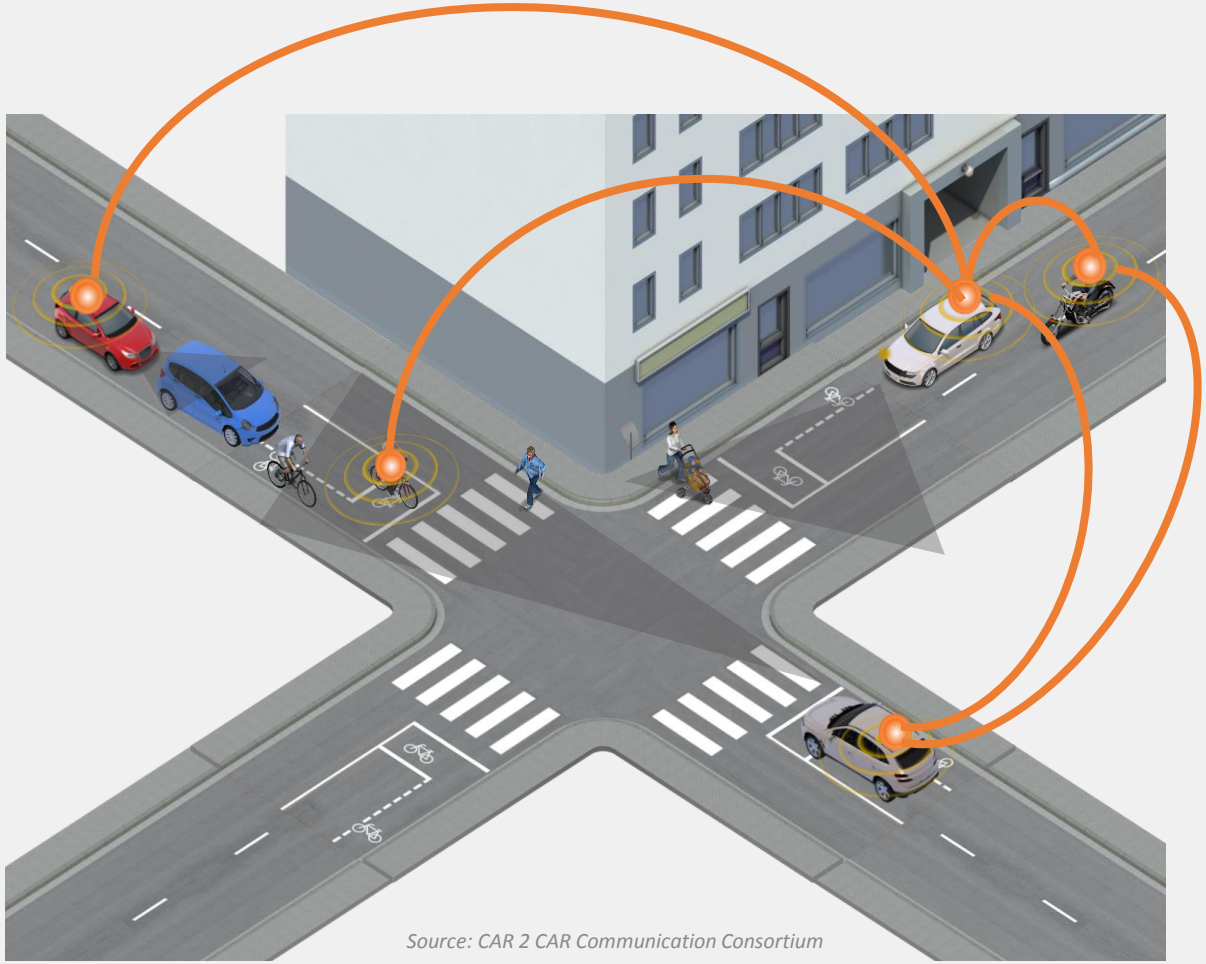
Autotalks The Confidence of Knowing Ahead

# Driving the Future of Connected Vehicles

Yaniv Sulkes

# World in 2025: Cooperative Driving

- Cooperative perception
  - (“see through” other sensors)
- Coordinated maneuvering
- Automated driving coordination
- Cooperative positioning
- Ad-hoc Platooning



