



European
Global Navigation
Satellite Systems
Agency

PRoPART

Precise and Robust Positioning
for Automated Road Transports





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PROPART
Precise and Robust Positioning
for Automated Road Transports



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HORIZON 2020

PROPART FINAL DEMONSTRATION EVENT


AstaZero, 2019-11-21

Stefan Nord

RISE Measurement Science and Technology



PRoPART Final Demonstration Event – Agenda



| Time | Item |
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| 09:00-09:30 | Registration / Welcome coffee |
| 09:30-09:40 | Welcome and Agenda <i>Mr. Stefan Nord, Senior Research Project Manager, RISE</i> |
| 09:40-10:00 | PRoPART Project Presentation and Highlights <i>Mr. Stefan Nord, Senior Research Project Manager, RISE</i> |
| 10:00-10:20 | PRoPART Galileo role and benefits <i>Mr. Matthias Overbeck, Group Manager Precise GNSS, Fraunhofer IIS</i> <i>Mr. James Tidd, CEO, Waysure</i> |
| 10:20-10:40 | Vehicle Platform and Application <i>Mr. Fredrik Hoxell, Development Engineer, Scania</i> |
| 10:40-11:10 | Networking Coffee Break (with roll-ups / exhibition) |
| 11:10-11:30 | PRoPART Positioning Solution <i>Mr. James Tidd, CEO, Waysure</i> <i>Ms. Katrin Dietmayer, Software Development Engineer for Satellite Navigation Receivers, Fraunhofer IIS</i> |
| 11:30-11:50 | PRoPART Cooperative Perception Concept <i>Mr. András <u>Varádi</u>, Research Program Director, <u>Commsignia</u></i> <i>Mr. Liang Zhang, Project and Business Development Manager, <u>Baselabs</u></i> |
| 11:50-12:10 | UWB Ranging Concept <i>Ms. Ainhoa Cortés, Associate Director of Electronic Systems and Communications Group, CEIT-IK4</i> |
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PRoPART Project Presentation and Highlights

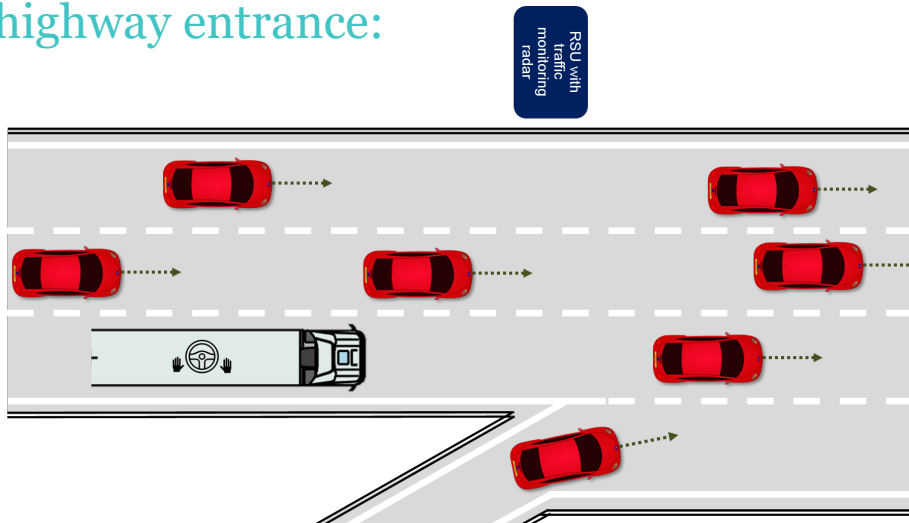
- **Call:** Applications in satellite navigation – Galileo
- **Topic:** GALILEO-1-2017: EGNSS Transport applications
- **Budget:** ~3.5 M€
- **EU Grant:** ~3.0 M€
- **Project start:** 2017-12-01
- **Project End:** 2019-11-30

| | |
|-------------------------|--|
| Project acronym: | PRoPART |
| Project title: | Precise and Robust Positioning for Automated Road Transports |
| Grant Agreement Number: | 776307 |
| Programme: | H2020-GALILEO-GSA-2017 (H2020-GALILEO-GSA-2017-1) |
| Contract type: | Innovation Action |
| Start date of project: | 2017-12-01 |
| Duration: | 24 months |



