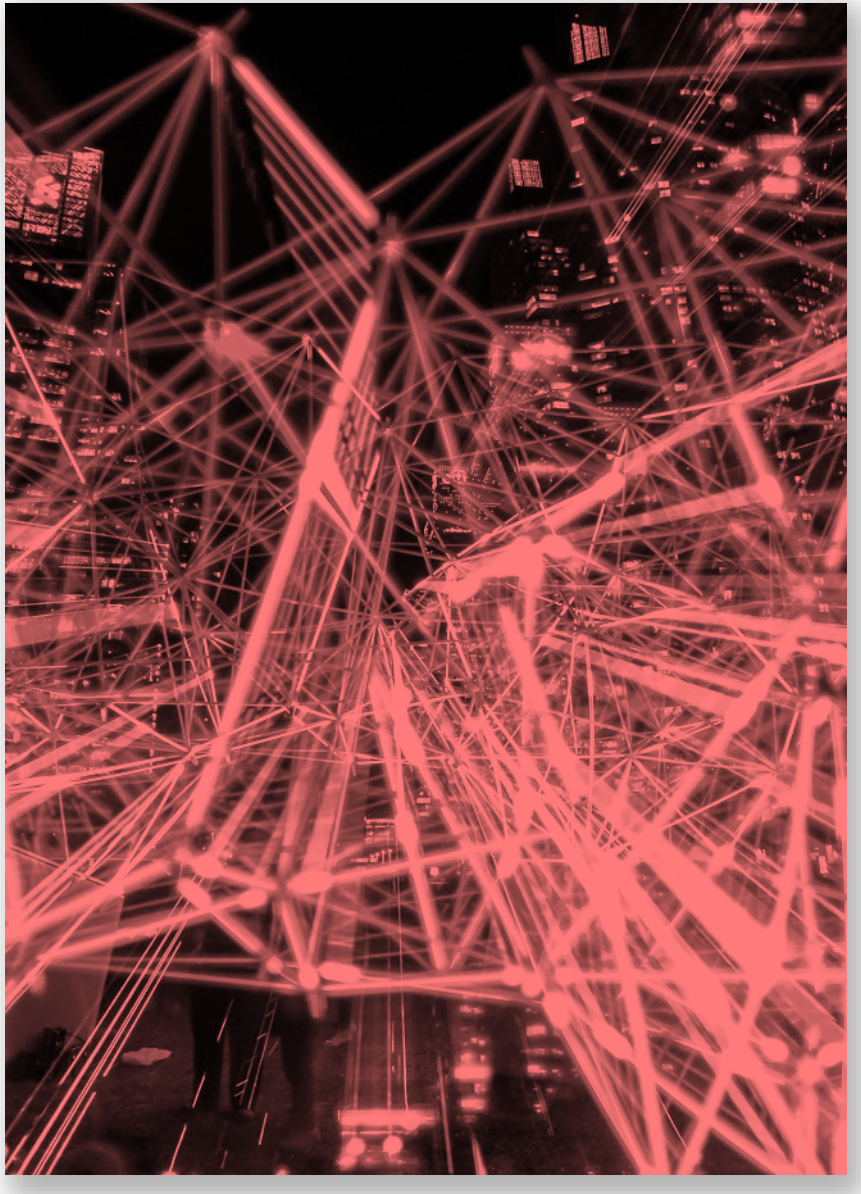
ITEA Smart City Day session III

Smart mobility

CIO Chief Information Innovation Office

Smart City Dortmund

Mobility Challenges

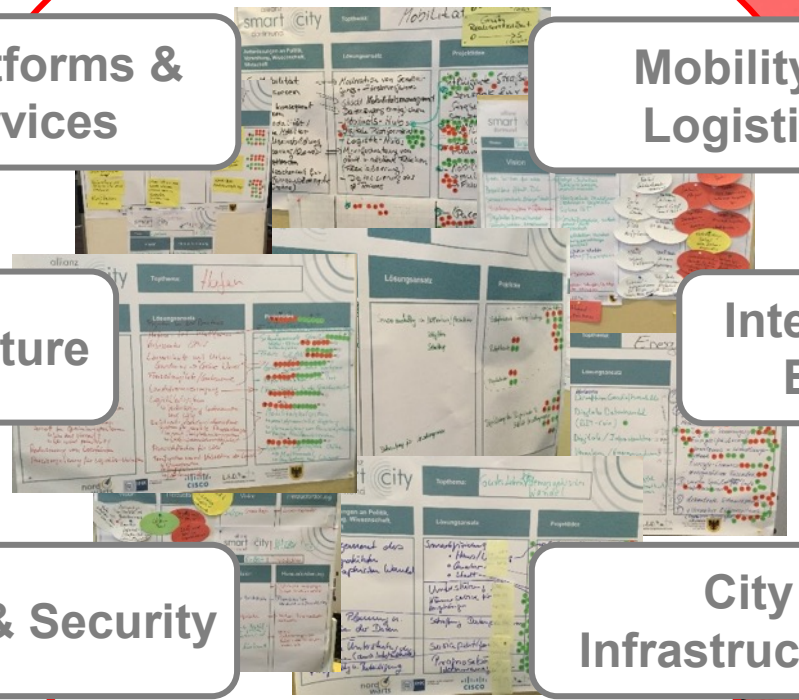


DOGITAL.
Dortmund digitalisiert.