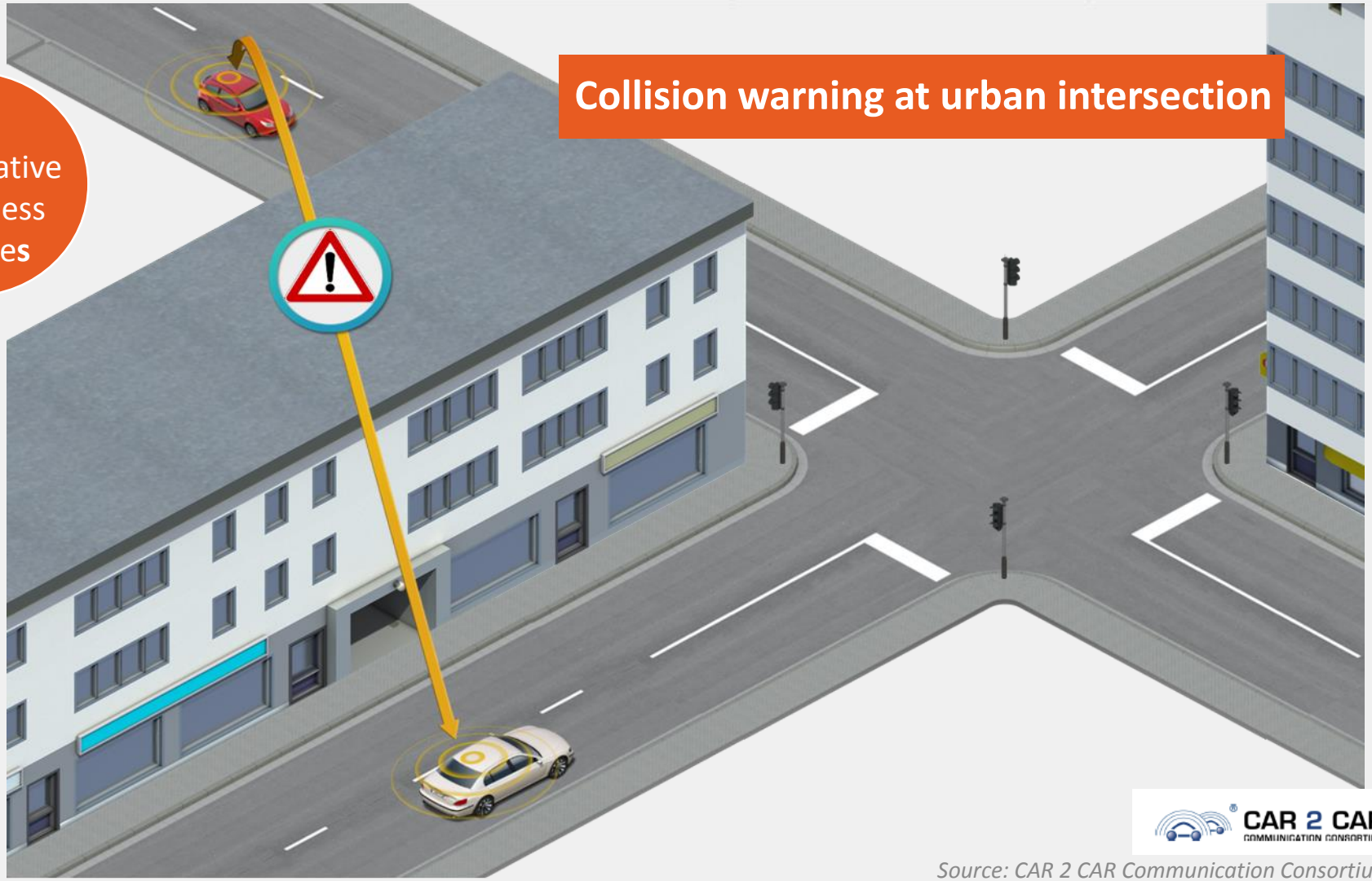
*Source: CAR 2 CAR Communication Consortium*

# Improved Safety

## V2X is about knowing ahead, without visibility

**CAM:**
**C**ooperative
**A**wareness
**M**essages

**Collision warning at urban intersection**

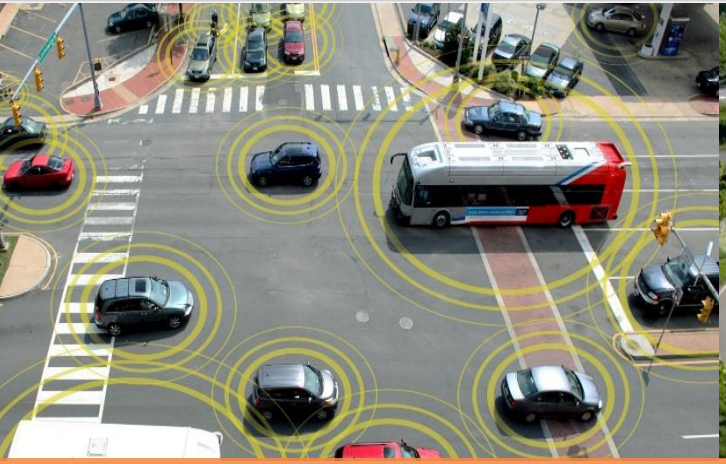


CAR 2 CAR COMMUNICATION CONSORTIUM

*Source: CAR 2 CAR Communication Consortium*

*Autotalks is a contributing member of Car 2 Car Consortium*

# V2X Applications



**Vehicle-to-Vehicle**
Intersection Movement Asist

**Vehicle-to-Motorcycle**
Motorcycle Approaching Indication


**Cooperative-Adaptive Cruise Control / Platooning**
Safer, increased road efficiency and reduces fuel consumption

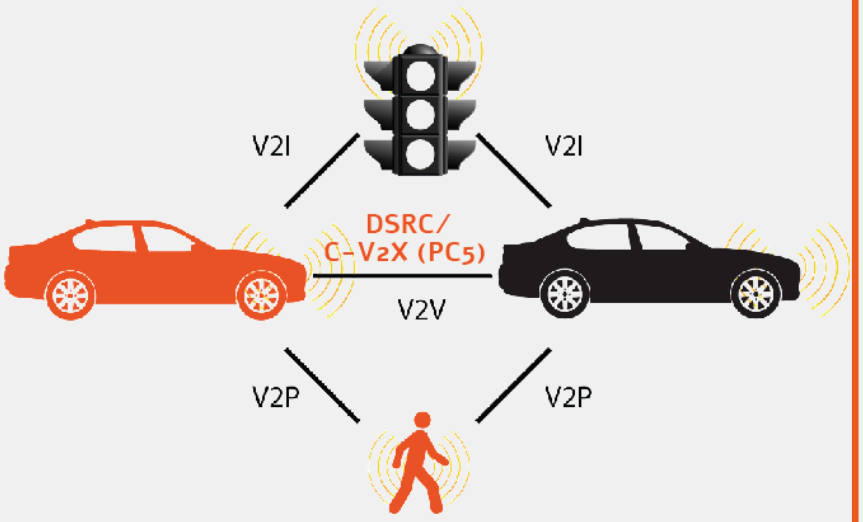
**Vehicle-to-Infrastructure**
Green Light Speed Advisory

