

DAIMLERCHRYSLER



Vehicle IT and Services Research

Berlin · Stuttgart · Ulm · Palo Alto

driving connectivity

International Initiatives Europe in Comparison to USA and Japan

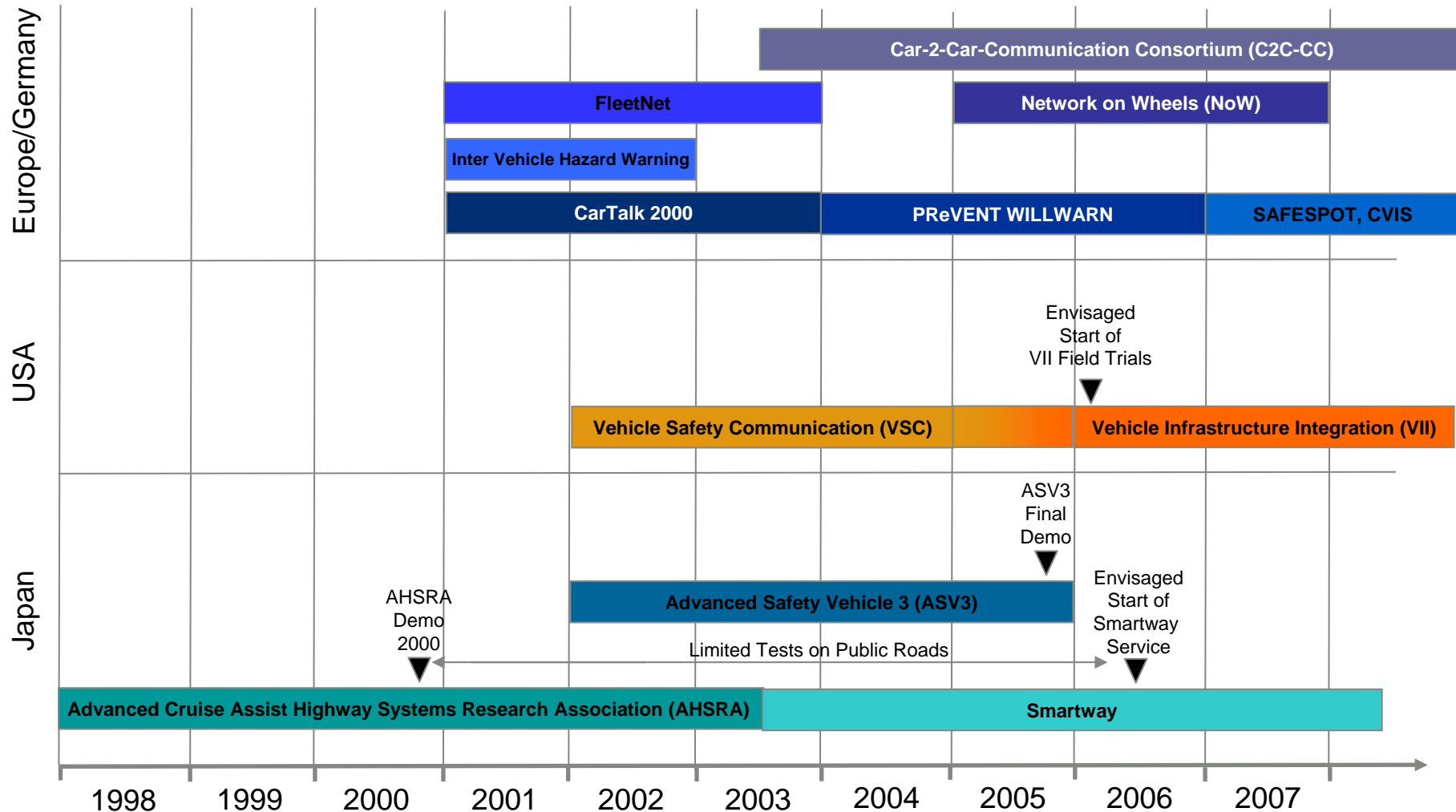
Matthias Schulze

Telematics Functions
(REI/VF)

28. Februar 2006



Vehicle Safety Communication in USA, Japan and Europe





US Story: VII (Vehicle Infrastructure Integration) Program

US Government

- In 1999 US Government allocated Dedicated Short Range Communication (DSRC) spectrum exclusively for automotive use with the primary purpose of safety use (wording from FCC document).
- US DOT, Federal Highway Administration issued a Request for Application **Number DTFH61-05-RA-00102** on June 16, 2005 for “Vehicle Infrastructure Integration Program” It is expected to announce funding of approximately 50 million dollars for VII field trials starting in late 2005 or early 2006.
- US DOT is also expected to fund related projects e.g. Cooperative Intersection Collision Avoidance System (CICAS) & ‘Vehicle to Vehicle (V2V)’.

