AI Aware

AI Powered Awareness for Increased Traffic Safety

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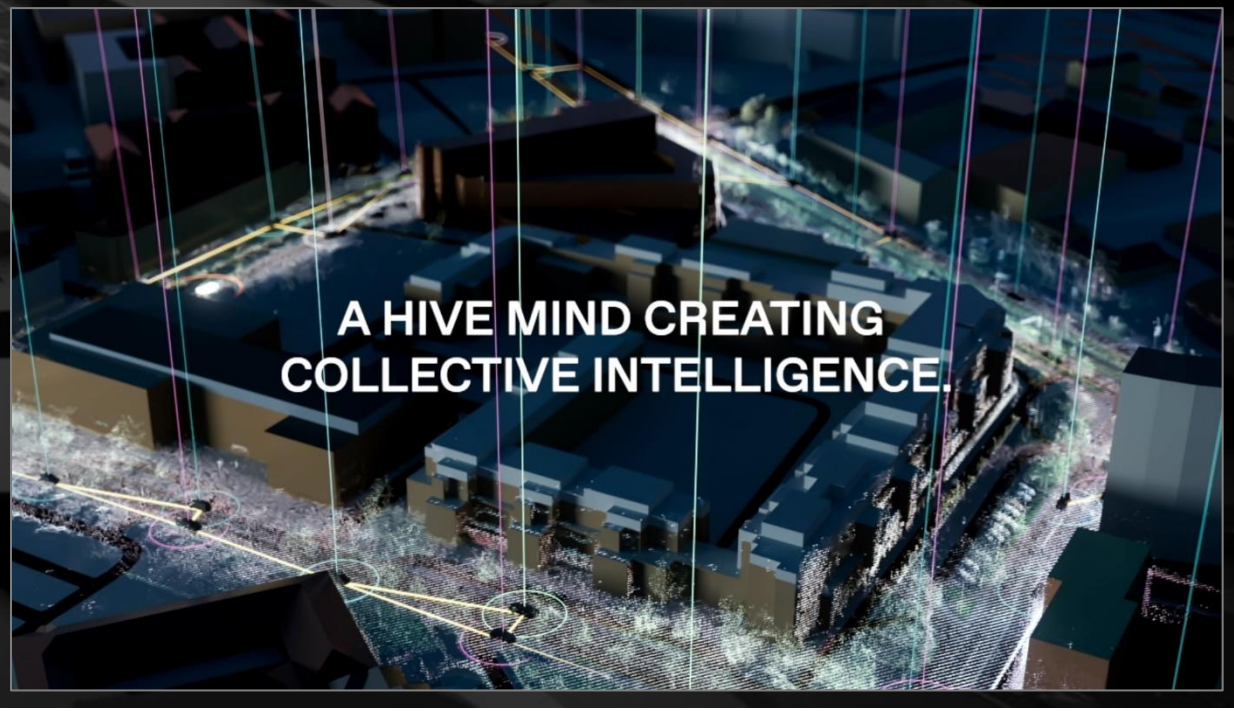

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AI Aware – Focus on Accident Risk Predictions

Project Challenge:

- Is it possible to predict a traffic accident and which precision in time and geography is possible?
- Can preemptive measures be taken based on predictions to avoid accidents?

Planned Deliverables:

- An AI-powered Risk Prediction solution available for a Smart City Central Traffic Control System that can also be used to disseminate critical safety messages to road users.
- Interfaces (“APIs”) allowing for additional data sources to be utilized, such as potentially other vehicle fleets.
- Public demonstrations in Gothenburg.
- Film and presentations for dissemination purpose.

