



In-Vehicle Telematics: Current & Future Directions

Presented By:

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TRG's Presentation Agenda

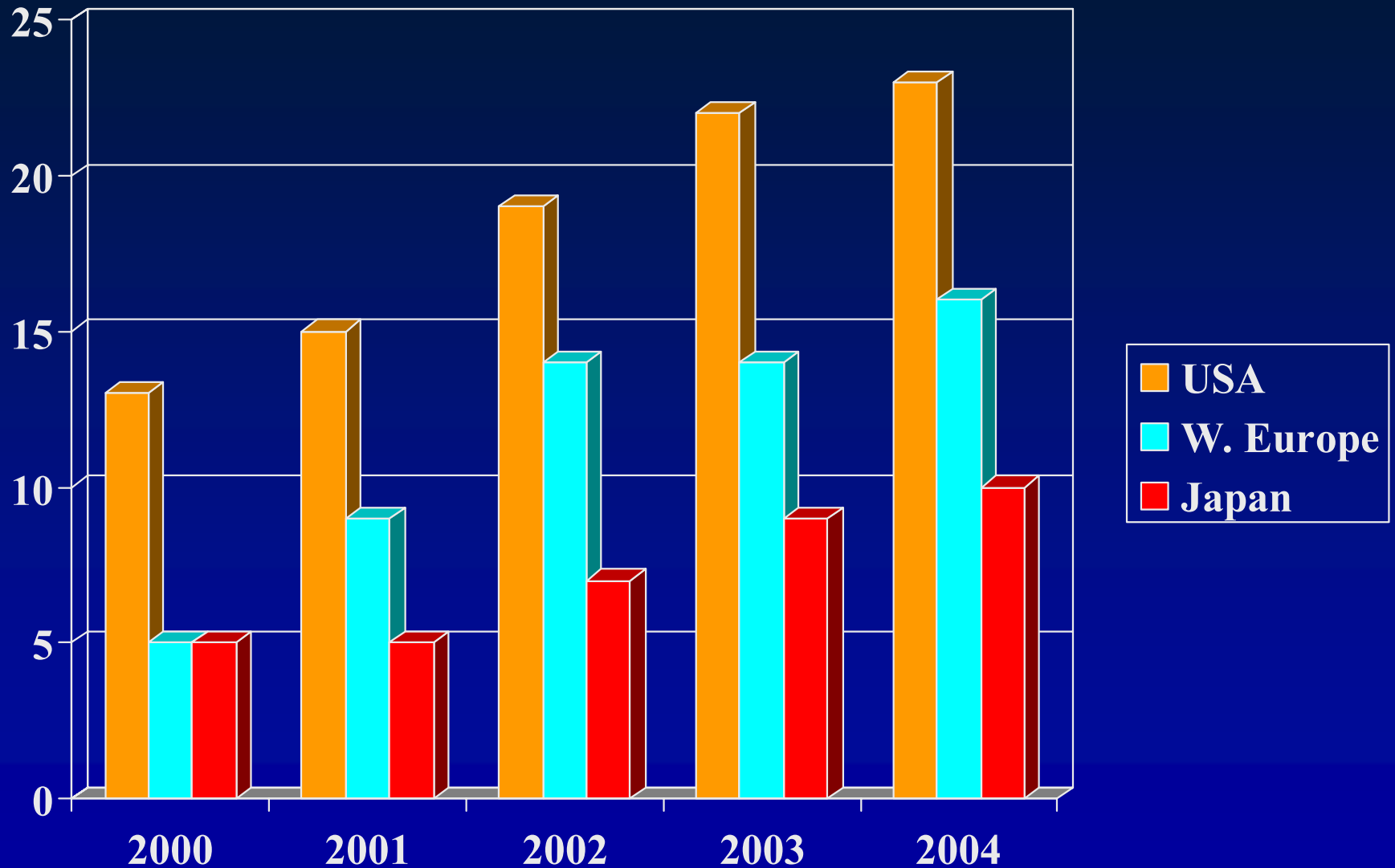
1. Opening Remarks
2. Telematics Global Markets
3. Telematics Perspectives
4. Telematics Product Segmentation
5. The Telematics Hardware Portfolio
6. Telematics, Driver Assist, Active Safety

Telematics Gains Traction!