OEMs

- Since 2002 BMW, DaimlerChrysler RTNA, Ford, General Motors, Nissan, Toyota and VW have worked together in the Vehicle Safety Communication (VSC) Consortium on the development of DSRC standards, protocols and applications.
- In 2004 the VII Consortium was formed. CG is a member of the VII Consortium.



US Story: VII Applications

VII applications comprise a variety of DSRC-based public sector applications primarily in the area of safety, operations and maintenance. OEM and other commercial applications not interfering with the primary purpose of DSRC are also supported.

- **Public Sector Applications:**

- **Safety:** The primary motivation for VII is to improve highway safety. The majority of priority public sector applications fall under this category. Safety applications include active safety warning system applications, crash and incident response applications, advance warnings of hazards, and data collection to improve traffic and roadway safety.
- **Operations:** Public agencies are constantly seeking ways of moving traffic more safely and efficiently. VII offers the promise of providing traffic managers with speed data that they can use to paint an accurate picture of current conditions on all freeway and major arterial routes. Using that data to inform drivers and manage traffic flow can increase the efficiency of the road infrastructure.
- **Maintenance:** The leverage of vehicle sensor data such as light level, temperature, wiper activations, and ABS and traction control enable highway maintenance managers to make more timely and cost effective decisions regarding road treatments and crew deployments thus saving lives and preventing injuries while maximizing resource utilization.

- **OEM and other Commercial Applications:**

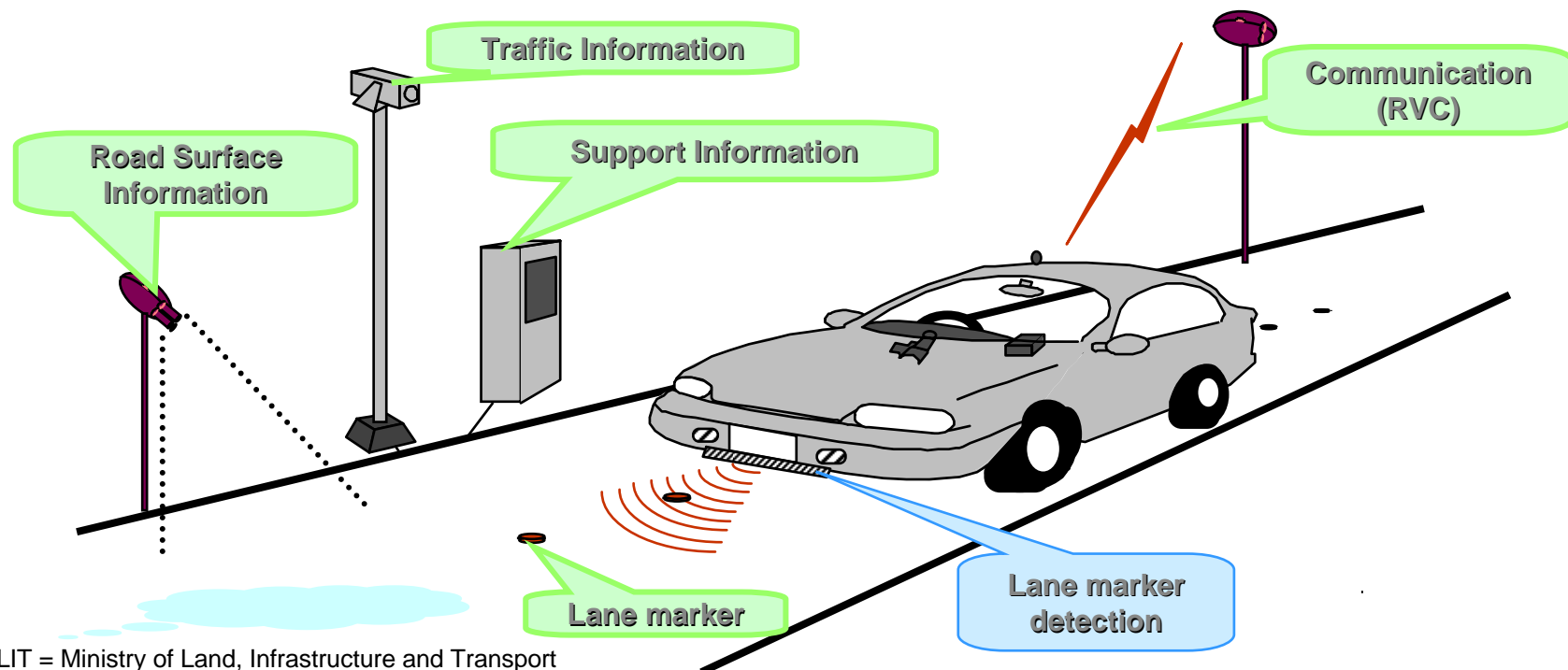
- Wireless Electronic Payments (e.g. Electronic Toll Collection)
- Vehicle Relationship Management (Quality and Maintenance Applications, Remote Diagnosis, Dealer Service Applications, Engineering Support, ...)
- Wireless Digital Content Delivery (e.g. Digital Map Updates)



