"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

Dense NETWORKS

The Social Think Tank™

2019 Event Schedule

March 14	Denver
May 21	Orlando
June 13	Las Vegas
August 15	Chicago
September 10	Seattle
September 18	St. Louis
October 24	Los Angeles
October 29	San Diego
November 14	New York

"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

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

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.
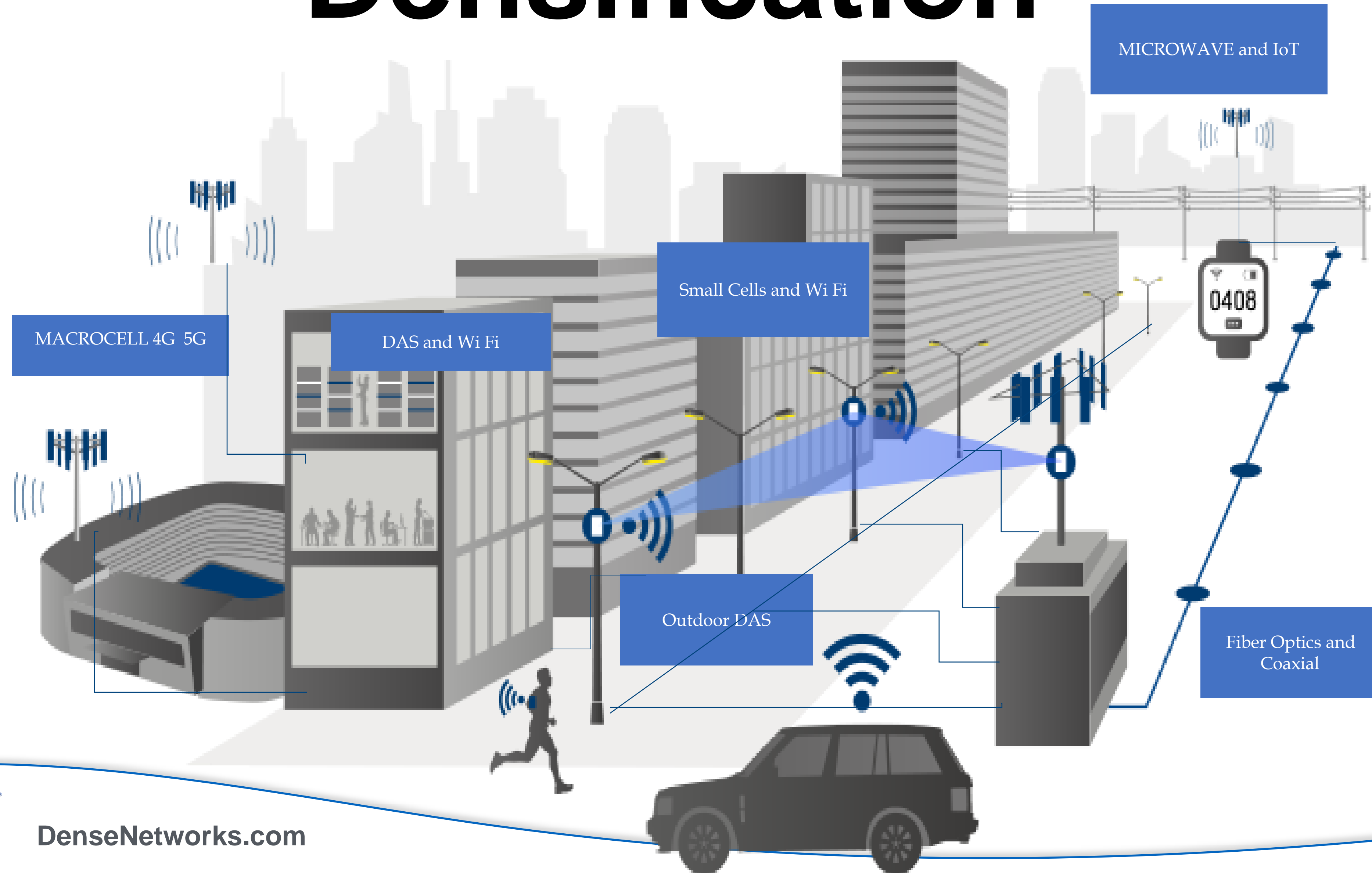
extenet SYSTEMS HITACHI Inspire the Next JMA WIRELESS ᐧ ᐧ ᐧ T ᐧ ᐧ ᐧMobile ᐧ ᐧ ᐧ

Dense The Social Think Tank™ SAFER BUILDINGS COALITION bandwidthlogic IWCE INTERNATIONAL WIRELESS COMMUNICATIONS EXPO 5th Gen MEDIA CityPole Granite

Connected City
Smart City

Densification

MICROWAVE and IoT

Small Cells and Wi Fi

MACROCELL 4G 5G

DAS and Wi Fi

0408

Outdoor DAS

Fiber Optics and Coaxial

Dense
N E T W O R K S

DenseNetworks.com

How Many Networks?