- OnStar to double output via GM vehicles
- OnStar Introduces Advanced ACN (ACCN)
- Bluetooth Hands-Free Calling emerging rapidly
- Saab introduces phone workload manager
- Honda/Acura debut dynamic traffic solutions
- EU initiatives to standardize E-Call telematics
- Telematics being used for ITS applications

Telematics Availability: Brands

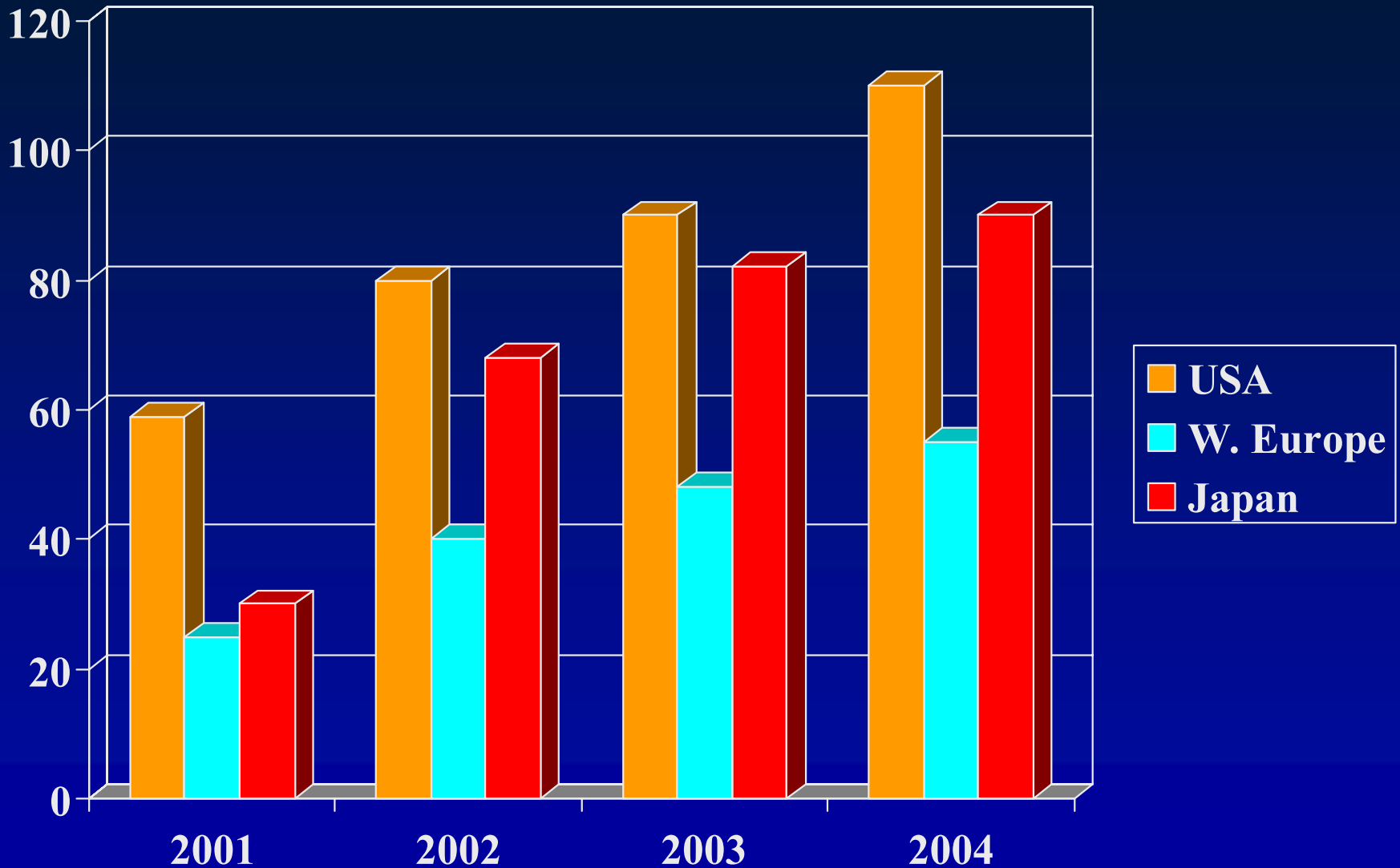
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Source: TRG telematics database

