

"Getting to Smart" Connected Cities Tour

Connectivity and Bandwidth are the oil of the Gig Economy.

Network Technologies such as: 4G/5G, IoT, Fiber, Small Cell and Wi Fi are Transforming How Society Operates.

These sessions bring together thought leaders from Government, Enterprise, Academia and the Tech Community to look at the Business Models, Technology Architectures and action plans that City and Community ecosystems are using to build Dense Broadband Infrastructure.

Be part of the Solution



www.densenetworks.com

2019 Event Schedule

January 30	Miami
February 21	Tampa
March 14	Denver
May 22	Orlando
June 13	Las Vegas
September 10	Seattle
September 18	St. Louis
October 24	Los Angeles
October 29	San Diego
November 14	New York

Connected Colorado "GETTING TO SMART"

History Colorado Center
1200 N Broadway Denver
March 14 9:00 am to 2:00 pm

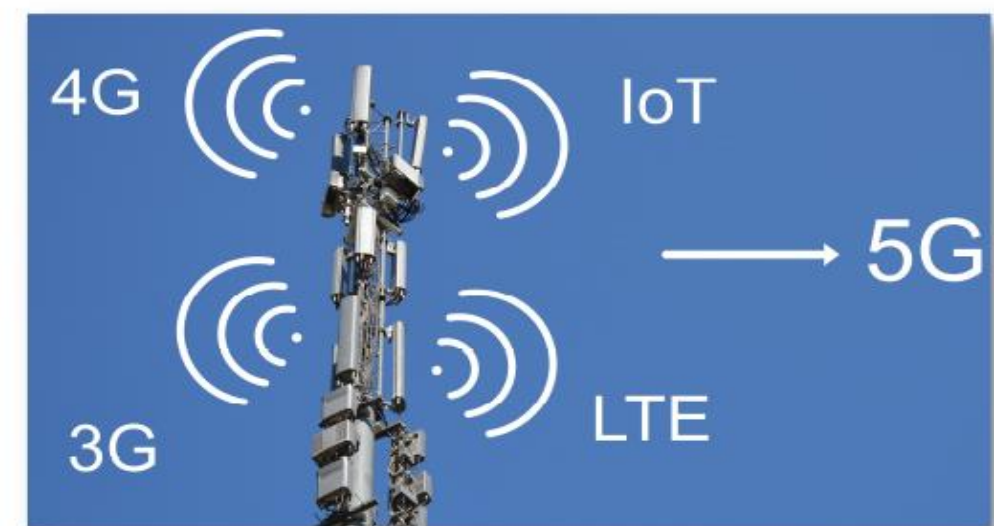
Presenting Sponsor: **GraybaR**

"Getting to Smart" is a quick dose of knowledge to help you navigate in our increasingly mobile, always-on, information intensive, and SMART Society.

Smart Cities and Smart Buildings will explore the technologies that are enabling digital transformation.

- 5G and IoT are key to the future of Smart Cities.
- DAS Networks are essential for In Building Public Safety and Wireless Communications. Will Beacons and Location Based Services become the norm?
- Innovations in Street Furniture are enabling integration of comm gear and built environment.

Join Industry Thought Leaders and explore Business Models, Technology Architectures and First Hand Use Cases that are driving Innovation and Disruptive Solutions.



HITACHI
Inspire the Next

JMA
WIRELESS



... T-Mobile ...

IWCE
INTERNATIONAL WIRELESS COMMUNICATIONS EXPO



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“Getting to Smart” Las Vegas

June 12th Connected Corridor Tour
June 13th Connected Cities Event

5G, WiFi, IoT, DSRC,
Small Cells, DAS, CBRS



Michael Sherwood
Director of Technology
and Innovation
City of Las Vegas

Presenting Sponsor: **GraybaR**

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Las Vegas understands the role of Connectivity in “Getting to Smart”. On the afternoon of the 12th we will tour the Connected Corridor and understand how Las Vegas is enabling interoperability between smart infrastructure supporting transportation, public safety, energy, facilities and public works.

On the 13th, we will explore how Smart Infrastructure provides a platform for advancements in autonomous and connected vehicles, video surveillance and analytics.

Join Industry Thought Leaders and explore Business Models, Technology Architectures and First Hand Use Cases that are driving Innovation and Disruptive Solutions.



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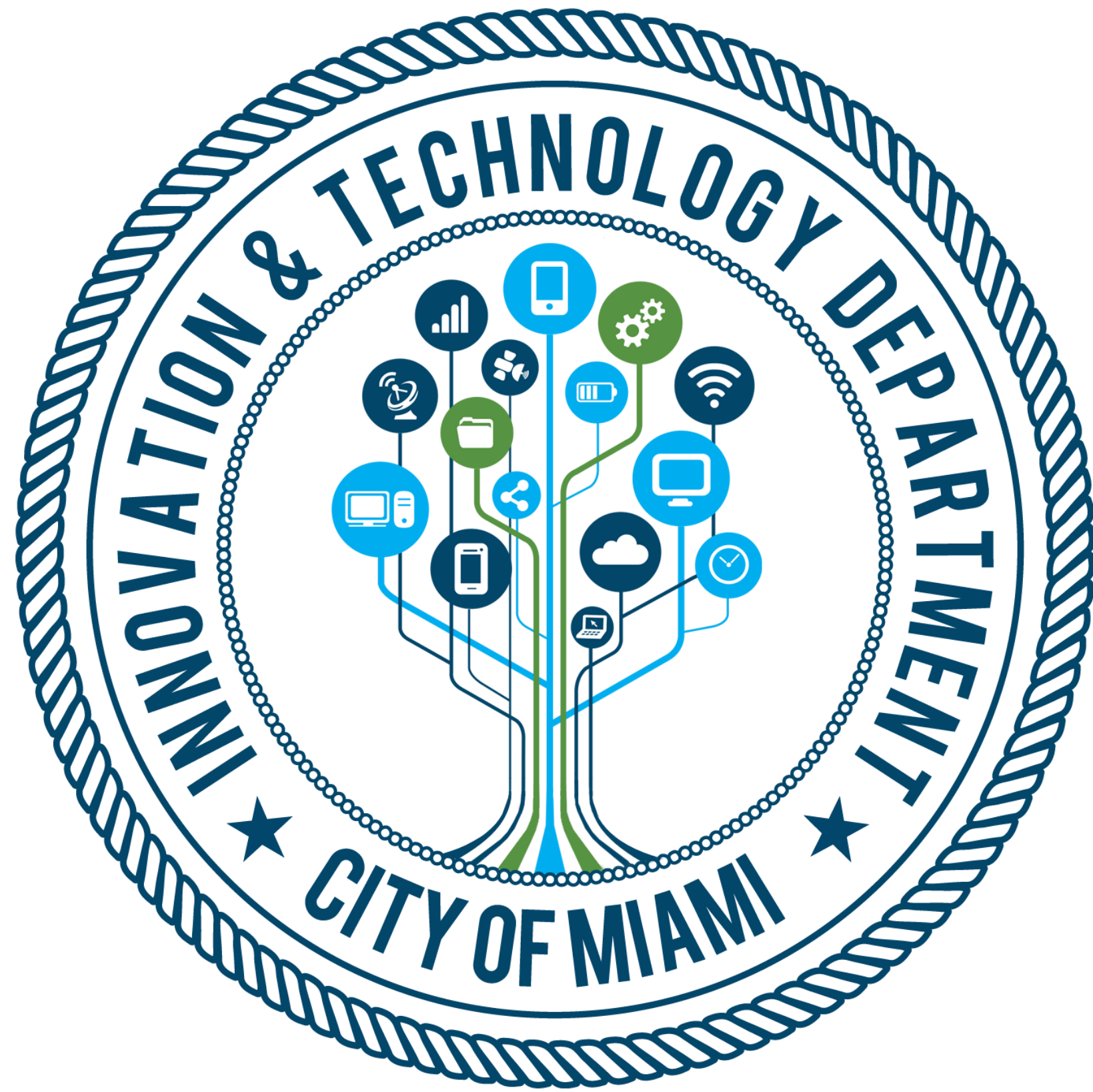