PRoPART Project Presentation and Highlights

- The starting point of the project was the final event of the H2020 project AUTONET2030 at AstaZero in October 27 2016.
- The idea was to develop a robust positioning solution using a use case that AUTONET2030 did not have time to do:
 - A connected cooperative automated vehicle application:
Crowded highway entrance:



Connected Automated Driving that shares sensor data with other vehicles and the infrastructure requires **reliable absolute positioning and accurate time.**

PRoPART Project Presentation and Highlights

- PRoPART has developed and enhanced an existing RTK (Real Time Kinematic) software solution developed by Waysure, by **exploiting the distinguished features of Galileo signals(*)** as well as **combining it with other positioning and sensor technologies**.



PRoPART has also investigated **a low-cost Ultra Wideband (UWB) ranging solution for redundancy** and robustness in areas where the coverage of GNSS is poor e.g. in tunnels or in urban canyons.

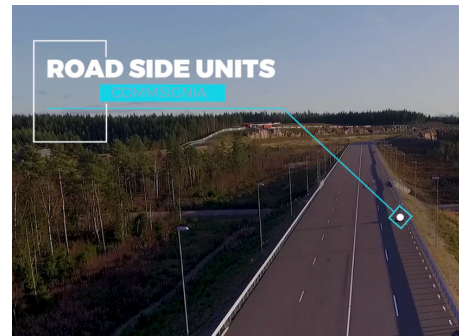
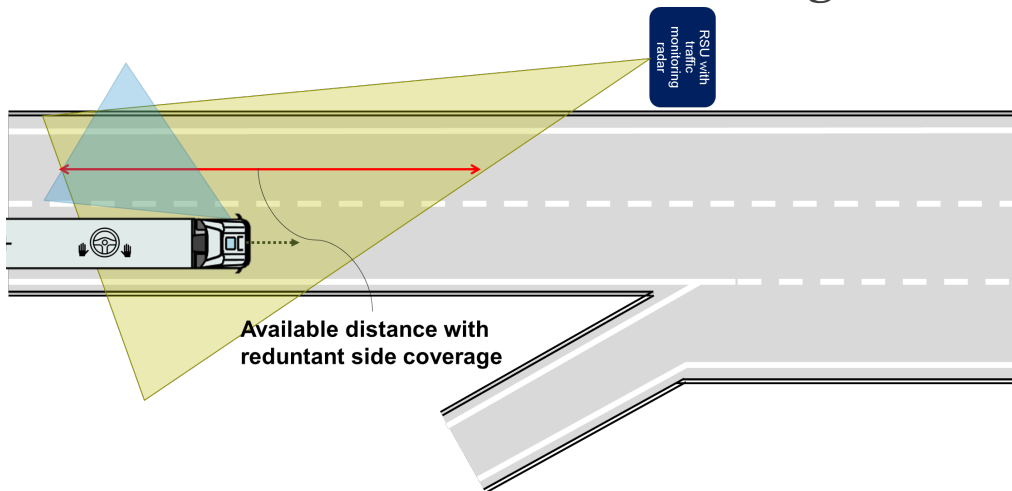


(*) Utilise Galileo specific features in combination with other GNSS systems. Particularly:

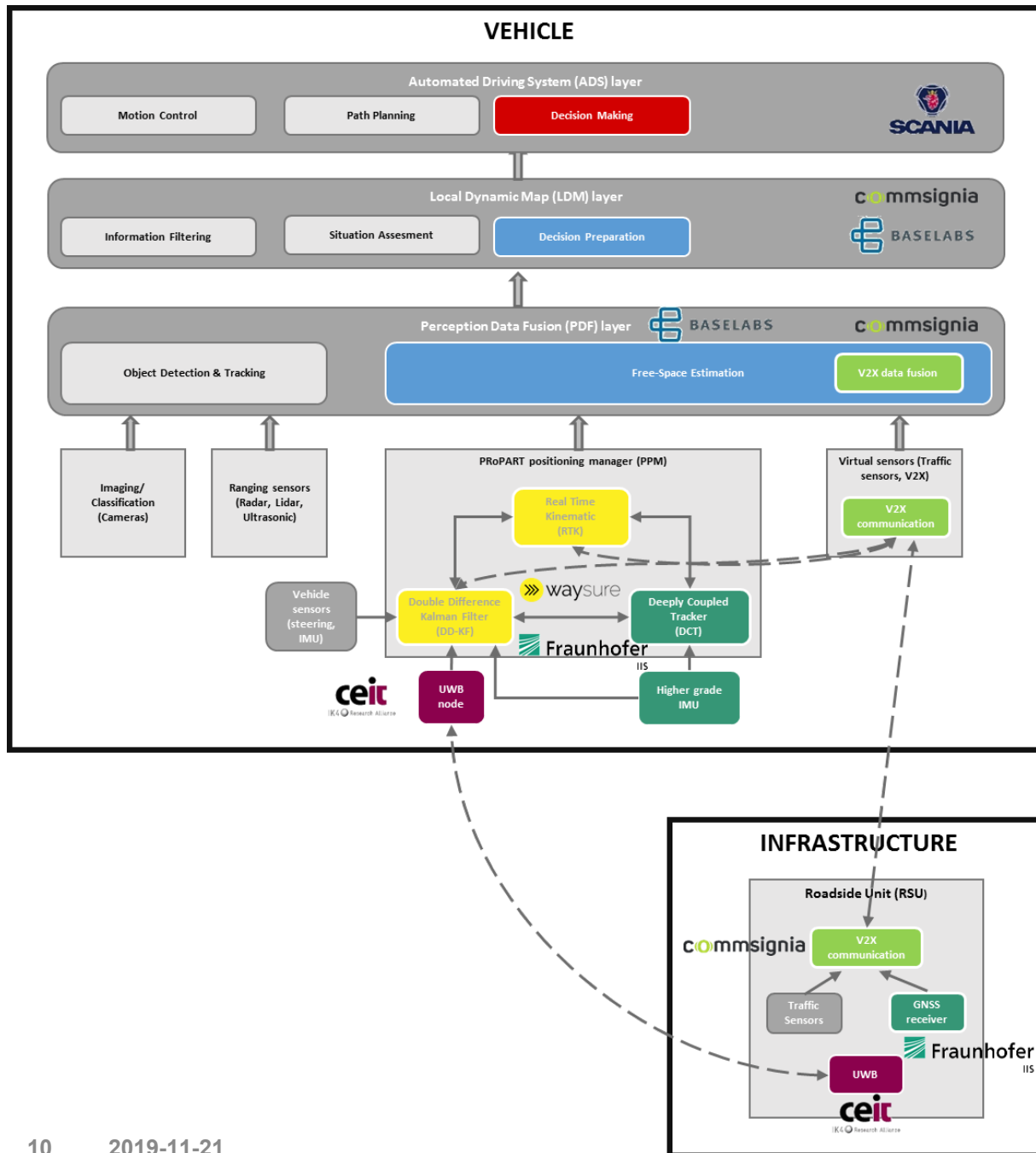
- Higher multipath mitigation because of Binary Offset Coding.
- Substantial improvement of the reliability of the carrier phase ambiguity resolution using E5AltBOC