# The Hybrid Model for Vehicle Connectivity

## V2X

### Direct communications

DSRC / C-V2X (PC5) for V2X operates in the ITS band (5.9 GHz)



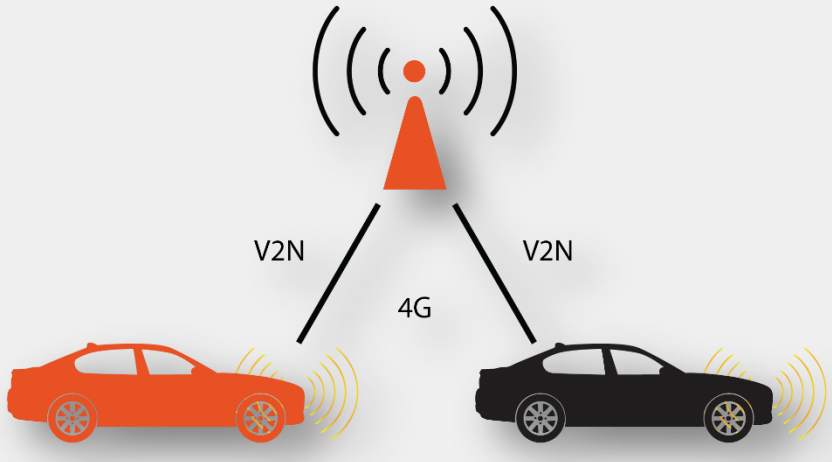

### V2X - Vehicle to Everything

**Safety - mission critical → cybersecure, robust & reliable, real-time, low latency, automotive grade**

## V2N

### Network communications

LTE/5G for V2N operates in licensed cellular spectrum




### V2N – Vehicle to Network

**Infotainment - non-mission-critical, non-real-time, non-secure, comes from consumer market**

**DSRC / C-V2X is independent of cellular network**

# The First Ever Global V2X Solution


**Autotalks offers the first ever global V2X communication processor**

- **The only truly Global Platform addressing: US , EU, China, APAC markets**
- **Dual mode V2X: DSRC or C-V2X (PC5) modem**
- **Truly safe, secure and certifiable**
- **Decoupled from NAD (cellular modem agnostic)**
- **Leveraging production grade software**

# Top Global OEMs are Implementing V2X

"With the aim of increasing safety in road traffic, Volkswagen will enable vehicles to communicate with each other as **from 2019**"

"Toyota will launch V2V & V2I in the US **starting 2021**", Already has 100K deployed vehicles in Japan

"Our main goal is to offer our fleet customers cars that are safer on the roads and improve the flow of traffic…..these vehicles 'talk' to each other and warn each other in real time"

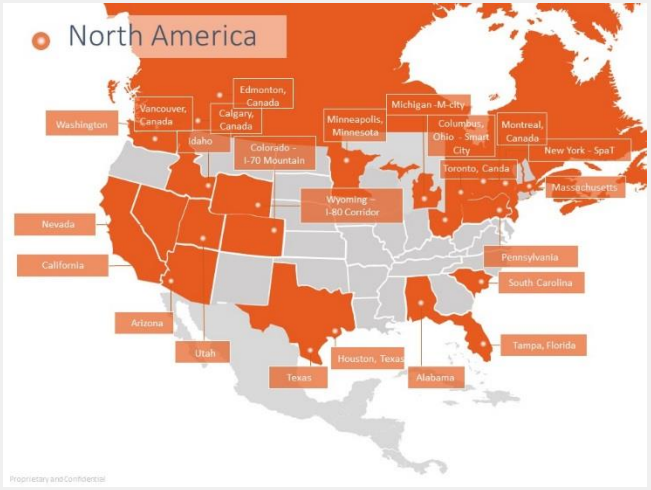
"A language needs to be created, so all the sensors can be linked up... We believe C-V2X is that connection that brings it all together."

BMW showcases vehicle-to-vehicle communication tech

"**In 2020**, SAIC-GM will begin implementing connected vehicle (V2X) technology that will connect vehicles to other vehicles and infrastructure to further enhance intelligence"

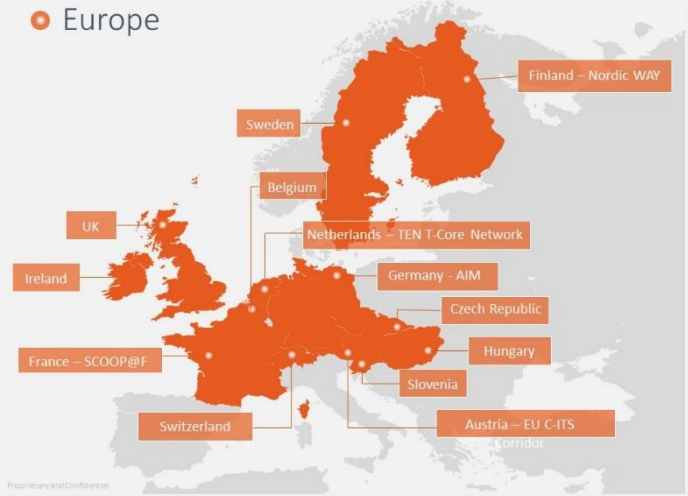
Cadillac to deploy V2X in a high volume SUV **by 2023**

# V2I Infrastructure is Deployed Globally




- Over 20 states have active infrastructure deployment projects (details here)
- Thousands of Road Side Units are already deployed
- Government allocated yearly $220M budget for Smart City projects

