

The NAVTEQ logo is located in the top right corner. It consists of the word "NAVTEQ" in a bold, black, sans-serif font. The letter "V" is stylized with a blue diagonal line passing through it. The letter "Q" has a blue diagonal line extending from its top right corner.

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ADAS & ADASIS v2

GENIVI F2F Dec 15 2010

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BACKGROUND : ADAS, EH, ADASIS

What is ADAS?

- ▶ Advanced Driver Assistance Systems (ADAS) is the application of automotive sensor, computational and/or digital map technologies to create driving experiences that are:
 - ▶ safer
 - ▶ less stressful
 - ▶ more productive
 - ▶ more economical



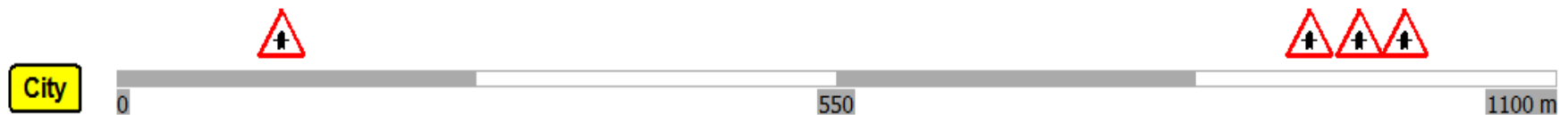
What is an Electronic Horizon?

1. Find current position
2. Find all possible paths
3. Calculate probabilities

Electronic Horizon

4. Starting from current position, follow highest probable path

Most Probable Path



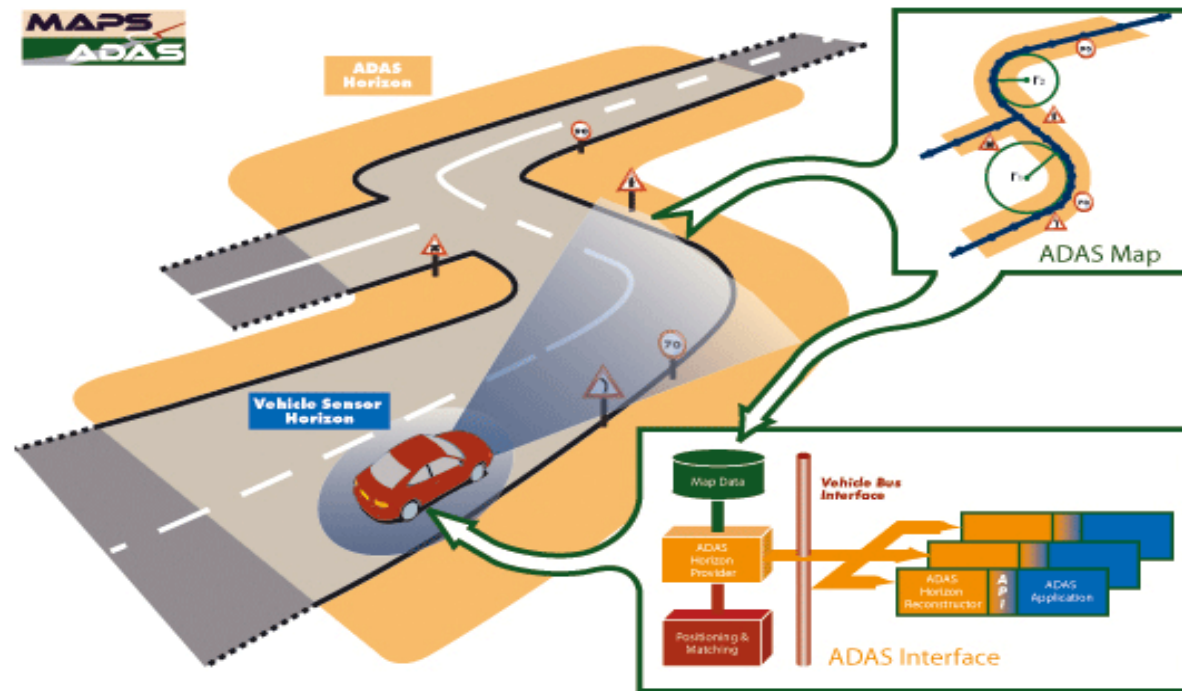
Electronic Horizon

Data structure containing:

- ✓ *Vehicle position* – location with reference to the map and vehicle dynamics information.
- ✓ *Road network* in front of vehicle including attributes – all potential driving paths from the current position up to a certain depth.
- ✓ *Probabilities* – the driving probability of each path
- ✓ *Route Information* – optional route information to influence the driving probabilities dynamically.

