Project Status - NPAD and PRoPART

29 November 2018

James Tidd

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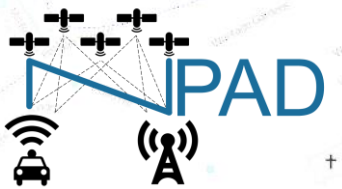
The Projects' Objectives

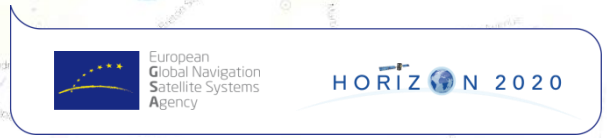


- **Network-RTK Positioning for Autonomous Driving**
  - Develop and Demonstrate a scalable GNSS correction service over cellular communications for Autonomous Driving.

PRoPART
Precise and Robust Positioning for Automated Road Transports

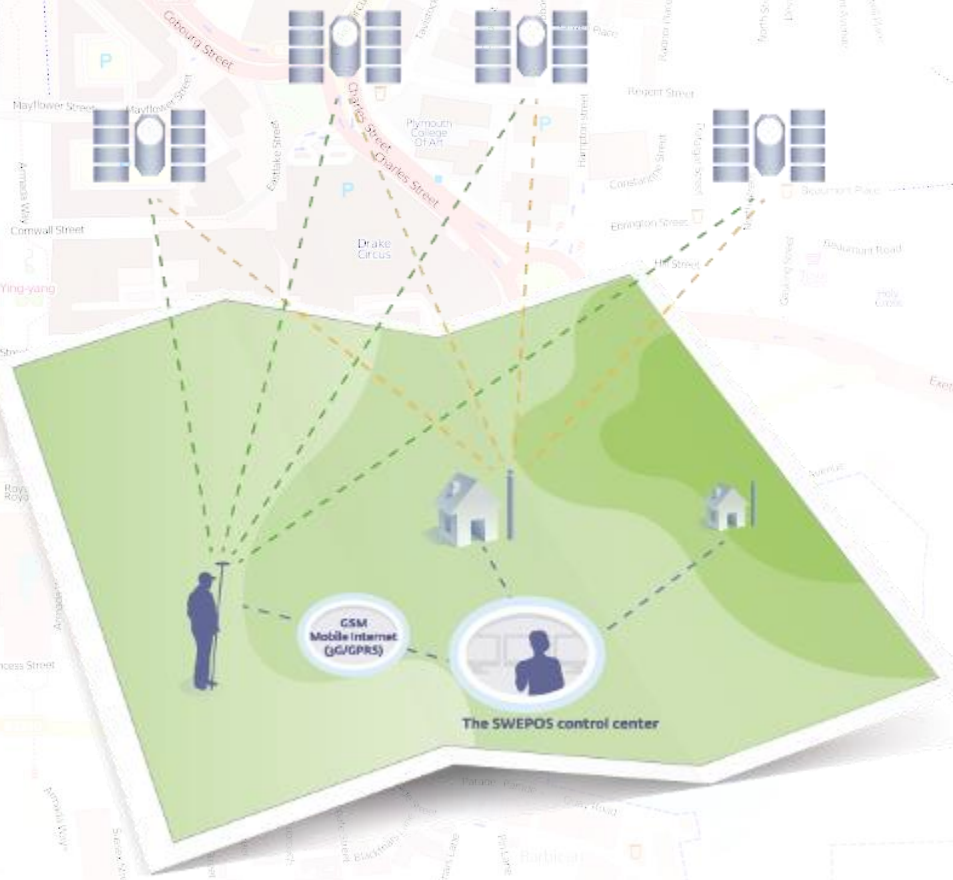
- **Precise and Robust Positioning for Autonomous Road Transport**
  - Develop and Demonstrate a high accuracy, robust GNSS positioning solution for Autonomous Driving.

