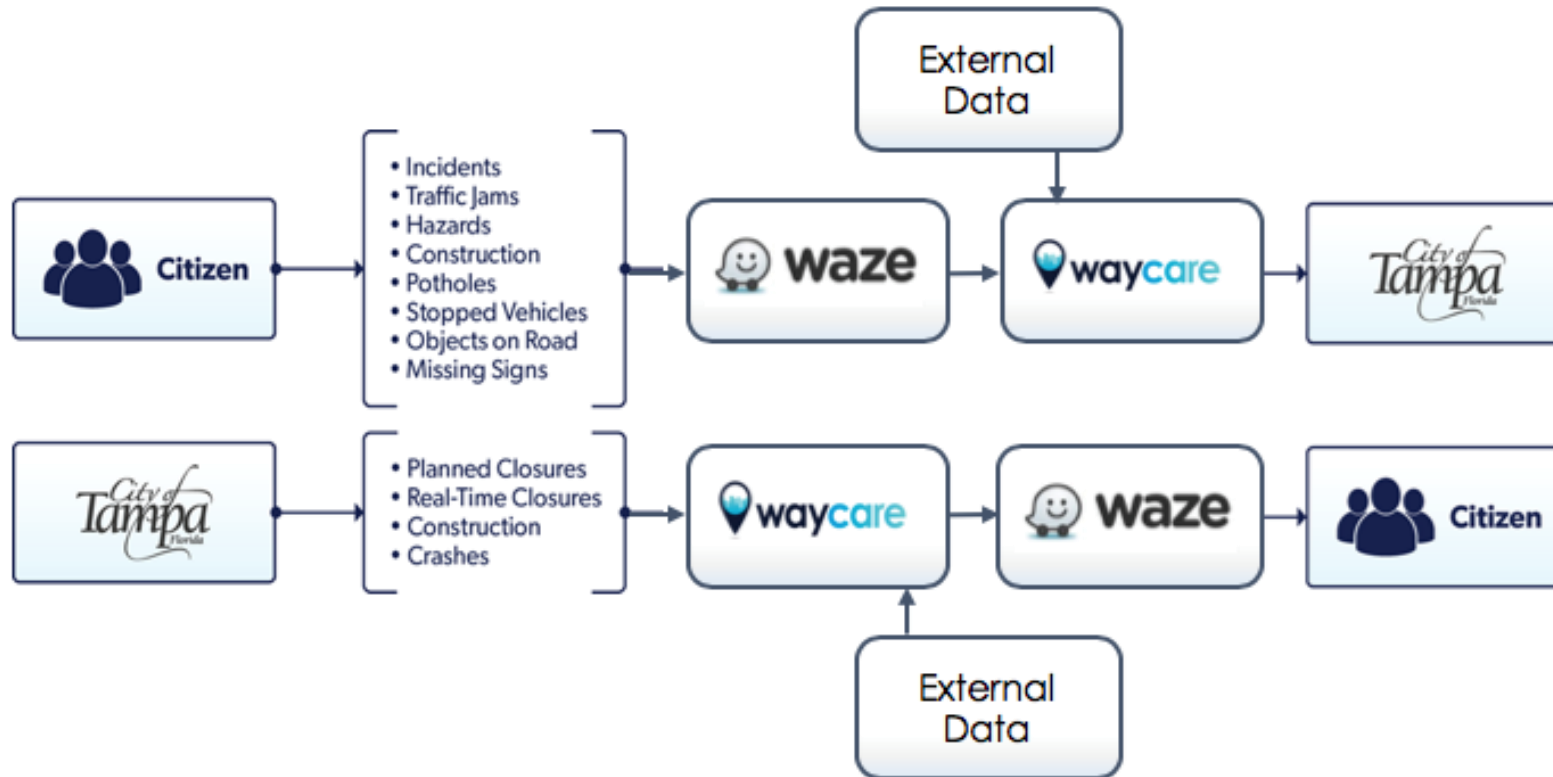- **Low Energy Consumption**

Near-Term
- Gunshot detection
- Parking Space Management
- Traffic Counting

Future
- Flood Detection
- EV Charging