**The UN predicts Global Population Growth
Greater than 30% by 2050**



The Majority will be in Cities



What does
“Smart” Mean for
the City of Miami?

A Smart Miami is:

- *Connected*
- *Equitable*
- *Resilient*
- *Sustainable*
- *Transparent*
- *Self-Aware*



A Smart Miami is *Connected*

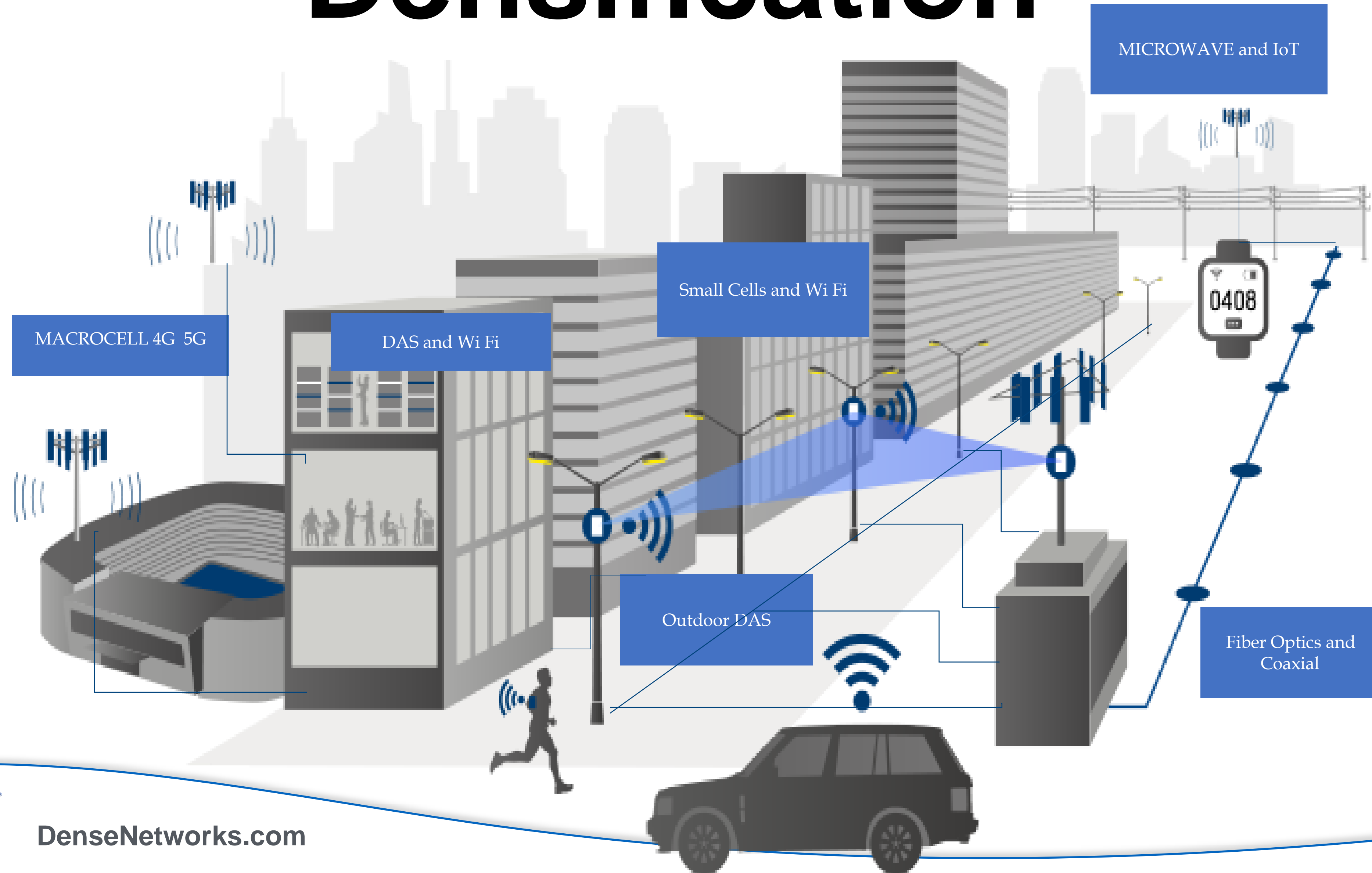
- We are working closely with industry to quickly and efficiently build-out a citywide 5G network.
- Build out a citywide network of sensors that relay critical information to control centers and data portals.
- Soon all services will be accessible online from a mobile device.