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Project Details

Participants

- Volvo Car Corporation(Coordinator)
- Zenseact
- Carmenta
- Ericsson
- HERE Technology
- Swedish Transport Administration (STA)
- City of Gothenburg

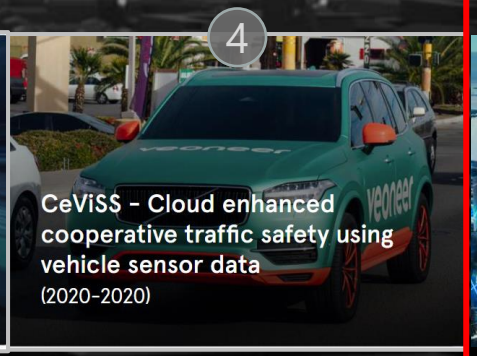
Time frame

- 2020-11-01 – 2021-12-23

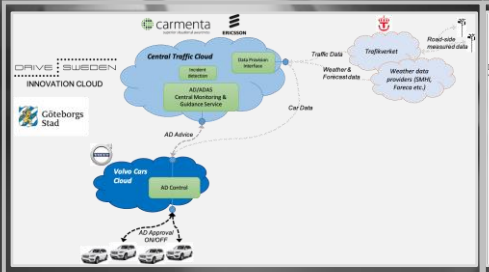
Budget

- 7.980.000 SEK

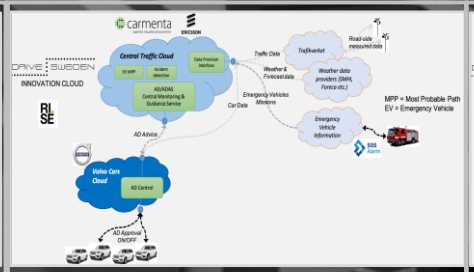
Background – Drive Sweden AD Aware Projects



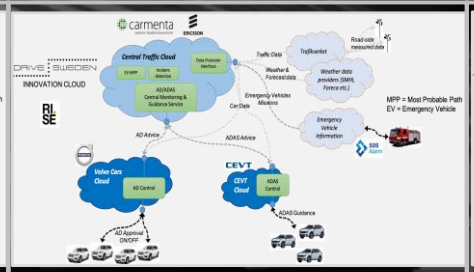
2016 2017 2018 2019 2020 2021



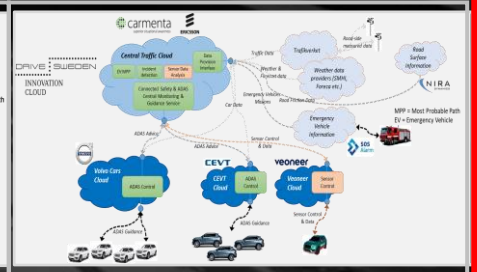
- Cloud architecture setup
- Datex II traffic data
- AD Certified Roads
- Weather data



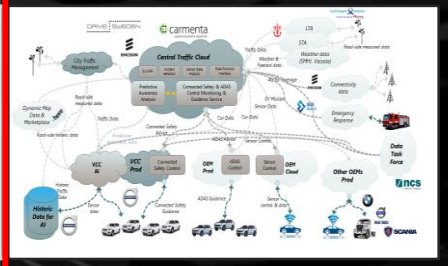
- Emergency center connect
- EVA warning solution
- EV most probable path
- AD vehicle guidance



- Advanced ADAS guidance
- ETSI DENM ITS warnings
- Vehicle probe data
- Slippery road data