- Pedestrian Counting
- Environmental Sensing
- Motion Detection Services
- Drone Charging
- LED Banners
- Data Mining
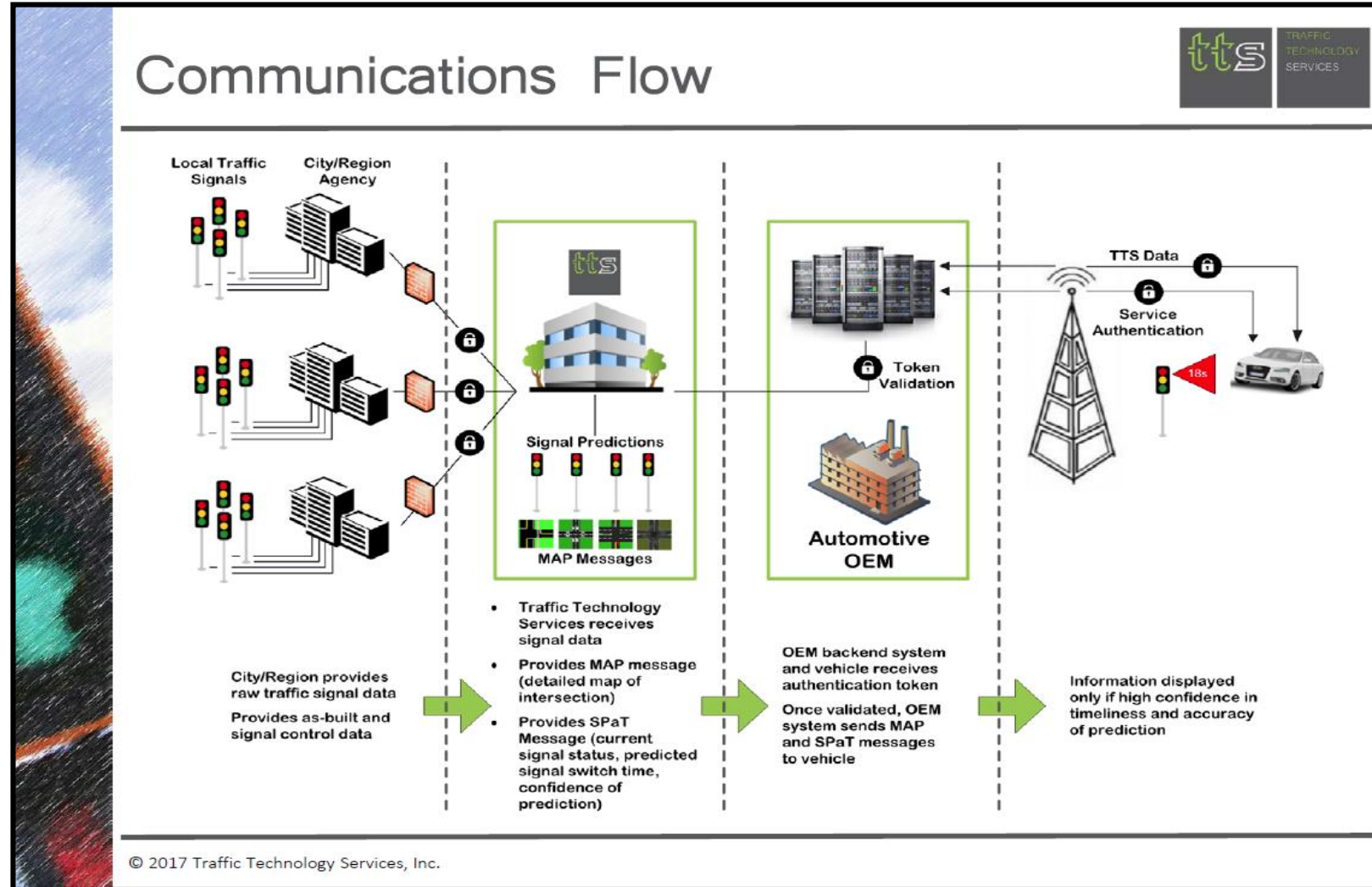- Customer Awareness