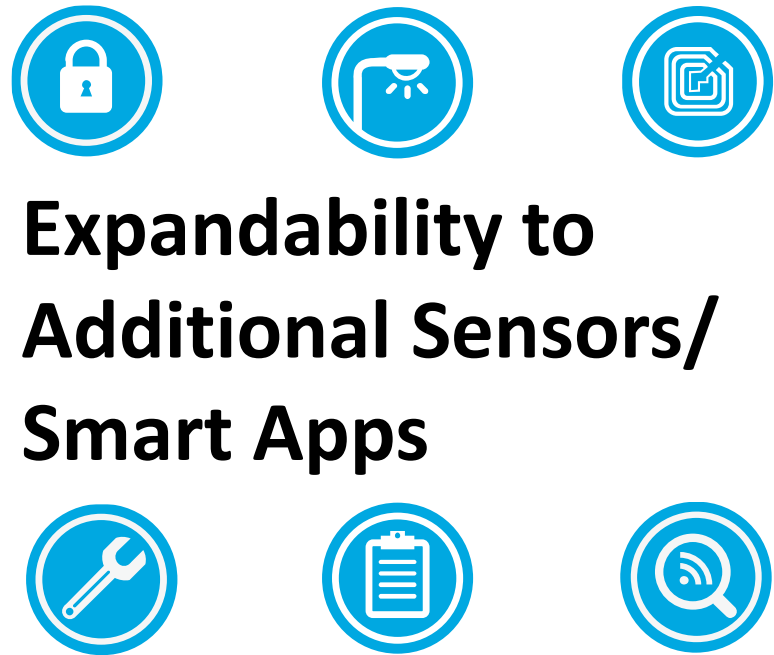# Capacity, Coverage, Compliance
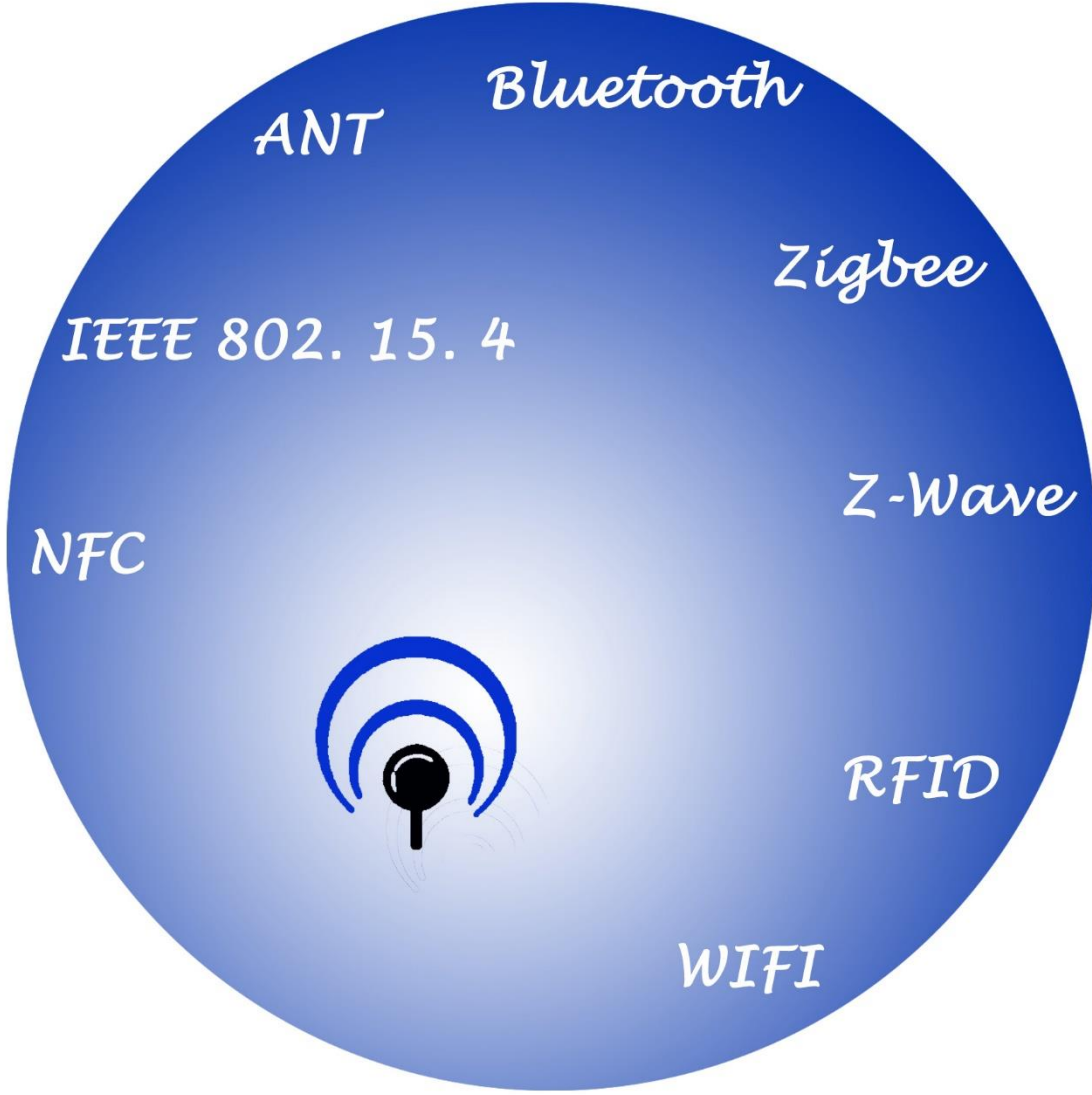
A Tidal Wave of Antennas

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

Light Pole as Smart Venue Information Hub

Smart Parking

Smart Lighting

Smart Traffic

Expandability to Additional Sensors/ Smart Apps

One Network, No New Poles or Trenching

Video Surveillance

Wi-Fi Connectivity

verizon✓
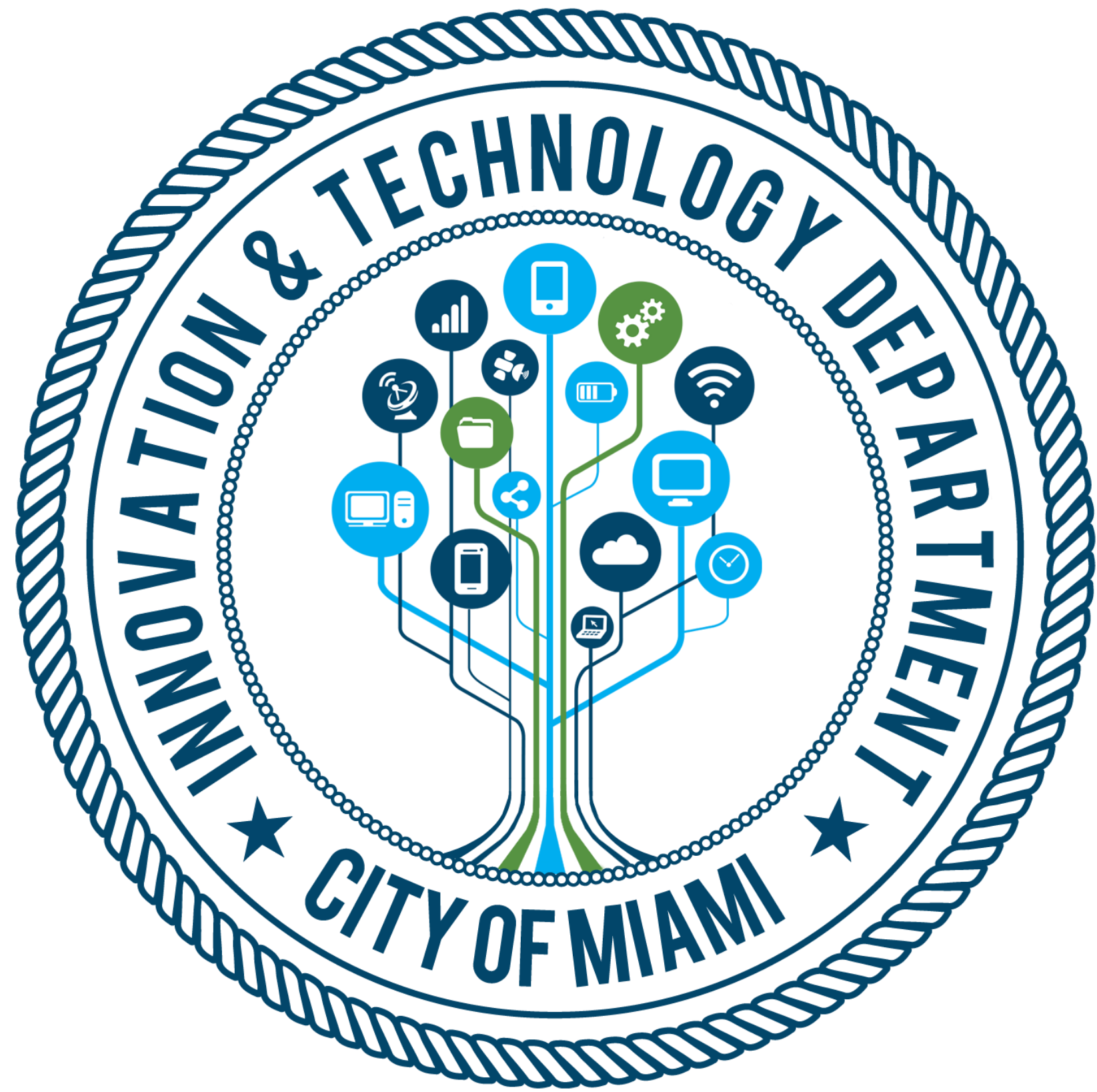
What does "Smart" Mean for the City of Miami?