- €500M investment by 16 member states (C-ROADS)
- In France, 2000km of roads and inter-city highways are being equipped with V2I




Autotalks chipsets are implemented across thousands of Road Side Units and Onboard Units in US, Europe and Asia

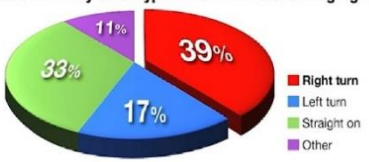
# V2X in Israel

- First 10MHz channel is allocated in the 5.9GHz band as a pilot for V2X
- Allocation of two more channels requested
- Several pilot projects are underway

# Real-Life Value of V2X: Toyota's Deployment in Japan (100K Vehicles)

## Effectiveness of ITS Connect

In Japan, approximately 40% of accidents at signalized intersections–more than any other type–involve drivers turning right




The number of accidents caused by cars at signalized intersections in Japan (2011)
Source : ITRADA Information No95

Video footage of near misses involving vehicles not equipped with "ITS Connect" making right turns

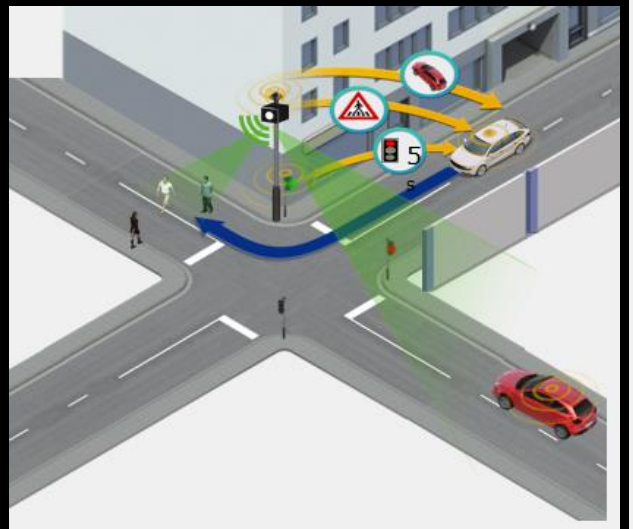

"ITS Connect" would reduce the risks of collisions when making a right turn by approximately 40%*

*Preliminary estimates under current testing conditions

Based on data collected in Tokyo and Aichi at nine different intersections from April 2016 to March 2017

Video footage of a safely executed right turn involving a vehicle equipped with "ITS Connect"


Genuine footage from a privately owned vehicle



- Main intersections in Tokyo equipped with Camera + V2X
- Camera detects pedestrians crossing / vehicles approaching
- Alerts of possible collision is sent to car equipped with V2X
- High value for every vehicle with V2X

