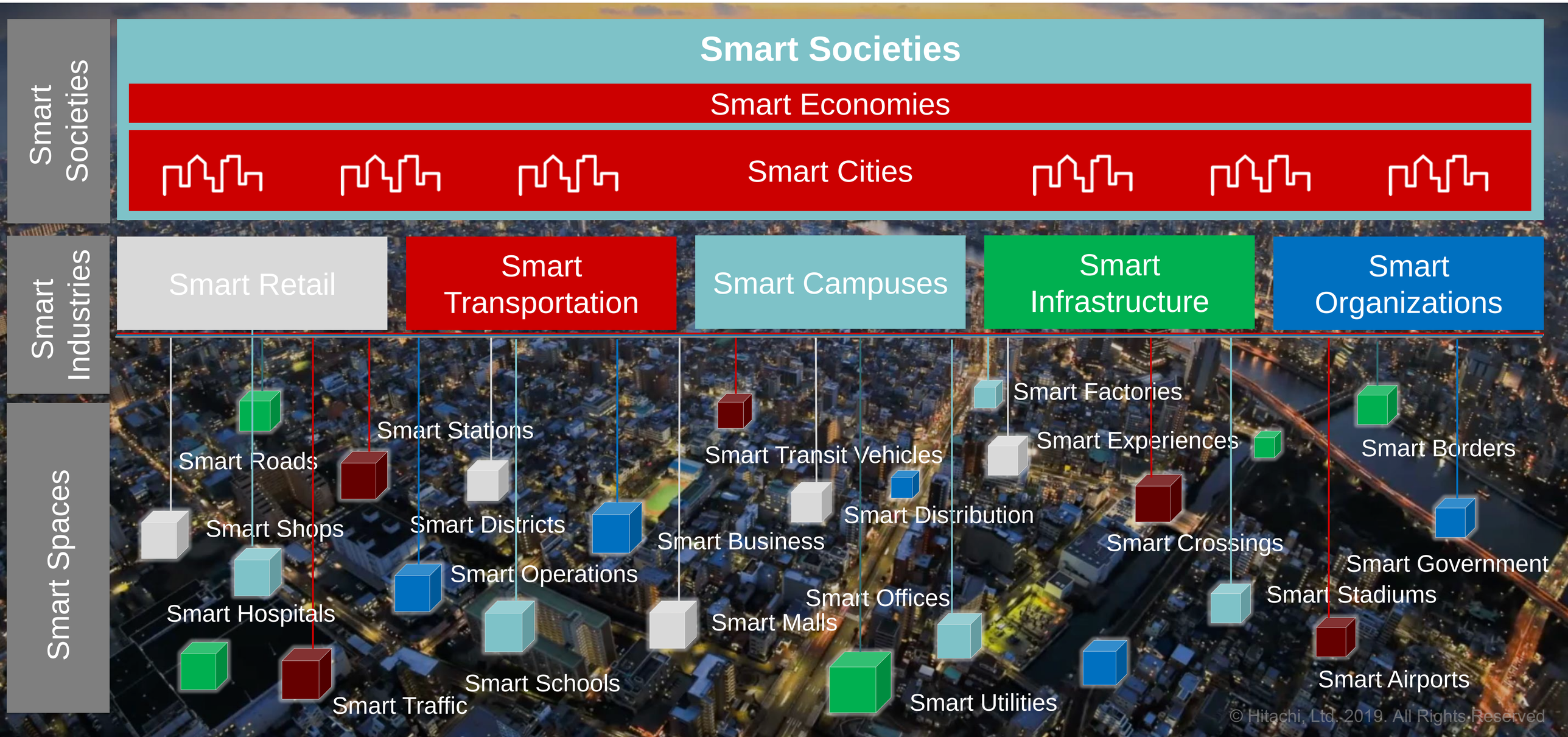
Connected City
Smart City

CONNECTED CITIES
TOUR 2019
www.ConnectedCitiesTour.com

# Smart Cities and Smart Spaces:
## The Building Blocks for Smart Societies

HITACHI
Inspire the Next

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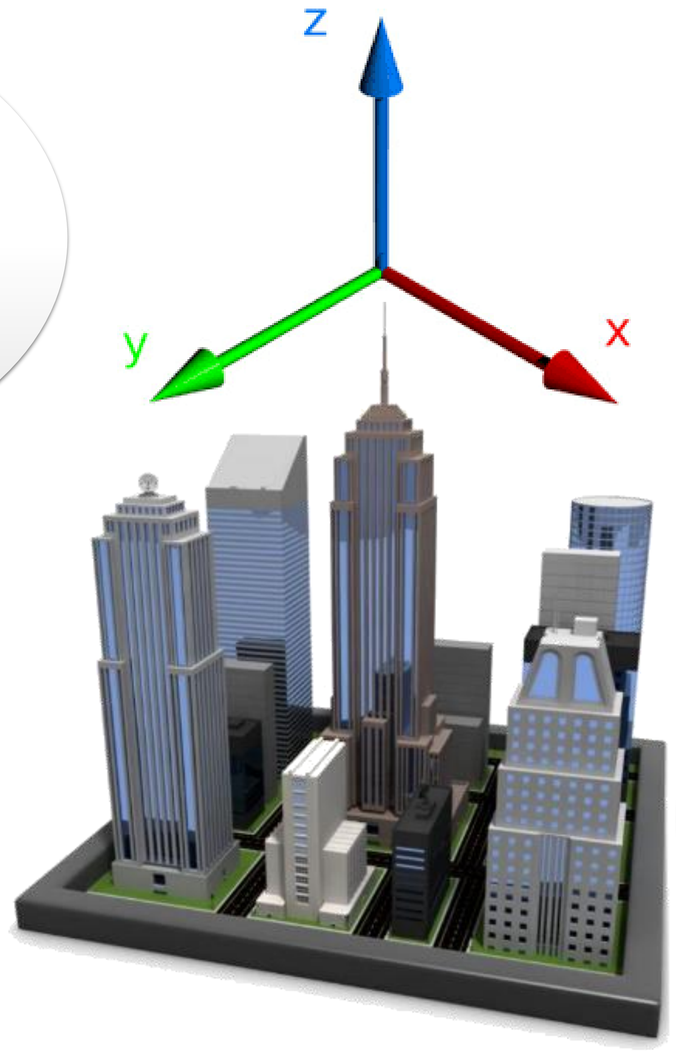
# Spectrum Diversity on the Path to 5G