PRoPART Project Presentation and Highlights

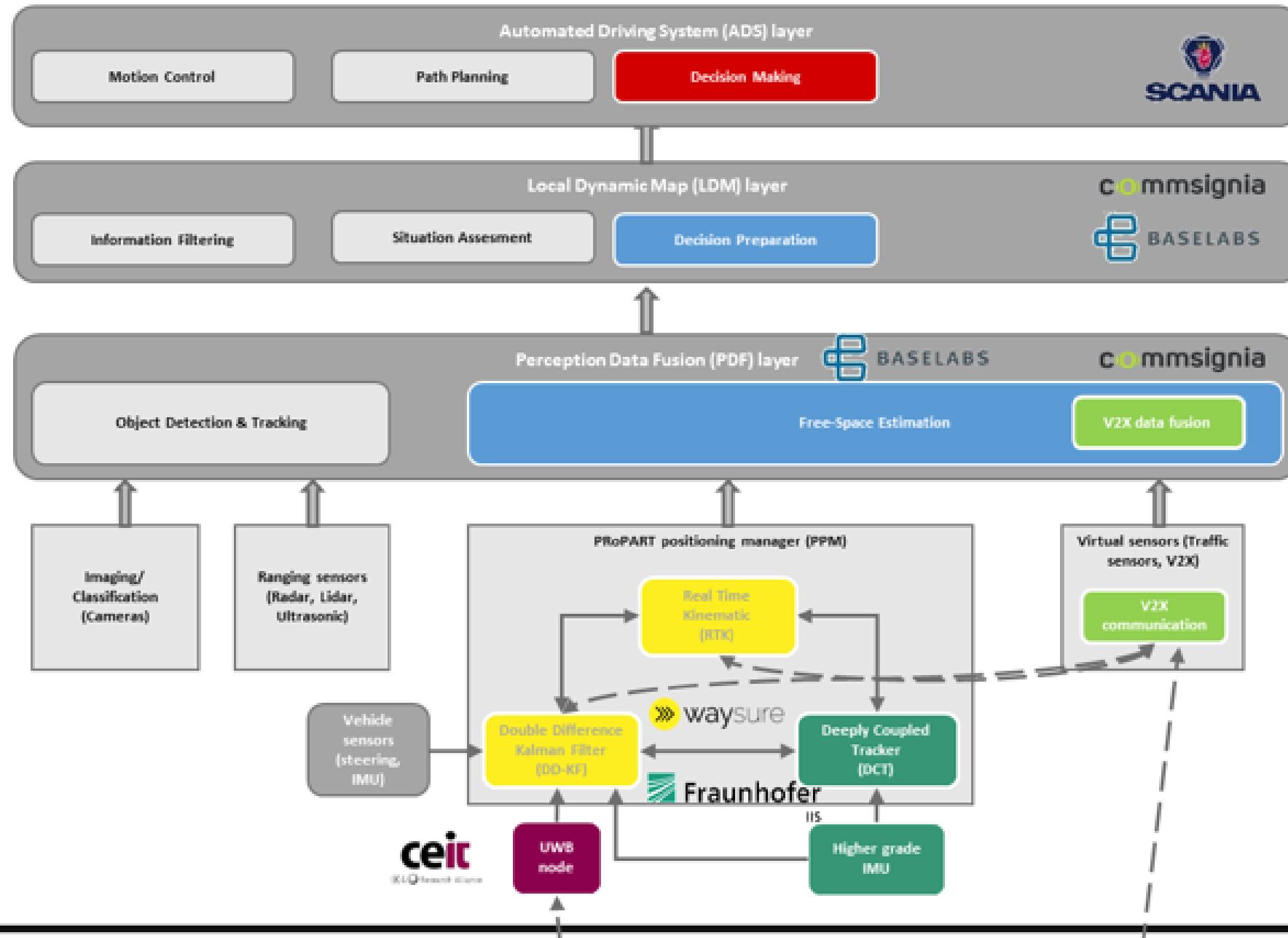
- During a transition period, a lot vehicles will neither be connected nor automated.
- **PRoPART has implemented an RSU (Road Side unit)** with high precision positioning that uses **both UWB and a traffic monitoring radar sensor** that supplies ranging, object perception **and EGNSS RTK correction data** via ETSI ITS-G5 to the connected automated vehicle so it can make safe decisions based on robust data.
- **PRoPART has also implemented perception layer sensor fusion** that uses information collected in the LDM (Local Dynamic Map) from the RSU:s as well as information from the on-board vehicle sensors and the high availability positioning solution.