Other names:

- ADAS Horizon
- ADASIS Horizon
- Extended Driver Horizon
- eHorizon

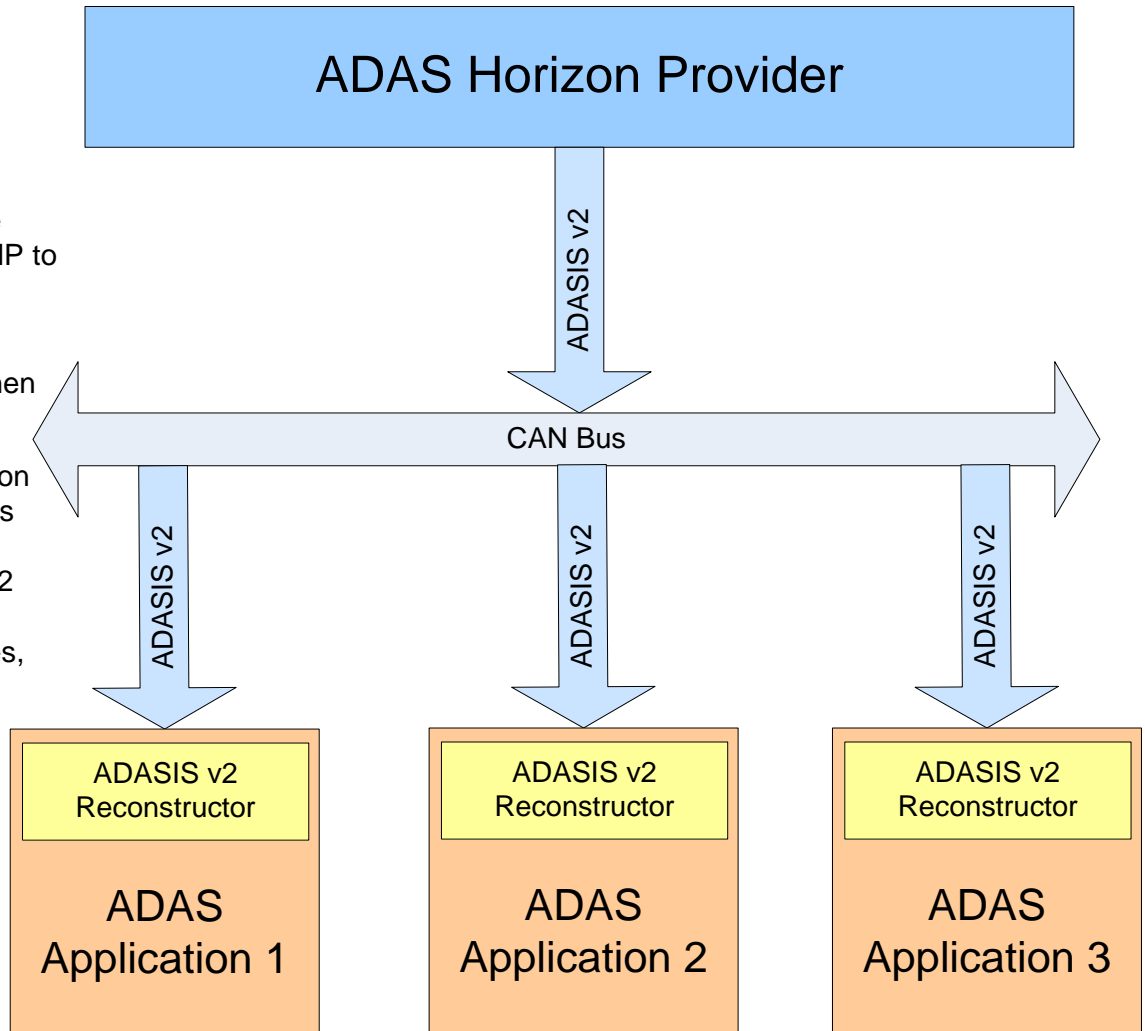


ADAS Interface Specification (ADASIS) Forum

- ▶ Initiated by Navteq in May 2001
- ▶ Goals:
 - Define an open standardized data model and structure to represent map data in the vicinity of the vehicle position (i.e. the ADAS Horizon), in which map data are delivered by navigation and/or by a general map data server
 - Define open standardized API(s) to enable ADAS applications to access the electronic horizon and position-related data of the vehicle
- ▶ http://www.ertico.com/en/activities/safemobility/adasis_forum.htm#www.ertico.com/adasisforum
- ▶ A.D.C. GmbH, AISIN AW, Alpine, Autoliv, Blaupunkt, BMW, DaimlerChrysler, Denso, Ford Research Center Aachen, Hella, Honda, Intermap Technologies, Michael Sena Consulting AB, Mitsubishi Electric Automotive Europe, Navigon, Navteq, Nissan, Opel, PSA, Renault, Robert Bosch, Scania, Siemens VDO Automotive, Tele Atlas, Toyota Motor Corporation, Visteon, Volkswagen, Volvo Technology Corporation (VTEC), Volvo Car Corporation, Zenrin Europe BV