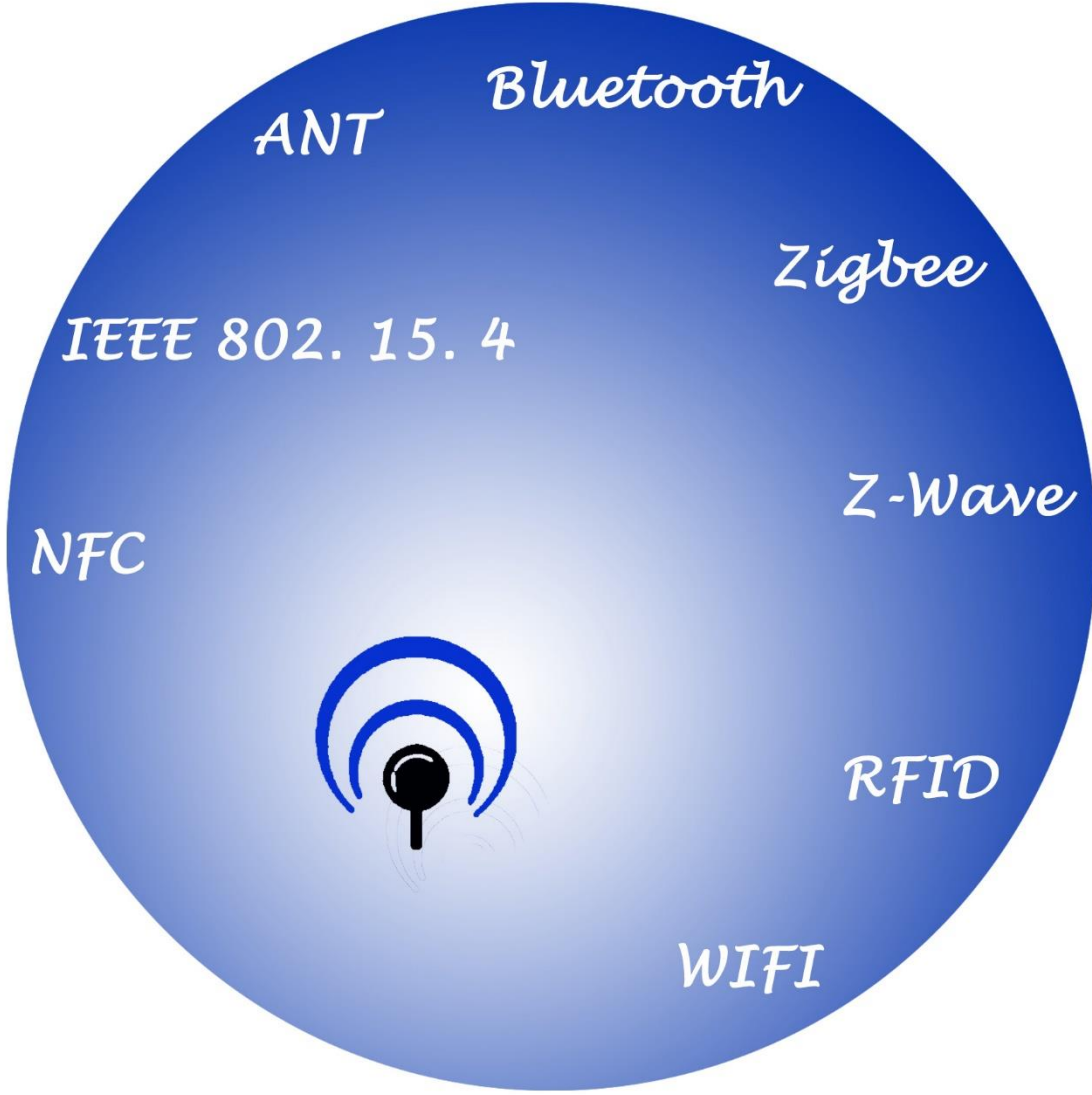
Connected City
Smart City

Densification



How Many Networks?

Capacity, Coverage, Compliance



A Tidal Wave of Antennas



Significant opportunity exists to evolve to a *shared* infrastructure model in urban centers

Easter morning 1900: 5th Ave, New York City. Spot the automobile.

Disruption can happen very fast...



Source: US National Archives.

**Easter morning 1913: 5th Ave, New York City.
Spot the horse.**

Disruption can happen very fast...



Source: George Grantham Bain Collection.