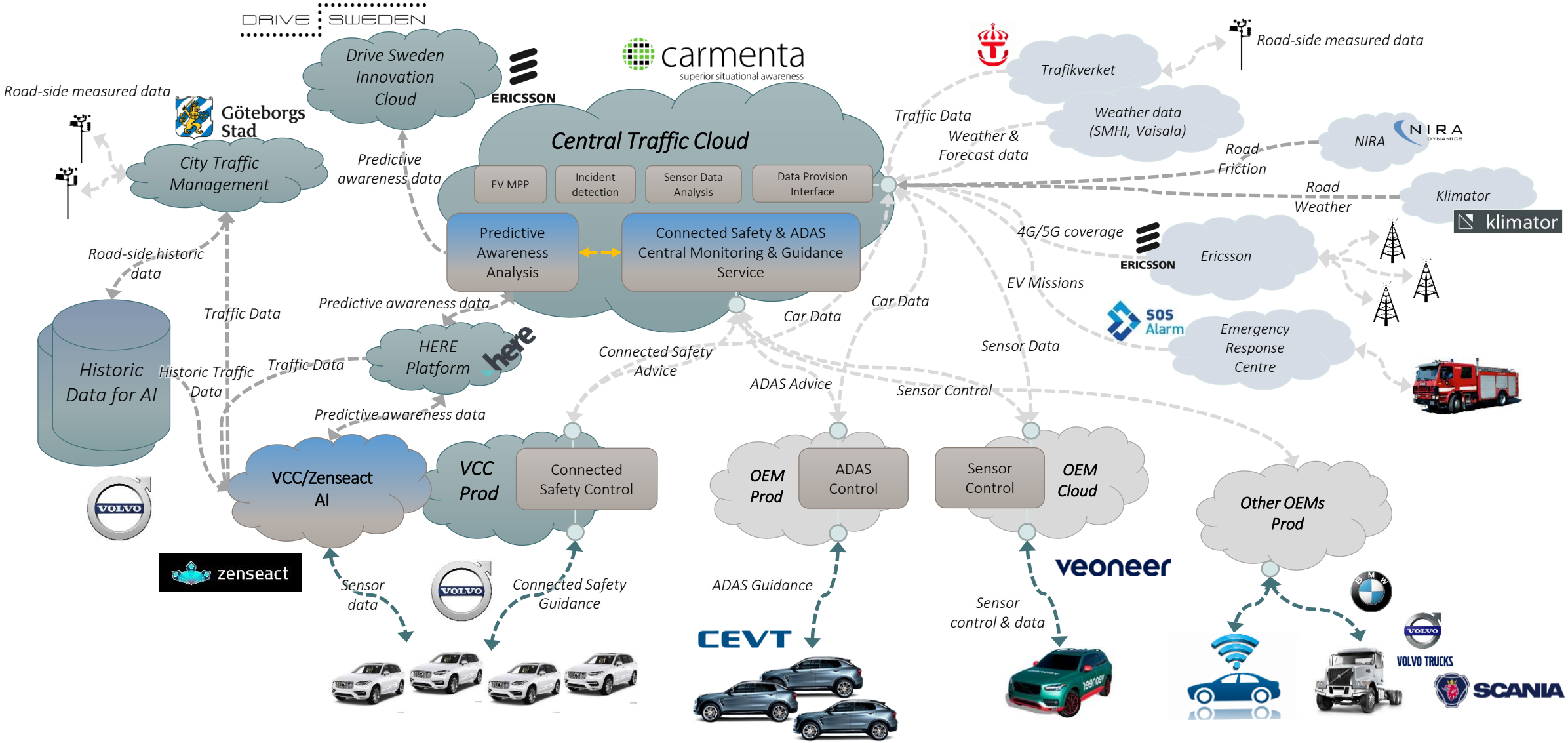


- Cloud enhancement of data
- Automated vehicle guidance
- Vehicle sensor control
- Accident warnings



- AI accident risk prediction
- HERE Platform integration
- Advanced data fusion
- Road condition data

AD Aware + AI Powered Awareness - CONCEPT



The Predictive Awareness AI module

- Volvo Cars and Zenseact collaborated on developing an AI algorithm for accident risk prediction.
- Real-time data streams and static traffic system data were fused through an algorithm producing a predictive Accident Risk Alert (ARA).
- Data includes road attributes, weather, traffic flow, road friction, accidents and hazards.