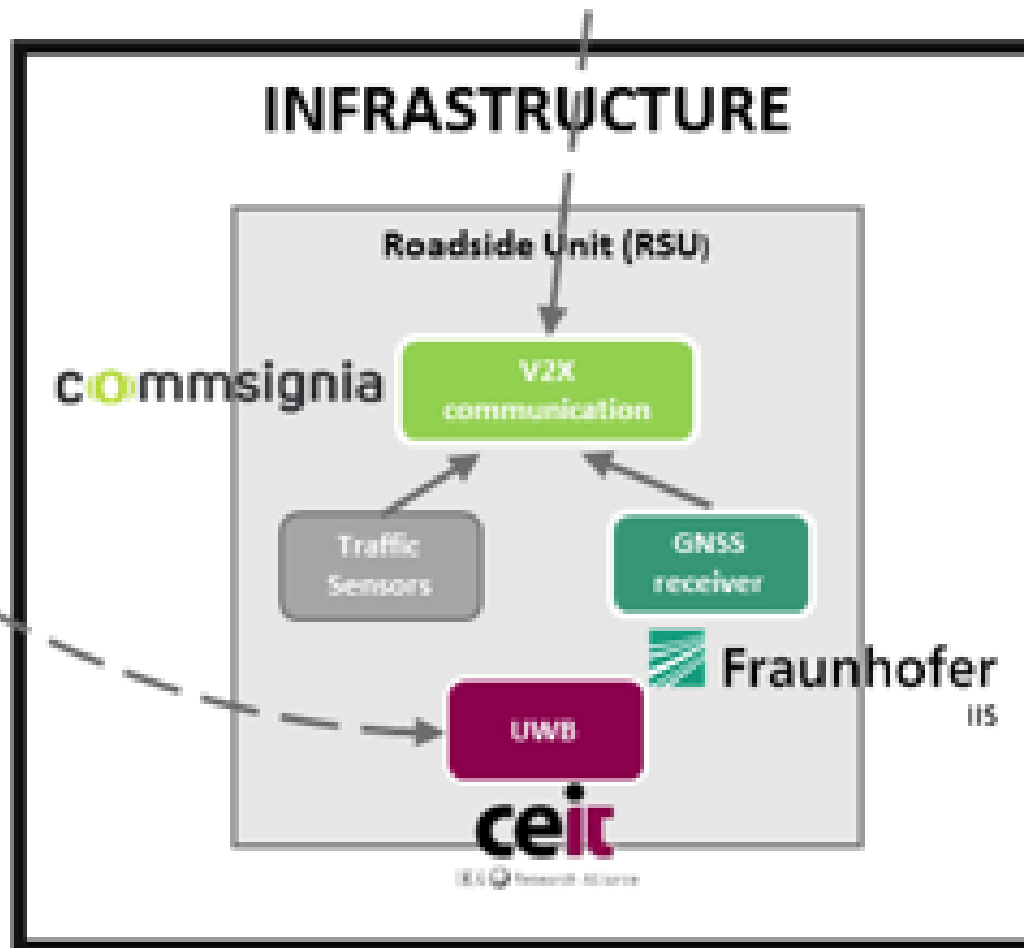


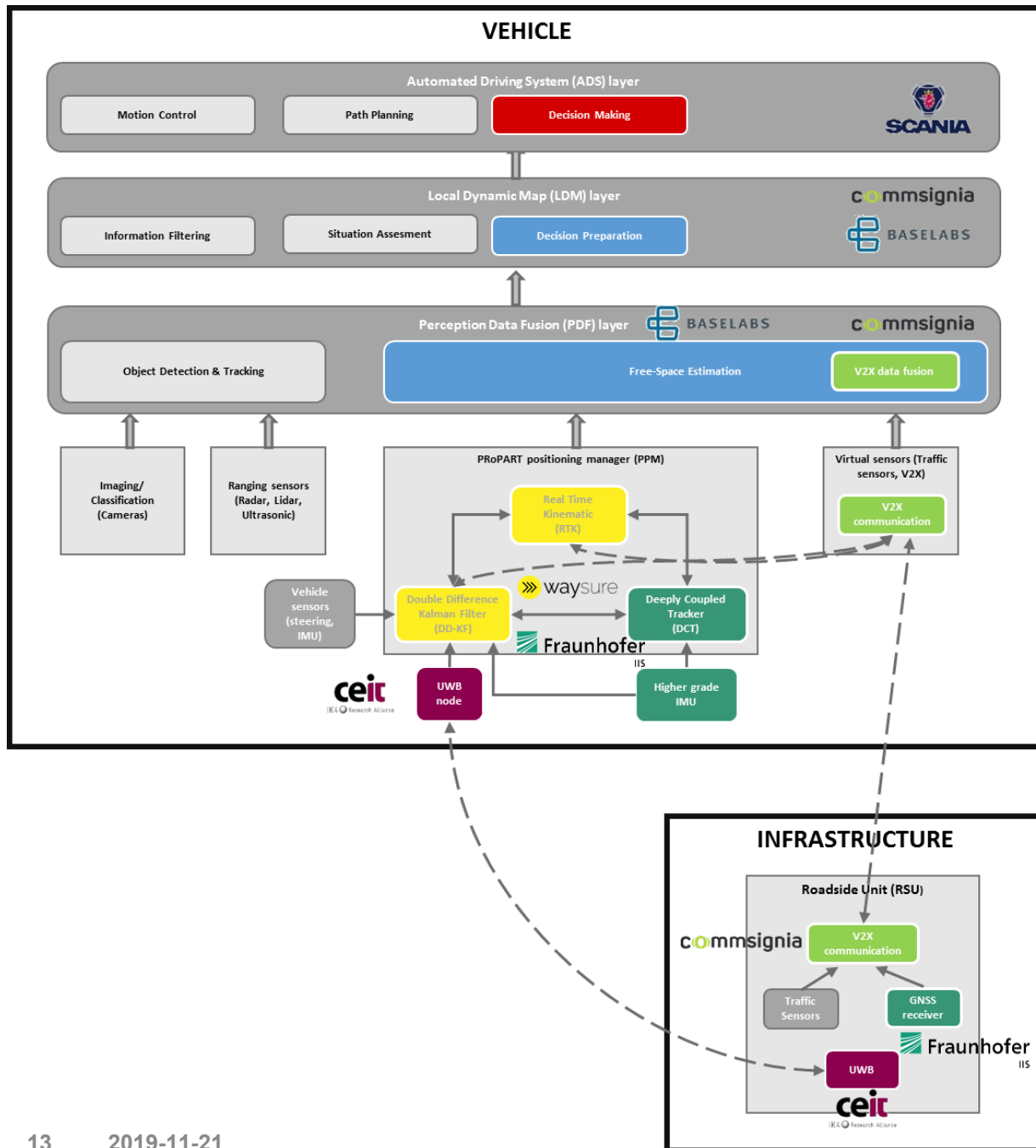
PRoPART System Diagram and partner contributions