Autonomous

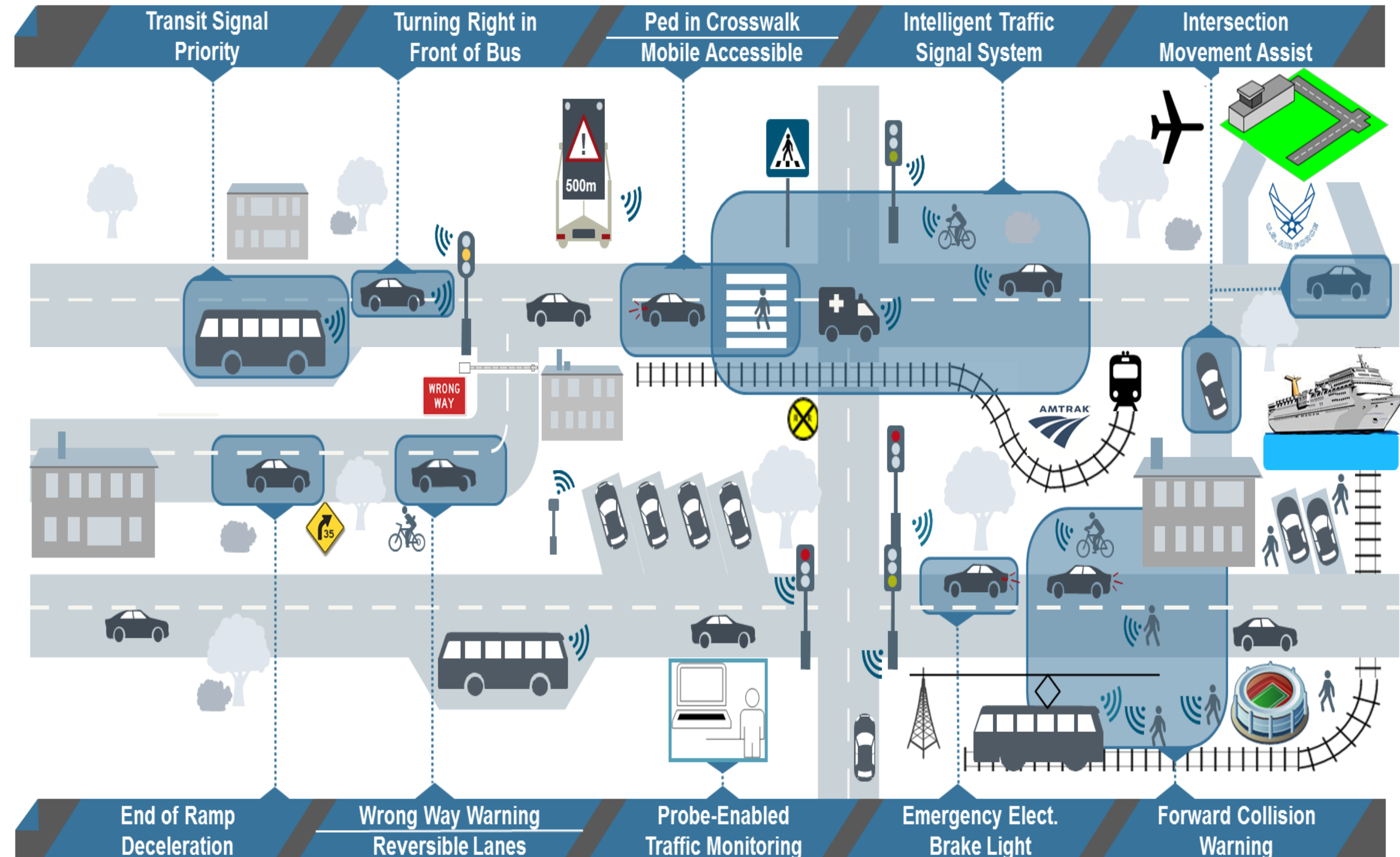


Connected

CV Pilot Overview



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



PROJECTS

Our Communities

Today



**Retirement &
Private**

All-in-one living for residents

Tomorrow



Public Street Town

Drive the transition in Small Town USA to
autonomous vehicles

4,000

Communities in US with
20k-150k population

150M

Total US population of
these communities



Travel to activities



**Easy
Happy Hour**



**No more
night driving**

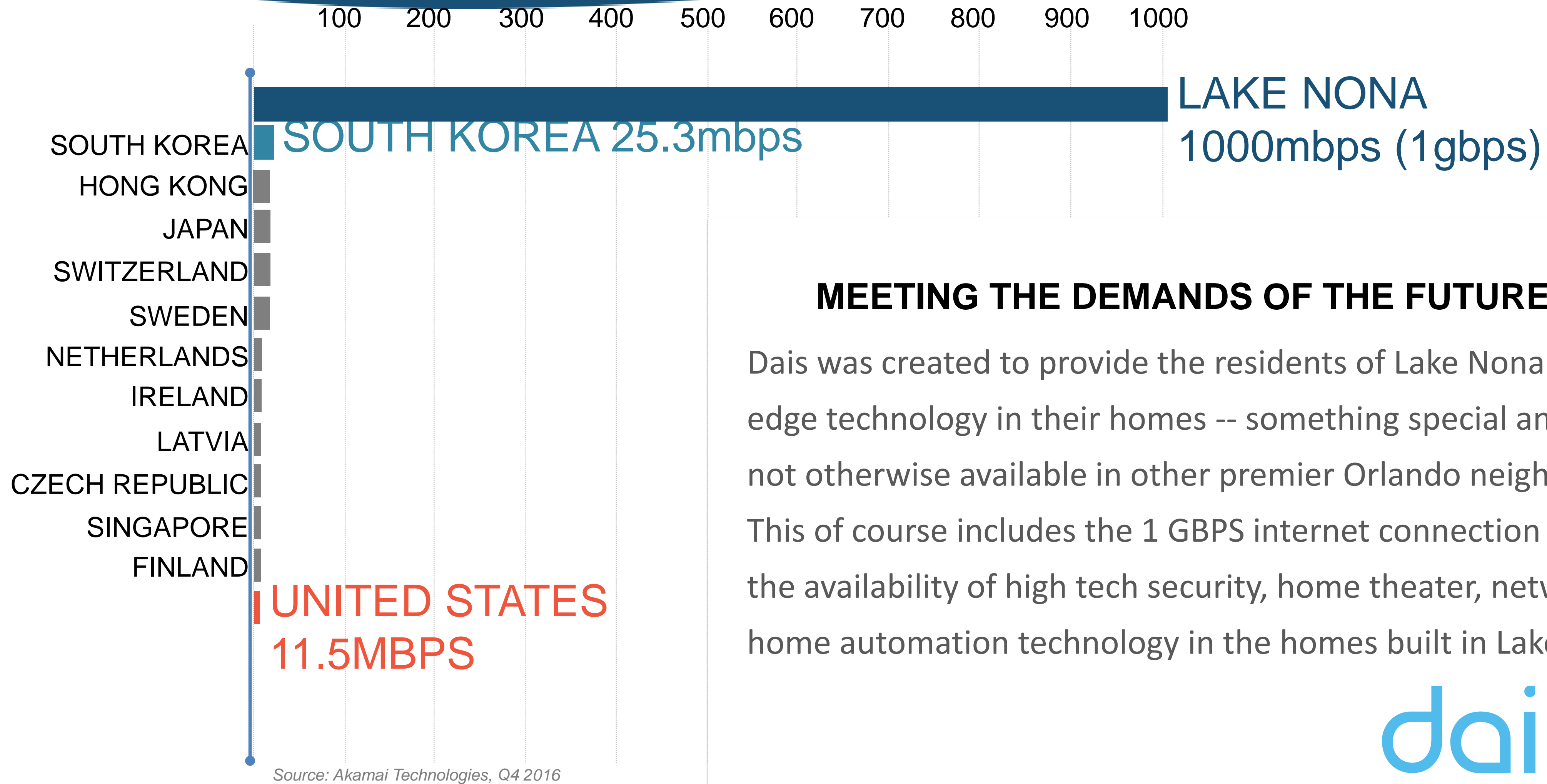


Travel Further



Parking Space

TECHNOLOGICAL INFRASTRUCTURE



MEETING THE DEMANDS OF THE FUTURE - TODAY

Dais was created to provide the residents of Lake Nona with cutting-edge technology in their homes -- something special and exciting, and not otherwise available in other premier Orlando neighborhoods. This of course includes the 1 GBPS internet connection. It also includes the availability of high tech security, home theater, networking and home automation technology in the homes built in Lake Nona. “