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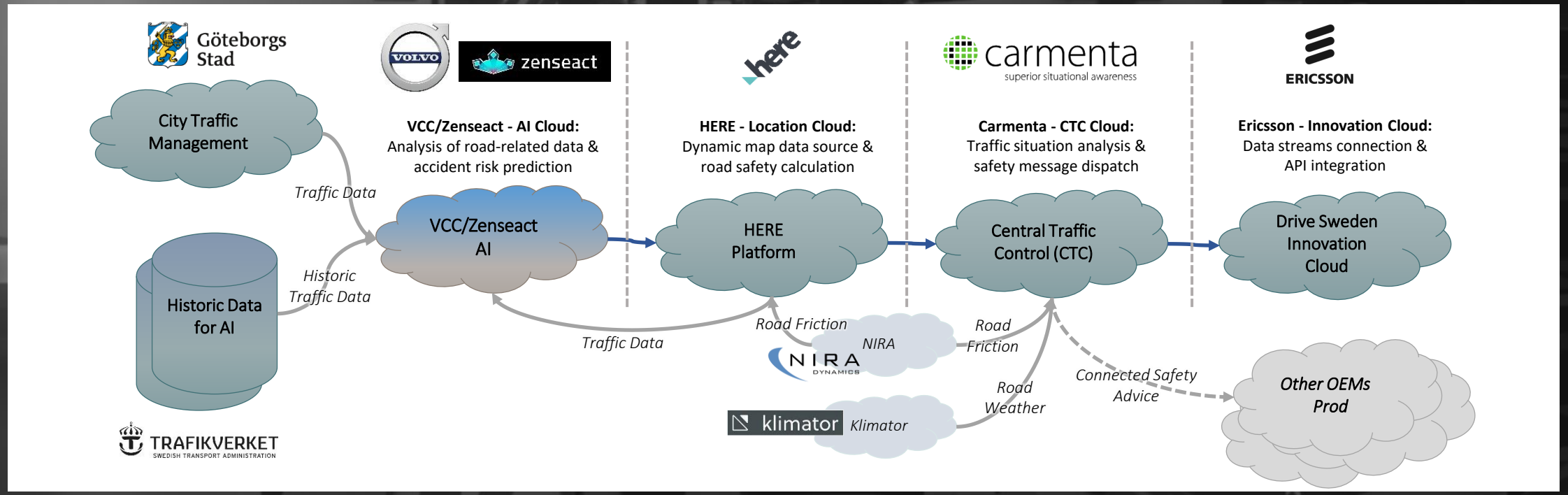