## Mobile Cellular

*- Multiple Carriers -*

verizon AT&T Sprint T-Mobile




## Shared & Unlicensed

*- CBRS, 5G, LAA, WiFi -*

OnGo 5G Wi Fi

## Public Safety

*- FirstNet, LMR -*

FirstNet™

## Internet of Things

*- NB-IoT, CAT-M, LoRa -*

NB-IoT LTE-M LoRa™



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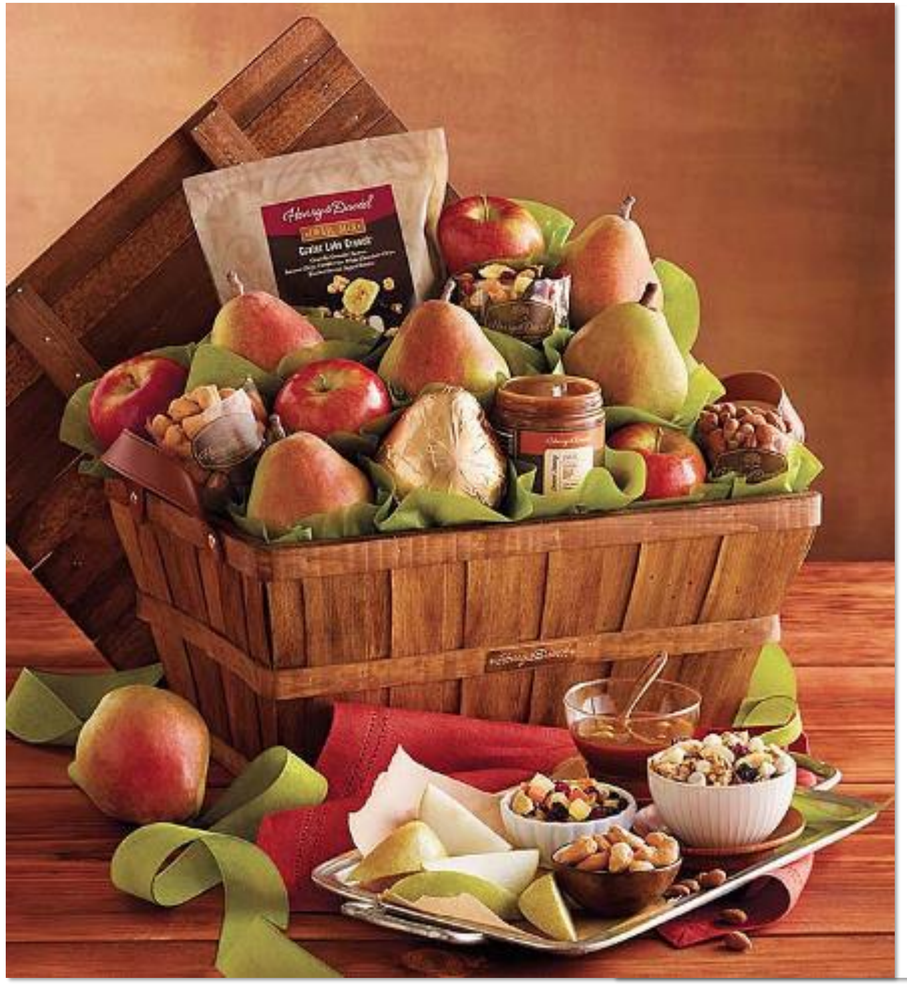
# 5G Technology Basket

*"Its all good but you don't have to eat everything!"*



5G

- **Spectrum:** Expanded, Shared, Dynamic, mmWave
- **Topology:** Distributed, User & Control Separation
- **Antennas:** Massive MIMO, Beam Forming
- **Edge Computing:** Applications, APIs
- **Security:** Authentication, Privacy
- **Radio:** New Radio (NR), Software, Micro Cells
- **IoT:** Low Power, Low Latency, NB-IoT, CAT-M
- **Network:** Slicing, Virtualization, SDN, SON, COTS
- **Interoperability:** Path from 4G (NSA), Coexist with 4G (SA)

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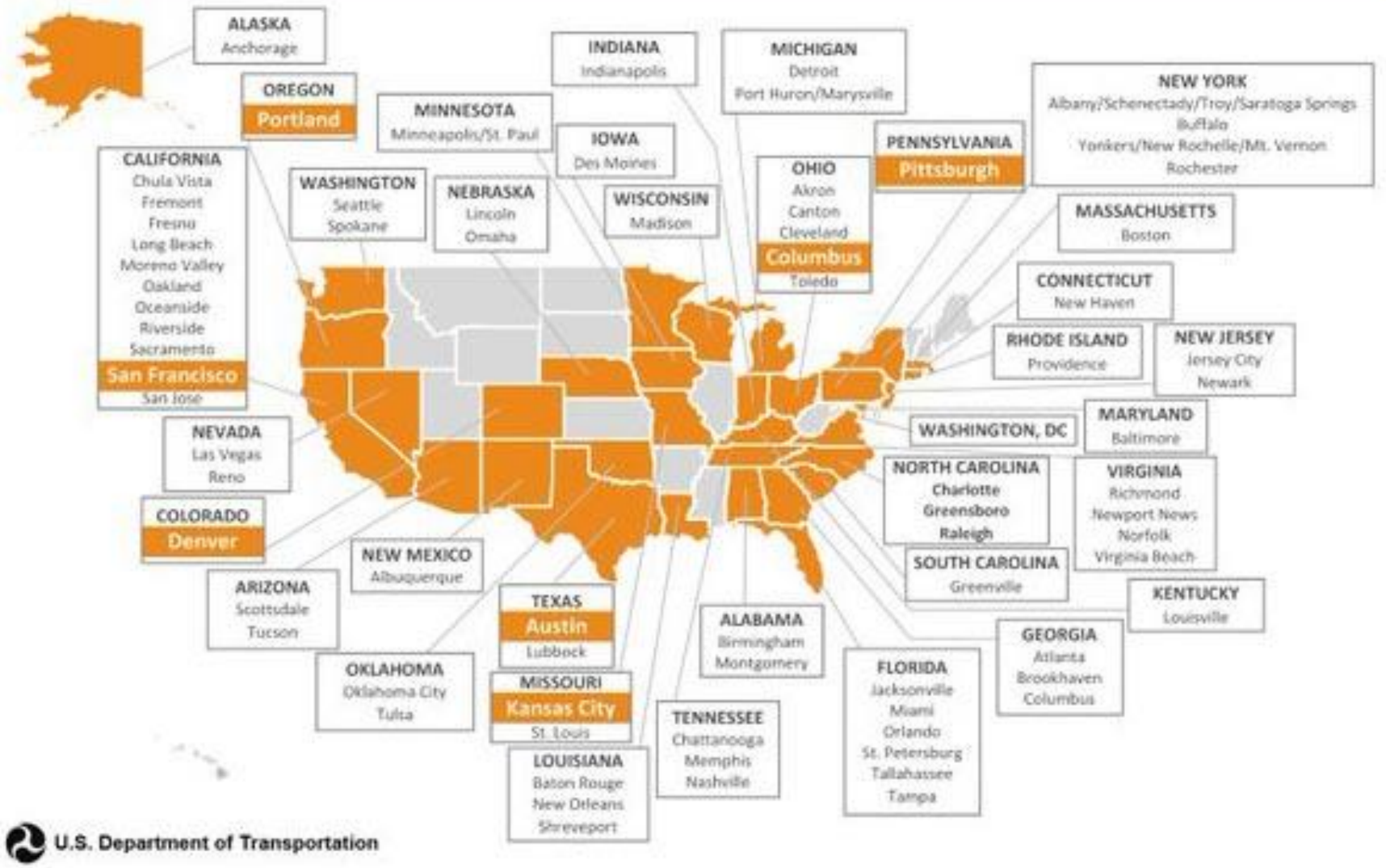
SMART COLUMBUS