Japan Story: Japanese MLIT* Programme „AHSRA“

Advanced Cruise Assist Highway Systems Research Association (AHSRA)

Development, test and implementation of new vehicle and infrastructure based systems in order to improve active safety through vehicle-infrastructure co-operation





Japan Story: Japanese MLIT* Programme „AHSRA“

Advanced Cruise Assist Highway Systems Research Association (AHSRA)

Purpose:

- Development of car to infrastructure communication based driver information and warning system with information collection by infrastructure sensors

Status:

- Start in autumn 1997
- Demonstration of feasibility in December 2000 at AHSRA Demo 2000
- Limited tests on public roads at various spots in Japan between 2001 and 2005
- Gradual transition from AHSRA to Smartway, AHSRA continues to exist as co-ordination body for Smartway

Conclusion:

- AHSRA Approach needs comprehensive infrastructure equipment of roadside and is not feasible in other countries, but proved to be promising for Japan, where a lot of usable infrastructure is already existing.

* MLIT = Ministry of Land, Infrastructure and Transport



Japan Story: Japanese MLIT Programme „Smartway“

- Four goals of Smartway: reversing the negative legacy of motorization; ensuring mobility for the elderly; developing affluent communities and lifestyles; and improving the business climate.

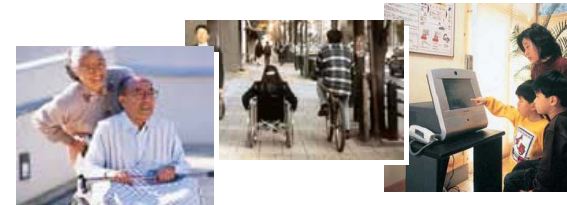
Goal

Society of smart mobility

Reversing the negative legacy of motorization



Ensuring mobility for the elderly



Developing affluent communities and lifestyles



Improving the business climate

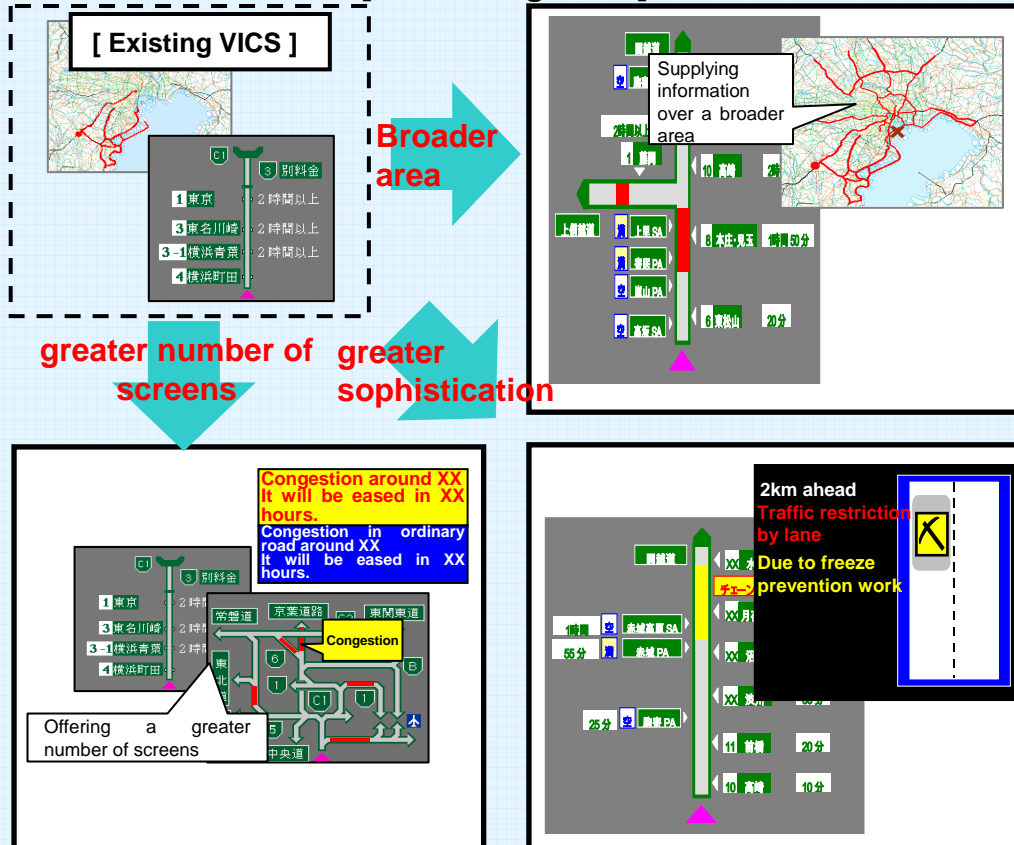




Japan Story: Timely Driver Information – The Smartway Concept

- Improving safety by providing various information instantly while driving
- Enhancing the existing VICS services
- Establishment of infrastructures such as roadside units based on international standards and multi-modal application of on-board units

[Enhancing VICS]



[Notification when approaching a congested section]



[Information on locations with frequent accidents]