The Partners

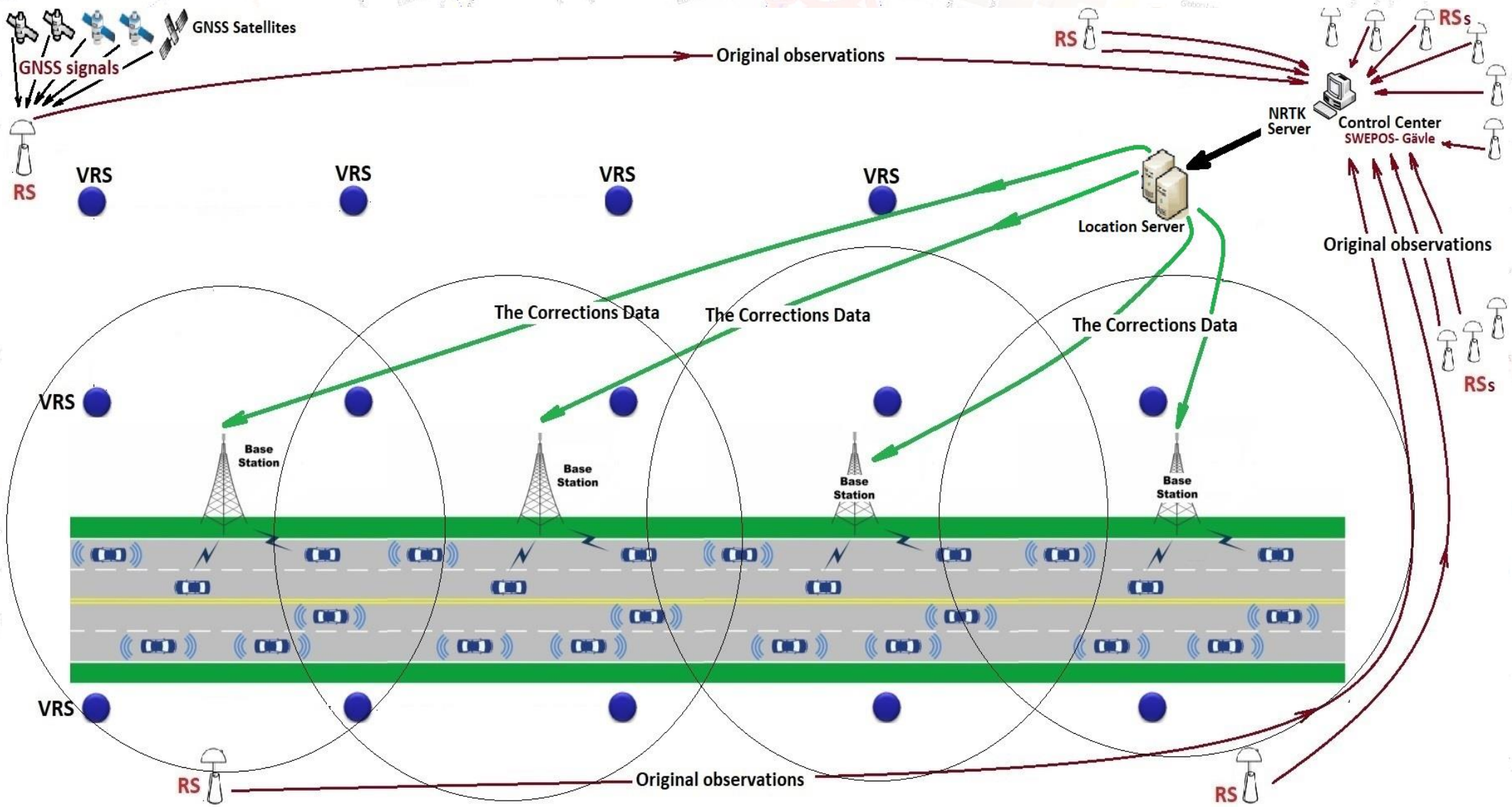


NPAD Overview

- Using Lantmäteriets existing GNSS reference Network…
- Distribute Network-RTK corrections over Cellular communication…
- To enable Autonomous Driving