# Smart City Challenge Finalists



Autonomous
P
Connected

# 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

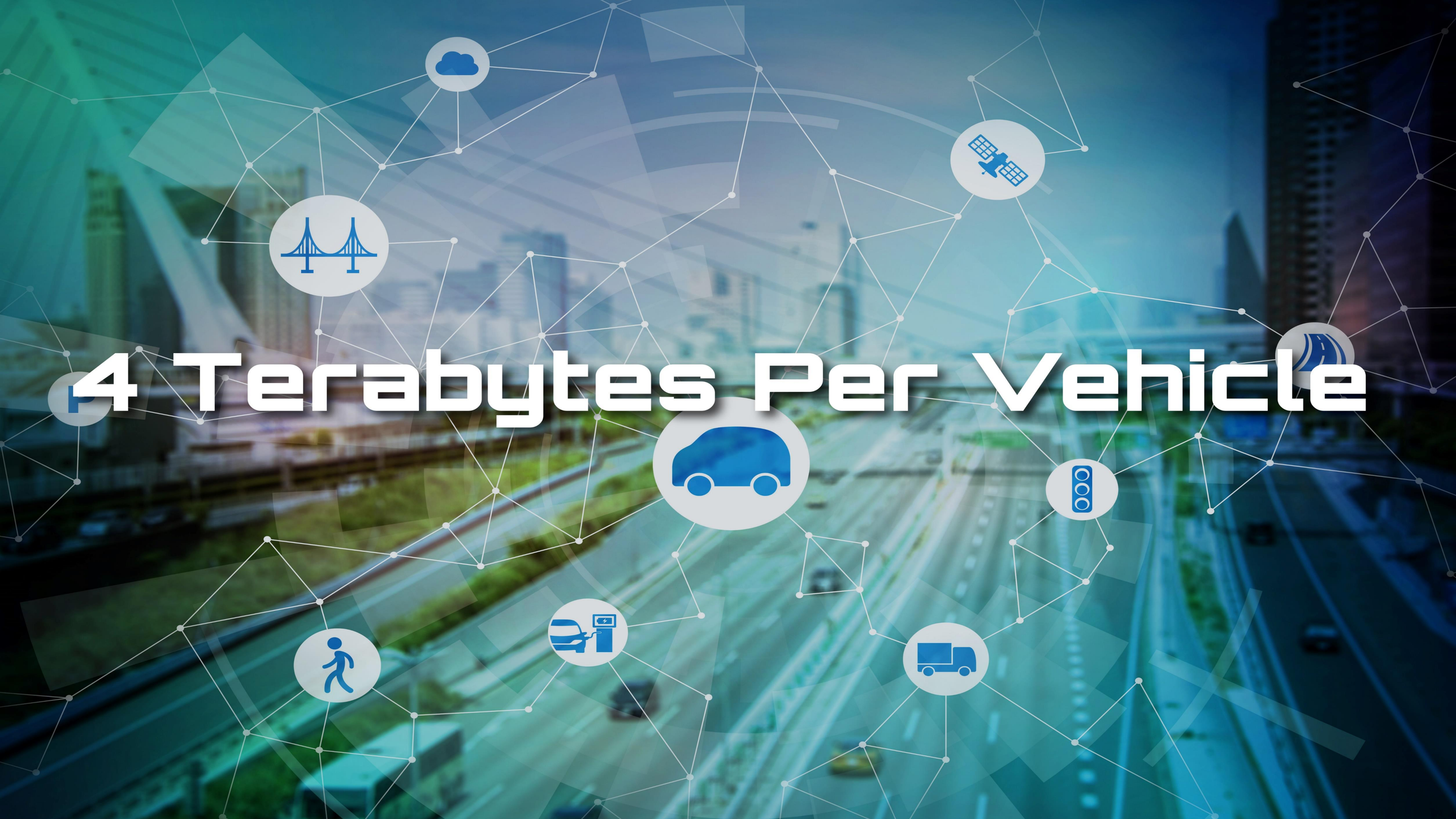
These cars are officially driverless in certain environments.

## LEVEL 5

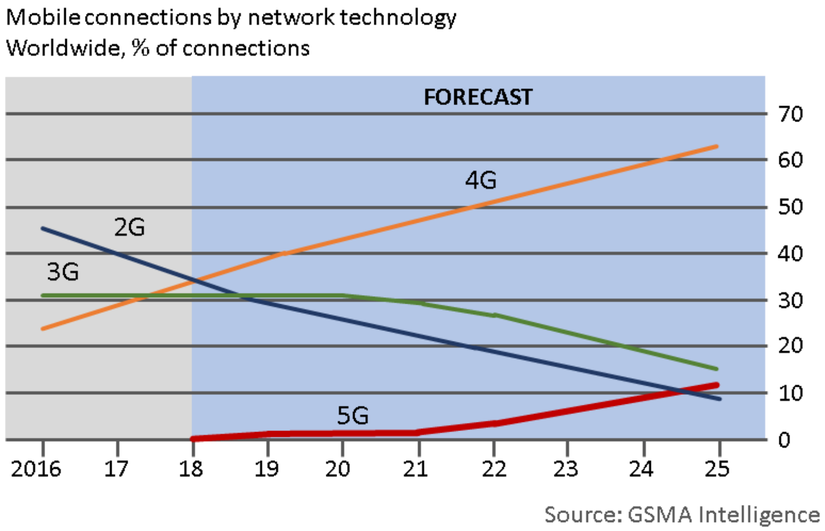
These cars can operate entirely on their own without any driver presence.

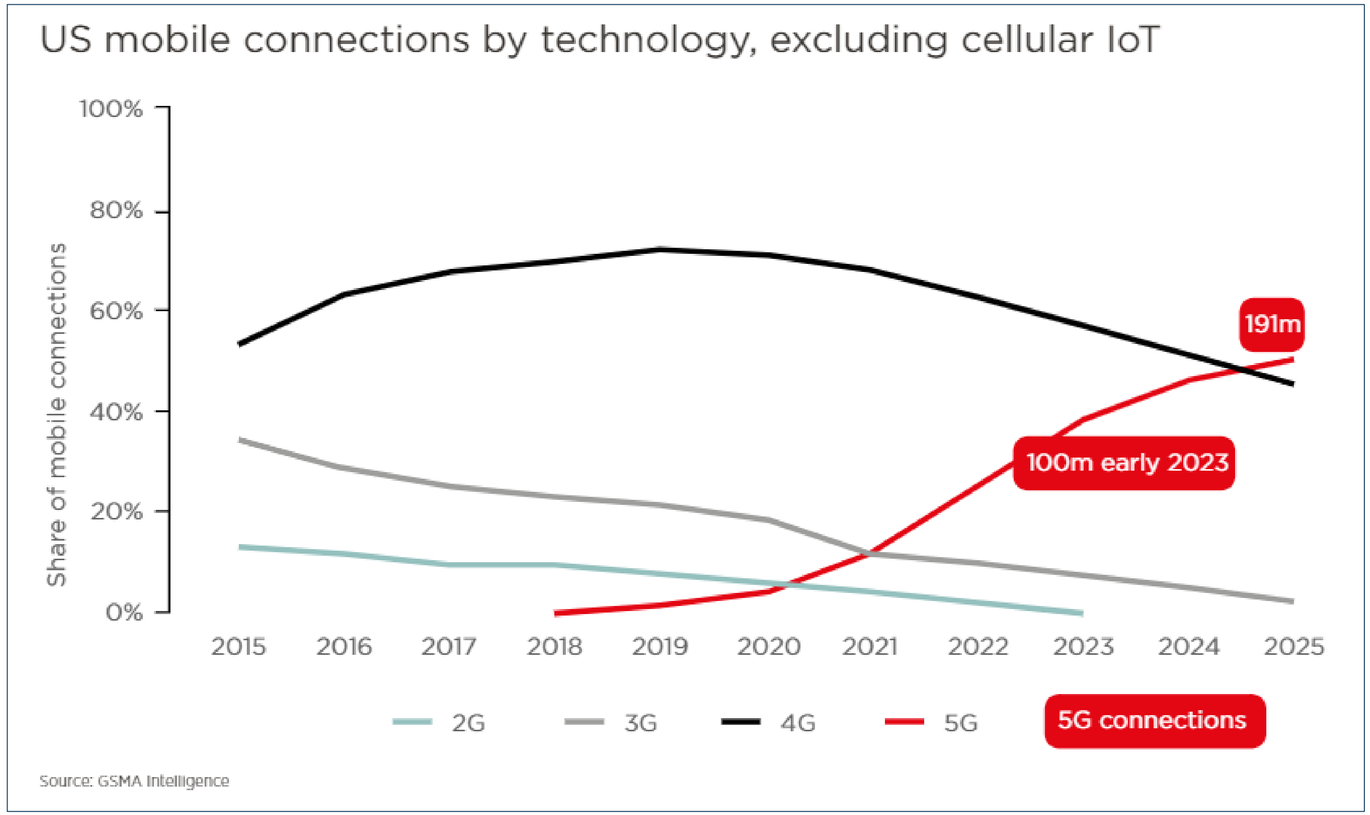
**SOURCE:** SAE International

BUSINESS INSIDER


4 Terabytes Per Vehicle

# 5G Rollout




- 10/20 rule
  - 10 years between "Gs"
  - 20 years until that G peaks in deployment
- US a leading adopter