Smart City Dortmund

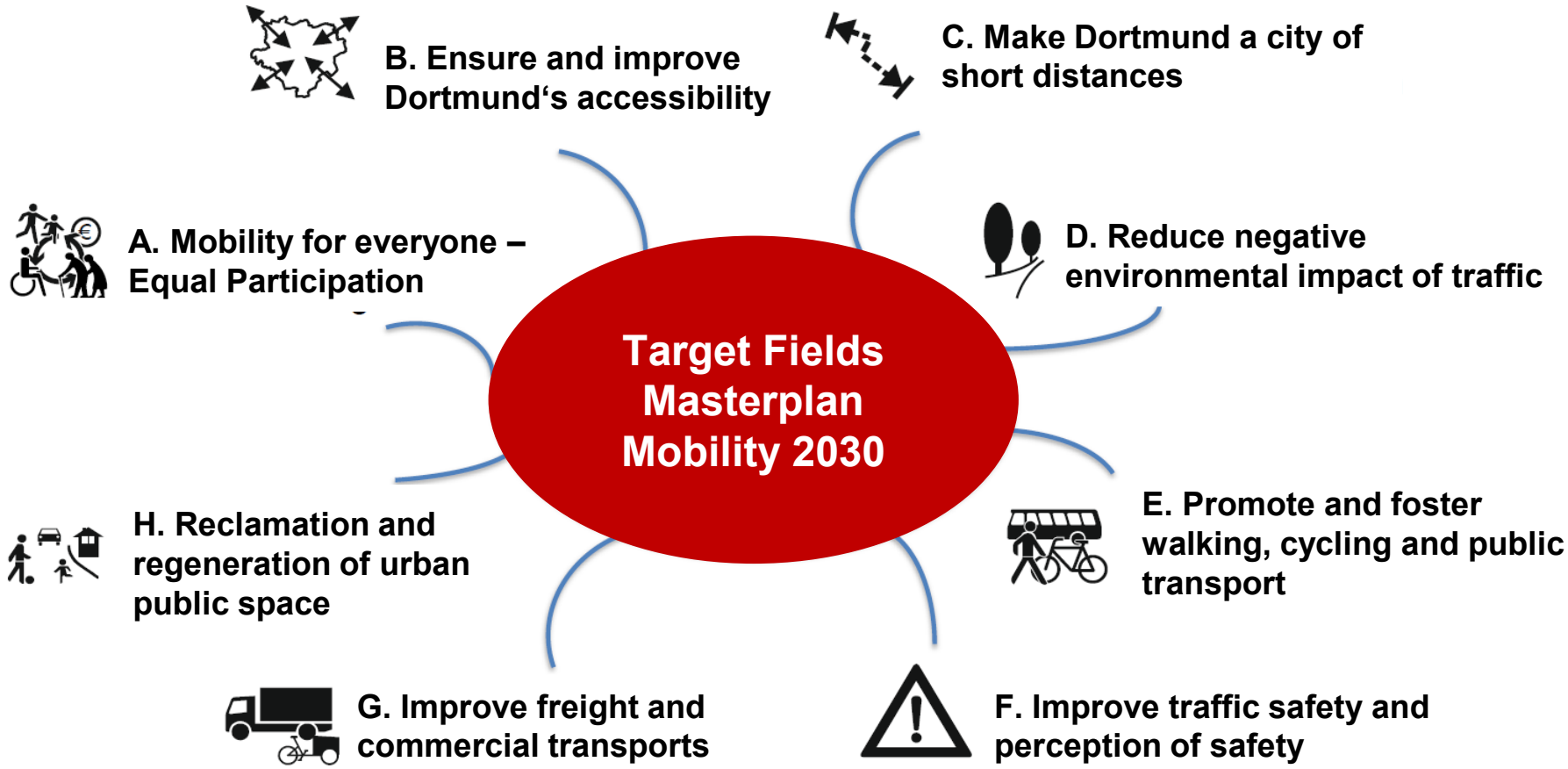
Topics

- Energy & Climate
- IT Platforms & Services
- Mobility & Logistics
- Sports & Culture
- Intercommunal Exchange
- International Cooperation (NEW)
- Safety & Security
- City Infrastructures
- Demographic Change & Living



Smart City Dortmund

Mobility



Smart City Dortmund

Mobility

Smart City Dortmund

Concrete Mobility Challenges

Connecting Transport Modes

- Development of local and regional rail transport
- Improving the quality of rail transport
- New on-demand services

Digitalisation of Transport

- Dynamic traffic guidance system on the motorways around Dortmund
- Gatekeeper traffic lights in combination with measures for fluent traffic
- Park&Bike and Park&Ride Apps on entry roads
- E-Car Sharing and digital mobility platforms
- Digital mobility platform for bike traffic
- Digital parking management

Electrification

- Driving forward electrification of taxis
- Expansion of city-wide charging infrastructure
- Covering municipal driving needs by electric cars and bikes
- Expansion and replacement of the existing bus fleet by electric buses

Urban Logistics

- Establishment of E-Logistics-Hub
- Environmental-sensitive truck routing on highly congested roads
- Privileged status for environmentally friendly vehicles

Bike Traffic

- Development of priority routes for bicycles, cycle paths, protection strips
- Development of a city-wide cargobike rental

Parking & Inactive Traffic

- Expansion and implementation of city-wide parking space management
- Expansion of bicycle parking opportunities

Mobility Management

- Mobility management across actors and institutions
- Reduced public transport rates
- Free annual tickets for public transport when you return your driving licence in your old age

Information & Communication

- Umbrella brand and communication strategy „Dortmund mobil“

Many Thanks for Your Attention!

Dr. Jan Fritz Rettberg

Tel.: +49 231 50-2 92 46

Mobil: +49 172 4 75 81 05

Mail: jrettberg@stadtdo.de

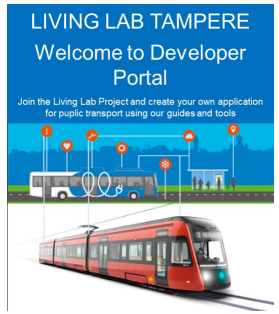
@cio_dortmund

SmartRail Ecosystem & Urban Rail Mobility Living Lab

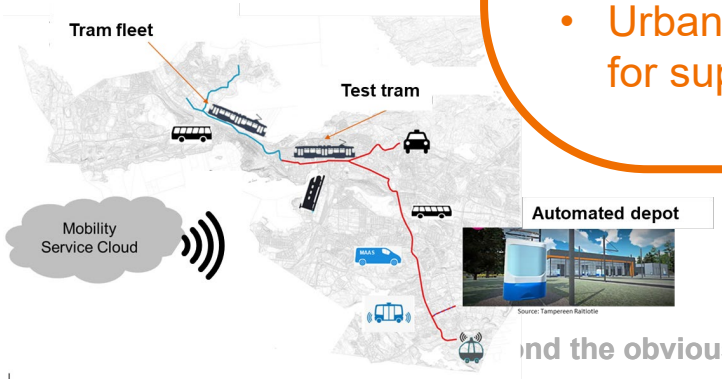
Unique & internationally attractive
Tampere Urban Rail Mobility Living Lab (TURMS) featuring:

- The whole city transport system forming one big Living Lab arrangement
- Special tram for experimentation of product and service innovations including autonomous tram & depot
- World's first test environment for pilot series first/last mile autonomous feeder busses
- Testbed for smart parking
- City traffic monitoring and management system and test environment
- 5G connectivity through smart lighting pole system
- Autonomous drone swarm for traffic management and urban air mobility
- City data platform and predictive situational awareness system
- Urban mobility research data platform and Living Lab tools and services for supporting RDI activities

Research Data Platform & Living Lab support



Tram based urban mobility + feeder traffic



Automated feeder traffic in city area

5G + Smart lighting poles

Speeding up co-learning within urban mobility testbed network

Tram Testbed

Open Standard Application Platform

for Cars and Transportation Vehicles.