PROJECTS

Crowd Sourced Data

100+ cities in Waze Connected Communities
Program…Tampa was 1st City in Florida

CV Demo - TTS

- Cellular-V2X
- In-vehicle Traffic Signal Data
- Safety Warnings
- Signal Change Alerts

Communications Flow

Local Traffic Signals — City/Region Agency

Signal Predictions

MAP Messages

- Traffic Technology Services receives signal data
- Provides MAP message (detailed map of intersection)
- Provides SPaT Message (current signal status, predicted signal switch time, confidence of prediction)

City/Region provides raw traffic signal data

Provides as-built and signal control data

Token Validation

Automotive OEM

OEM backend system and vehicle receives authentication token

Once validated, OEM system sends MAP and SPaT messages to vehicle

TTS Data

Service Authentication

Information displayed only if high confidence in timeliness and accuracy of prediction

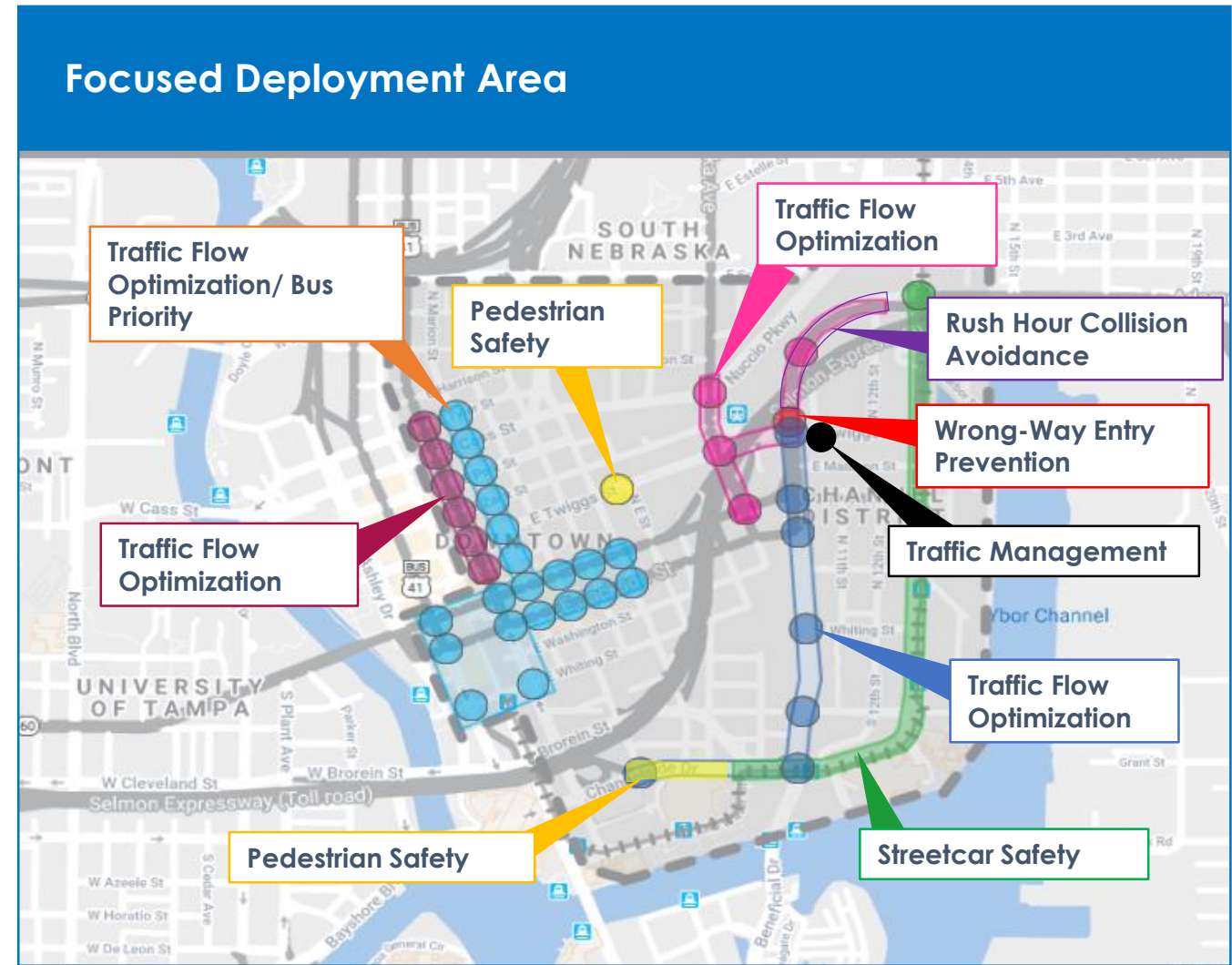© 2017 Traffic Technology Services, Inc.