dais

L A K E N O N A

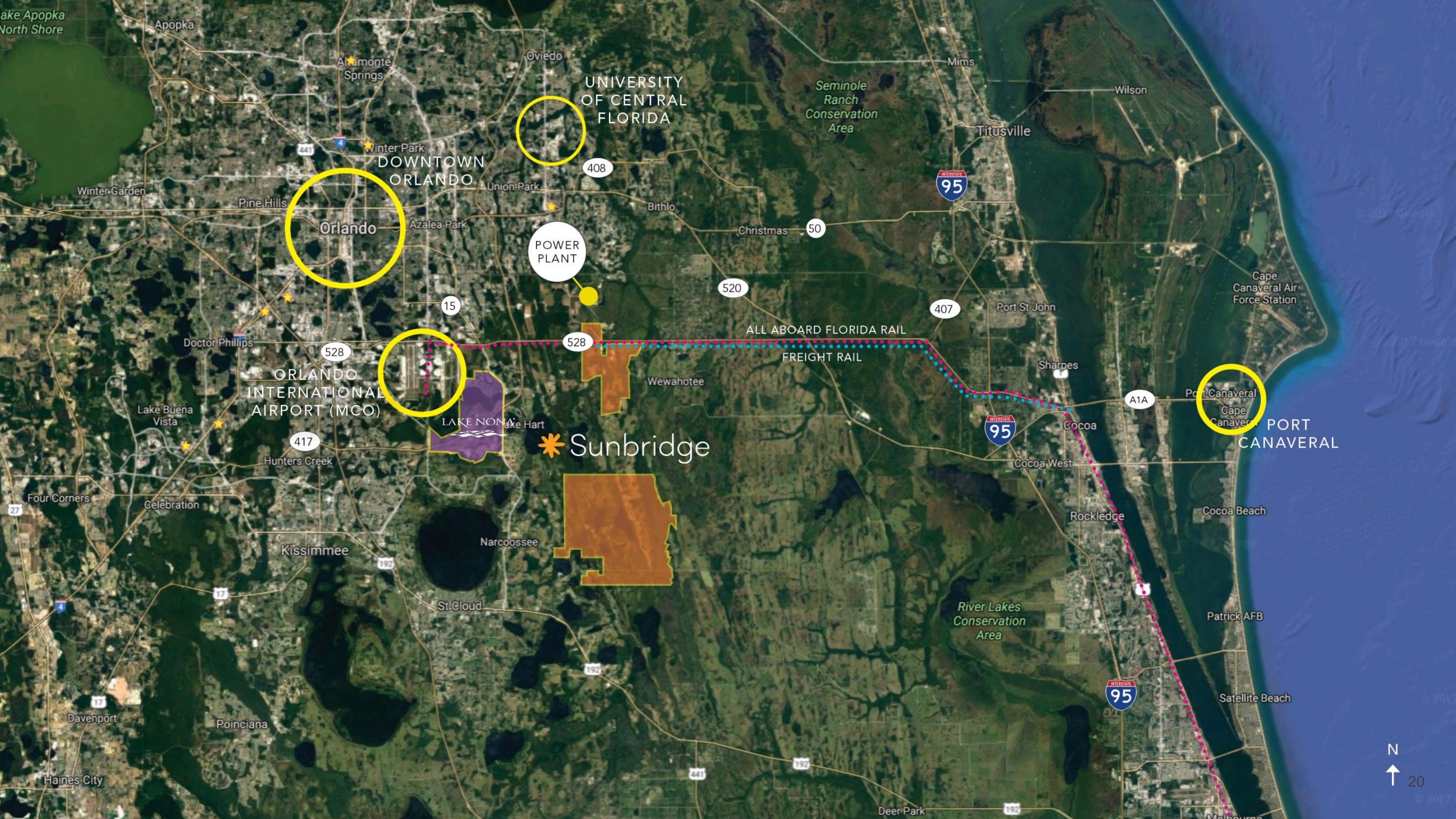
“HOW TO BUILD A GREAT AMERICAN CITY.”

– FORTUNE

LAKE NONA[®]



Spring 2018



LAKE NONA IS A SMART CITY



- **Clustering businesses to create moments of intersection** that spark breakthrough ideas
- **US. Home of Veteran's Affairs SimLearn Center**, their national simulation training center
- **Partnered with White House** for U.S. Ignite project to focus on possibilities of gigabit network
- Network of towers providing robust cellular coverage & operates a campus wide **Distributed Antenna System (Das)**
- **First Gigabit city** in Florida & 1st Cisco designated Smart + Connected City
- **Robust fiber network** across 17-square-mile community
- Designing **healthy homes** that enhance wellbeing
- **Partnering with GE** to build homes with a 20% reduction in energy emissions and water consumption
- **Lake Nona's definition of SMART extends far beyond our robust technology infrastructure...**



New York Subway

- The largest in-building DAS network in the world covering all NYC underground stations with expansions into the tunnels.
- Serves 282 underground stations.
- Design, built, operate entire network from 5 base station hotels to 160 miles of carrier grade fiber optic cable.
- Integrated Access Points throughout each station.
- Privately funded with a license that extends to 2038 and covers all current & future commercial cellular wireless bands as well as unlicensed WiFi bands.
- Supports Transit Apps, Public Safety and Security requirements for Federal, State and City agencies.

Objectives

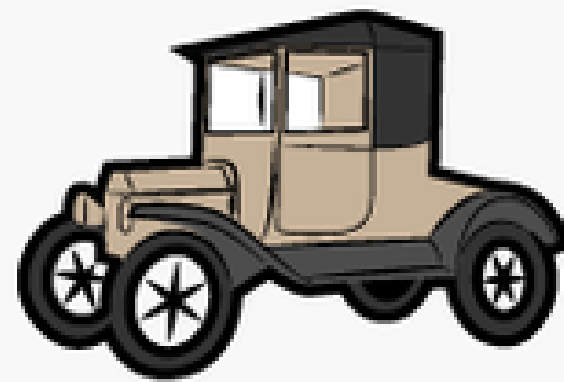
- Resilient, fault-tolerant
- Leverage fiber for future assets
 - Street infrastructure
 - Buildings
- Ubiquitous WiFi
 - APPs to promote transit
 - Ad-based
- Support NYC Transit Operations