APPSTACLE

ITEA Smart City Day 2021
16 March 2021 – Online
Teemu Karvonen, University of Oulu

ITEA 3 EUREKA

APPSTACLE Project goals

- Establishing an Open Source project for external applications and software developers and to start to use open source code for connected vehicles and smart mobility

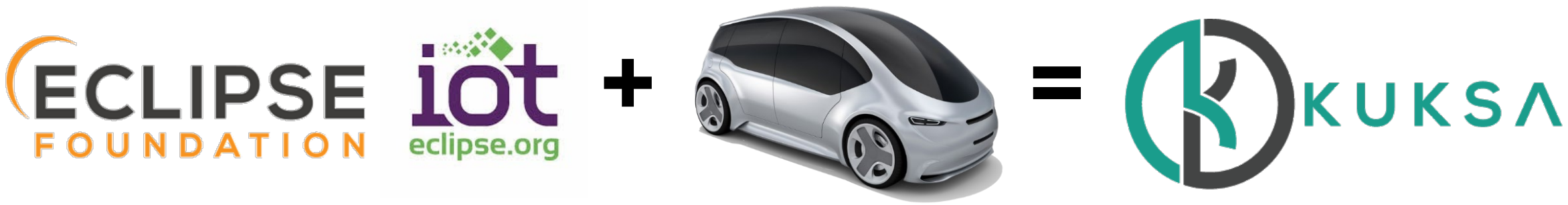
- Developing an open and secure car-to-cloud-to-car platform that interconnects transportation vehicles via internet connection and utilizing 5G opportunities

- Enabling development of secure onboard and connected car services and applications

Eclipse Kuksa

Providing a solid foundation

Providing a solid technical foundation routed in Open Standards and proven software will benefit everybody



Mission

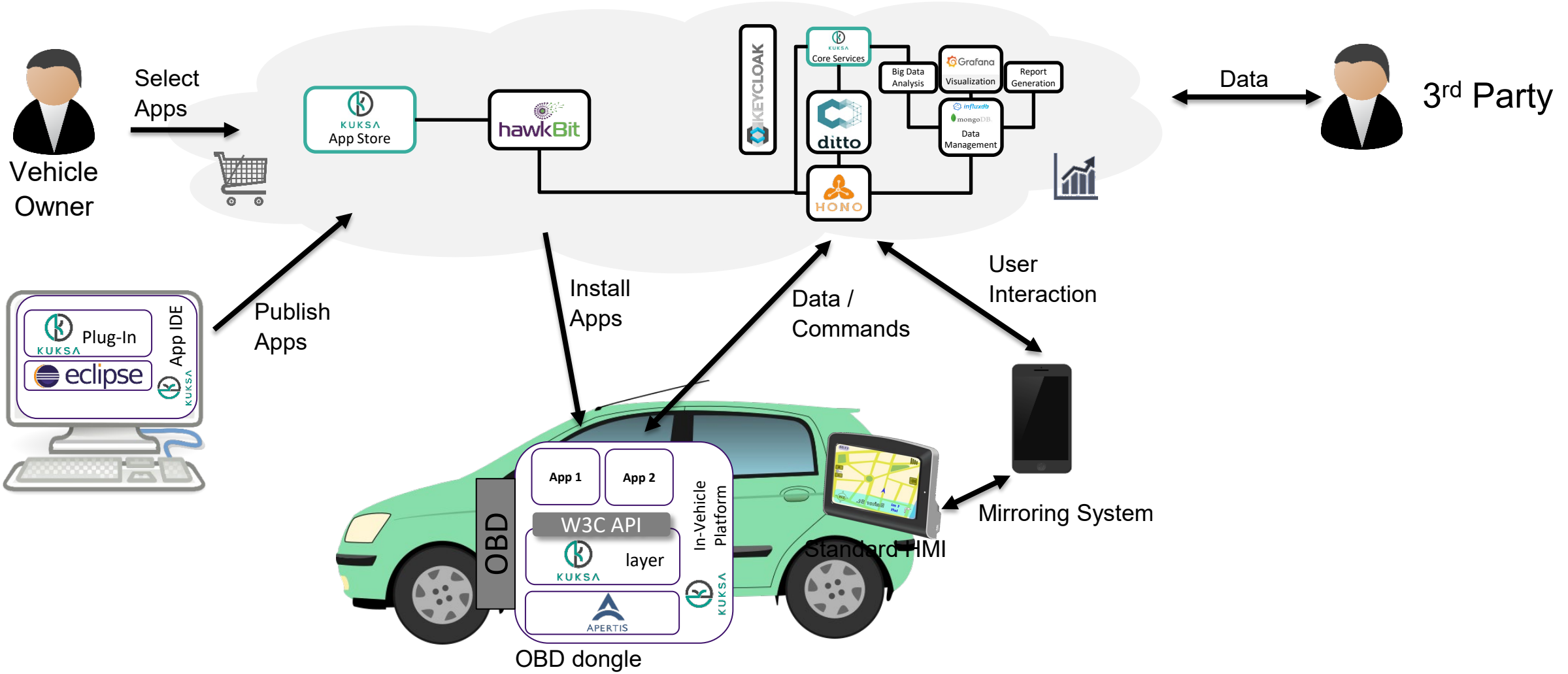
Create a ***cross-vendor*** connected vehicle platform that relies on ***open standards*** and uses ***open source software*** to leverage the potential of a ***large developer community***!

What is Eclipse…

…and how do I use it?