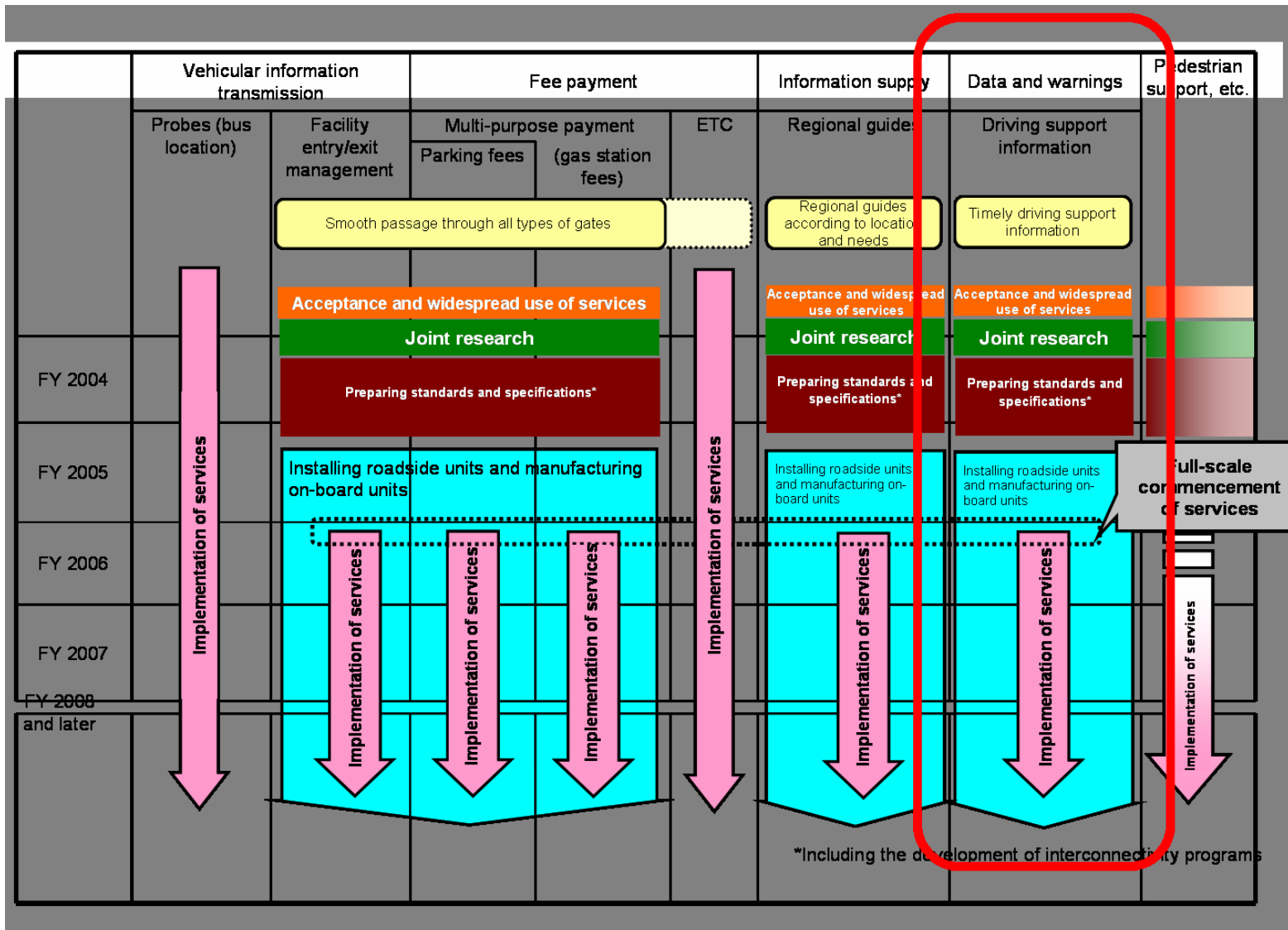
[Support for safe driving on curves]



Testing a curve entry warning system (Sangubashi, Metropolitan Expressway)



Japan Story: Smartway Deployment Scenario





Japan Story: Japanese MLIT* Programme „Smartway“

Purpose:

- Development of „Smartway“ service based on car to infrastructure communication at 5.8 GHz, combining ETC, e-payment services, VICS (Vehicle Infrastructure Communication System) traffic information and communication based driver information and warning in one onboard unit (OBU)

Status:

- Smartway driver warning system successfully tested in field trials on public roads in 2004 and 2005
- Smartway production OBU presented to the public officially on February 23 and 24, 2006
- Smartway driver information and warning service operational in Summer 2006

Conclusion:

- Benefiting from already existing ETC and VICS communication infrastructure Smartway could become the first operational communication based driver information and warning system in the world!