Telematics Availability: Models

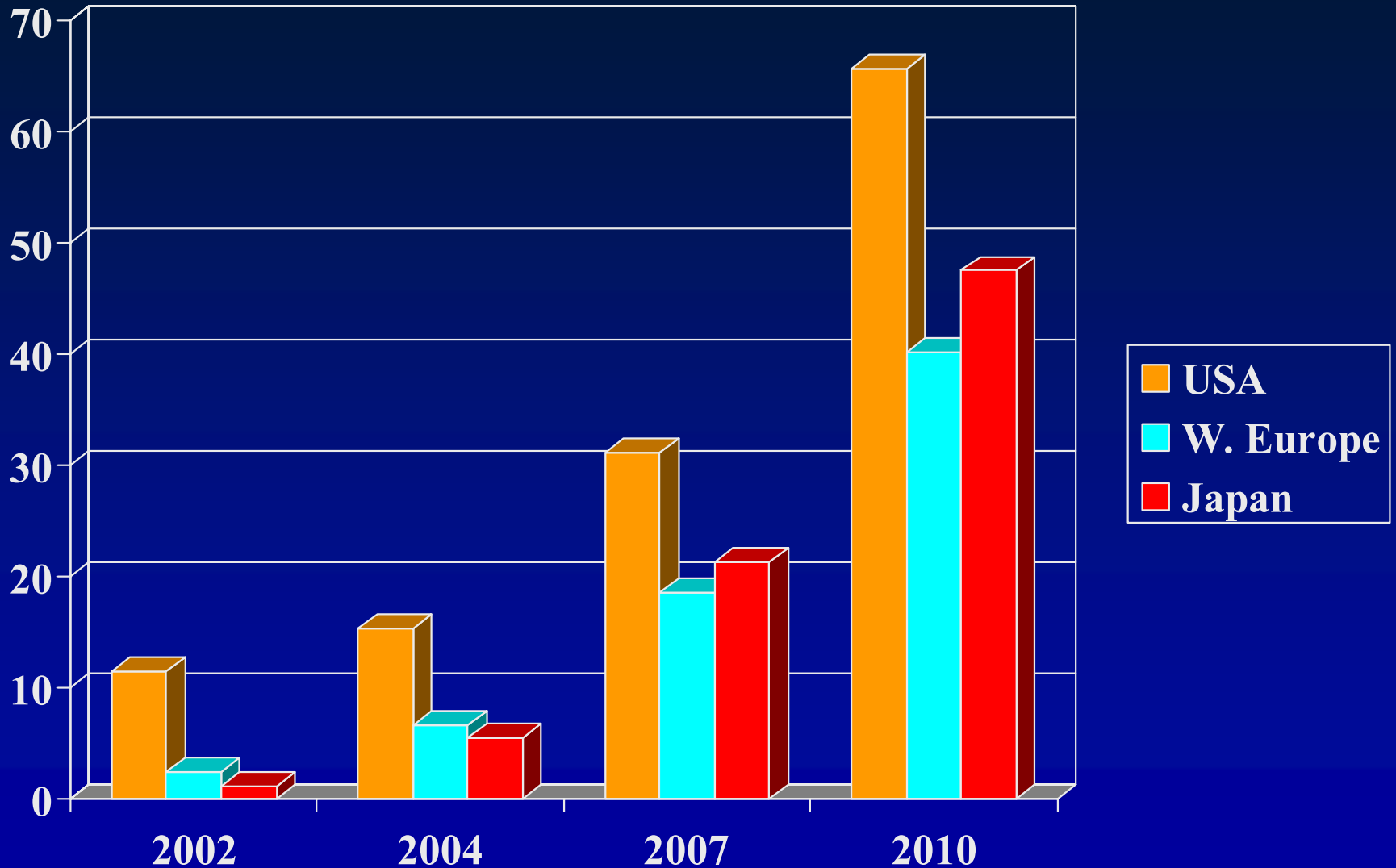
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Source: TRG telematics database

Telematics System Attach Rate

%



Telematics: Industry Perspective

Telematics is about enabling vehicles for wireless services...