Challenges

- Heat
- Equipment size and orientation
- A lot of RF
- 24x7 Rail Ops with Express Track (only system in the world)
 - 22 Lines
 - 5.7 million daily riders
- Multiple agencies involved
- Cost

AUTOMATION LEVELS OF AUTONOMOUS CARS

LEVEL 0



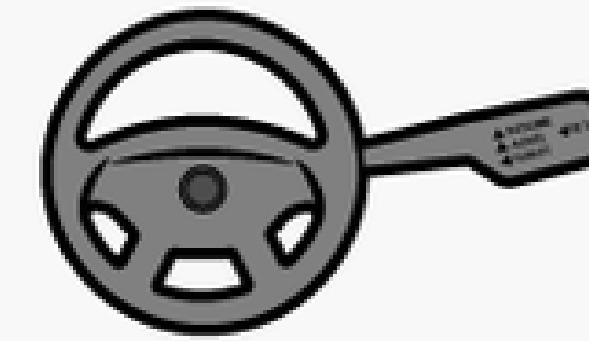
There are no autonomous features.

LEVEL 1



These cars can handle one task at a time, like automatic braking.

LEVEL 2



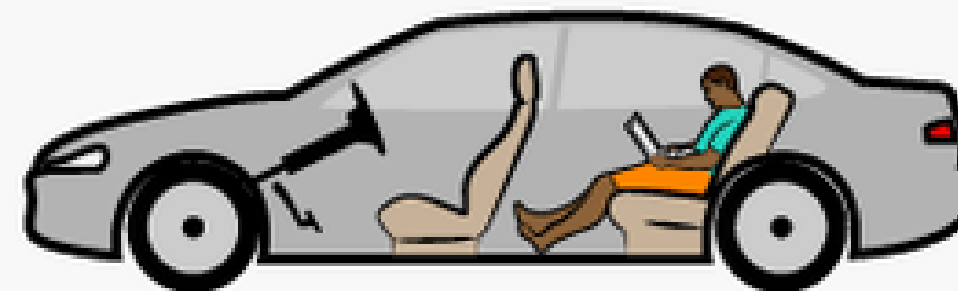
These cars would have at least two automated functions.

LEVEL 3



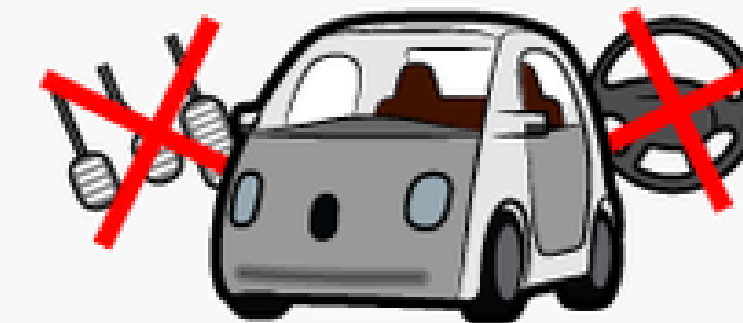
These cars handle “dynamic driving tasks” but might still need intervention.

LEVEL 4



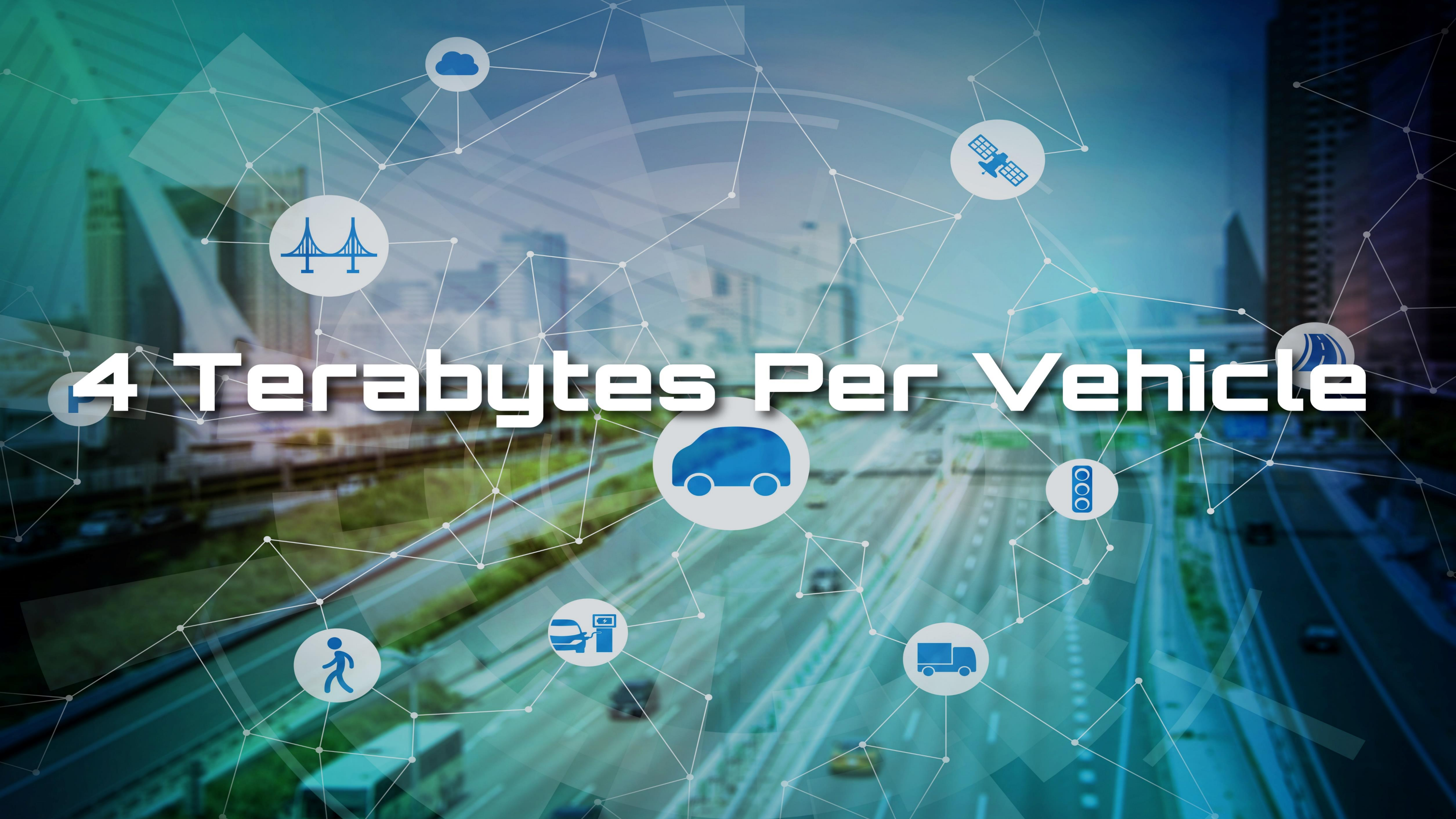
These cars are officially driverless in certain environments.