A Smart Miami is:

- Connected

- Equitable

- Resilient

- Sustainable

- Transparent

- Self-Aware
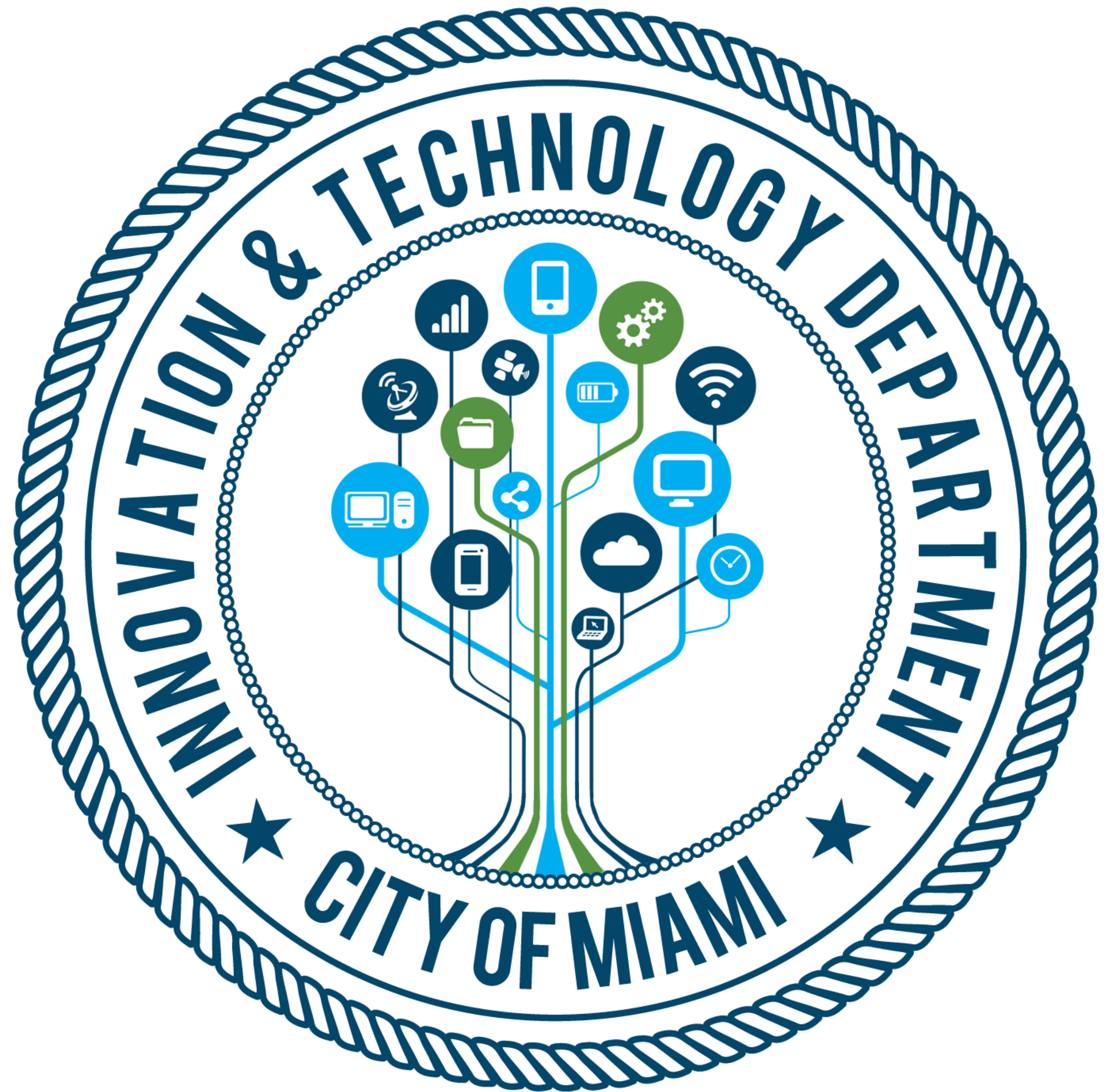
A Smart Miami is *Connected*

- 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.

LAKE NONA

"HOW TO BUILD A GREAT AMERICAN CITY."