ADASIS v2 Reference Architecture

1. **ADASIS v2 Horizon Provider (Av2HP)** -- maintains the ADASIS v2 Horizon;
2. **ADASIS v2 Protocol (Av2)** -- defines how the ADASIS v2 Horizon will be sent from the Av2HP to the ADAS Applications;
3. **ADAS Application** -- a client application that receives the ADASIS v2 Protocol messages then reconstructs and uses the ADASIS Horizon;
 - **ADASIS v2 Reconstructor** -- a common component of ADAS Applications that is built in accordance with this general architecture. The task of the ADASIS v2 Reconstructor is to receive, parse and interpret ADASIS v2 Protocol messages, and, in effect, reconstruct a copy of the ADASIS v2 Horizon on the client side.



Two Modules and Three APIs

1. Message Codec

- Decodes messages and takes care about path index/path id conversion and offset conversions

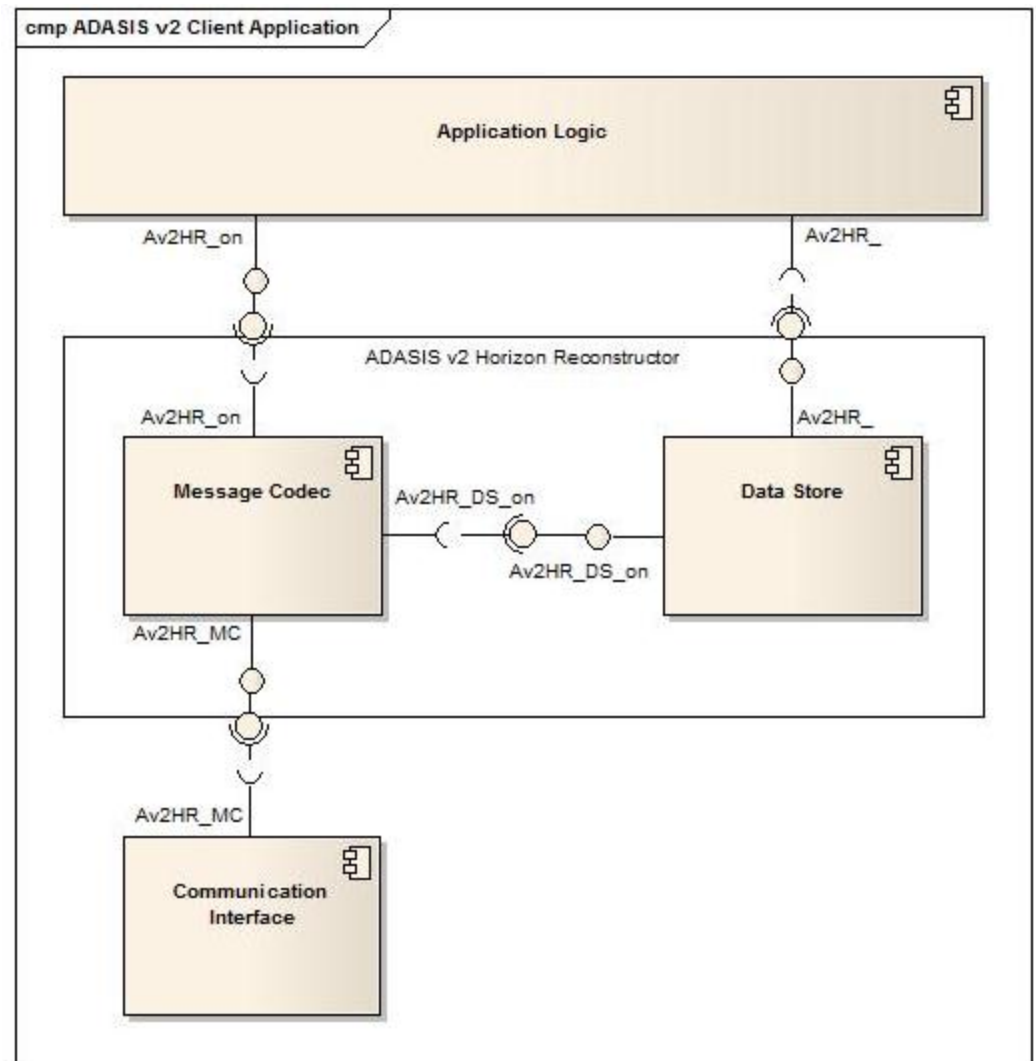
2. Data Store

- Reconstructs and keeps track of ADASIS v2 Horizon

1. Message Codec API (MC-API)

2. Event API (Ev-API)

3. Data Store API (DS-API)



EH, ADAS IN GENIVI

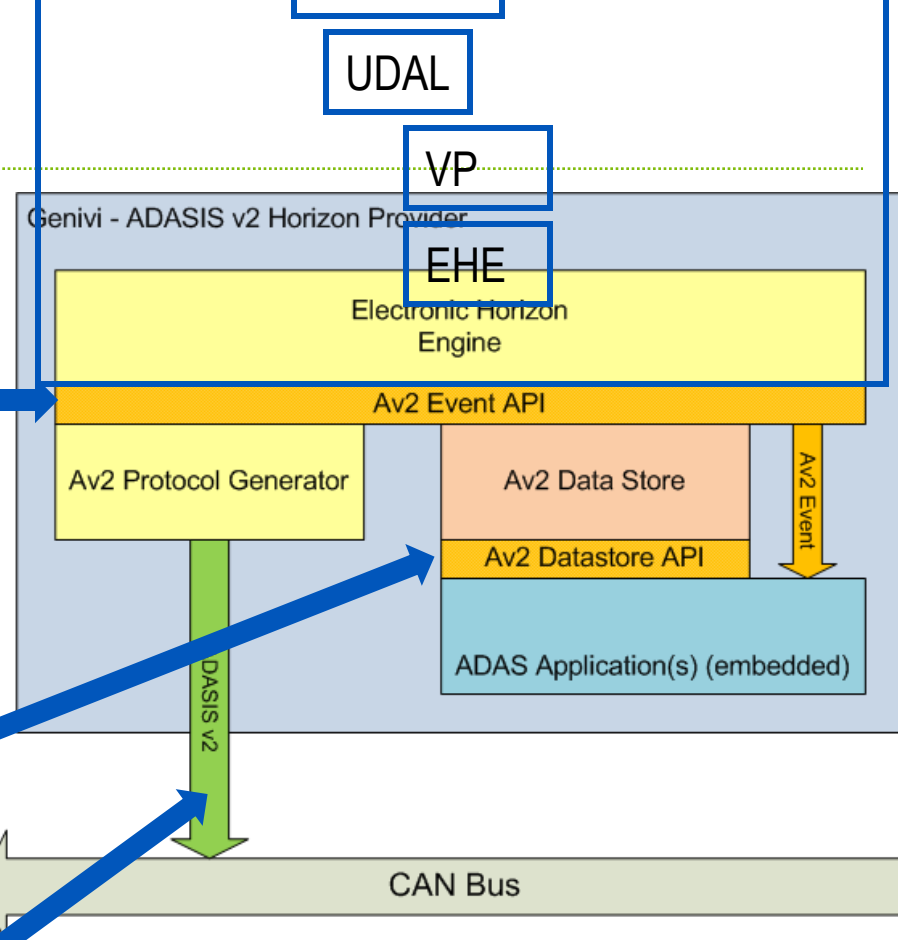
ADASIS v2 in Genivi – Rationale

- ⦿ Map-enabled/map-enhanced ADAS slowly but surely finds its place in modern cars
 - ▶ BMW 7: Speed Limit Warning
 - ▶ Audi A8: Adaptive Front Lighting