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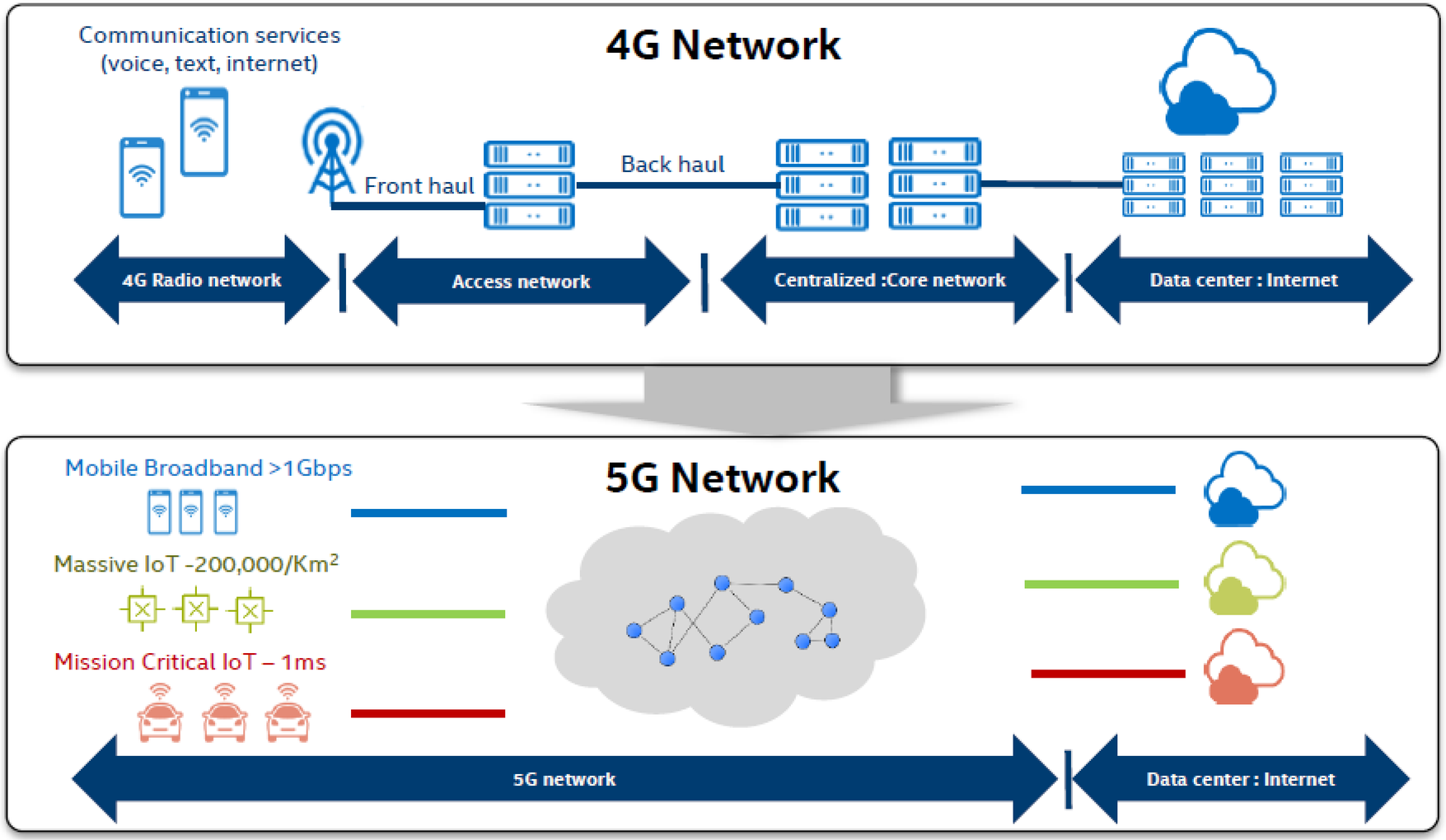
# Transition to Multi-dimensional Networks