NPAD Overview



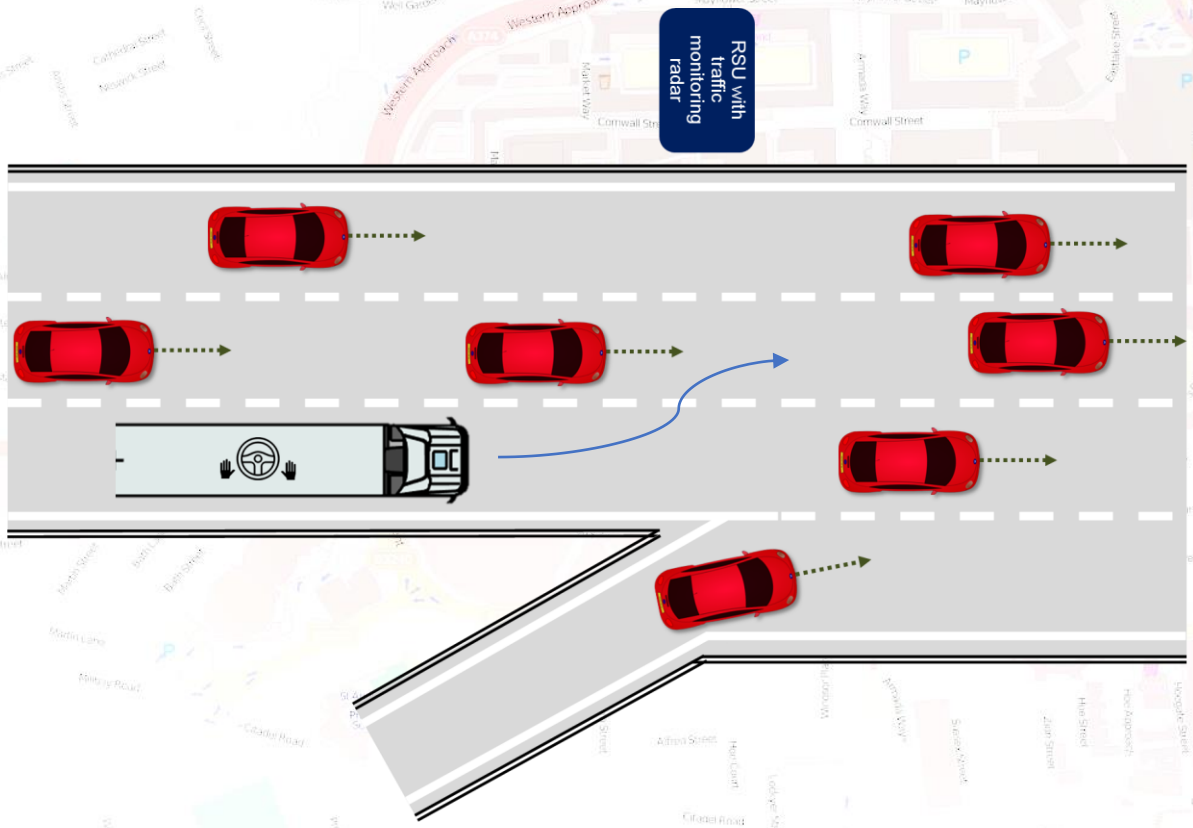
NPAD Status

- Requirements and Scenarios defined
- System Architecture in development
- Executed simple automated case with Einride and existing RTK solution
- Ericsson location server running in Sweden