**Actual Results: 40% reduction in right turn accidents**

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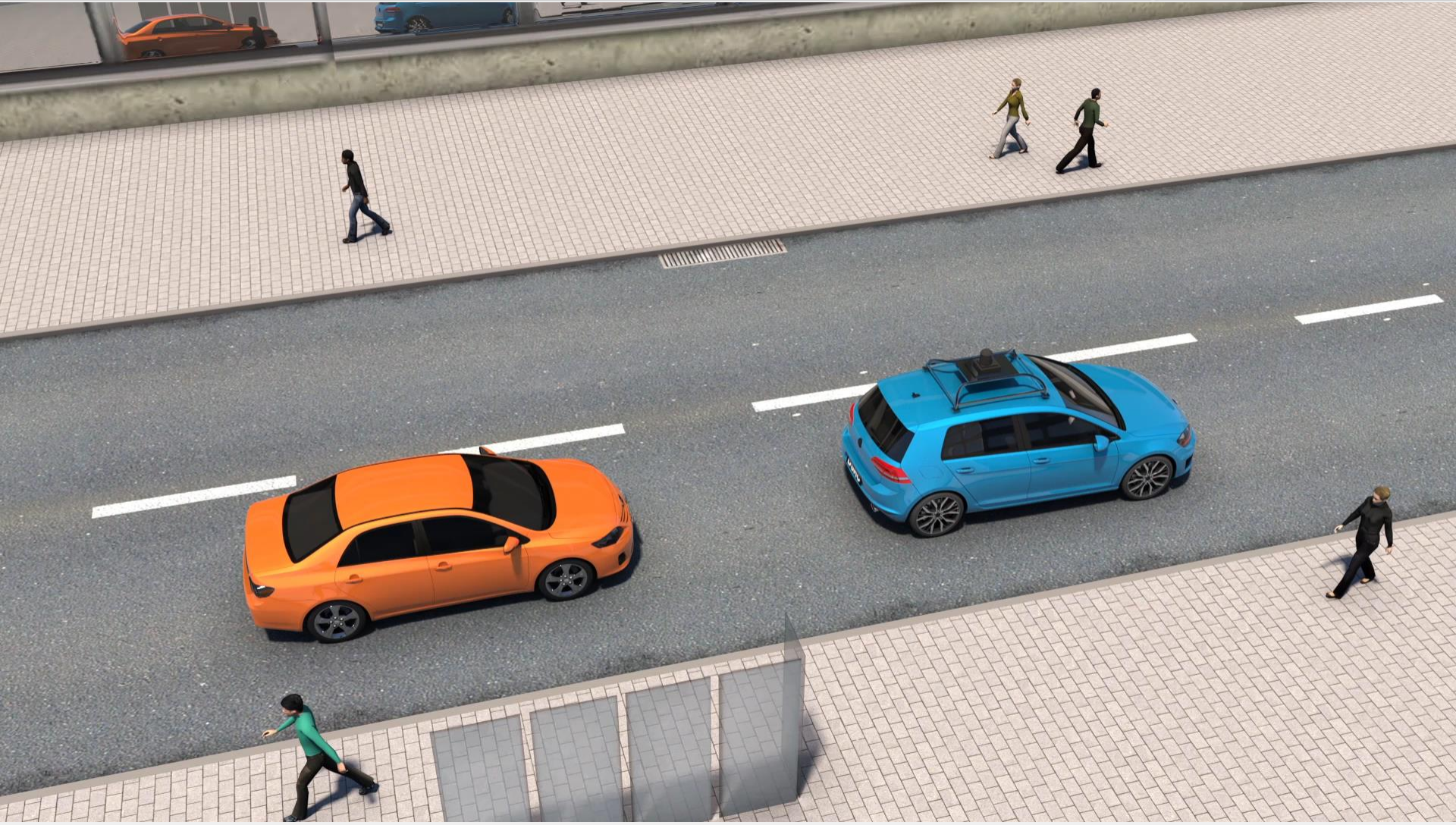
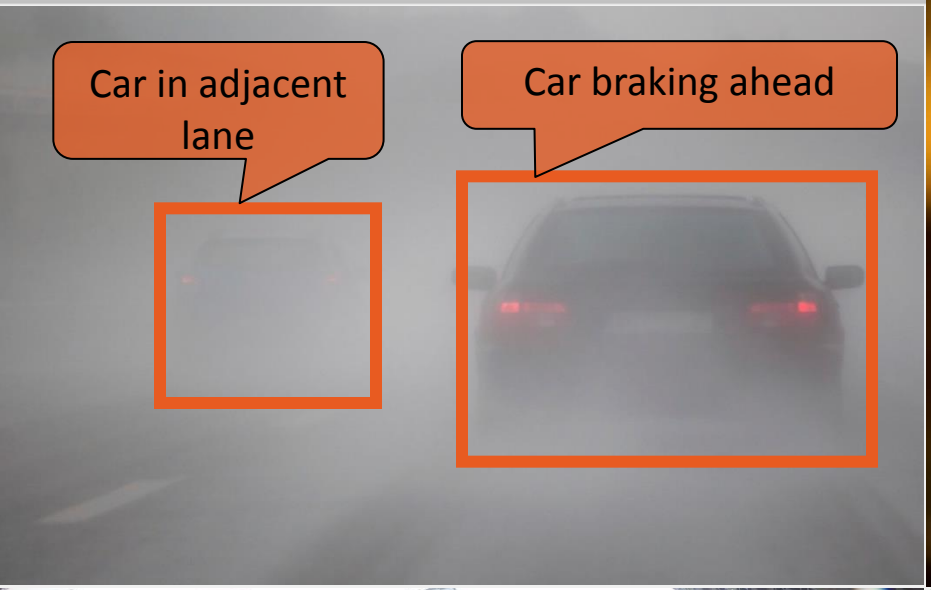
# V2X Sensor for Autonomous Vehicles

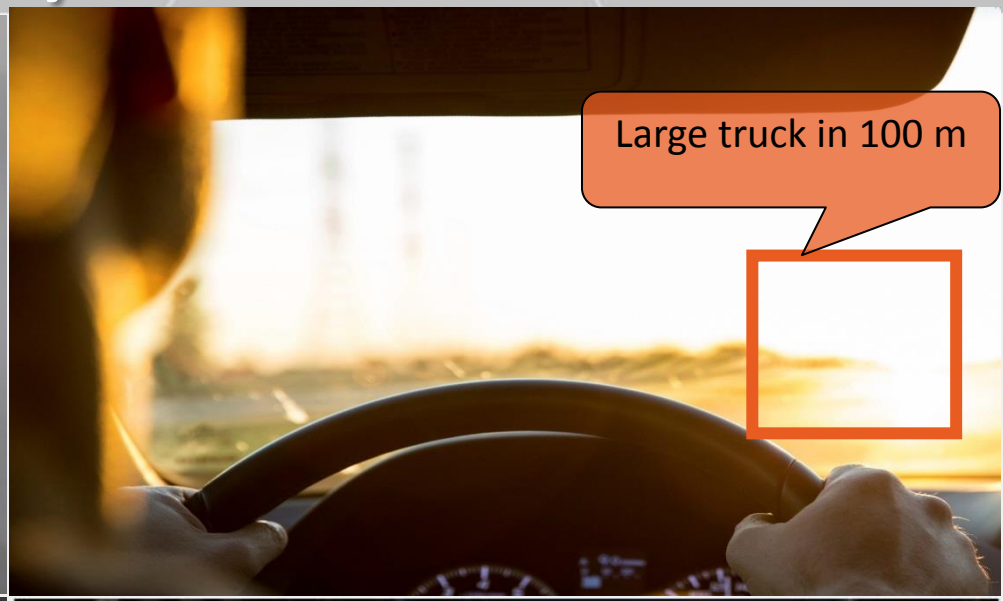
# Watch How Autonomous Vehicles can Share Our Roads