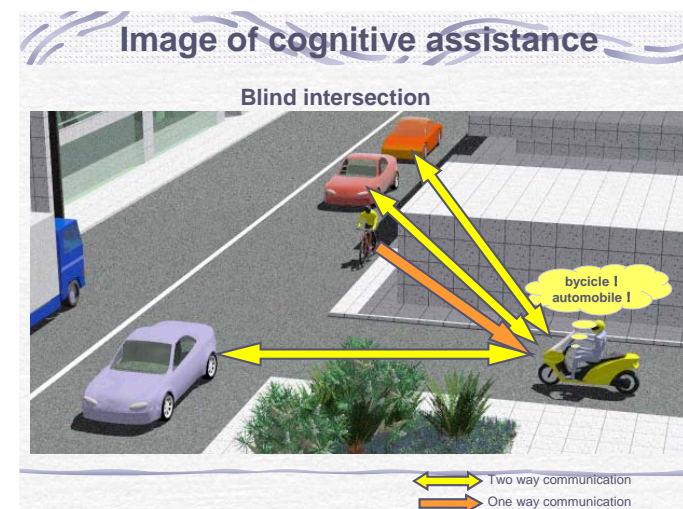
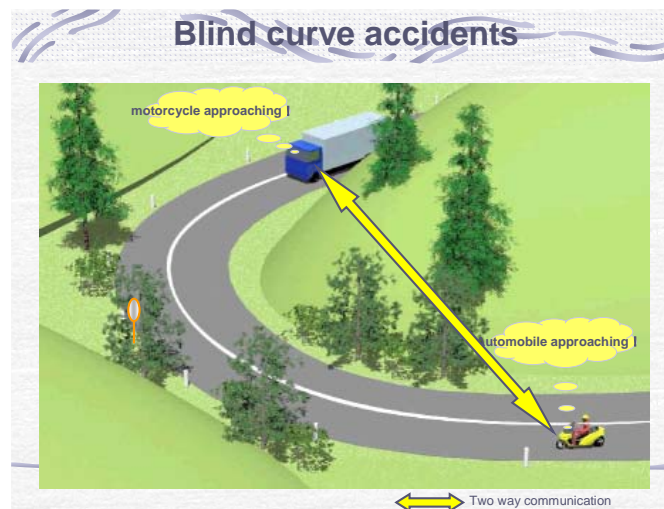
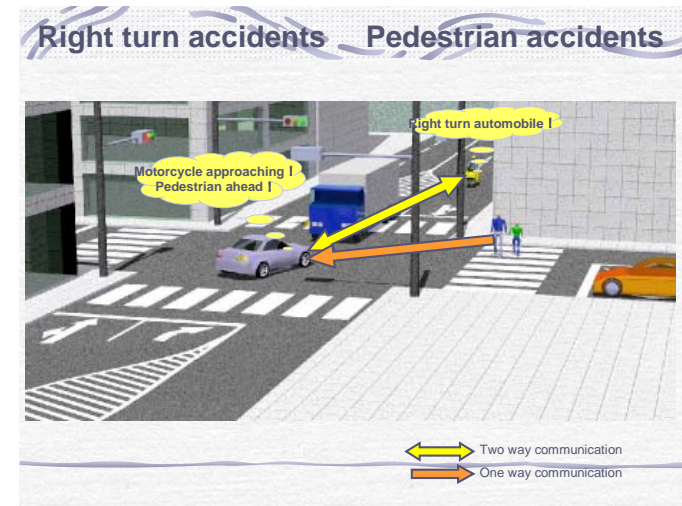
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Japan Story: Japanese MLIT* Programme „ASV3“

Advanced Safety Vehicle Research Program 3:

- Focusses on direct communication between vehicles
- Infrastructure-based communication used for augmentation (already investigated in earlier projects; DSRC infrastructure exists)
- Japanese OEMs have rapidly turned prototypes from ASV-1 and ASV-2 into initial products



* MLIT = Ministry of Land, Infrastructure and Transport



Japan Story: Japanese MLIT* Programme „ASV3“

Purpose:

- Development of car to car communication based driver information and warning system

Status:

- Demonstration of project results on test track in Hokkaido in October 2005
- Public road tests planned for 2008
- Begin of market introduction envisaged for 2010