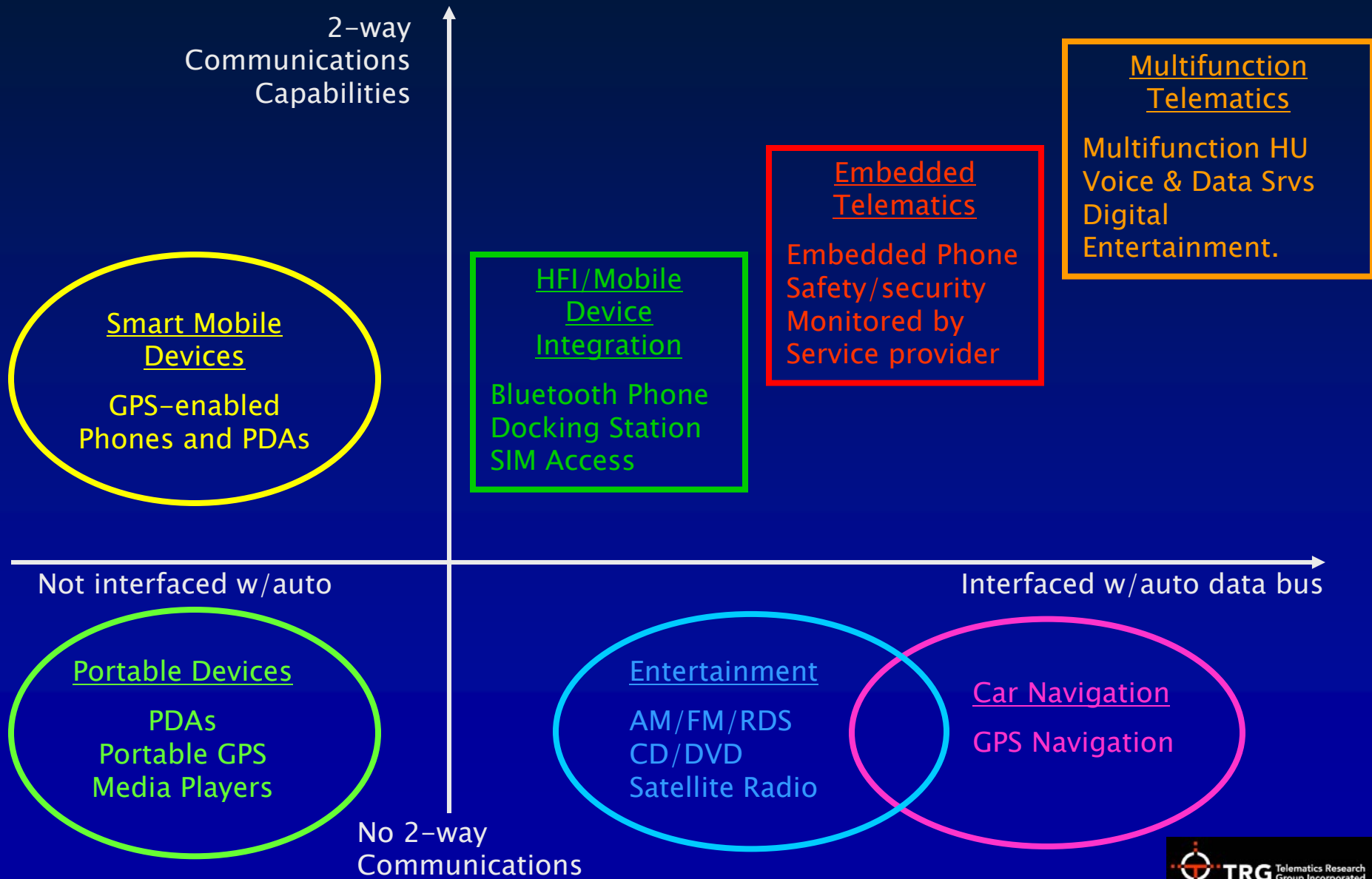
Telematics: OEM Perspective

In-vehicle electronics for information, entertainment, safety, and productivity



The automotive industry is putting more resources into the interior of the car!