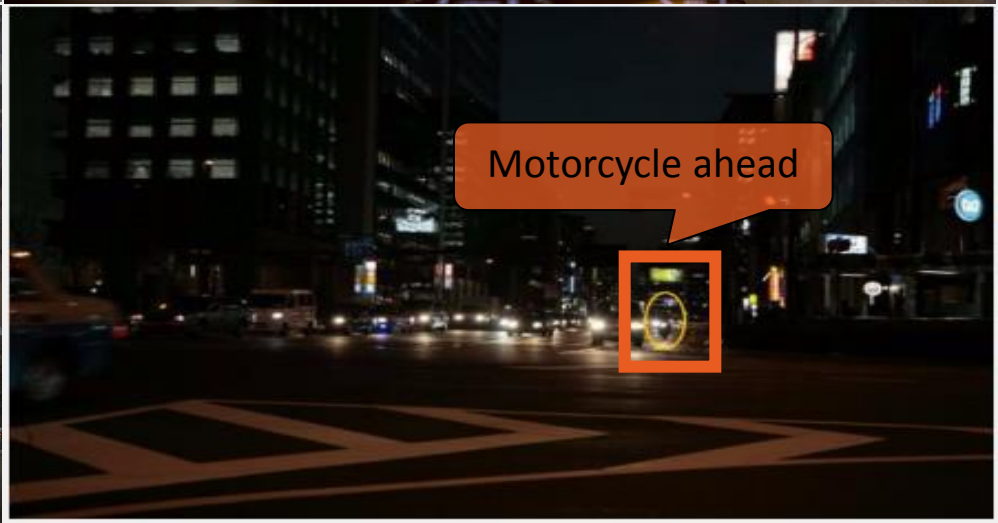
# Reliable Sensing in all Conditions

## Detected accurately with V2X



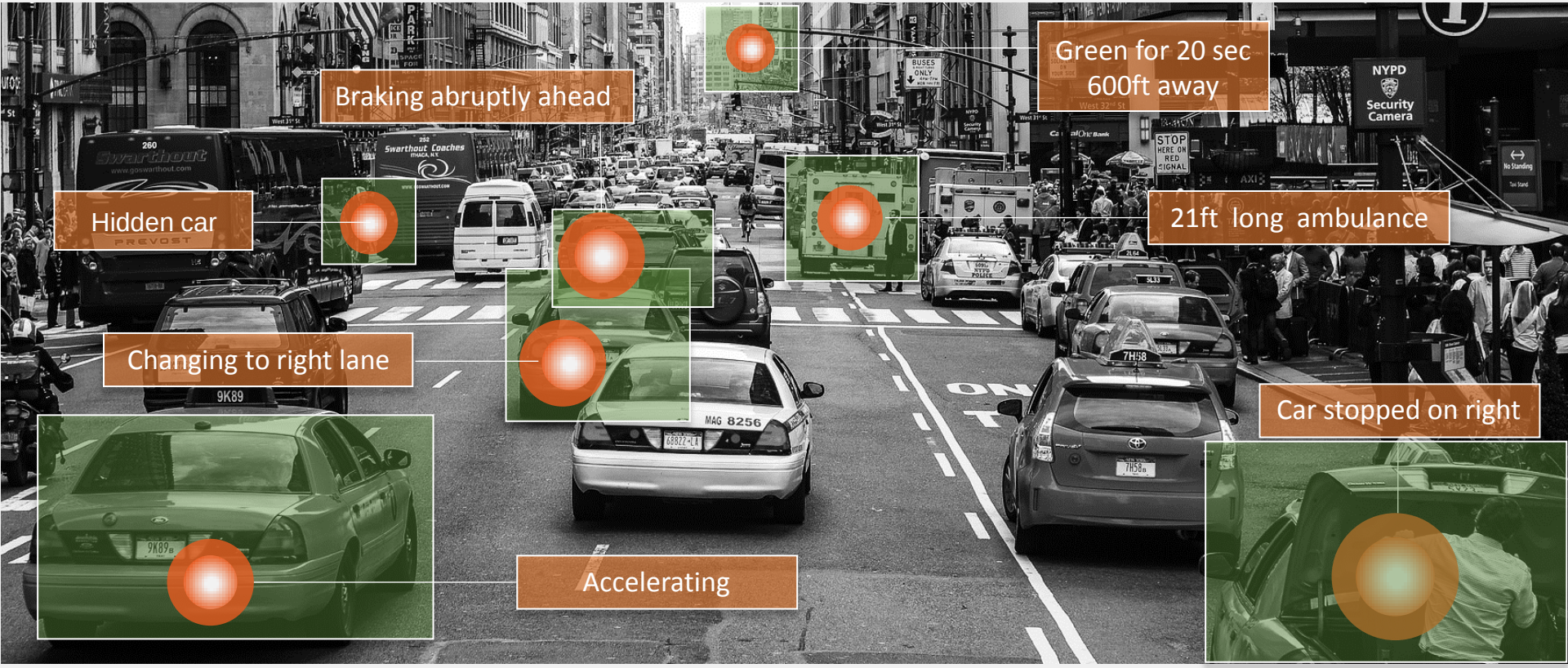





Where is a motorcycle? (source: Honda R&D)