Tampa CV Pilot

- 40 DSRC Roadside Units
- 1600 Vehicles
- 10 Streetcars
- 10 Buses
- 500 Personal Devices
- 12 V2V, V2I and V2P apps
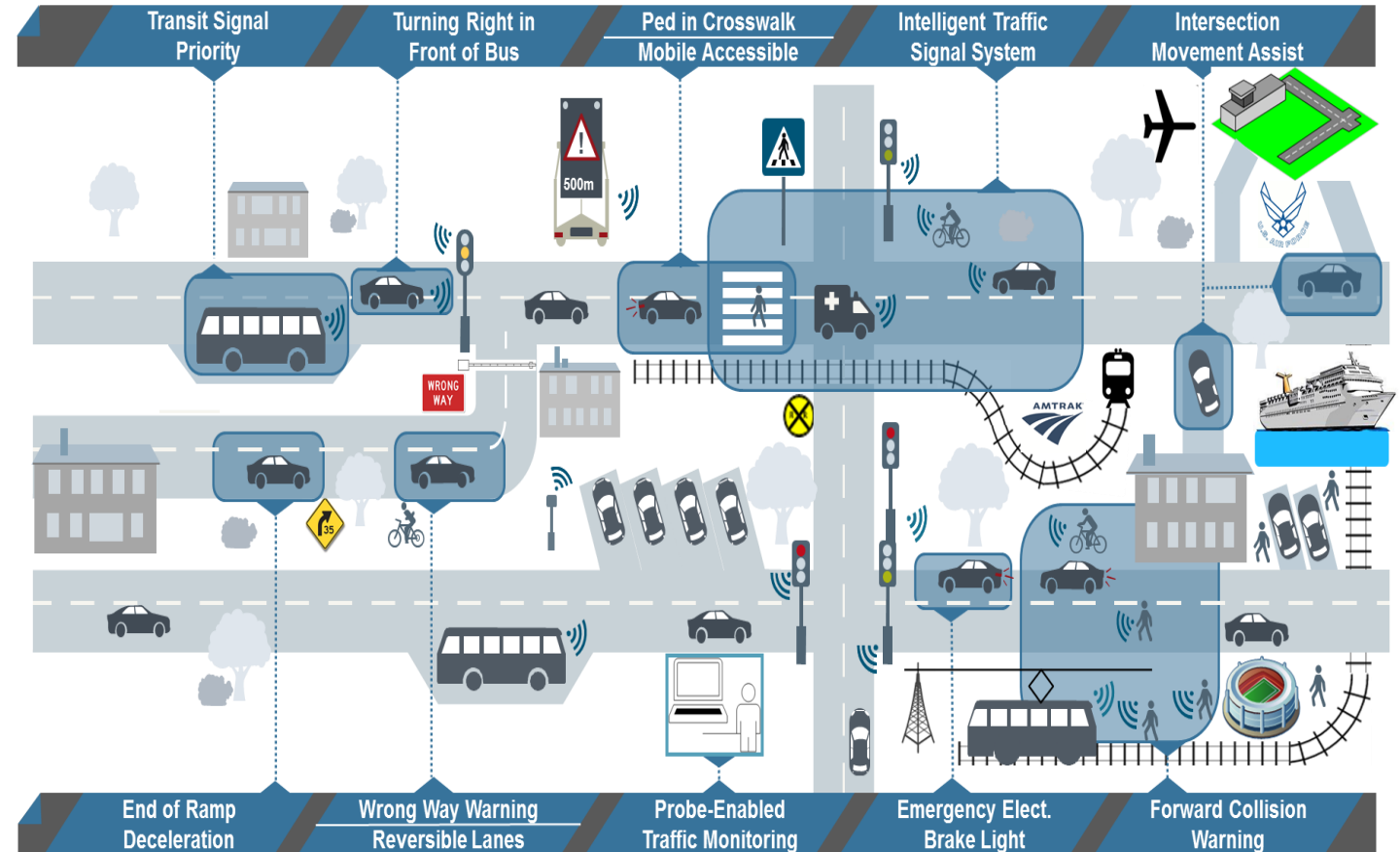- Detection Equipment
- Management Platform
- Agency Data