Eclipse Kuksa

Use case example

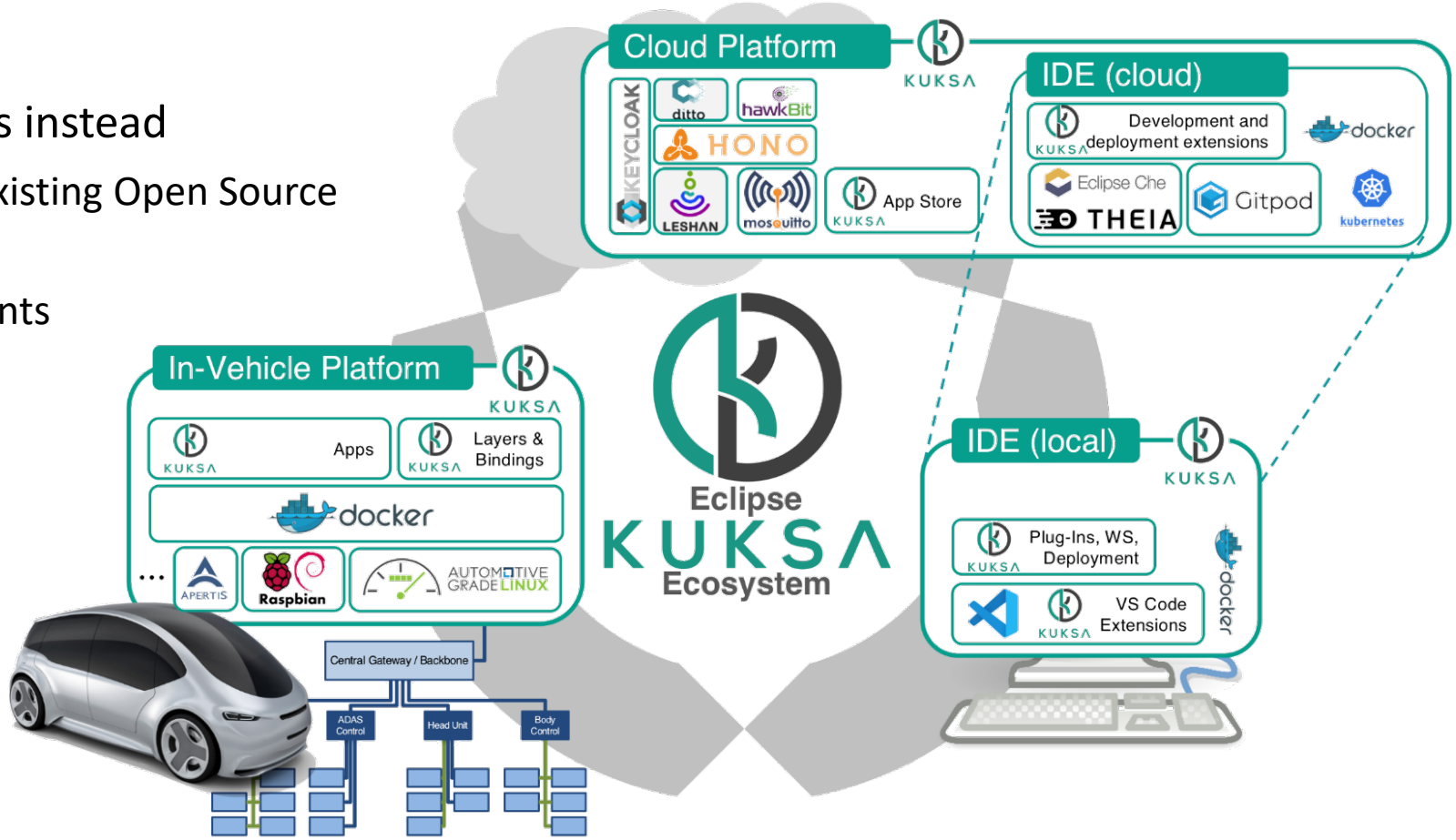


Eclipse Kuksa

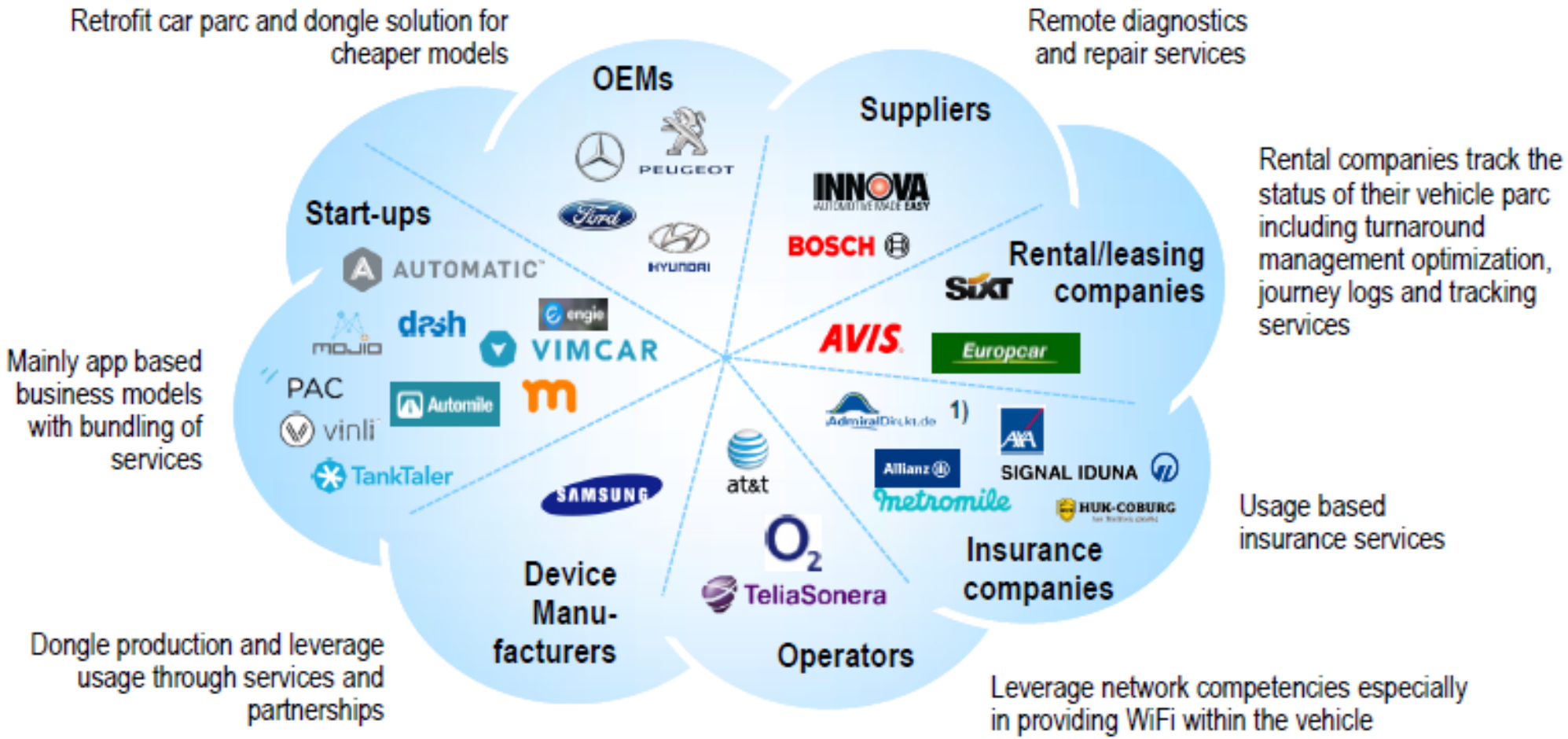
The Kuksa Ecosystem

- Eclipse Kuksa is not trying to reinvent the wheel

- use and foster Open Source solutions instead
  - create a harmonized composition of existing Open Source projects
  - enriched with specific Kuksa components