– FORTUNE

LAKE NONA®

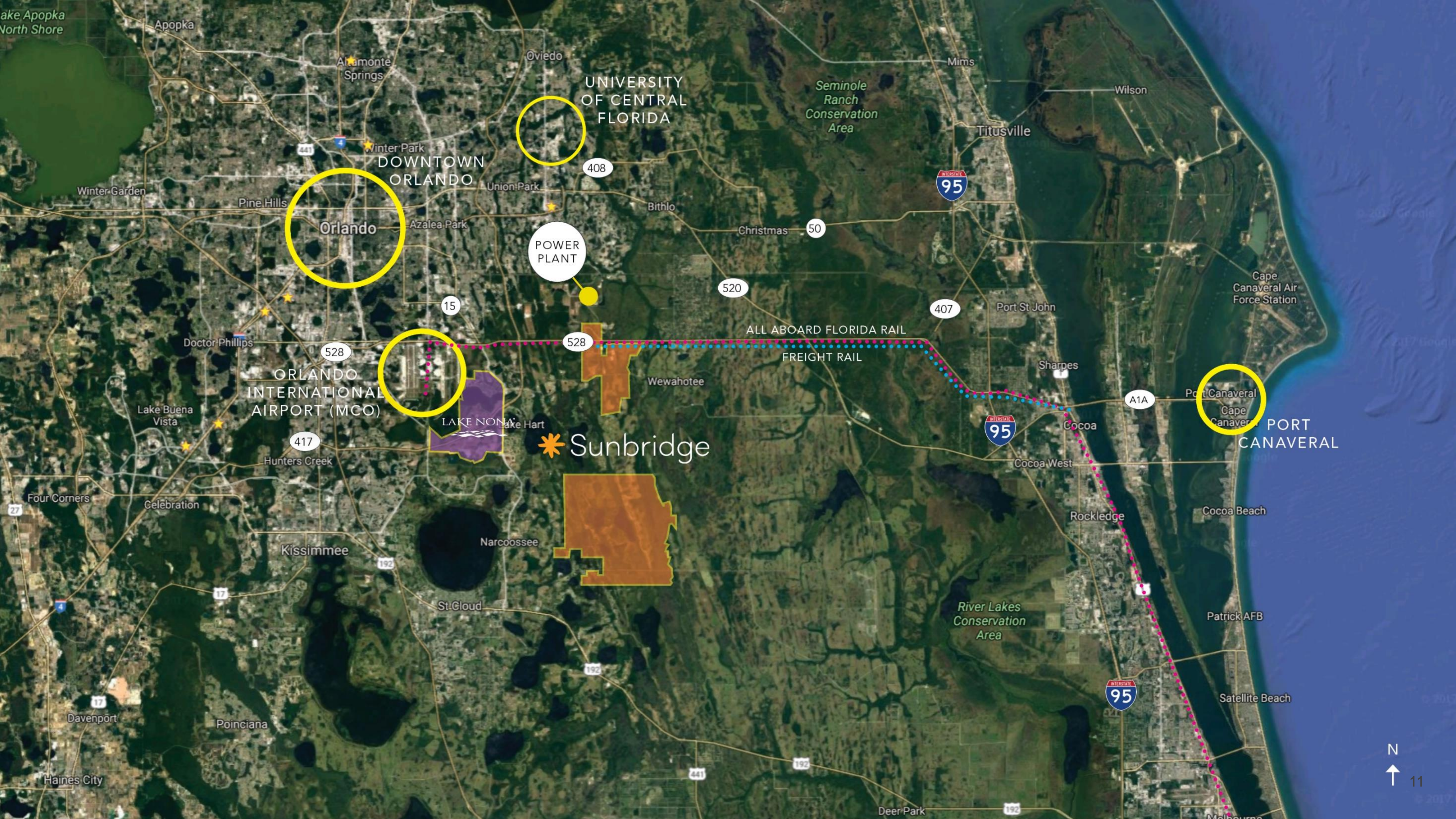Spring 2018

APOPKA
Lake Apopka
North Shore

Apopka

Mims

Wilson

Altamonte
Springs

Oviedo

UNIVERSITY
OF CENTRAL
FLORIDA

Seminole
Ranch
Conservation
Area

Titusville

Winter Park

DOWNTOWN
ORLANDO

408

Pine Hills

Orlando

Union Park

Bithlo

Interstate 95

Winter Garden

Azalea Park

Christmas

50

POWER
PLANT

Cape
Canaveral Air
Force Station

520

407

Port St John

15

528

ALL ABOARD FLORIDA RAIL

Doctor Phillips

ORLANDO
INTERNATIONAL
AIRPORT (MCO)

528

FREIGHT RAIL

Sharpes

Port Canaveral

Lake Buena
Vista

LAKE NONA

Lake Hart

Wewahotee

Interstate 95

Cape
Canaveral

PORT
CANAVERAL

Sunbridge

Cocoa

A1A

Hunters Creek

417

Cocoa West

Cocoa Beach

Four Corners

Celebration

27

Rockledge

Narcoossee

Kissimmee

192

St. Cloud

River Lakes
Conservation
Area

Patrick AFB

17

4

192

441

Davenport

Poinciana

Deer Park

Satellite Beach

Interstate 95

Haines City

17

192

N

TECHNOLOGICAL INFRASTRUCTURE

100 200 300 400 500 600 700 800 900 1000

LAKE NONA
1000mbps (1gbps)

SOUTH KOREA — SOUTH KOREA 25.3mbps
HONG KONG
JAPAN
SWITZERLAND
SWEDEN
NETHERLANDS
IRELAND
LATVIA
CZECH REPUBLIC
SINGAPORE
FINLAND

UNITED STATES
11.5MBPS

Source: Akamai Technologies, Q4 2016
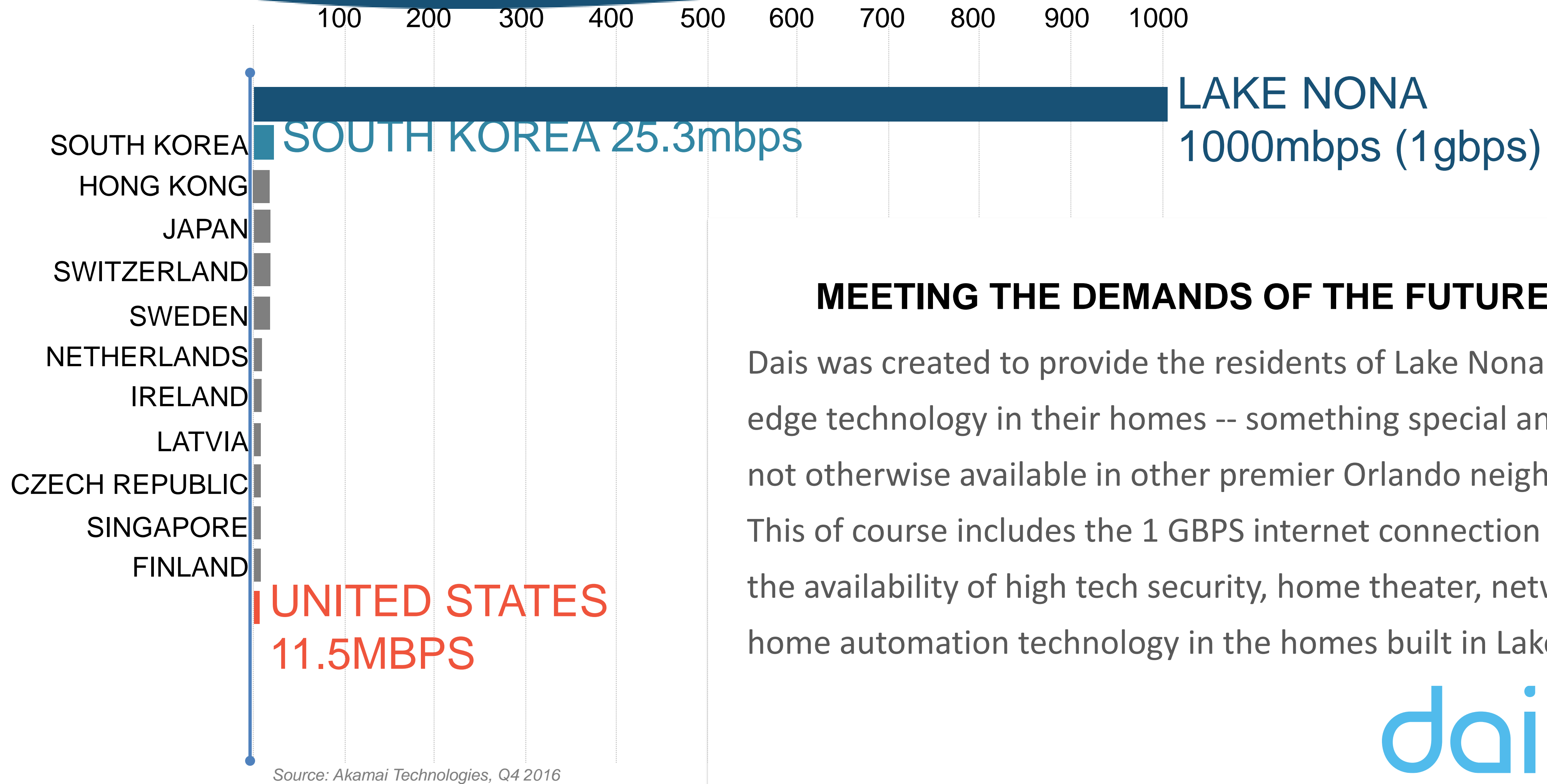
MEETING THE DEMANDS OF THE FUTURE - TODAY

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

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
- <u>**Lake Nona's definition of SMART extends far beyond our robust technology infrastructure...**</u>

A WELLNESS HOME BUILT ON INNOVATION AND TECHNOLOGY

MeetWHIT.com

Actions

RELAX
REDUCE STRESS AND IMPROVE YOUR WELL-BEING WITH AROMATHERAPY, BIOPHILIC SOUNDS, AND MINDFUL MEDITATION

BREATHE
A SIX-STAGE AIR FILTRATION SYSTEM, LOW VOC PAINT, AND CORK FLOORING TACKLE EVERY MAJOR POLLUTANT CATEGORY HELPING YOU BREATHE EASIER.