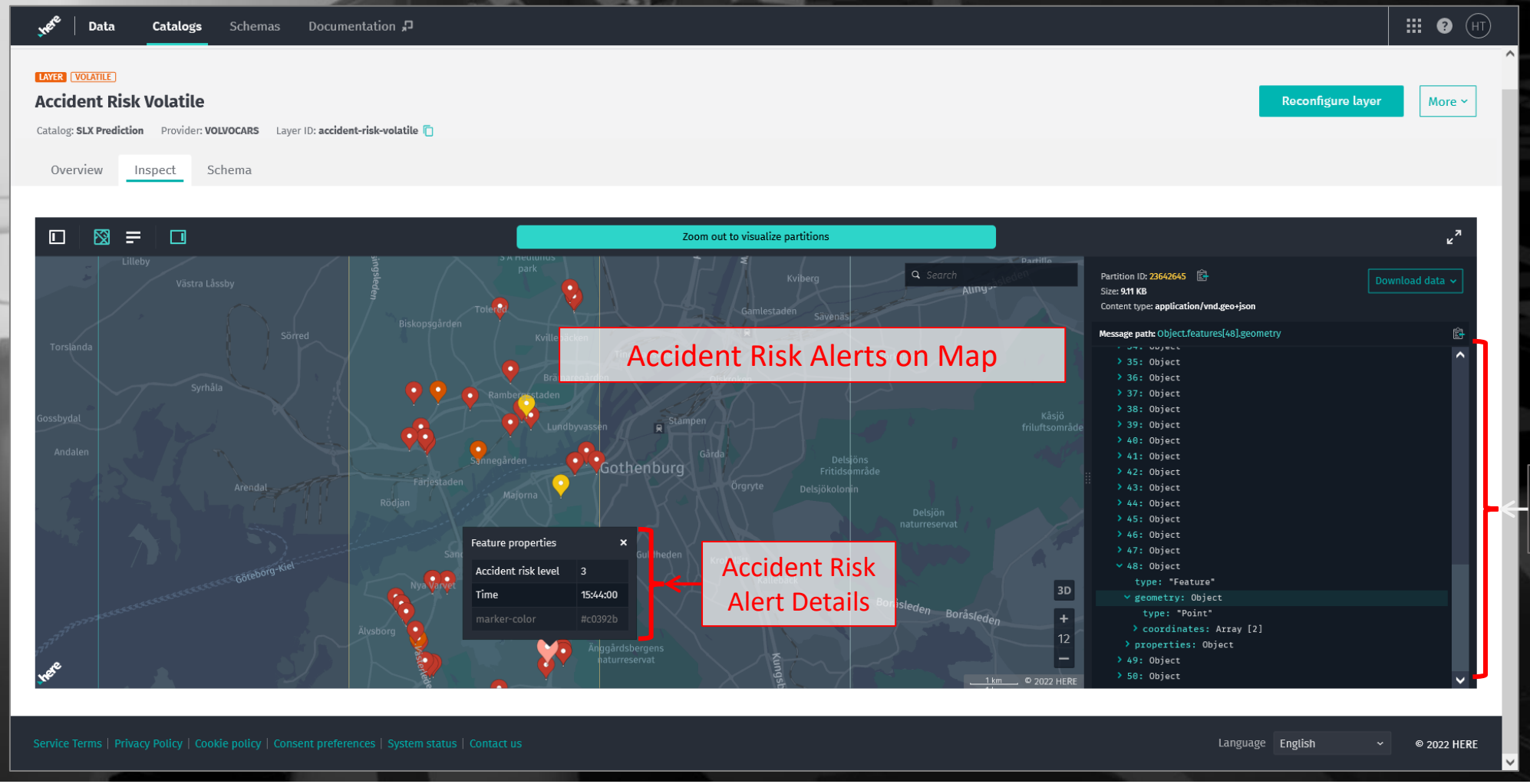
AI Aware – Data Flow