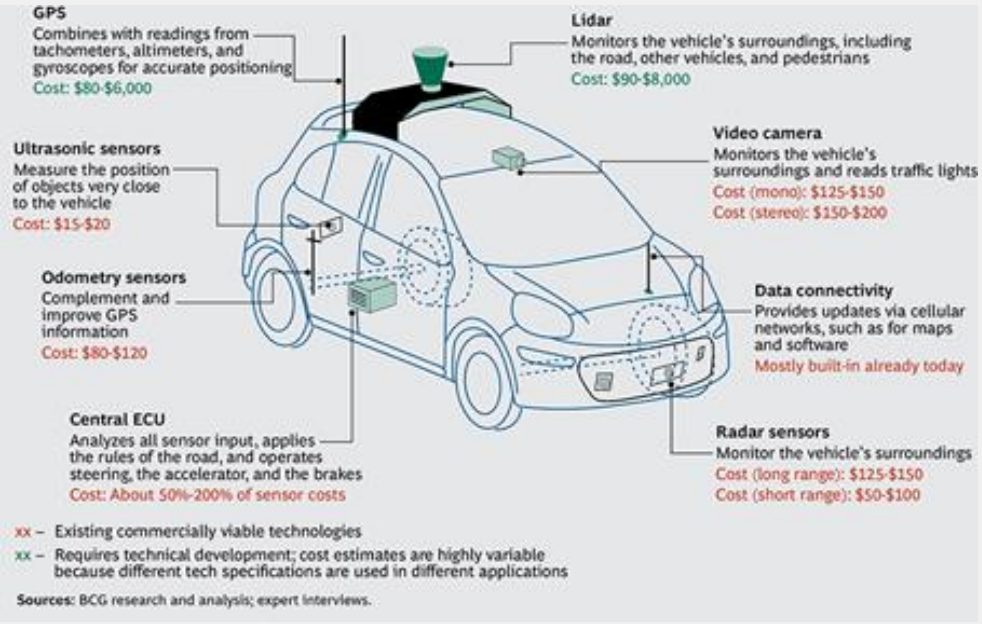
# V2X Enables Autonomous Driving

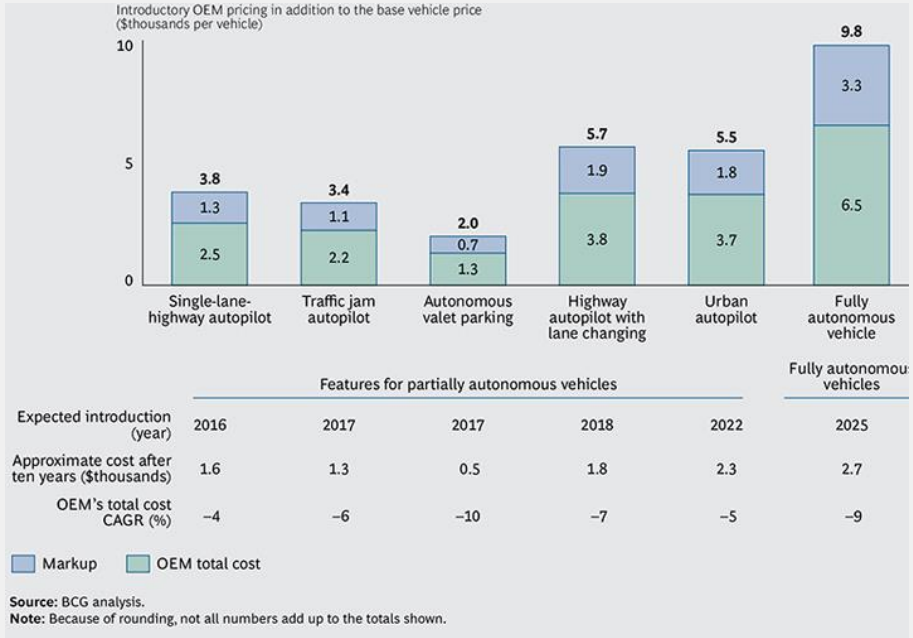
LOS Sensor
V2X Sensor



# The Most Cost-Effective Sensor

- ADAS/AV features are costly
  - >2K USD for Automated Level 3
  - Doubling/Tripling for each added Level
- V2X is a cost-efficient sensor
- V2X amplifies the value of all sensors across all connected vehicles
- Both premium and economy vehicles benefit



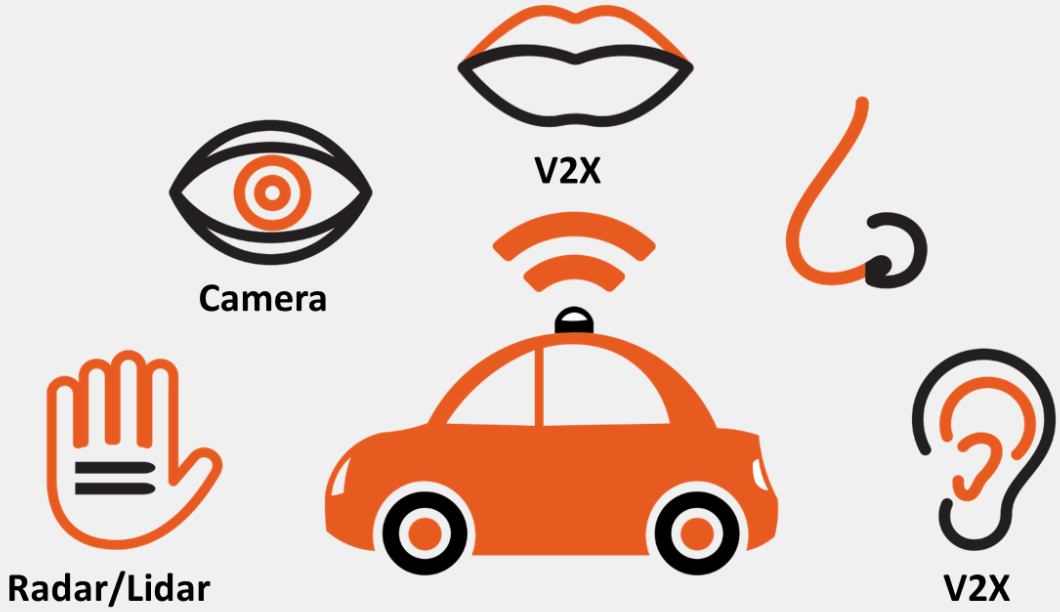




Source: Boston Consulting Group [analysis]