CARE
A VARIETY OF TECHNOLOGIES ENABLE YOUR HOME TO BECOME YOUR OWN PERSONAL CARE CENTER CAPABLE OF MONITORING HEALTH ISSUES AND CONNECTING WITH HEALTH PROFESSIONALS IN REAL TIME.

MOVE
A COLLECTION OF EQUIPMENT, MOBILE APPS, AND GAMES THAT INSPIRE YOUR ENTIRE FAMILY TO REACH EXERCISE GOALS IN THE COMFORT OF THE HOME

SLEEP
IMPROVE THE QUALITY AND QUANTITY OF SLEEP WITH CIRCADIAN LIGHTING, LONG WAVE NIGHT LIGHTING, BLACK OUT SHADES AND MUCH MORE

HYDRATE
WATER FILTRATION SYSTEMS THAT REDUCE IMPURITIES AND CONSUMPTION TRACKING DEVICES WORK TOGETHER TO PROMOTE OPTIMAL HYDRATION

WHIT
WELLNESS · HOME · INNOVATION · TECHNOLOGY

Spaces

LEARN
A REAL-LIFE CONSTRUCT AND INCUBATION LAB THAT GATHERS FEEDBACK ON INNOVATIVE SOLUTIONS DESIGNED TO IMPROVE HEALTH OUTCOMES

BUILT ENVIRONMENT
FROM THE SOUND-PROOF INSULATION, LOW VOC PAINT, TO THE HUE LIGHTING- ALL MATERIALS ARE PURPOSEFULLY DESIGNED TO ENHANCE YOUR HEALTH AND WELLNESS

BEDROOMS
LUXURY AND TECHNOLOGY INTERSECT IN UNIQUE WAYS TO PROVIDE A RESTORATIVE AND SOOTHING OASIS

BATHROOMS
AN INTIMATE YET CONNECTED SPACE WITH TECHNOLOGIES THAT EDUCATE, MONITOR, TRACK AND SHARE HEALTH METRICS

KITCHEN
THE WELLNESS HUB OF THE HOME WITH SOLUTIONS THAT CONNECT, EDUCATE AND INSPIRE FAMILY MEMBERS TO DEVELOP HEALTHY EATING HABITS

GARDEN
THE HEALTHFOOD STORE IN YOUR KITCHEN AND BACKYARD DELIVERING HYPER-LOCAL, SUSTAINABLE AND BEYOND ORGANIC FOODS FOR YOUR ENTIRE FAMILY

FAMILY ROOM
THE SOCIAL GATHERING SPACE OUTFITTED WITH INTERACTIVE DEVICES THAT CREATE PERSONALIZED ENVIRONMENTS TO SET THE MOOD FOR EVERY OCCASION

Looking to the Future

"We're at the footsteps of the most transformative technology in 100 yrs"
Nvidia CEO Jensen Huang