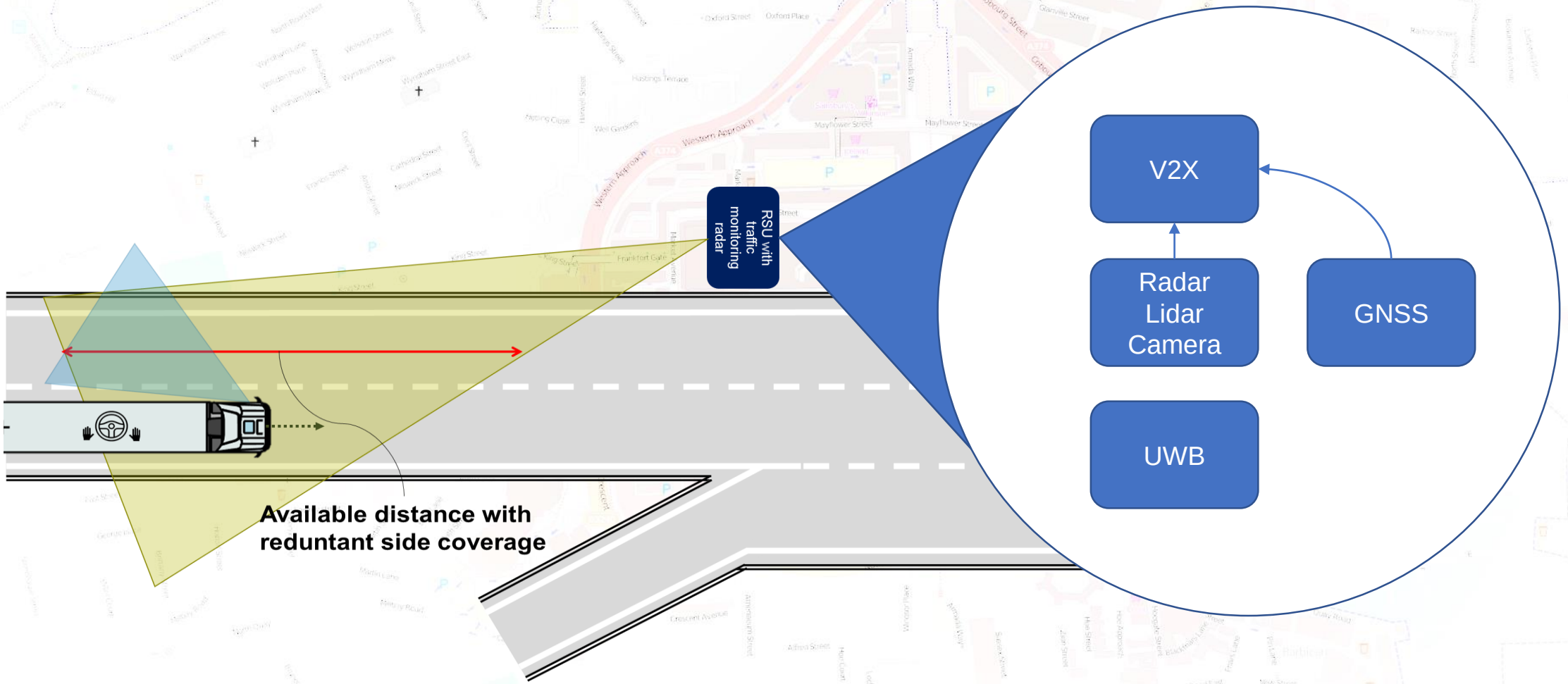
NPAD - Key Questions

- Scalable network architecture
- Navigation performance requirements
- Network correction data integrity
- Network correction data accuracy