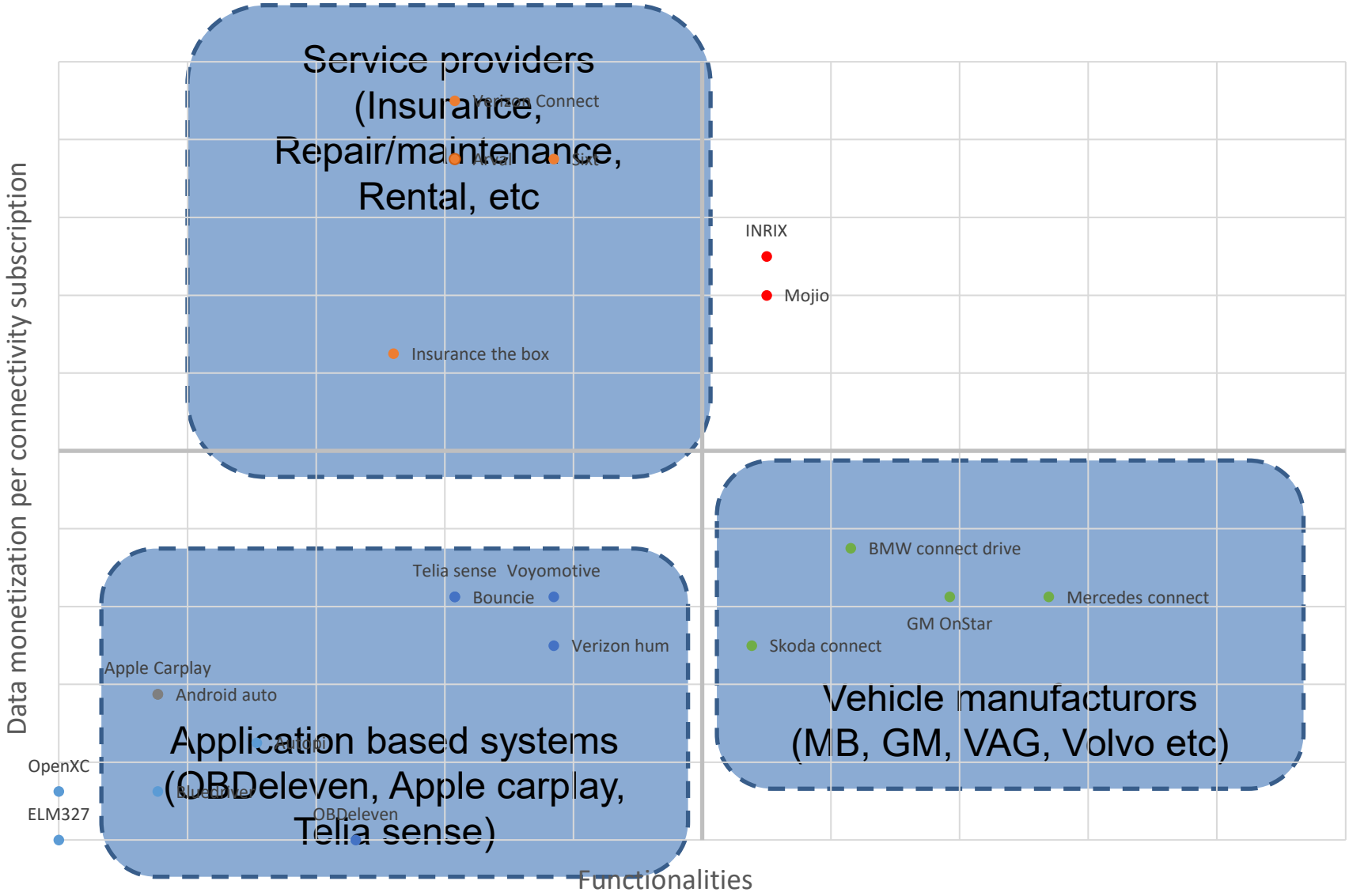


KUKSA targeted segments



Picture from Connected car, study Sep 201 Roland Berger

Telematics per service focus



- OBD 2 solutions
- Media & entertainment
- PaaS solutions
- OEM solutions
- Fleets & UBI

Kuksa

Where to go from here?

- Eclipse Kuksa Open Source project
  - Contribute with own ideas and development
  - Use and try the software
  - Be part of the development community