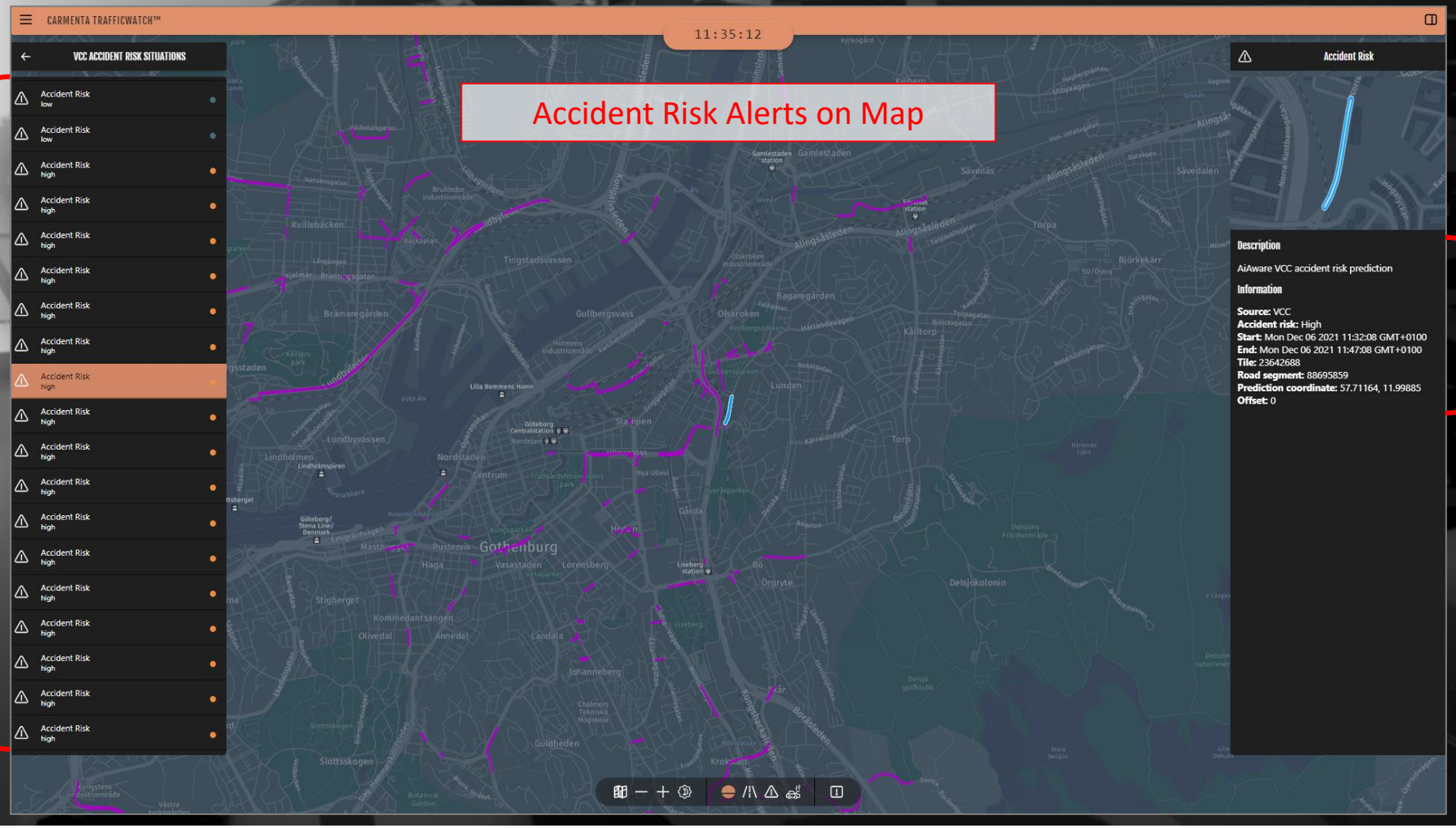


- The output from the VCC/Zenseact AI module is an Accident Risk Alert (ARA)
- ARAs were transmitted through the HERE platform to a Central Traffic Control (CTC) and passed on to the Drive Sweden Innovation Cloud.