 - ▶ Future developments: Ghost Driver Warning, Curve Speed Warning, Intelligent ACC, Green Driving, ...
- ⦿ ADAS applications will play even more important role in Electric Vehicles, where every Watt counts
- ⦿ Insurance companies discovered ADAS-type of applications (Pay-as-you drive)
- ⦿ ADAS as extension of Navigation System most important differentiator between in-dash and PND and other mobile devices

ADASIS v2 in Genivi

System shall expose the following interfaces:

- ▶ ADASIS v2 Event API
 - ▶ Base for ADASIS v2 Protocol Generator for CAN
 - ▶ Base for ADASIS v2 Data Store that will provide API for embedded ADAS applications
- ▶ ADASIS v2 Datastore API
 - ▶ To be used by embedded ADAS applications
- ▶ ADASIS v2 CAN Protocol
 - ▶ To be used by ADASIS client applications



Proposed Next Steps

- ▶ Review (and Refine Requirements) for ADAS EH
- ▶ LBS EG to adopt ADASIS Interfaces
 - ▶ ADASIS Event API, ADASIS Data Store API, ADASIS CAN Protocol
- ▶ Assess and Define Dependancies
 - ▶ Map Access (e.g. Common data access layer using NDS database)
 - ▶ Positioning Data
- ▶ Define implementation approach
 - ▶ E.g. use existing implementations, e.g. NAVTEQ EH Provider Engine
 - ▶ Provide interfaces and implementations of dependant components (Map, Position)
- ▶ Define maintainance approach
 - ▶ Discussion required

BACKUP

ADASIS v2 in Genivi