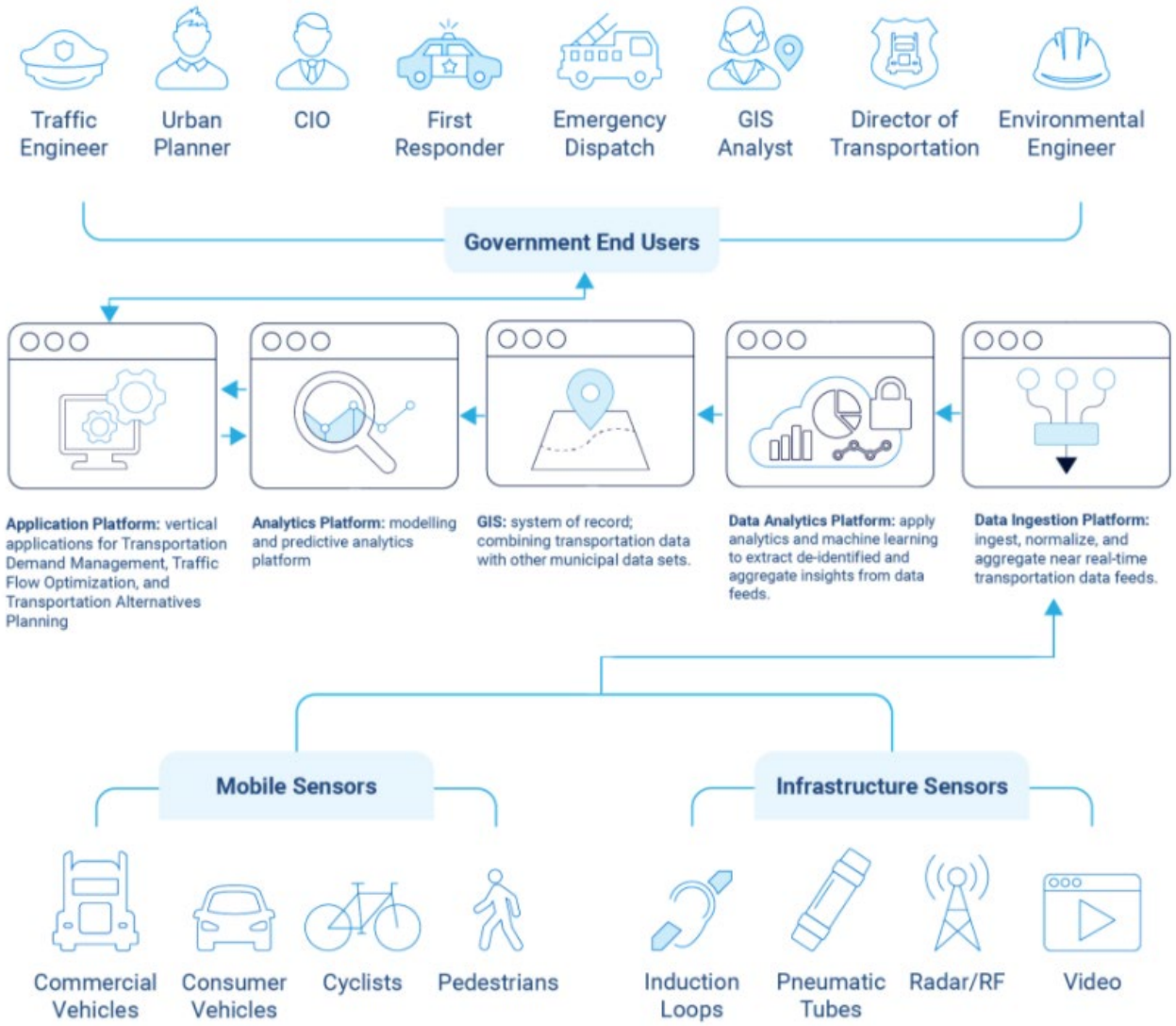
https://www.eclipse.org/kuksa/

https://github.com/eclipse?q=kuksa

Thank you


SMART
Spatial Modelling Analytics & Real-time Tracking
ITEA 3

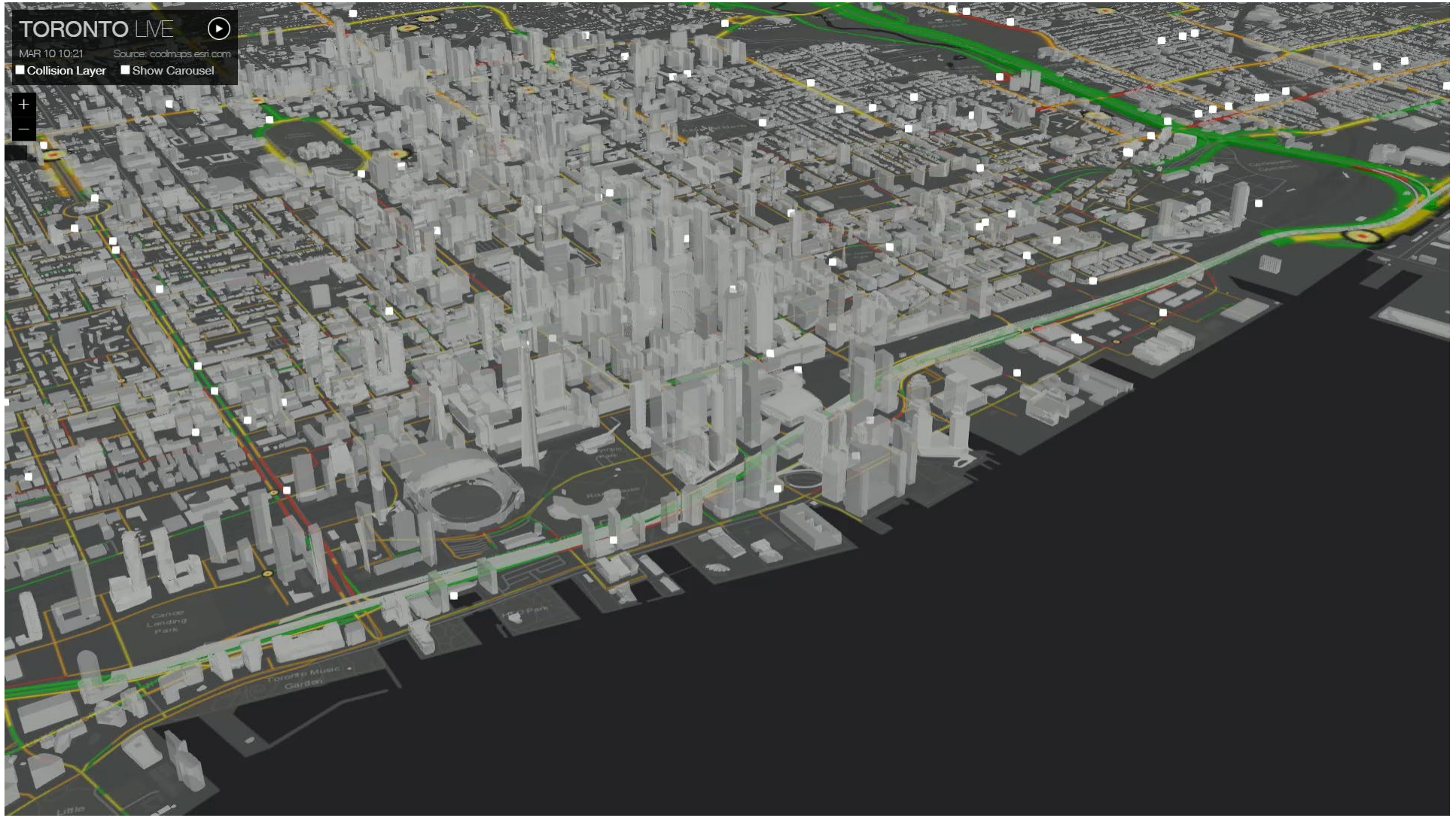
Smart City Platform



Challenges in mobility

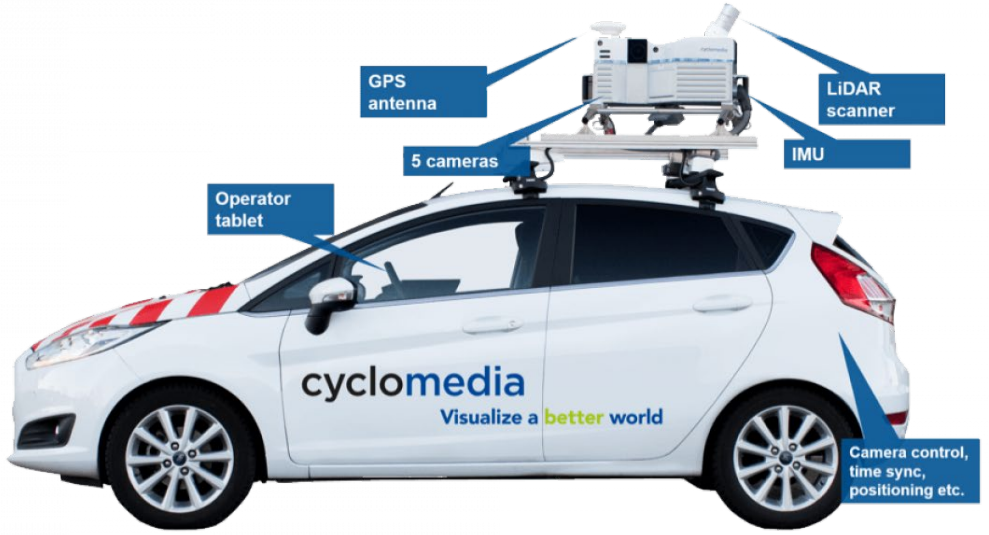
Challenges in mobility

Smart City Platform dashboard



Automatic Acquisition of infra

- Texturing of 3D models
- Road section topology
- And much more ….
  - Traffic Signs,
  - Billboards,
  - Road markings,
  - Road surface cracks,
  - (Road) surface type,
  - Utility poles,
  - Manholes,
  - Public lighting,
  - Building images,
  - Pedestrian ramps, roof measurements,