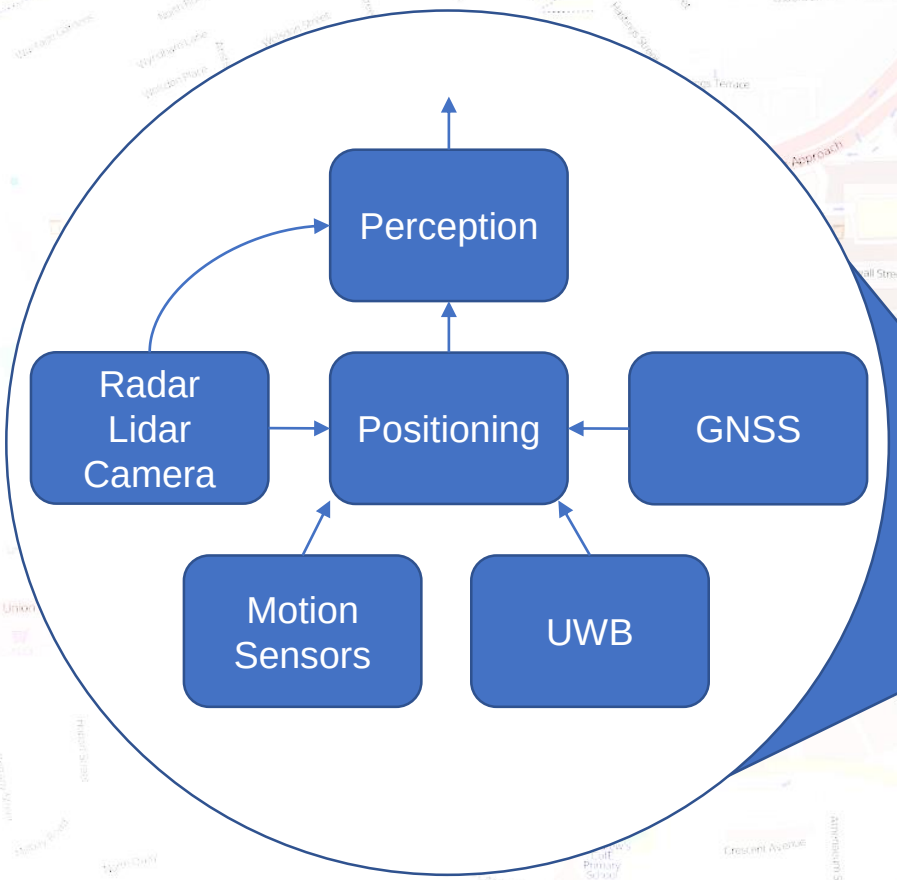
PRoPART Overview



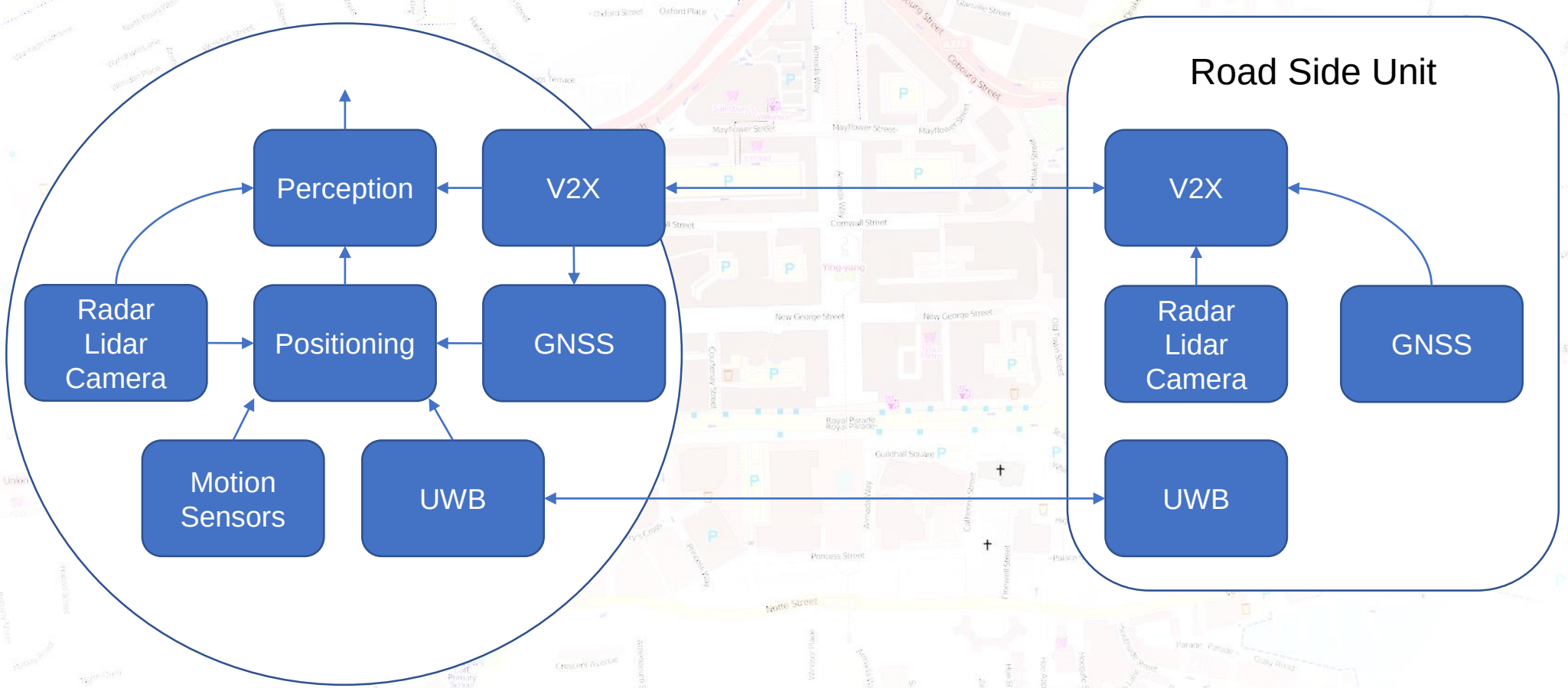
Road Side Unit



In Vehicle


Perception
Radar
Lidar
Camera
Positioning
GNSS