Focused Deployment Area

CV Pilot Overview

- Pedestrian Safety
- Traffic Management
- Transit Efficiency
- Collision Avoidance
- Wrong-Way Driver Alerts

Autonomous Vehicle Service (AV)

- HART AV shuttle service along Marion Street Transit Way

- One of 1st planned AV shuttle services in US

- Safety technology built into shuttle will reduce accidents to riders, pedestrians and bicyclists

- Sustainable introduction of AVs to Tampa

PROJECTS

Mobility as a Service (MaaS) Platform

EXPAND OBA (OneBusAway) TO MULTIPLE TRAVEL MODES

TRIP PLANNING TOOL

KIOSKS AND MOBILITY HUBS

"We're interested in having OneBusAway be as useful for as many people as possible…. We are looking at how we make it more user-friendly for blind and low vision riders."
– *Alan Borning, Computer Science and Engineering Professor involved in creating original OneBusAway App*

WHY DOES TAMPA NEED IT?

Diversify Mode Options

Reduce Single-Occupant Vehicle Trips

Manage Traffic Congestion

WHAT ARE THE BENEFITS?

Lower Software Costs

Benefits Vulnerable Populations

Enhanced Mobility Services & Trip Planning

CONCEPTS

"OneBusAway has had a real-world impact and will definitely make people's lives easier in terms of accessing transit." – *Sean Barbeau, University of South Florida Center for Urban Transportation Research*

Integrated Corridor Management (ICM)

CV INFRASTRUCTURE

EMERGENCY VEHICLE PRE-EMPTION & TRANSIT SIGNAL PRIORITY

INCIDENT MANAGEMENT

CONGESTION REDUCTION & ROUTE GUIDANCE

TRAVELER INFORMATION

PREDICTIVE ANALYTICS

WHY DOES TAMPA NEED IT?

- 12th Worst Congestion in US
- High Crash Rates
- Fosters Economic Development & Enhances Mobility

WHAT ARE THE BENEFITS?

- Anticipated B:C = 9.7:1
- Reduce Emissions
- Real Time Demand and Network Optimization

CONCEPTS

Key Achievements

Project	Achievement	Partners
CV Pilot	1st Suburban Pilot in the US	THEA, City, USF, HART, FDOT, FHWA
Smart District	1st WELL Certified District	SPP, City
Smart Paint	1st Deployment in US	City, HART, Lighthouse, USF, OSU
Waze	1st City in Florida on CCP	City

Tampa Informs the State-of-the-Practice

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