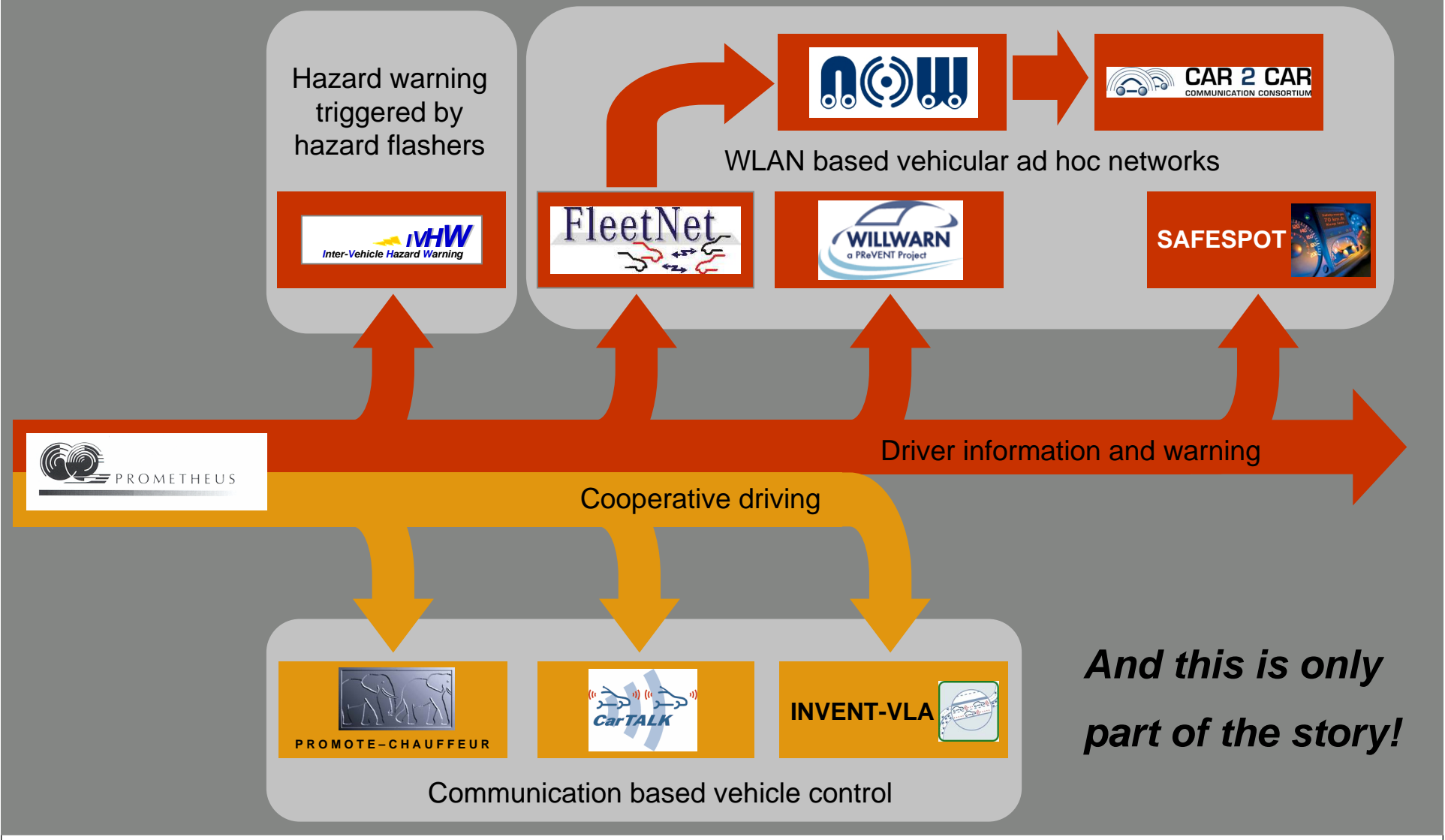
Conclusion:

- In the past work in ASV soon lead to MLIT approved design guidelines (emergency braking, parking aid) and the same can be expected for the VSC systems realised in ASV3. Nevertheless, the planned date for market introduction seems quite unrealistic.

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European Story: Various Initiatives





Comparison USA, Japan and Europe

USA

Plus

- Dedicated frequency available
- Strong governmental support
- One clearly focussed project

Minus

- Limited number of partners

Japan

Plus

- One major activity
- ETC technology as basis
- Strong governmental support

Minus

- Unclear responsibilities due to too many players
- Somewhat reluctant OEMs

Europe

Plus

- Strong support by European Commission and by some national governments
- OEM driven

Minus

- No dedicated frequency yet
- 25 countries instead of one
- Way too many activities, projects and players, which compete instead of co-operate



Conclusions for Europe

- Bring together national and European activities
 - Do not set up additional **competing activities**, adjust existing ones
 - Support **COMeSAFETY** and **eSafety Working Group Communication**
 - Co-operate with **Car 2 Car Communication Consortium (C2C-CC)**
- Focus future activities on **implementation instead of applications**
 - Identify **additional players** necessary for implementation (e.g. network operators, telecommunication companies,...)
 - Develop **viable business plan** taking into account the needs of all parties involved
 - Select most promising applications
- Agree on **one viable solution for communication technology**, that is cheap and available instead of working on highly sophisticated technology, that will never come.