Motion
Sensors
UWB

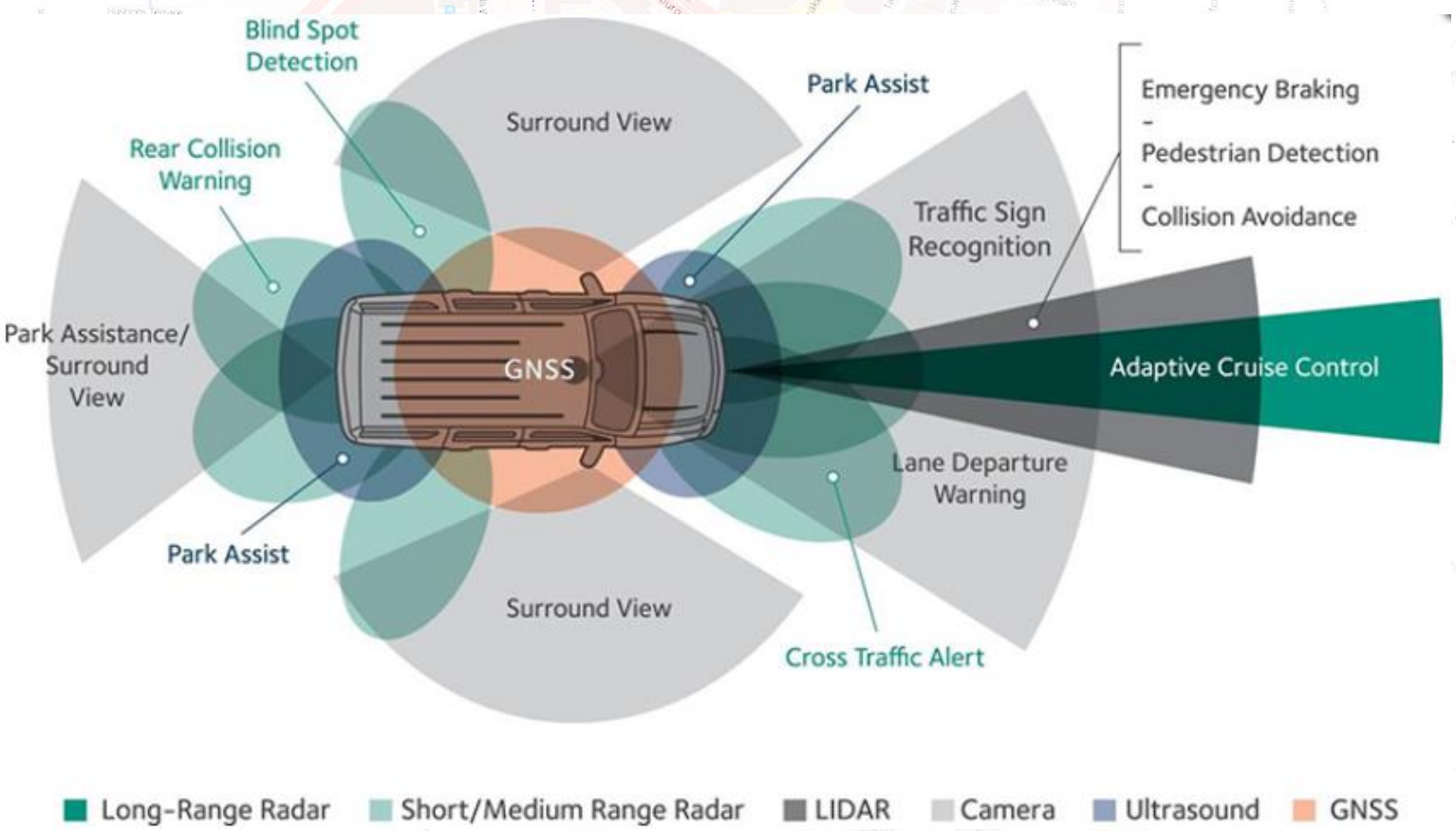
System



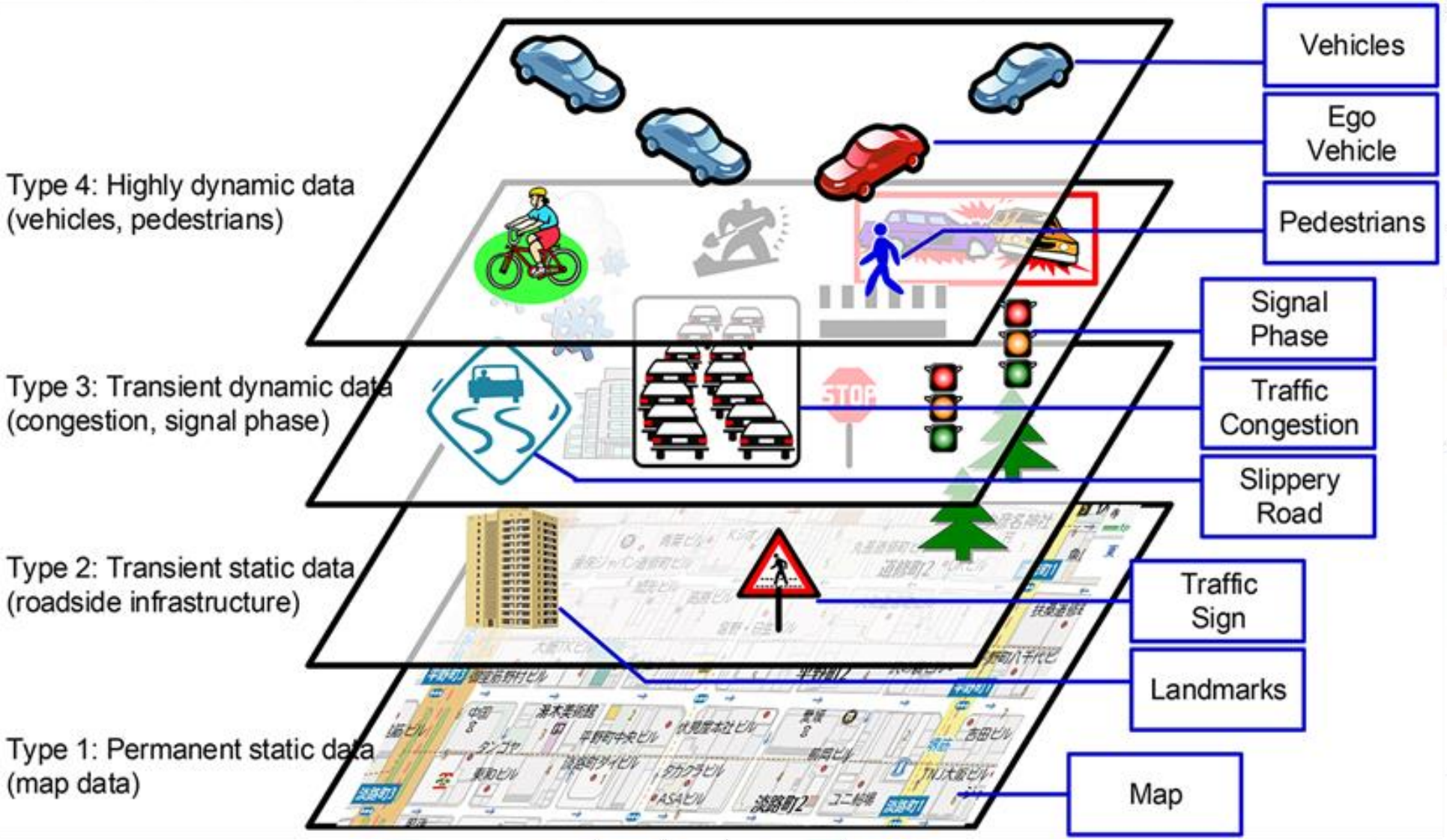
PRoPART
Precise and Robust Positioning
for Automated Road Transports