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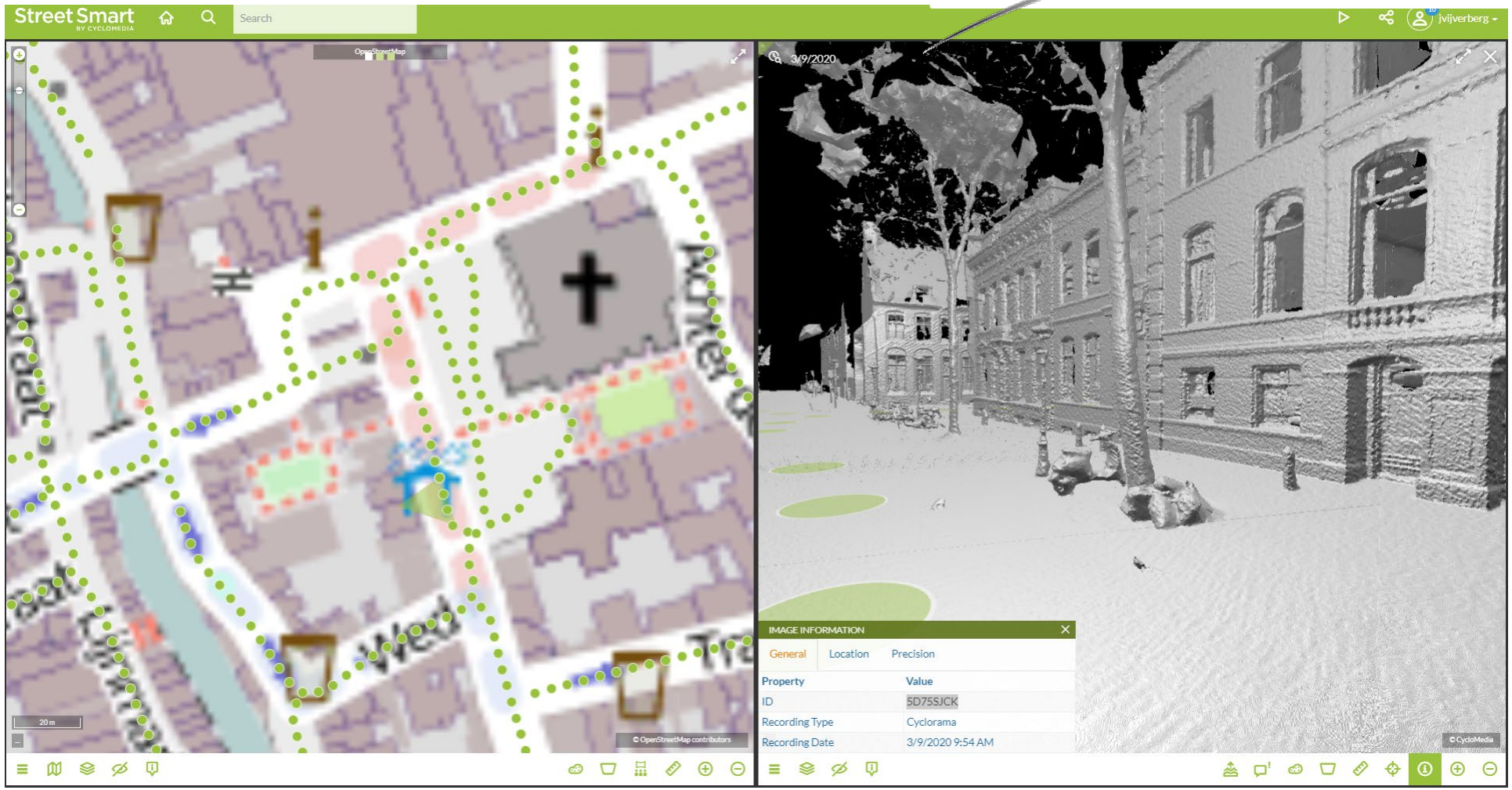
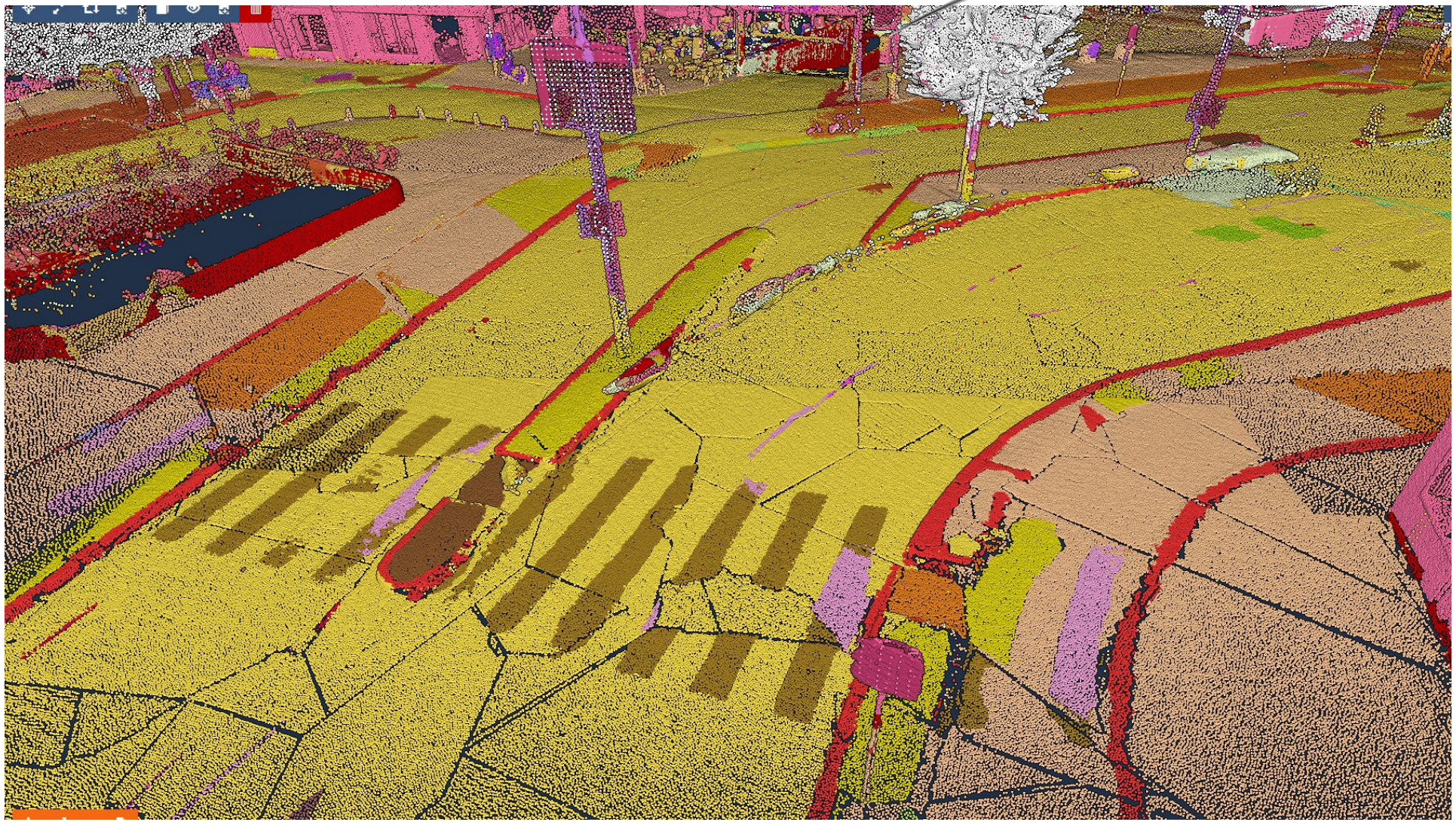