Graphic: Intel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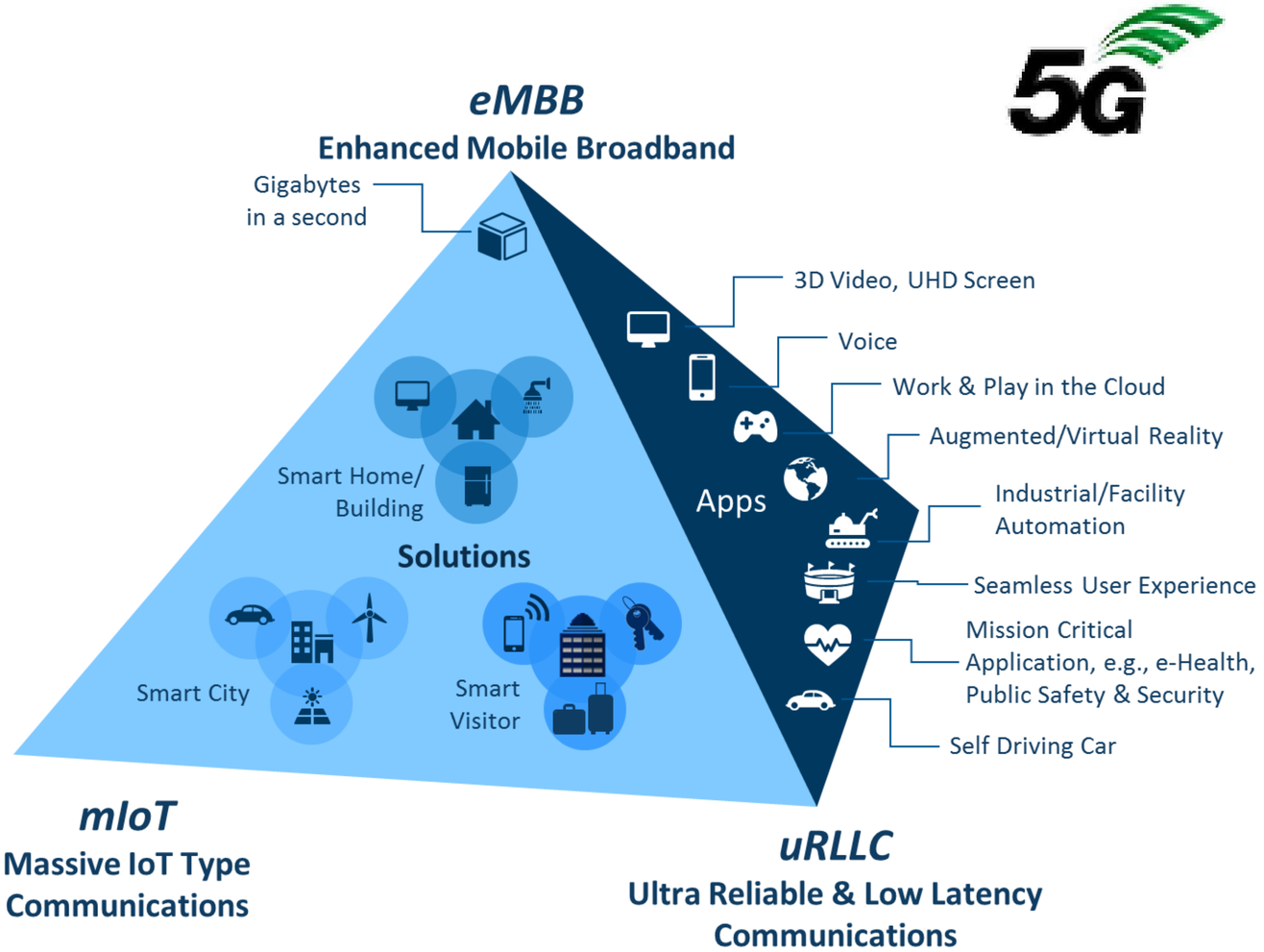
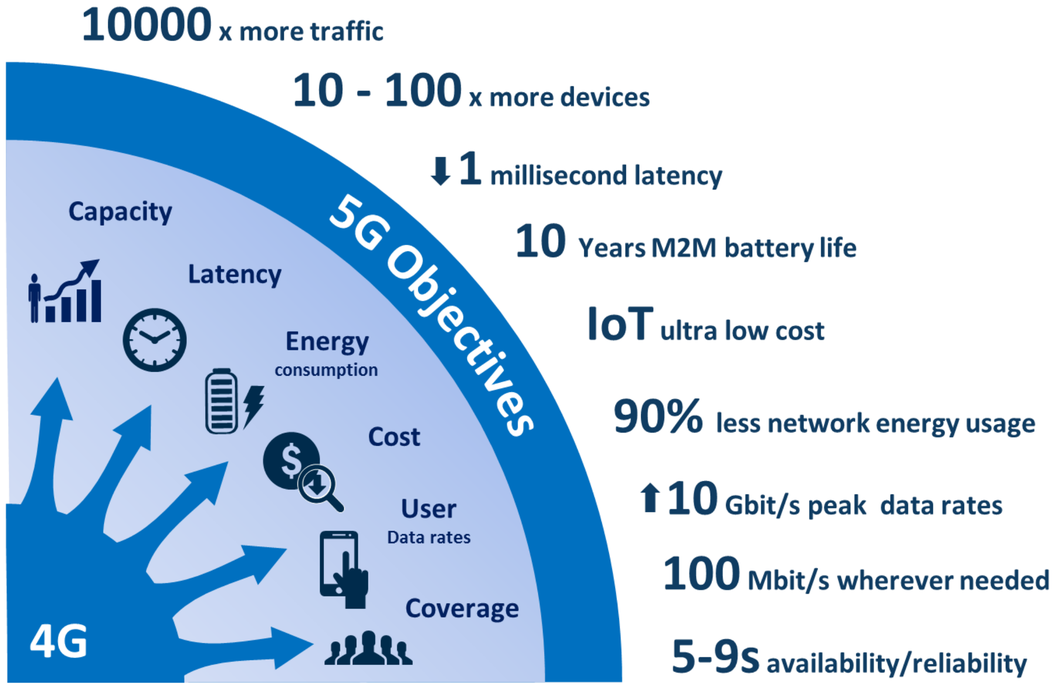
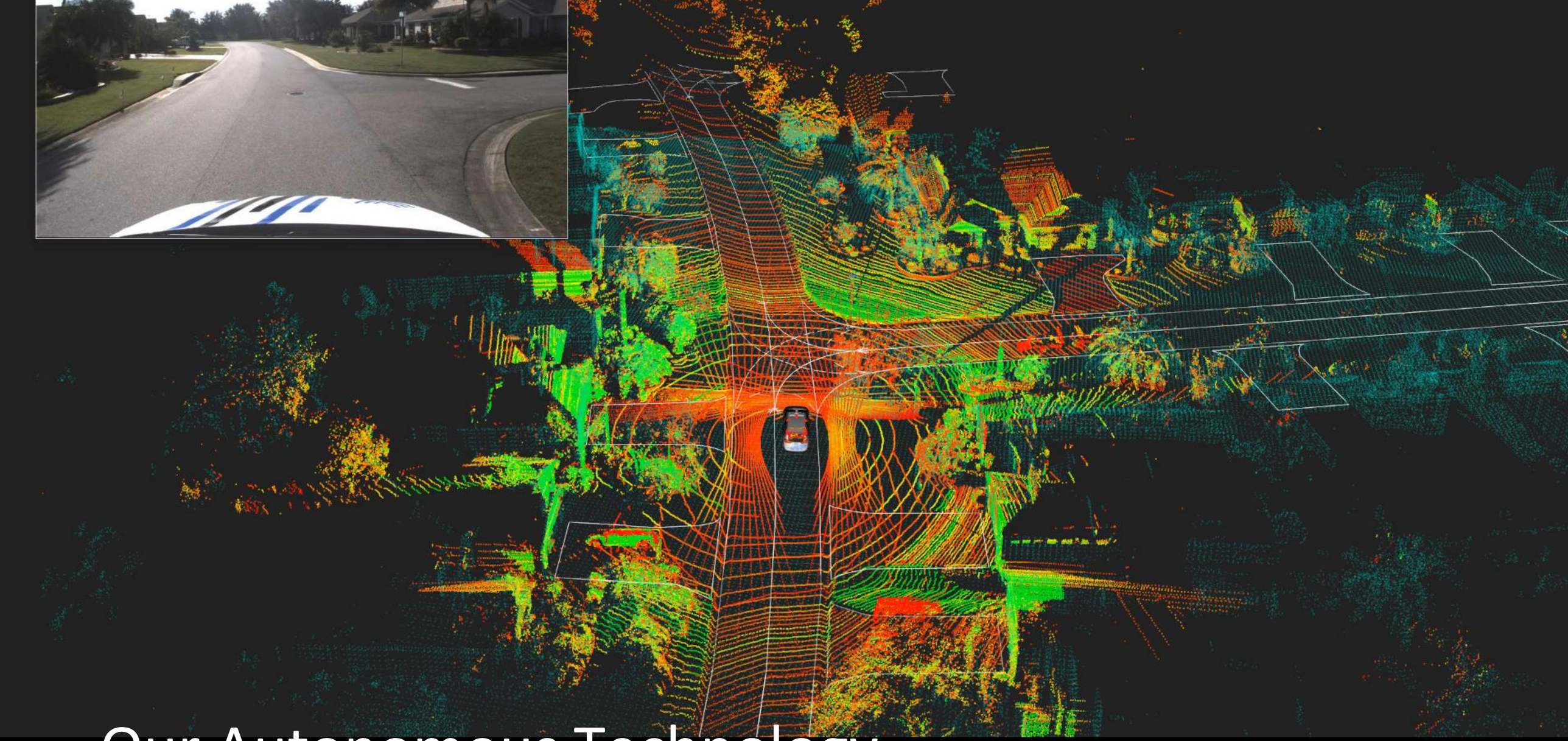
# 5G Goals and Objectives