Autonomous Driving Sensors

- Mass market
- Accurate
- Robust
- Trustworthy



Local Dynamic Map



PRoPART Status

- Requirements and Scenarios defined
- Detailed system architecture and design
- Key component implementation
  - UWB
  - Multi-Frequency GNSS Receiver
  - Tightly integrated RTK INS
  - Deeply Coupled Tracker
  - V2X communication
  - Perception

PRoPART Key Questions

- Resolving reference frames
  - Flexible lever arms
  - Radar installation
- Integrity
- Synchronisation, latency and fusion

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Reserve Slides

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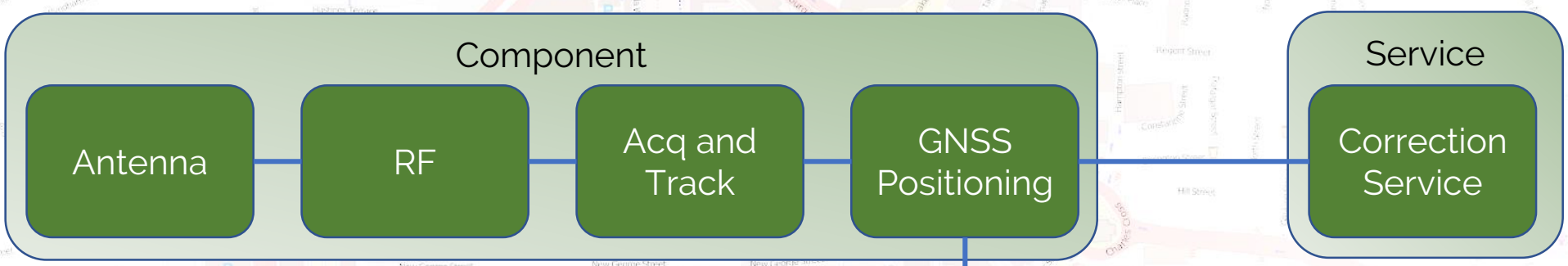
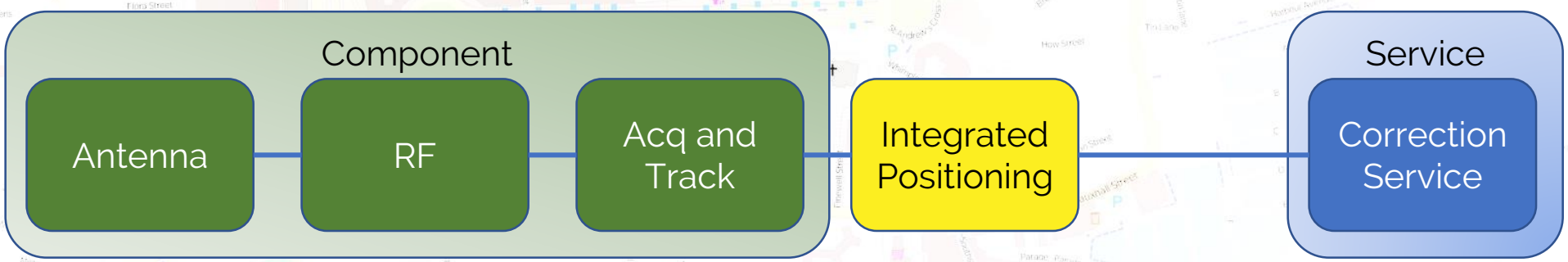
GNSS Architecture