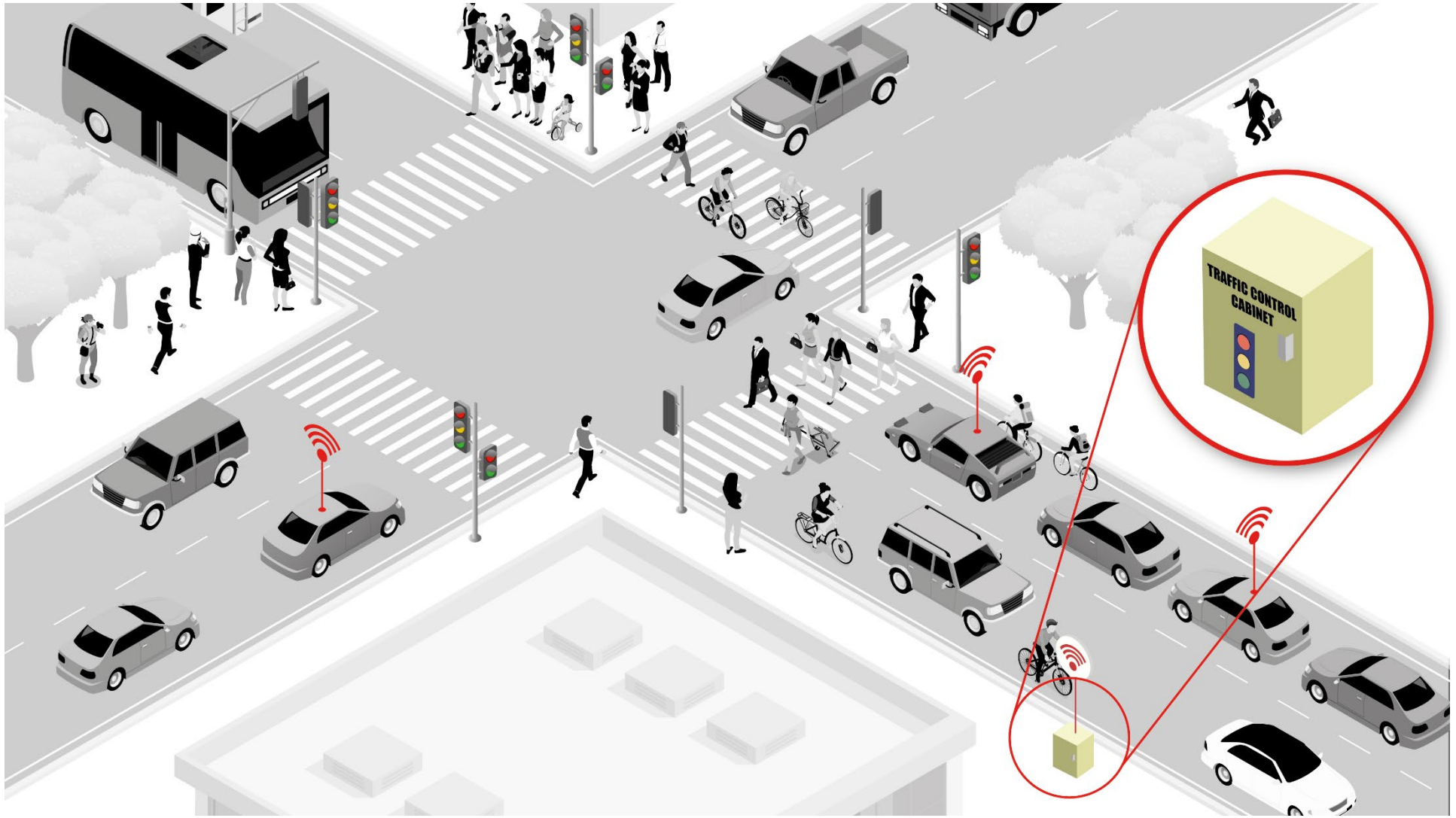
Automatic Acquisition of infra



Floating car data

- Many use cases
  - tracking, congestion map, road wear map

Traditional traffic control



SMART traffic control

SWECO

AI-based observation

INTERNATIONAL ROAD DYNAMICS CORP.

ViNotion
Making surveillance smart

- Embedded AI firmware on industrial quality level
  - Data collection of all traffic participants in real-time
  - Object tracking, classification, speed, directions, etc

Anomaly detection

- Accidents with vehicles, pedestrians or bicyclists
- Vehicles in reverse direction
- Stopped vehicle
- Speeding or under speeding
- Moving cargo track tilted on a side due to e.g. flat tires
- Throwing medium/large objects from moving vehicle
- Deadlock in the middle of the intersection
- Pedestrians/bicyclists crossing the lanes during heavy traffic
- A pedestrian/bicyclist stuck or fallen on a zebra crossing

SMART Conclusions

- A Smart City Platform
  - On a large city scale and beyond
  - Static data of infrastructure : 3D digital twin
  - Combined with dynamic GIS-based sensor data
  - Advanced AI-based sensing for high semantic information
- Enabling many application for many stakeholders
- Scalable through partners with existing market access