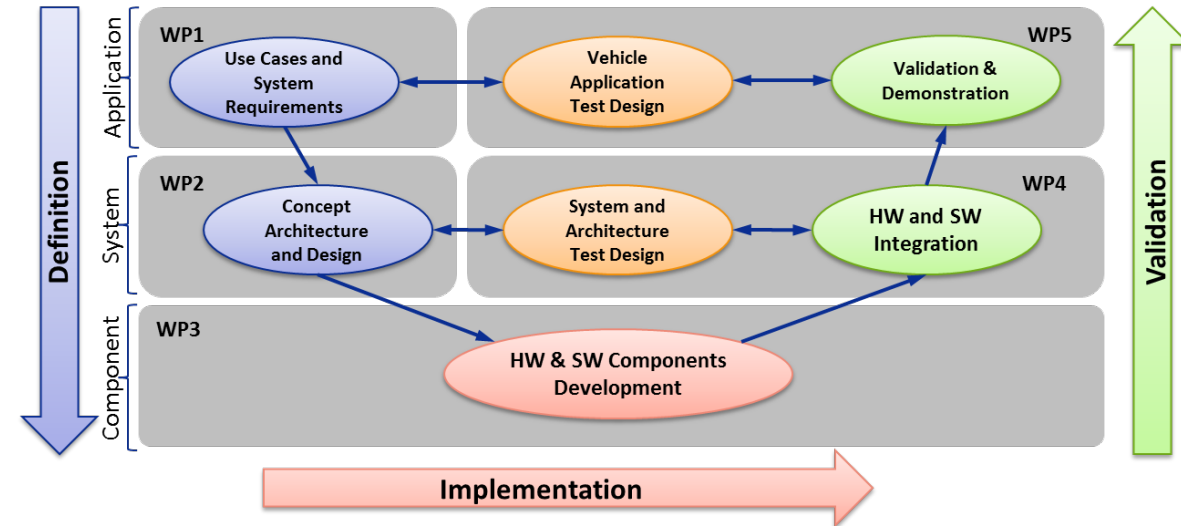
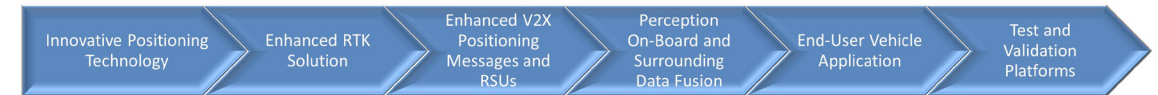
VEHICLE







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| 09:40-10:00 | PRoPART Project Presentation and Highlights <i>Mr. Stefan Nord, Senior Research Project Manager, RISE</i> |
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| 10:20-10:40 | Vehicle Platform and Application <i>Mr. Fredrik Hoxell, Development Engineer, Scania</i> |
| 10:40-11:10 | Networking Coffee Break (with roll-ups / exhibition) |
| 11:10-11:30 | PRoPART Positioning Solution <i>Mr. James Tidd, CEO, Waysure</i> <i>Ms. Katrin Dietmayer, Software Development Engineer for Satellite Navigation Receivers, Fraunhofer IIS</i> |
| 11:30-11:50 | PRoPART Cooperative Perception Concept <i>Mr. András <u>Varádi</u>, Research Program Director, <u>Commsignia</u></i> <i>Mr. Liang Zhang, Project and Business Development Manager, <u>Baselabs</u></i> |
| 11:50-12:10 | UWB Ranging Concept <i>Ms. Ainhoa Cortés, Associate Director of Electronic Systems and Communications Group, CEIT-IK4</i> |
| 12:10-12:25 | EGNSS Outlook and Opportunities <i>Mr. Flavio <u>Sbardellati</u>, Market Development Technology Officer at European GNSS Agency (GSA)</i> |
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Instructions for Demonstrations

- You either belong to group A or B (check your badge!)

| | |
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- Group A goes for lunch
Group B follows guide to bus transport to Multilane Demo.
- Group A follows guide to UWB Demo by walking.
Group B goes with bus back to Seminar location for lunch.
- Group A follows guide to bus transport to Multilane Demo.
Group B follows guide to UWB Demo by walking.
- Group A and B meet at Seminar location for networking Coffee



We are here!
(Seminar)

UWB
Demo

Bus pick up for
Multilane Demo

Instructions for Demonstrations

- Put on a yellow vest!
- Follow your guide and stay with your group!
- Respect the time schedule
- Photo restrictions apply due to ongoing tests at other test tracks!!!
(only dedicated people with photo permit)
- Smoking is not allowed!!! (only at designated area outside seminar building.
- Enjoy!

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Precise and Robust Positioning
for Automated Road Transports



THANK YOU!

Stefan Nord

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RISE Measurement Science and Technology

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