LEVEL 5



These cars can operate entirely on their own without any driver presence.

4 Terabytes Per Vehicle

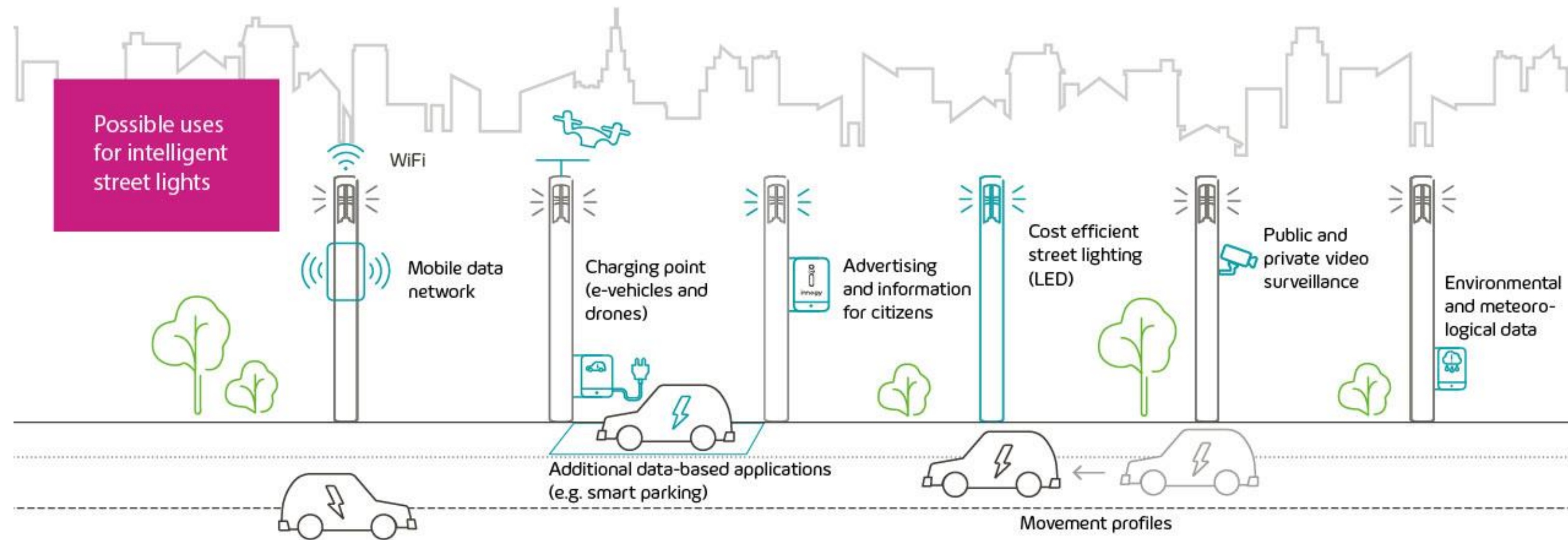


Key Technologies

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



Tampa LED Streetlight Program



Possible uses for intelligent street lights

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

Near-Term

- Gunshot detection
- Parking Space Management
- Traffic Counting

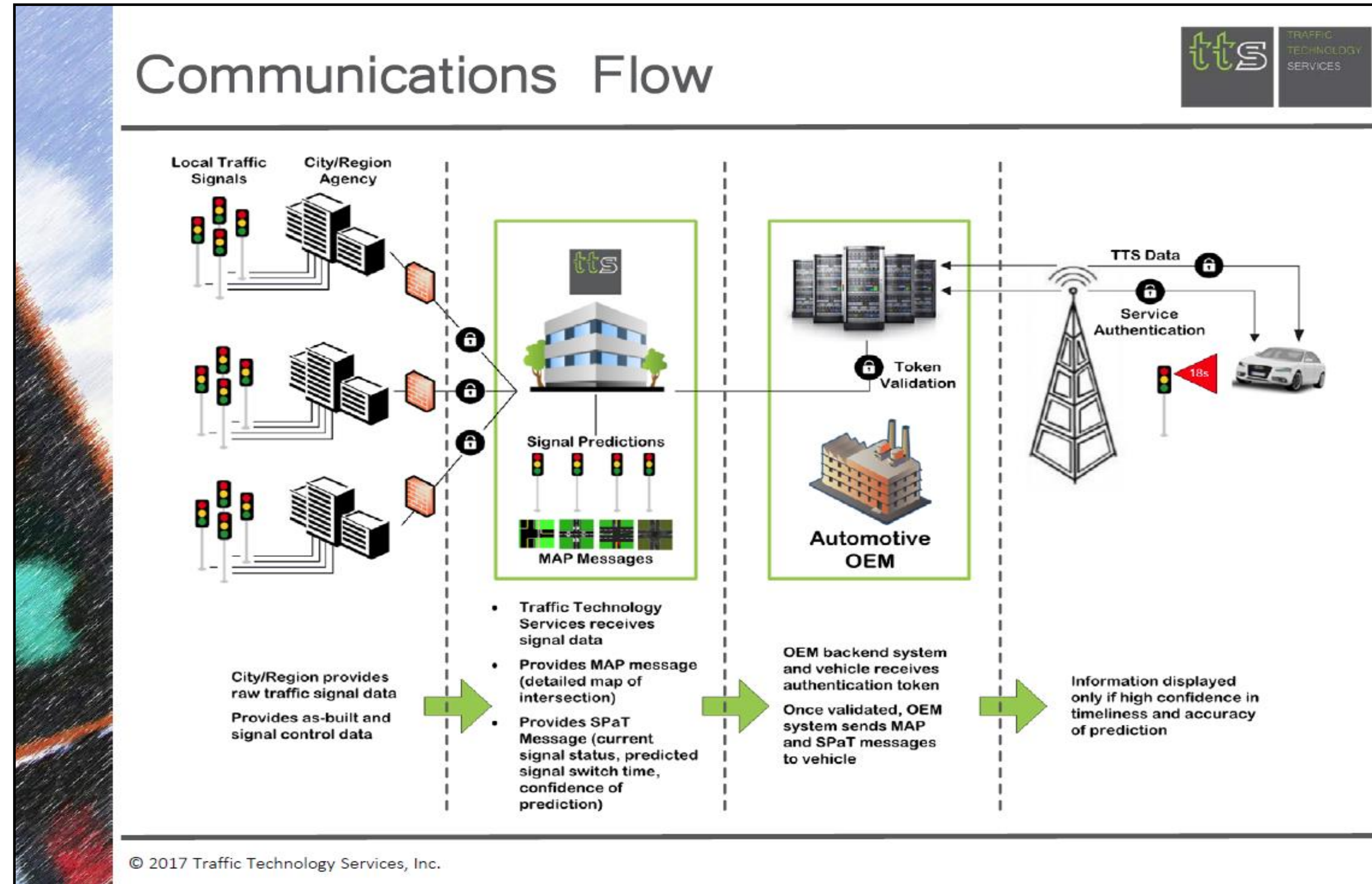
Future

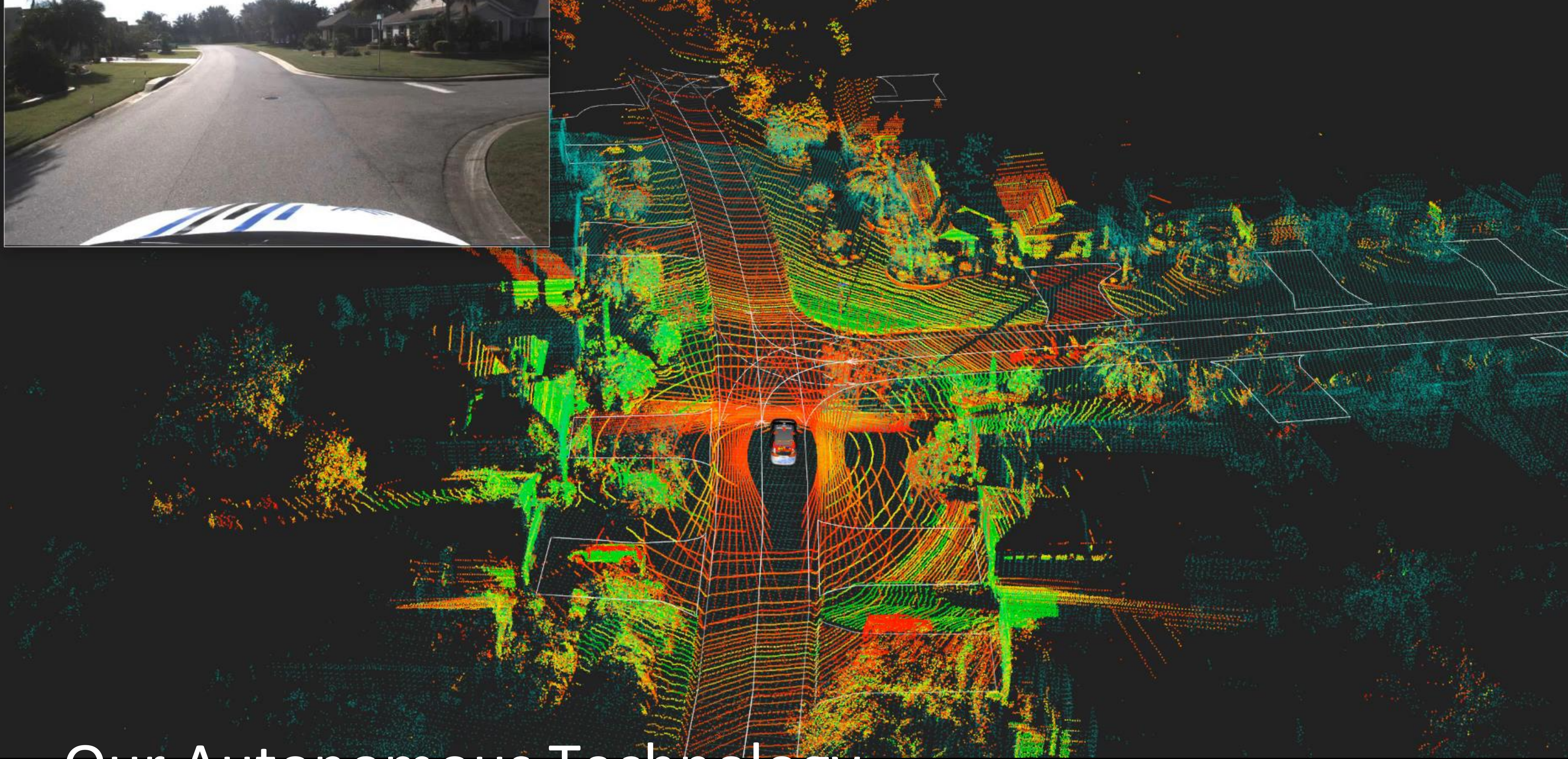
- Flood Detection
- EV Charging
- Pedestrian Counting
- Environmental Sensing
- Motion Detection Services
- Drone Charging
- LED Banners
- Data Mining
- Customer Awareness

PROJECTS

CV Demo - TTS

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





Our Autonomous Technology

L4 Our Robust Autonomy Stack

Autonomy

Perception

Prediction

Planning

Controls

Systems

Safety Systems

Redundancy

Diagnostics

Performance

Infrastructure

Mapping

Simulation

Remote Operation

Reliable Network





The technology



Back up systems



Safety drivers



Remote monitoring



Design

- Double Star Topology
 - Base Station Hotels to Stations
 - Primary Station Hub to multiple nodes in each station
- Fiber-To-The-Edge
 - (XG Ready)
 - Each station capable of well over 100Gbs
- Integration of CMRS, WiFi and PSR

Benefits

- Integrated solution a cost-effective means to solve multiple communications objectives
- Carrier Off-Loading due to network densification
- Happier customers - NYCT and CMRS
- Public Safety
 - See Something, Say Something
 - Wayside Blue Light System
- Improved communication with customers

A WELLNESS HOME BUILT ON INNOVATION AND TECHNOLOGY

MeetWHIT.com