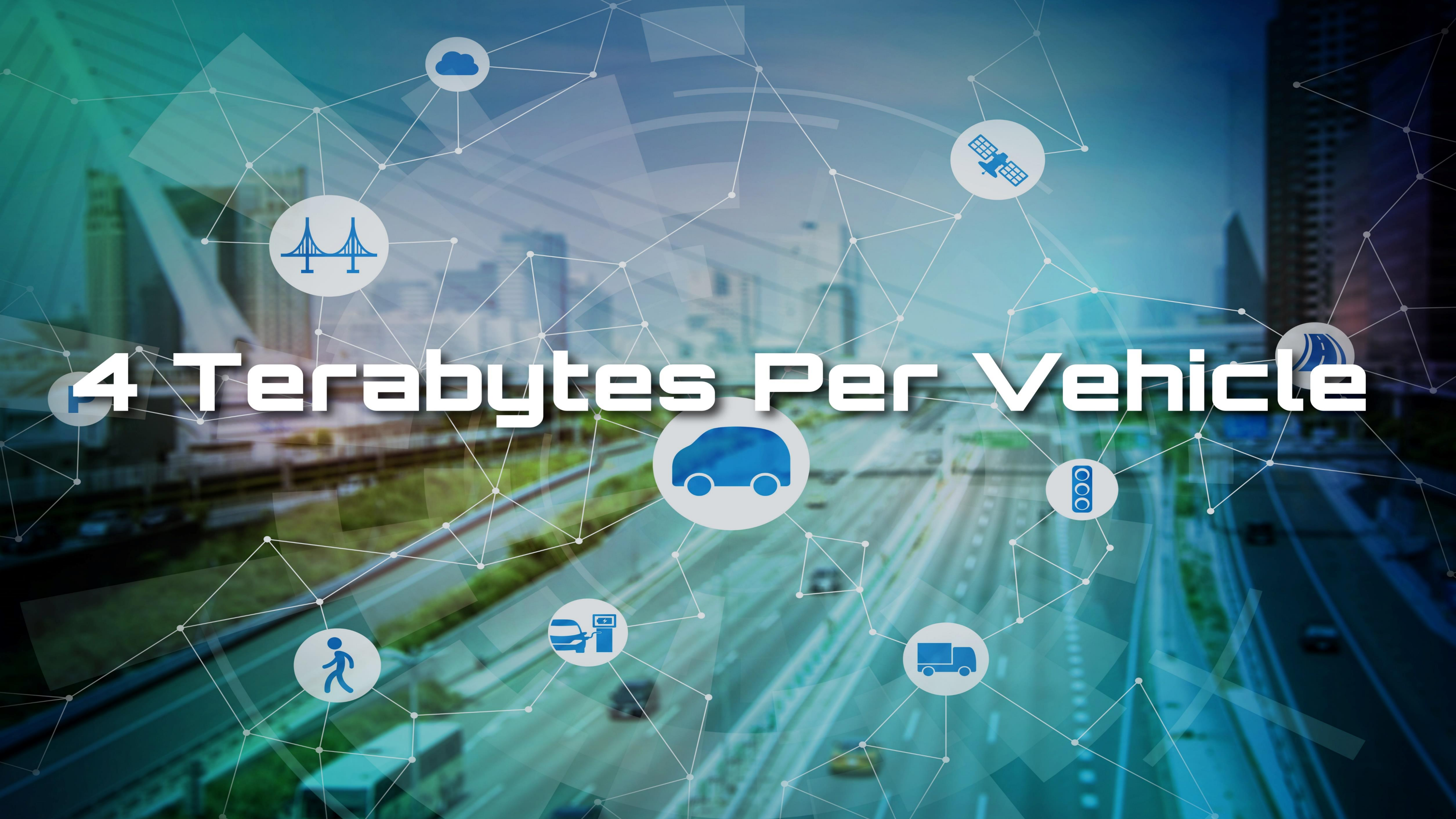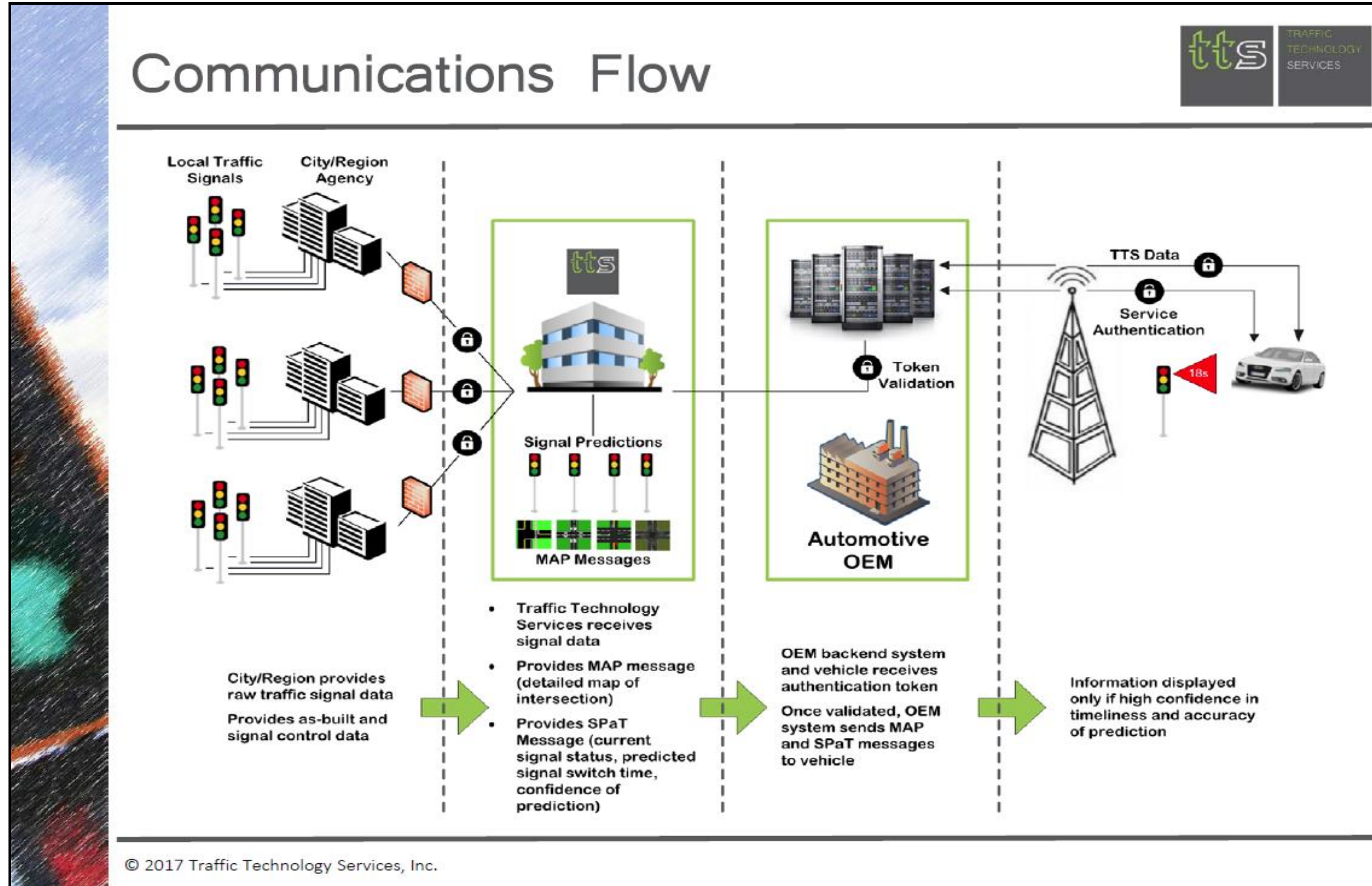- 82M accidents last year
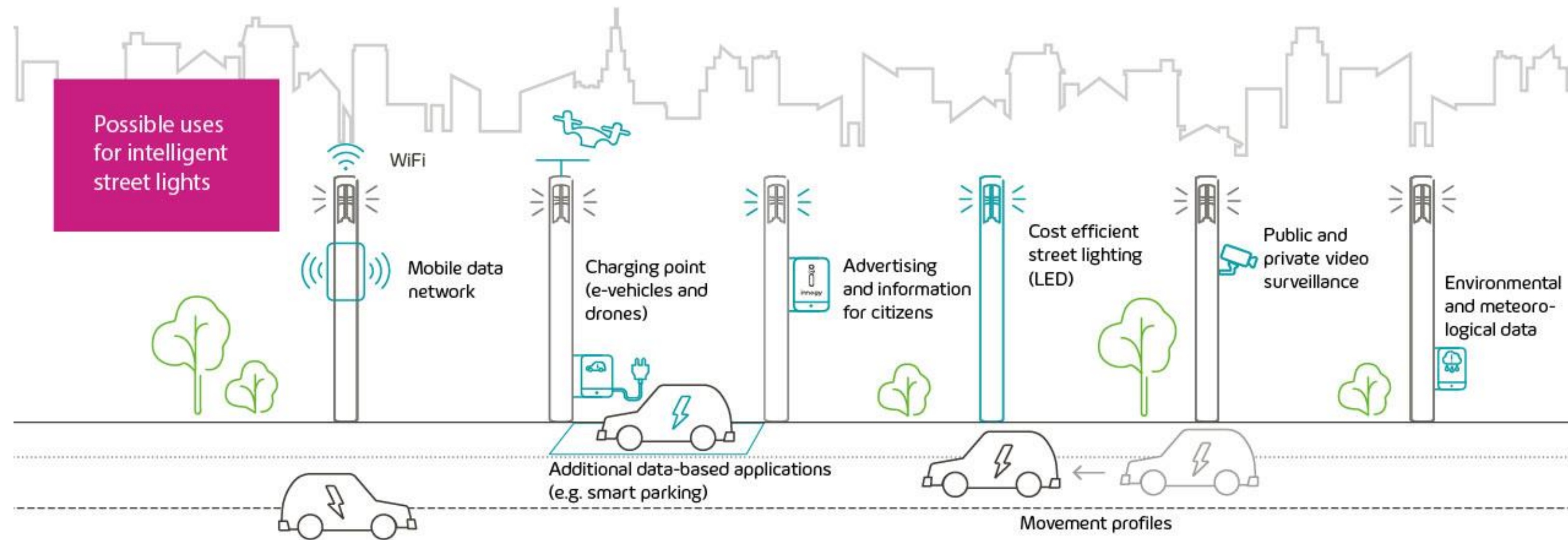- 1.3M fatalities
- $$Billions in Medical

4 Terabytes Per Vehicle

CV Demo - TTS

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

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 meteorological 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