International Mobile Technology **2020**





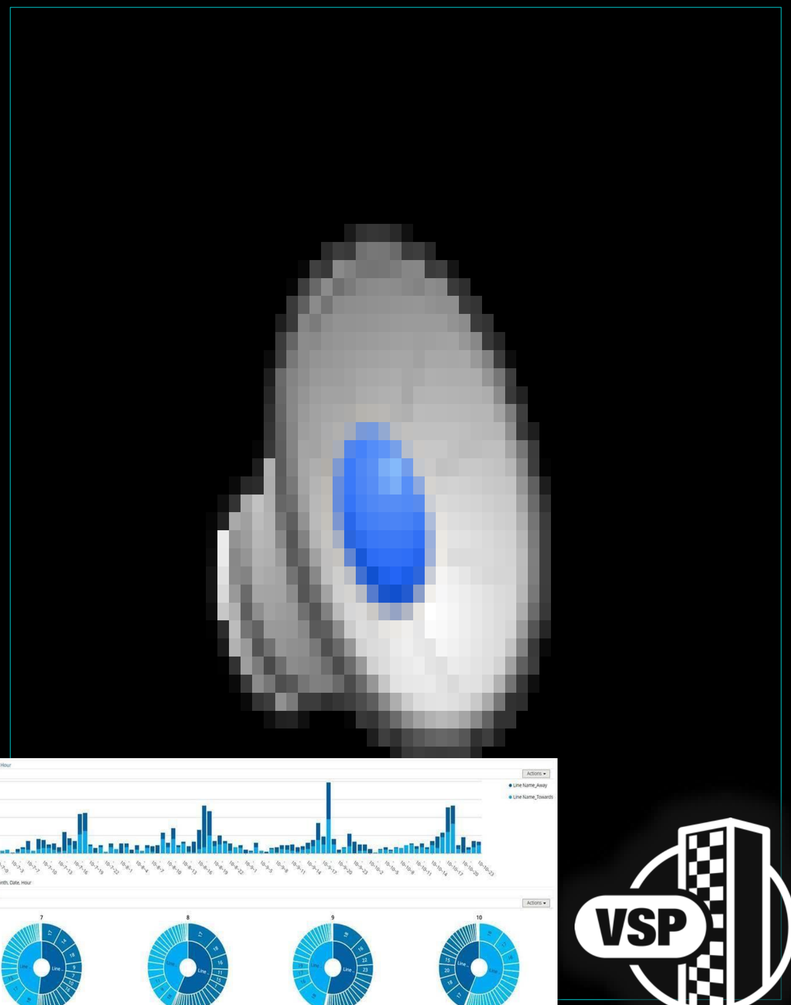
# Our Autonomous Technology

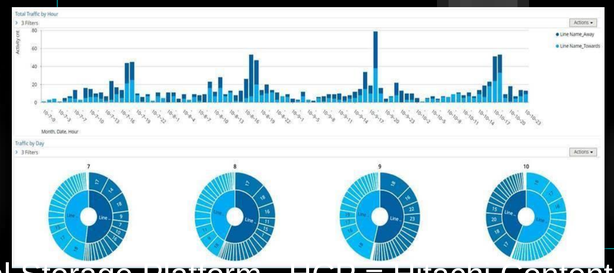
# Video + AI = Rich Insights and Alerts
# Operations, Business and Safety Intelligence

NEXT 2018

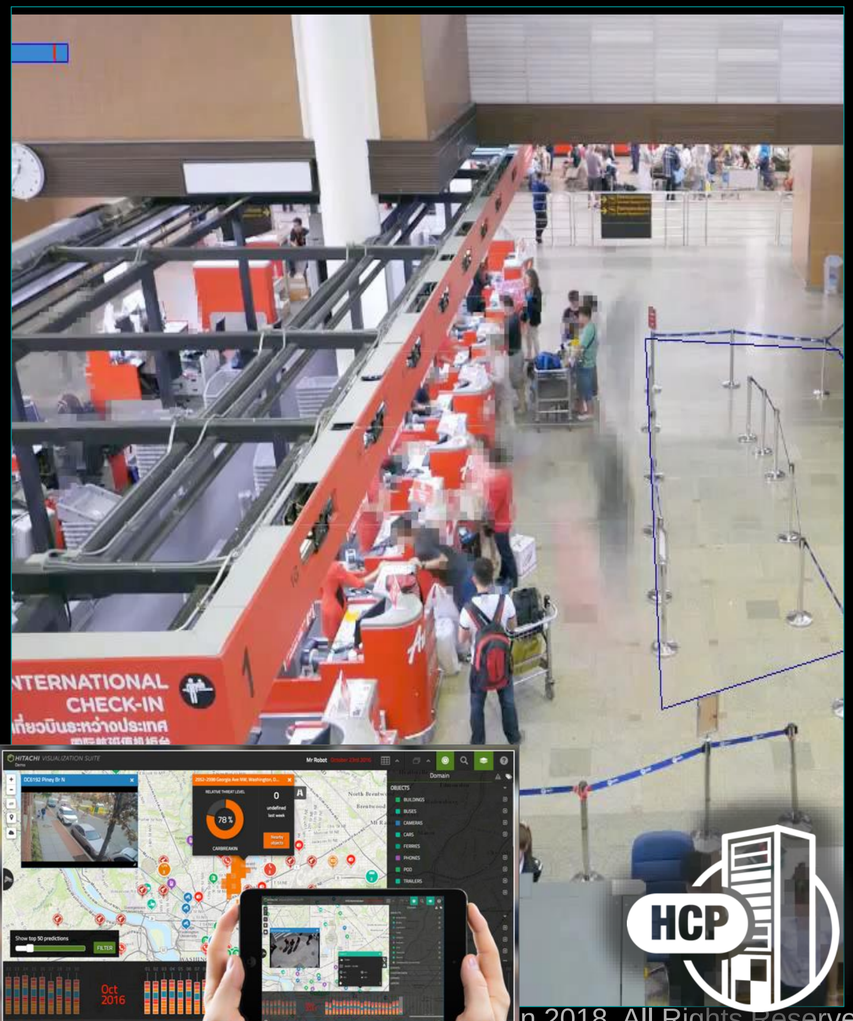
## Traffic Analysis

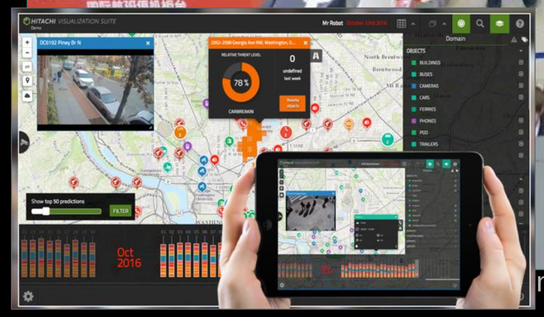
## People Counting





## Operations and Privacy






*VMP = Video Management Platform  VSP = Virtual Storage Platform  HCP = Hitachi Content Platform

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# Hitachi Video Analytics Delivers Digital Insights

NEXT 2018

## Operational & Business Intelligence

- People Counter
- Traffic Analyzer
- Queue Detector
- License Plate Recognizer
- Activity Visualizer
- Parking Space Analyzer
- Direction Controller
- Camera Health Monitor

## Security

- Intrusion Detector
- Facial Recognition
- Object Detector
- Video Enhancer

## Privacy

- Privacy Protector
- European Privacy Seal
  EP-P-F9LDTM / Valid till 2017-10

Police • Hospitals • Campuses • City Agencies • Retail • Financial Services • Transportation • Utilities