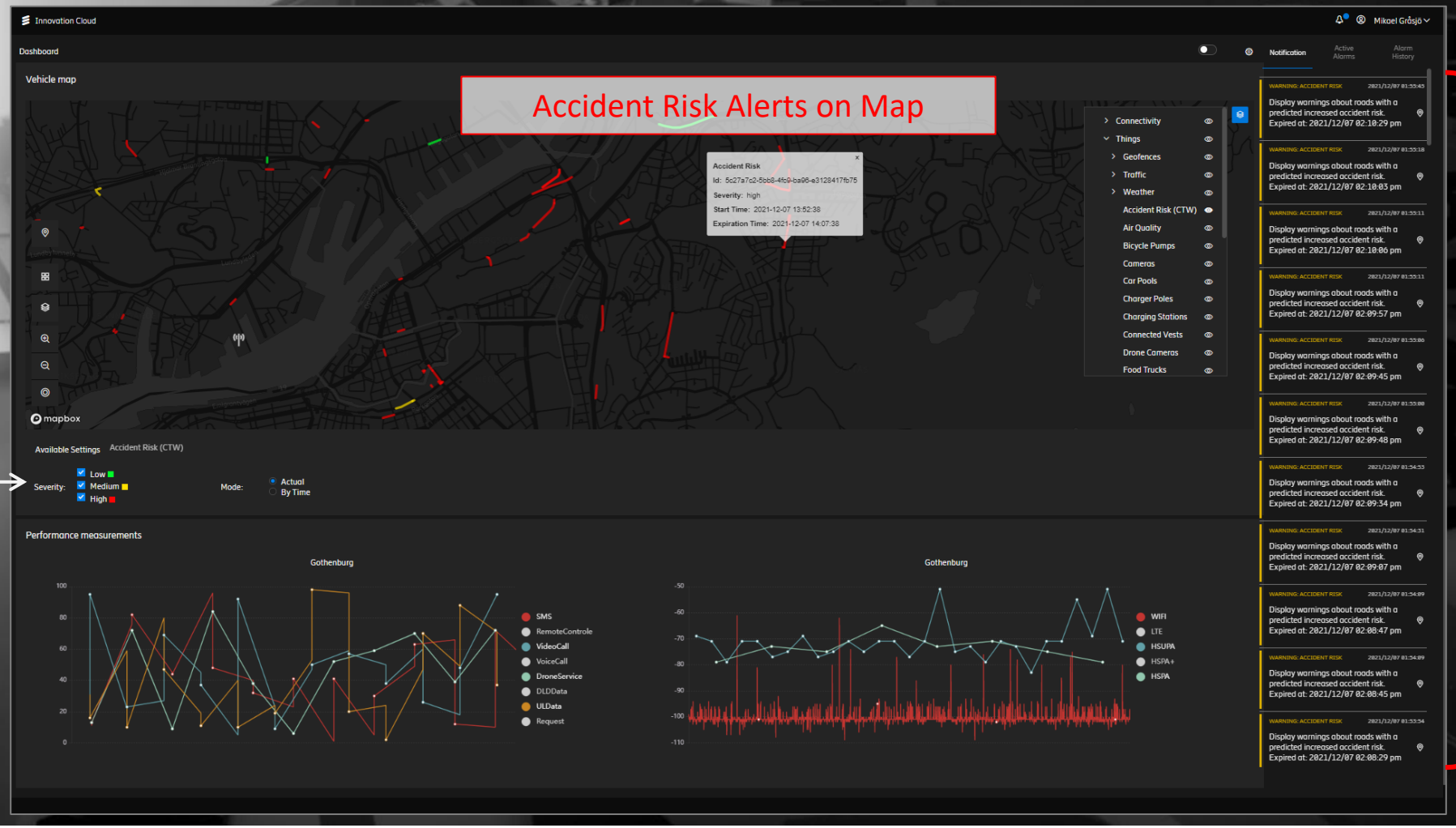
ARAs in HERE Platform Inspect Tool



ARAs in the Central Traffic Control UI



ARAs in Drive Sweden Innovation Cloud UI



Accident Risk Alert Layer Settings

Accident Risk Alerts Notification Panel

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Traffic Safety Workshop with STA experts

Swedish Transport Administration (STA) experts presented the current guiding policies around traffic safety issues in Sweden:

- Roads shall be designed to avoid serious or fatal injuries.
- “Lighter” crashes can be preferred if the number of crashes with fatal outcome or serious injuries are lowered.
- The foundation for any traffic safety analysis is the availability to data.

Workshop take-aways:

- Technology from the project could potentially be used to decide when, and on which roads, autonomous or highly automated driving is suitable/possible.
- AI-based accident risk analysis can guide how to do changes in the road Infrastructure.
- Traffic management is an obvious domain to receive and use crash risk predictions.

