4. 付録（APPENDEX）

4.2 地図利用走行支援（Digital Road Map for Advanced Driver Assist Systems） ：U.S.A.

CAMP

Enhanced Digital Maps Consortium

DAIMLERCHRYSLER Research and Technology North America, Inc. | GM | TOYOTA Toyota Technical Center, USA, Inc. | Ford | NAVTEQ

IVI Light Vehicle Enabling Research Program

Enhanced Digital Map

US – Japan ITS Workshop

19 Oct, 2004

James P. Foley, Ph.D.
Mitretek

ITS U.S. Department of Transportation

INTELLIGENT VEHICLE INITIATIVE

1

Enhanced Digital Maps

- Develop map database specifications that enable or improve driver safety assistance systems
- Evaluate the feasibility and commercial potential for advanced map databases

2

Safety Focus

- Map database developers need coordinated input for development of safety focused databases
  - Reliability requirements for safety focused applications are greater than for basic navigation

3

Determination of EDMap Candidate Applications

- A set of 12 applications having high safety potential was established
- Criteria based on potential safety benefits and estimated market penetration
- The EDMap Applications are either enabled or enhanced by information derived from map database information (mapplets)

4

Mapplet Requirements

- Near term mapplet requirements are a superset of currently planned map database enhancements.
- Mid term mapplets specify **lane** level instead of **road** level geometry and attributes. This is a significant change over the near term database.
- Long term mapplets are similar to that of the mid term, but have higher accuracy constraints.

5

Demonstration Goals

- Exercise map enabled or enhanced applications with on-road vehicle tests.

- Five applications were demonstrated:
  - Lane departure warning
  - Forward collision warning
  - Stop sign warning&control
  - Curve speed warning&control
  - Traffic signal warning
- Two levels of map capabilities were demonstrated:
  - RoadLevel – Vehicle matched to a road (like today's navigation systems)
  - LaneLevel – Vehicle matched to the lane of travel

6

Demonstration Applications

- Traffic Signal Assistant – Warning [LaneLevel]
- Lane Following Assistant – Warning [LaneLevel]

Jeep Liberty Test Vehicle

- Stop Sign Assistant - Warning [RoadLevel]
- Stop Sign Assistant - Control [LaneLevel]

Toyota Sienna Test Vehicle

- Curve Speed Assistant – Warning [RoadLevel]
- Curve Speed Assistant – Control [LaneLevel]

Jaguar XKR Test Vehicle

- Curve Speed Assistant – Warning [RoadLevel]
- Forward Collision Warning [LaneLevel]

Buick LeSabre Test Vehicle

7

Delivery Mechanisms to Users

- Current technology: On-board systems, map data stored in the vehicle
  - Prevalent system for navigation today
  - Unlikely to be timely enough for many safety applications
- Future technology: Off-board systems, map data stored in a central server, communicated to vehicle
  - Map delivery provides freshness
  - Requires high-bandwidth communications

8

The Big Picture

- Application and mapplet evaluations led to key optimizations
- Vehicle positioning capability is in the critical path
- The demonstrated EDMap applications provide good basis for the planning and implementation of map enabled safety applications