Broadband Strategy

Emerging landscape for voice and DATA

Effective in Dense Urban, Urban, and Suburban

Cell towers: carry all mobile voice & some data

4G/5G Small-Cells

Gigabit speed up to 50x faster

Fiber Lines

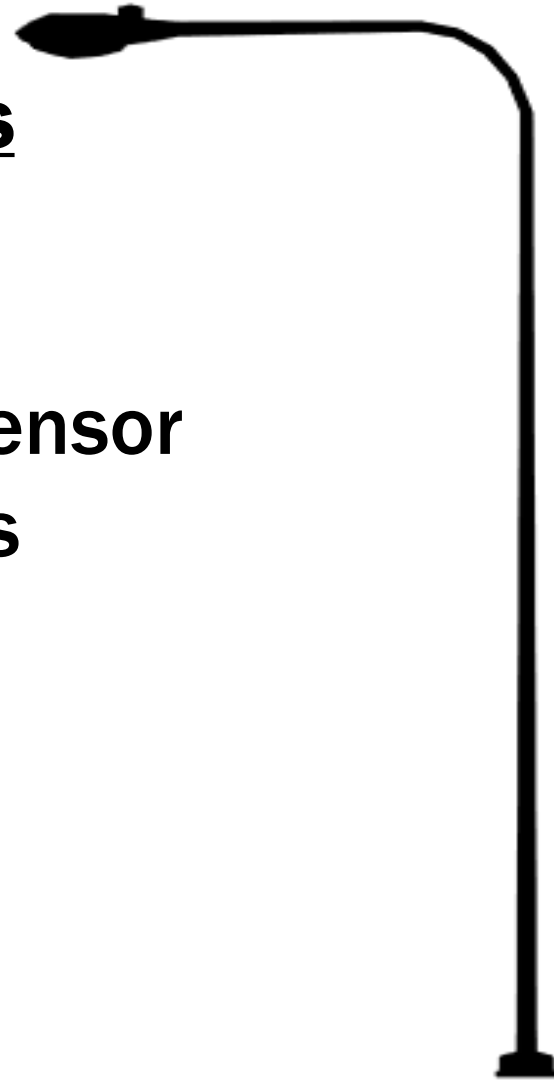*Light pole is most valuable asset for broadband*
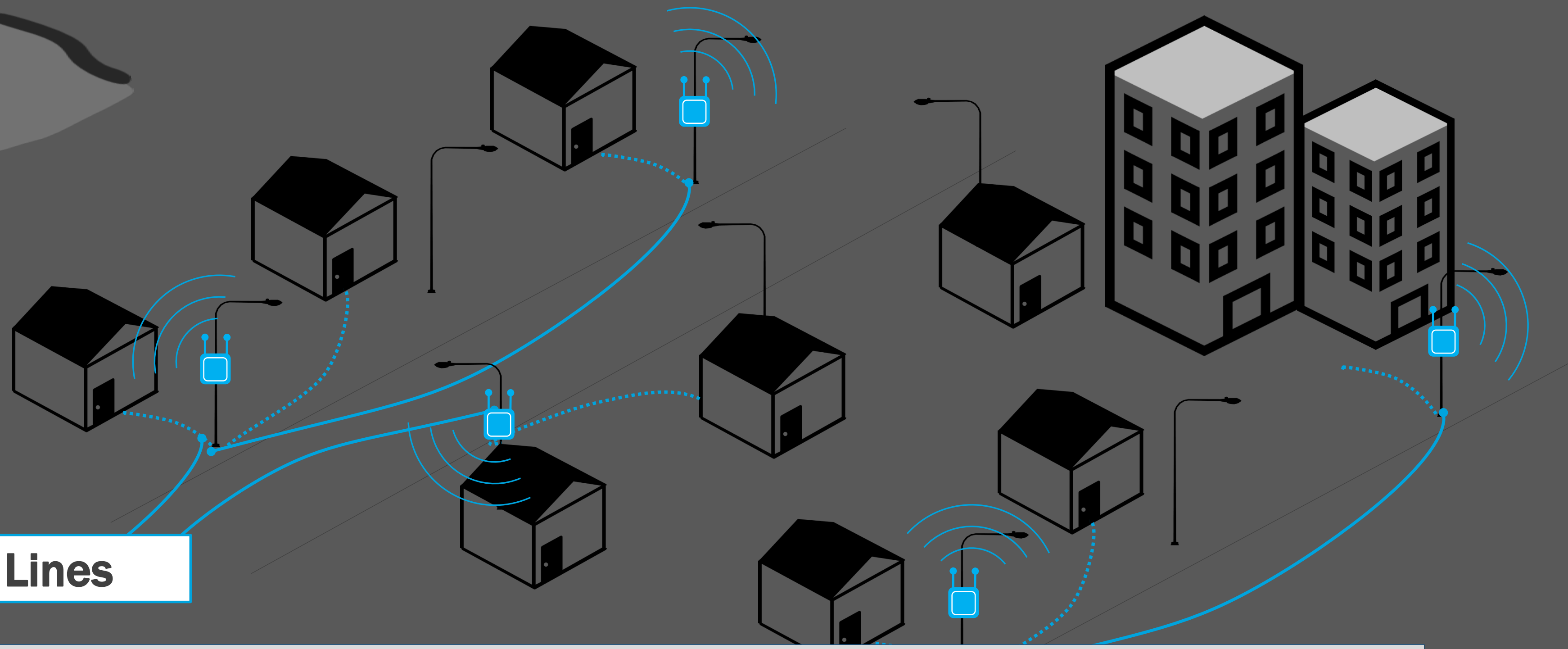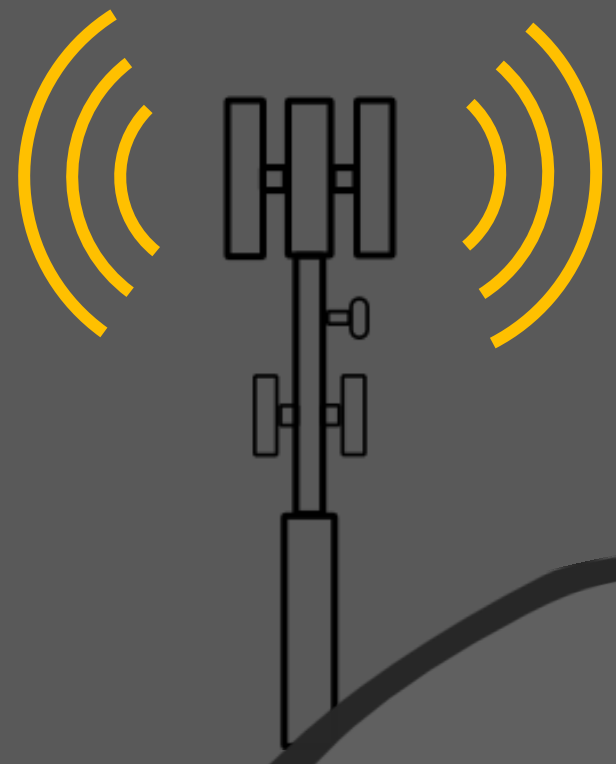
Broadband Strategy