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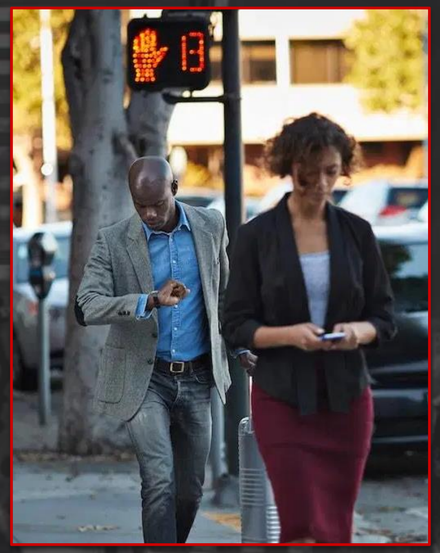
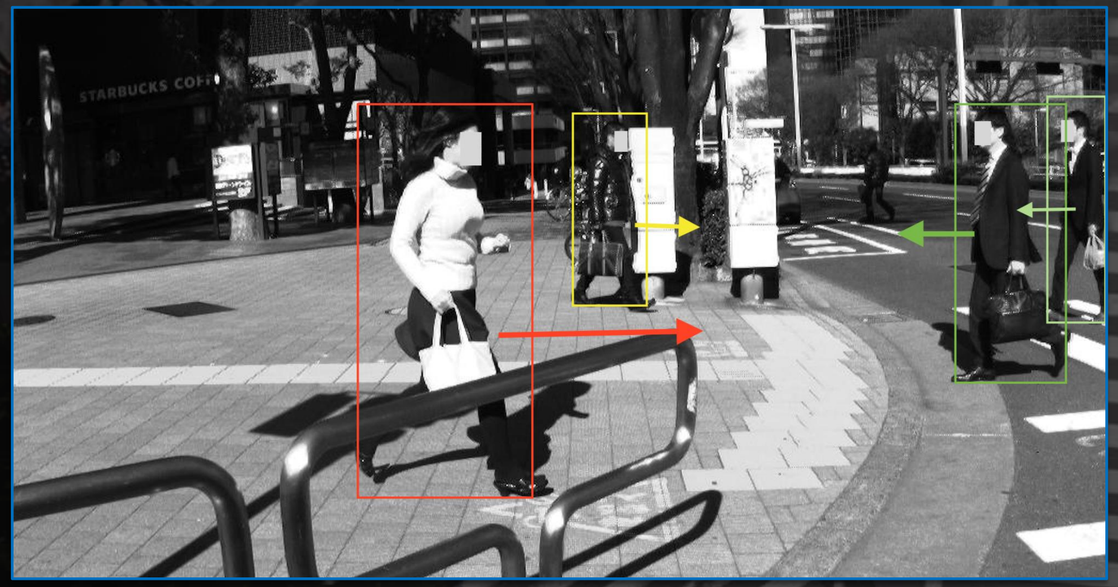
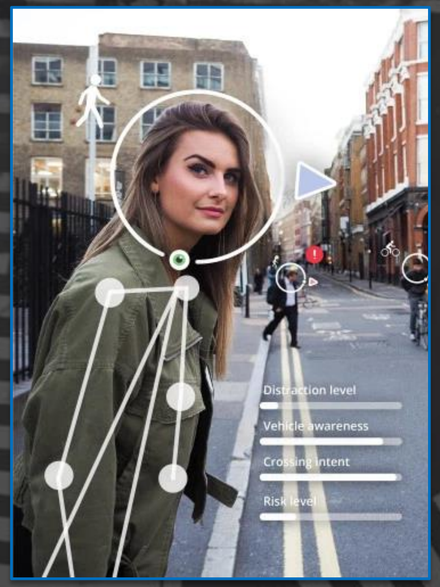
# Predictive Pedestrian Protection

NEXT 2019







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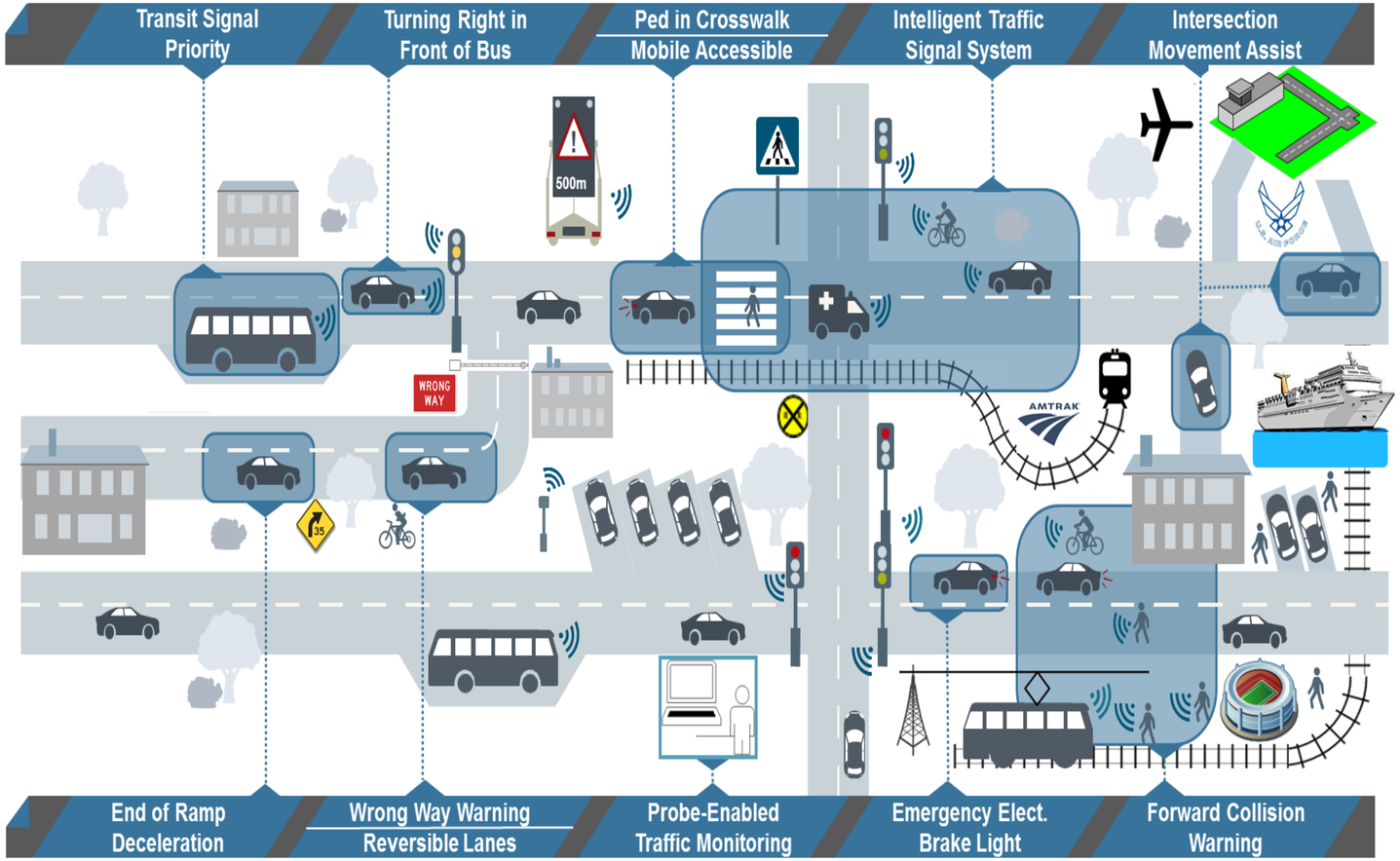
# CV Pilot Overview