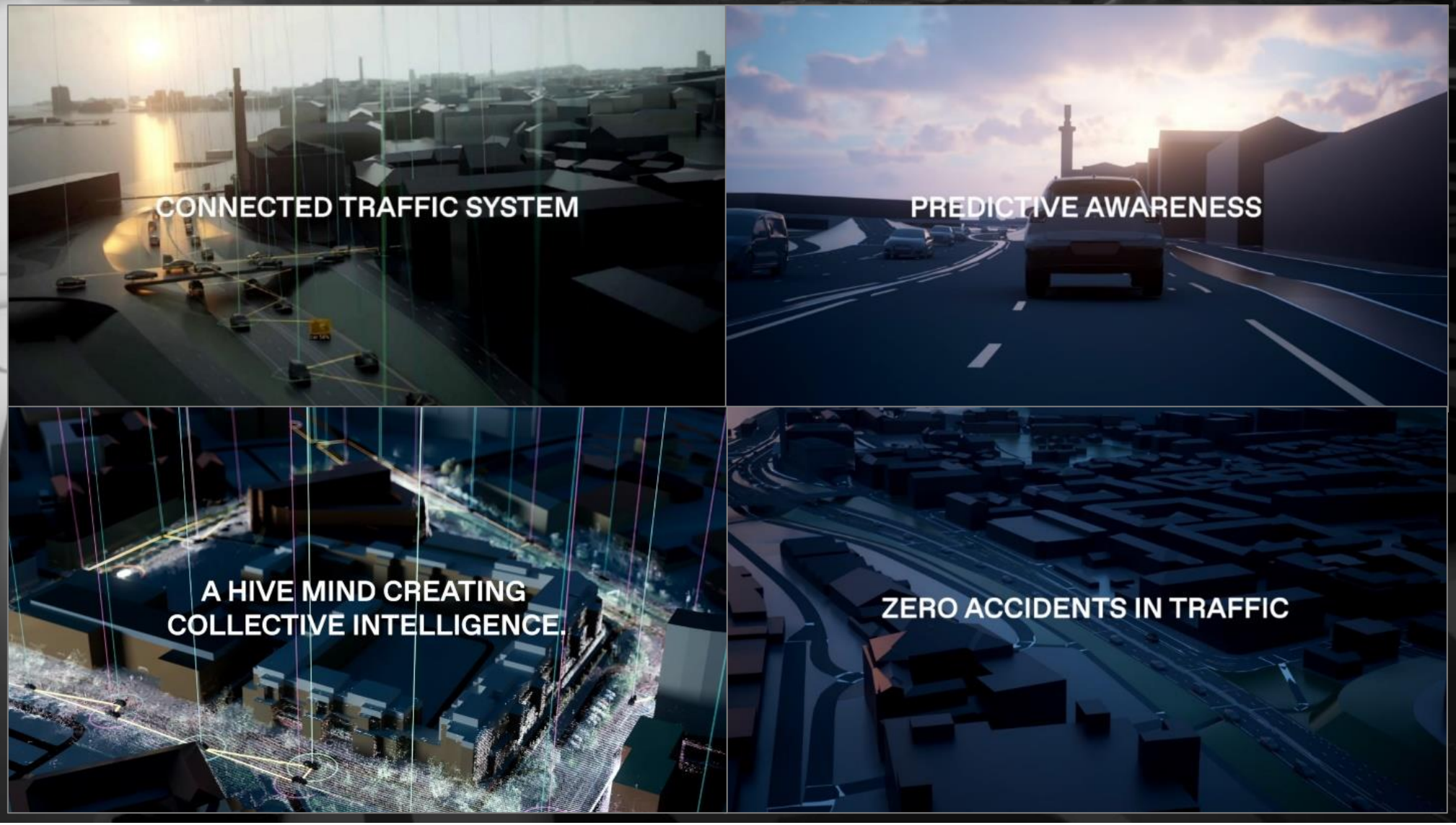
Project Results

- Established a solution for data collection and fusion to feed an AI algorithm to issue “Accident Risk Alerts” (ARAs).
- A first implementation of a software module to predict accident risk and issue ARAs.
- ARAs were successfully transferred from Volvo Cars via HERE Platform to Carmenta’s Central Traffic Control (CTC) and further to Drive Sweden Innovation Cloud (Ericsson).
- ARAs channeled through a centralized traffic control system and dispatched in real-time to connected organizations have a great potential to prevent accidents.

Project Findings

- Insight through traffic safety workshop with Swedish Transport Administration
- Successful re-use and extension of the AD Aware Central Traffic Control system
- Successful Drive Sweden Innovation Cloud integration
- It is necessary to collect data on traffic accidents for subsequent analysis and identification of hazardous patterns.
- Traffic accidents often happen on the same road segments and with a correlation in time. These dependencies can be subject of further studies.

The AI Aware film



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Next Steps

- All project parties agree on the great potential to increase traffic safety based on the project results and findings.
- The project parties will consolidate the findings and continue their exploration of predictive awareness.
- The availability of large volumes of traffic and road-related data is crucial to feed the AI algorithms. This will be further explored.
- Follow-up projects will possibly be initiated.

Thank you!

Questions?