# **AECC**

AUTOMOTIVE EDGE COMPUTING CONSORTIUM

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## **Driving Data To The Edge**

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Visit our AECC.org, get more information, and inquire about a membership application



## **Global Impact Around 2025**

- Original assumption 1 GB/month: only considers planned current/valid services
- AECC assumption: Need to consider future services & much larger data volumes

## **100M units**

**Connected Vehicles** 

# 1~10EB/mo.

Communication



## **Connected Vehicle Services Will Depend on Big Data**





## **Big Data Will Drive Connected Vehicle Services**



## What is HD Map?



Signature use-case of AECC System for data collection, processing and delivery. MSP Server collects various data from connected car to generate HD Map.





## Why do we need HD Map?

- Services such as Autonomous Driving require HD Maps with resolutions of 10-20 cm or better
- As more vehicles and their sensors are deployed in the real world, the challenge is how to handle the data and to extract the salient information from it
- New types of ICT infrastructures are needed to handle such volumes (Zetta scale) of data to support and maintain HD Maps.





## The Biggest Challenge with HD Map

Definitions of HD Maps differ by organization, and the types of data and the data volumes that are used can also be different.

AECC has created this paper to clarify the operational behavior of an HD Map and estimate the network traffic that occurs when vehicles contribute data to HD Maps.

#### **AECC** approach

- Develop an assumption about the application's behaviors by introducing its composition and processing patterns
- Describe possible implementation options based on the desired level of application functionality
- Summarize traffic patterns and data volumes based on the defined processing patterns and profiles, according to the AECC's expectations.

f Application

## **Use Case: Intelligent Driving**

Old Definition: "Intelligent Journey" providing humans with driving support

- Mapping service
- Alerts to road conditions
- Help finding retail services on route

New Definition: Using ML for a better, safer autonomous driving experience. Data collection includes:

- Cruising data
- Control data
- Biometric sensor data



## **Use Case: V2Cloud Cruise Assist**

Definition: Network mediation of vehicle-tovehicle communications by integrating information obtained from neighboring cars.

- Vehicles transmit cruising data to cloud
- Al determines information for autonomous driving assistance
- Information is transmitted to nearby vehicles and roadside facilities



## **Use Case: Mobility Services**

Old Definition: Real-time navigation assistance

- Mapping services
- Traffic-flow information
- Nearby consumer services

New Definition: Real-time service enhancements on top of V2Cloud services

- Sharing rides, cars, and parking lots
- Multimodal navigation
- Information shared between asset owners, service providers and end users



VECC

## **Use Case: Finance and Insurance**

Definition: Usage-based-insurance model monitors driving habits to align premium with actual level of customer risk.

- Monitors driver behaviors
- Real-time risk assessment for dynamic premiums
- Reduces unnecessary losses to insurers
- Encourages safe driving behavior







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# **AECC Technical Solutions**

### AECC Technical Exploration Address Big Data Issues and Potential Solutions





## AECC Proposed Solution: Distributed Computing on Localized Network

#### **Basic Requirements:**

- Large volume data downloading/uploading
- Local data sharing and usage
- Mobility
- Data security and integrity
- Various latency requirements

#### **Solutions:**

- Distributed Computing
  - Distributed data processing and computing across edge and center clouds
- Localized Network
  - Support access networks of different types and ownership
- Local Data Integration
  - Trusted data sharing within a same security domain and across security domains



![](_page_15_Picture_0.jpeg)

## **Study on Distributed Computing**

- A preliminary distributed computing architecture has been studied
- A Distributed Computing Reference Model has been defined involving both edge and center services in corresponding computing facilities
- Computing capabilities allocated to instances located in the Network Edge in order to provide desired service levels
- A Computing Infrastructure Operator exposes information about their resources and applications via an AECC Service

![](_page_15_Figure_6.jpeg)

## Putting Recommendations into Practice

### AECC Use Case Development

 Continue to develop use cases that drive technical recommendations

# Liaise with Standards Groups and Other Communities

• Bring eco-system insights to help inform standards work

# AECC Member Company Proof of Concept

 Adopt AECC technical reports solutions

![](_page_16_Figure_7.jpeg)

VECC

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## Next Steps & How AECC Can Help?

- Strong interest in solving challenging problems
- Help support standardization & reference architecture for Edge & MSP
- Bring all the right partners together

### **AECC Website**

![](_page_18_Picture_2.jpeg)

#### Automotive Edge Computing Consortium

#### Driving the vision of network and computing infrastructure for connected car big data

Connected cars are in everyone's near future. They will bring about new and better driving experiences with safer passage, smoother traffic flows and optimized energy consumption for lower emissions that are kinder to the environment.

Behind the operational curtain, connected car services will require a much larger data transfer capacity than used by today's early iterations. Our mission is to help automotive manufacturers, OEMs and the supply chain to accommodate growing requirements by evolving current network architectures and computing infrastructures.

#### Upcoming Events

5G World Edge Computing World ACM/IEEE Symposium on Edge Computing

#### **New White Paper**

The AECC recently published a new white paper Operational Behavior of a High Definition Map Application which aims to estimate the network traffic that occurs

## https://aecc.or

## Download our White Paper and Technical Reports

![](_page_18_Picture_13.jpeg)

Operational Behavior of a High Definition Map Application White Paper Version 1.0.0 · May 26, 2020

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#### Visit our Web page and get more information!

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# Thank you for your attention

Let's Get Connected!