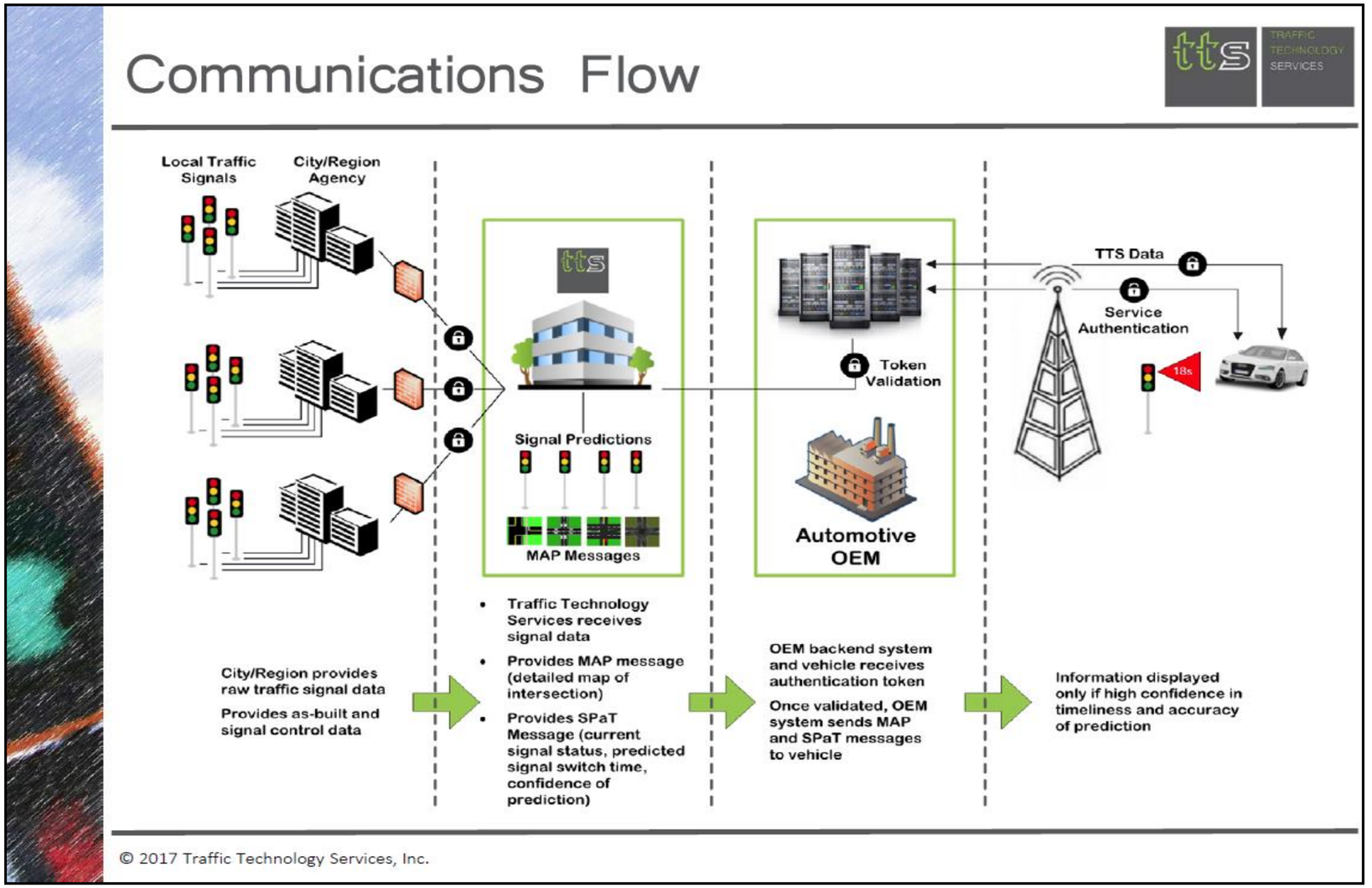
- Pedestrian Safety
- Traffic Management
- Transit Efficiency
- Collision Avoidance
- Wrong-Way Driver Alerts




PROJECTS

# CV Demo - TTS

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



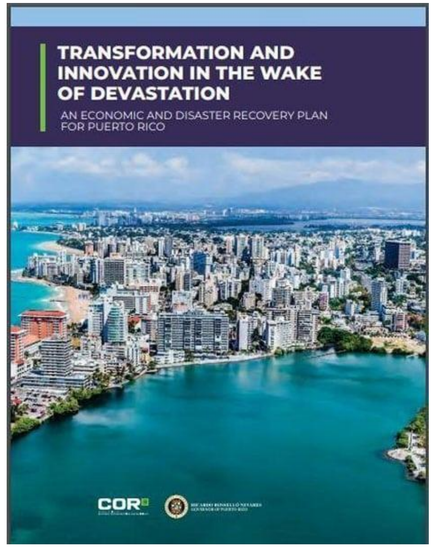

PROJECTS

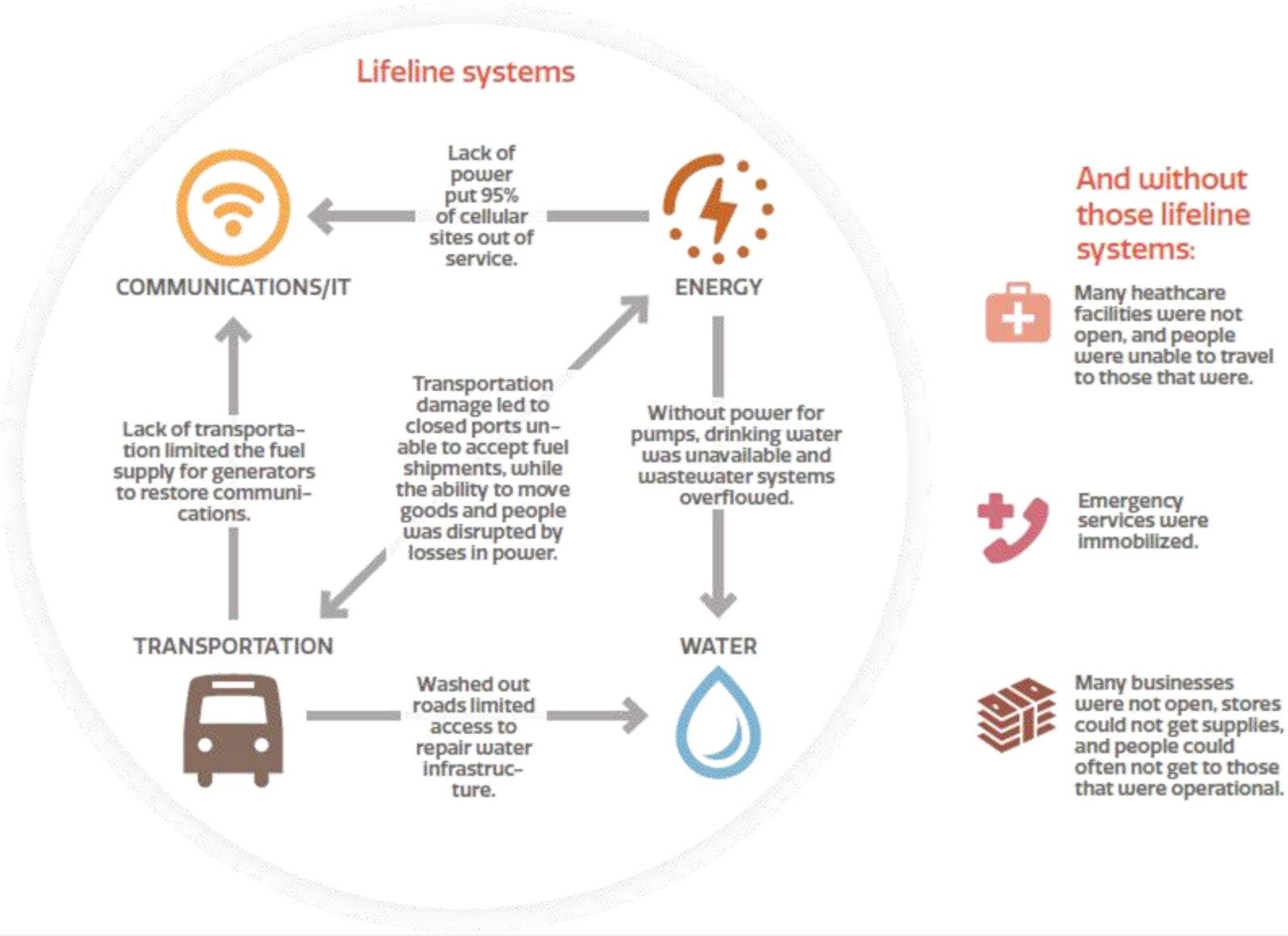
- Connected Intersection

- Platooning

# V2V, V2I, C-V2X

# Connectivity Dependence – 4G World




http://www.p3.pr.gov/assets/pr-draft-recovery-plan-for-comment-july-9-2018.pdf

# Initiatives for Resiliency

- Broadband Deployment Advisory Committee (BDAC)
  - Disaster Response and Resiliency Working Group
    - Industry Standards and Infrastructure
    - Mutual Aid, Support and Reporting
    - Policy and Regulations
- Alliance for Telecommunications Industry Solutions (ATIS)
  - Network Reliability Steering Committee
    - Industry Best Practices and Checklists
    - Disaster Information Reporting System (DIRS) with FCC
- Many Others
  - FEMA ESF #2, FirstNet, CTIA, TIA, WIA, Safer Building Coalition....
  - 2016 Wireless Industry Cooperative Framework

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