- **Offered**



- **Required**

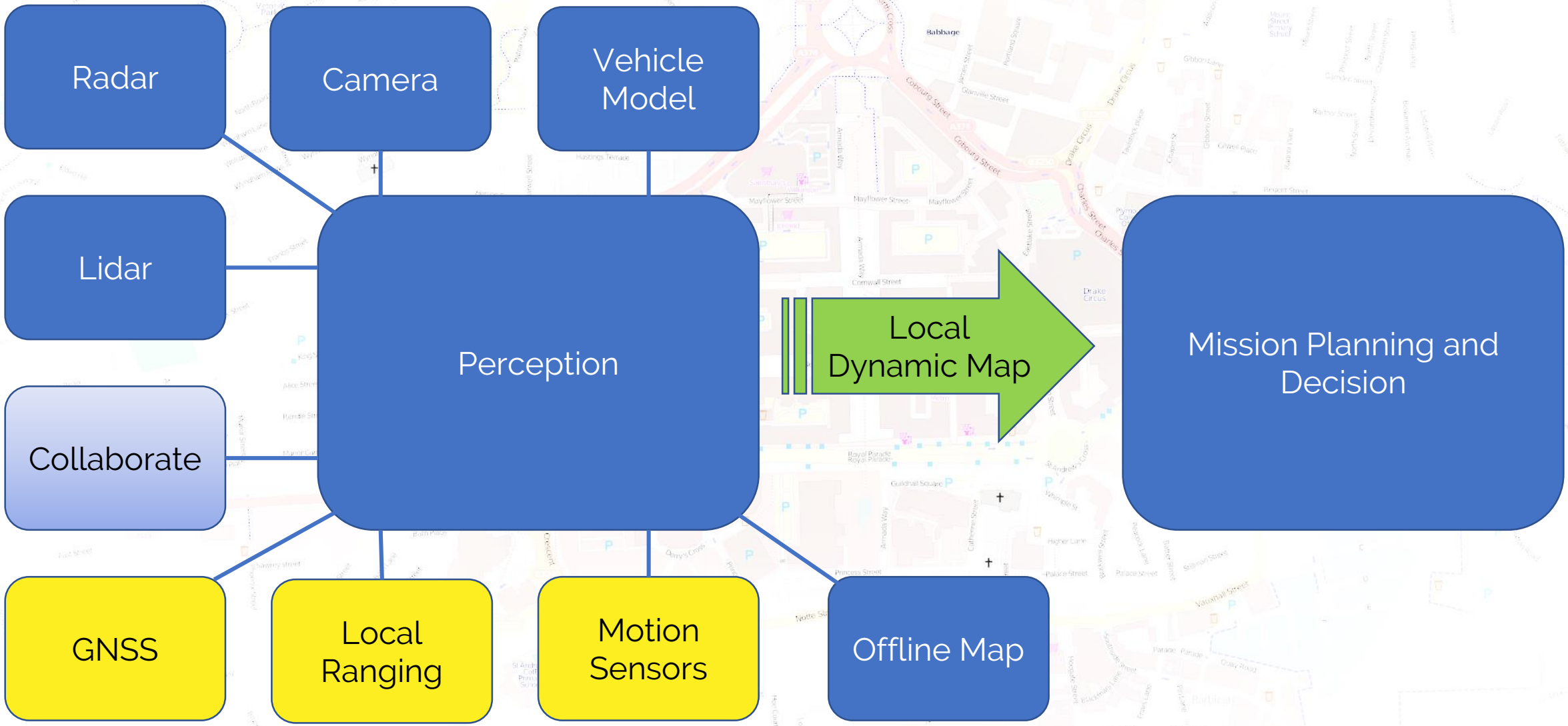


PRoPART

Precise and Robust Positioning for Automated Road Transports

- Automated friendly lane change for heavy goods vehicle
- Road side unit for additional sensor and GNSS support
- Local ranging support

- Distribute GNSS correction data to mass market
- Standardised methods
- Leverage existing installations and architecture
- End to end Proof of Concept


Radar
Camera
Vehicle Model
Lidar
Perception
Local Dynamic Map
Mission Planning and Decision
Collaborate
GNSS
Local Ranging
Motion Sensors
Offline Map

Local Dynamic Map