STREETLIGHT
Light/Safety

Properties
- Height
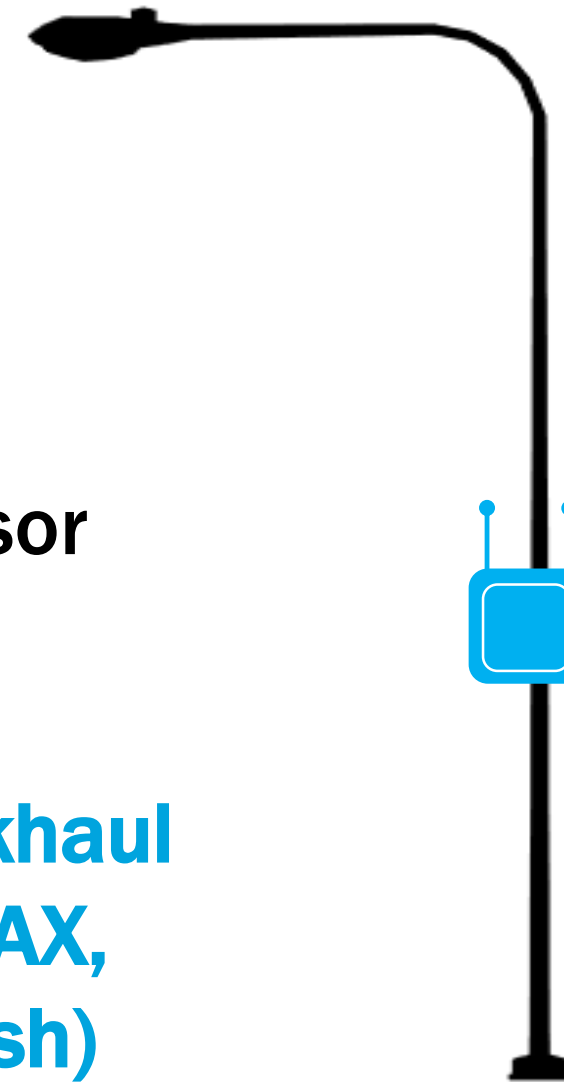- Power
- Light Sensor
- Lumens
- Density

SMALL CELLs
Broadband Digital Infrastructure

Properties
- Height
- Power
- Light Sensor
- Lumens
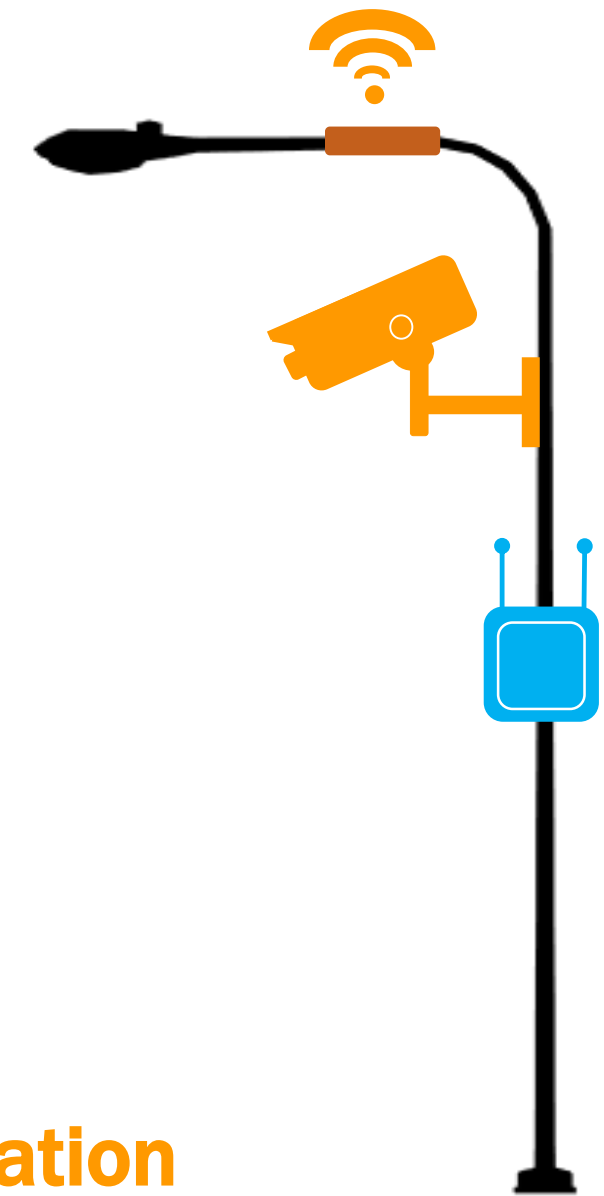- Density
- **Data Backhaul (Fiber, COAX, Radio mesh)**

INTERNET OF THINGS
Smart Cities

Properties
- Height
- Power
- Light Sensor
- Lumens
- Density
- **Data Backhaul**
- **Sensors**
- **Cameras**
- **2-way Communication**
- **Banner Advertising**

Maturity:
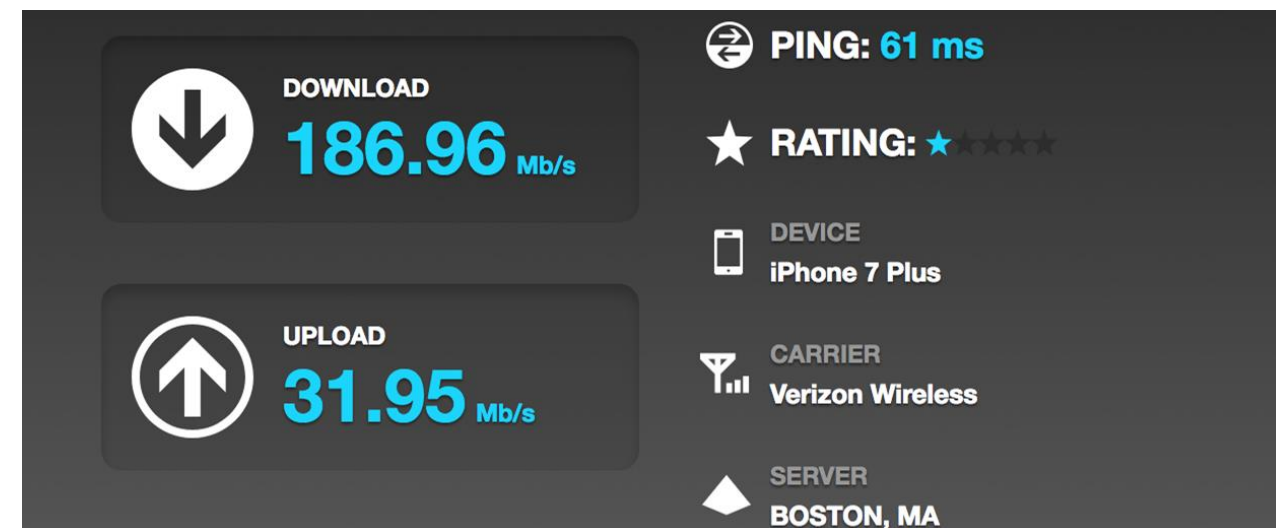
Mature — **Emerging** — **Extremely Immature**

Possible Action:

Proceed w/ LED Light Replacement Only — **Re-examine in Broadband Strategy** — **Seek to Understand with Knight IoT Grant**

- *>800 approved or installed, 314 in process*

- **90% approved within 10 business days, 100% within 28 business days**

- *Improved wireless service*

- *Funding for digital equity programs and hotspot lending*

- *Positive relationship between City and licensees*