# V2X Powers Autonomy

V2X enables safe, predictable and affordable autonomous driving

- Coordination (road sharing, merging)
- Cooperation (efficiency, platooning)
- Complements other sensors
- Identifying Vulnerable Road Users
- Knowing ahead with infrastructure communication



# About Autotalks

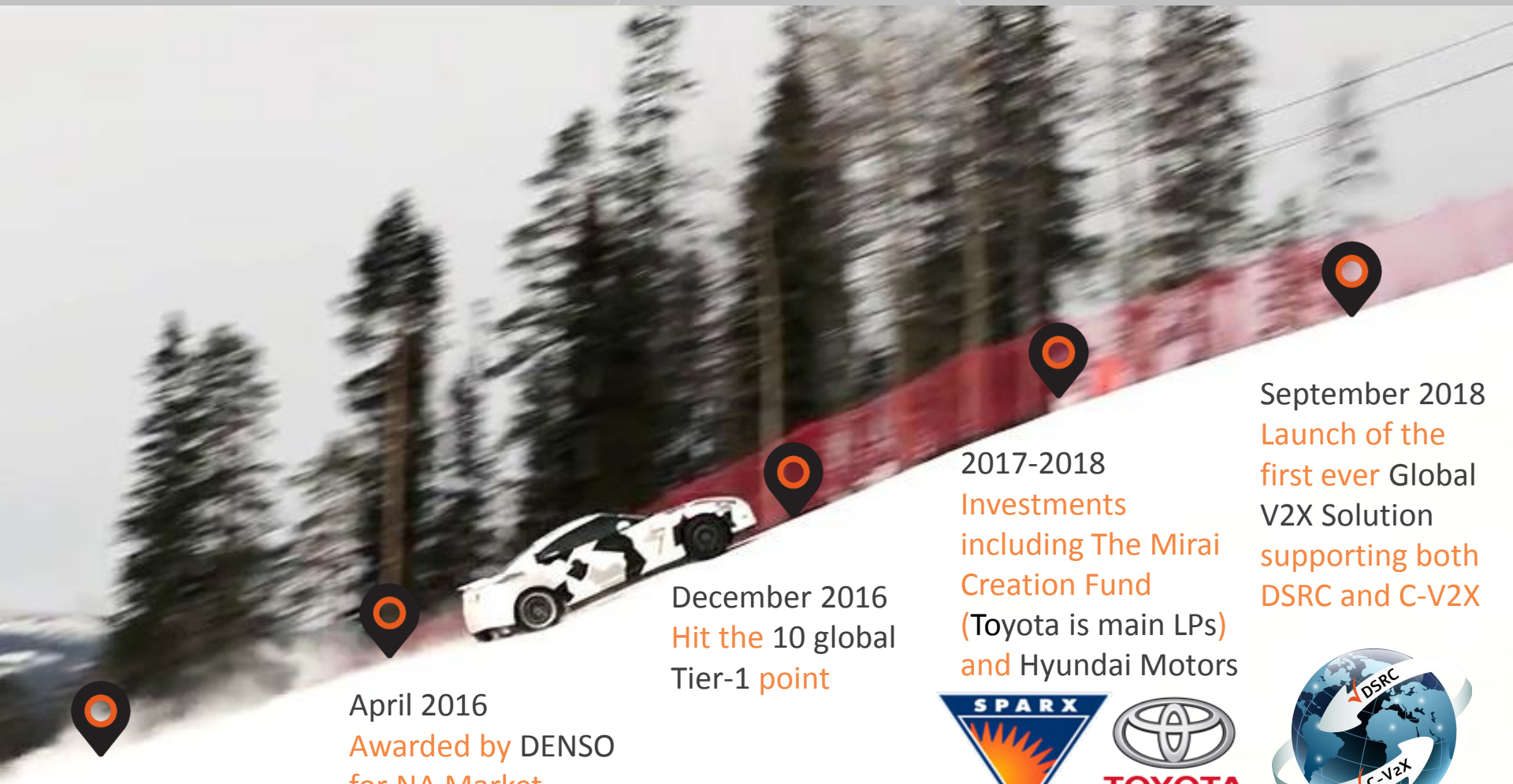
**World's leading V2X chipset provider**

**Israel based with worldwide offices**

**Committed and innovative team aiming to dramatically reduce road accidents**

**Offering global V2X communication solution for autonomous and manned vehicles**

# Autotalks' Milestones



2012
Pre-dev with OEMs. Participation in major trials

April 2016
Awarded by DENSO for NA Market

December 2016
Hit the 10 global Tier-1 point

2017-2018
Investments including The Mirai Creation Fund (Toyota is main LPs) and Hyundai Motors

September 2018
Launch of the first ever Global V2X Solution supporting both DSRC and C-V2X

# Mature Global V2X Solution

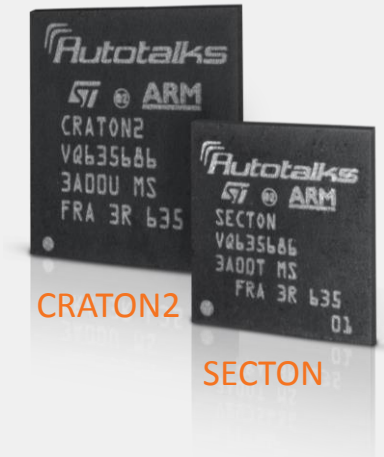
Autotalks 2nd generation chipset is the most mature, truly secure and top performing V2X chipset in the market

Chipset has been chosen for large production programs

Deployed in over 10 Tier1 V2X platforms and promoted for OEMs RFQs, demos and field trials

PRODUCTION READY **NOW!**


**The only dual-mode V2X communication processor**

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The Confidence of **Knowing Ahead**

# Thank you!

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