Automotive Telematics Landscape



Current Telematics – Embedded Basic Telematics



Current Functions

- Embedded hardware
- Emergency services
- Automatic Collision (ACN)
- Concierge services
- Voice portals
- OEM “line-fitted” solutions

Emerging Trends

- Shared wireless profiles
- Off-Board navigation
- Unbundled Services
- Pay-per-use
- Limited aftermarket solutions

Mobile Device Integration – Mobile Phone



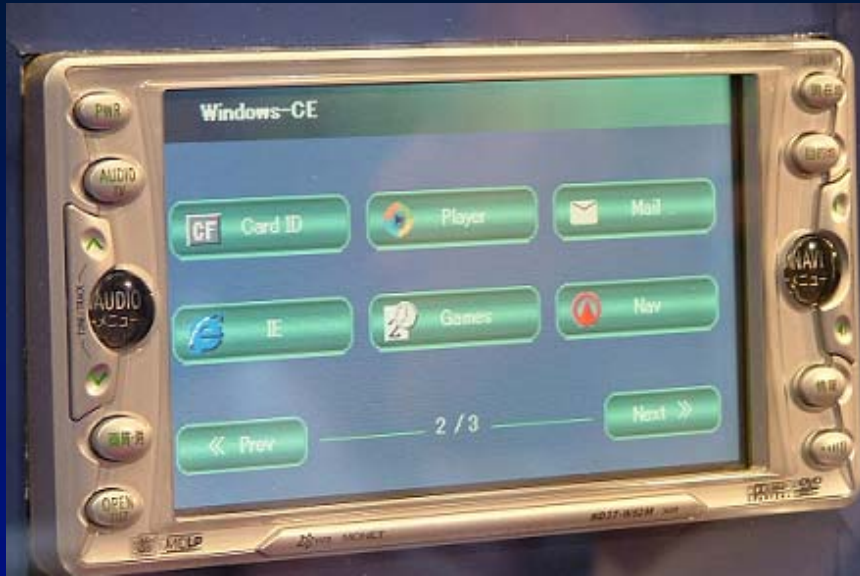
Functions and Features

- In-vehicle phone solutions
- Docking, Bluetooth, SIM
- HFI – Voice Recognition

Emerging Trends

- Increased functions (i.e. mail)
- Voice and data (i.e. audio)
- LBS (i.e. off-board navi)
- Rapid Take-up rates
- OEM and aftermarket solutions

Multifunction Telematics



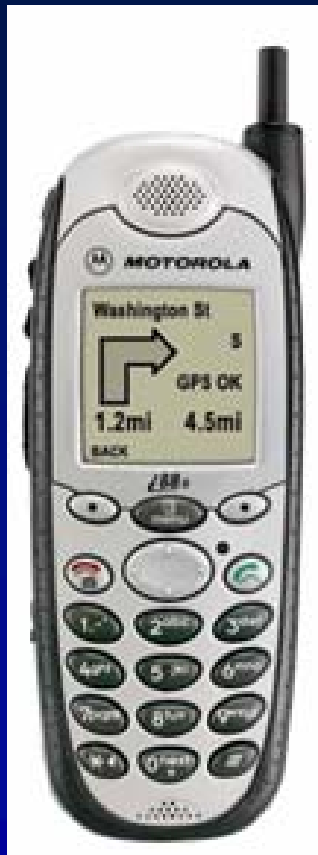
Functions and Features

- Navigation & audio-based systems
- Multiple wireless sources
- Audio, phone, navigation applications
- Voice and data services
- OEM “line-fitted” solutions
- Aftermarket solutions

Emerging Trends

- Off-board services
- Multiple media formats
- Digital entertainment options
- Multiple wireless channels
- Embedded functions
- Bluetooth

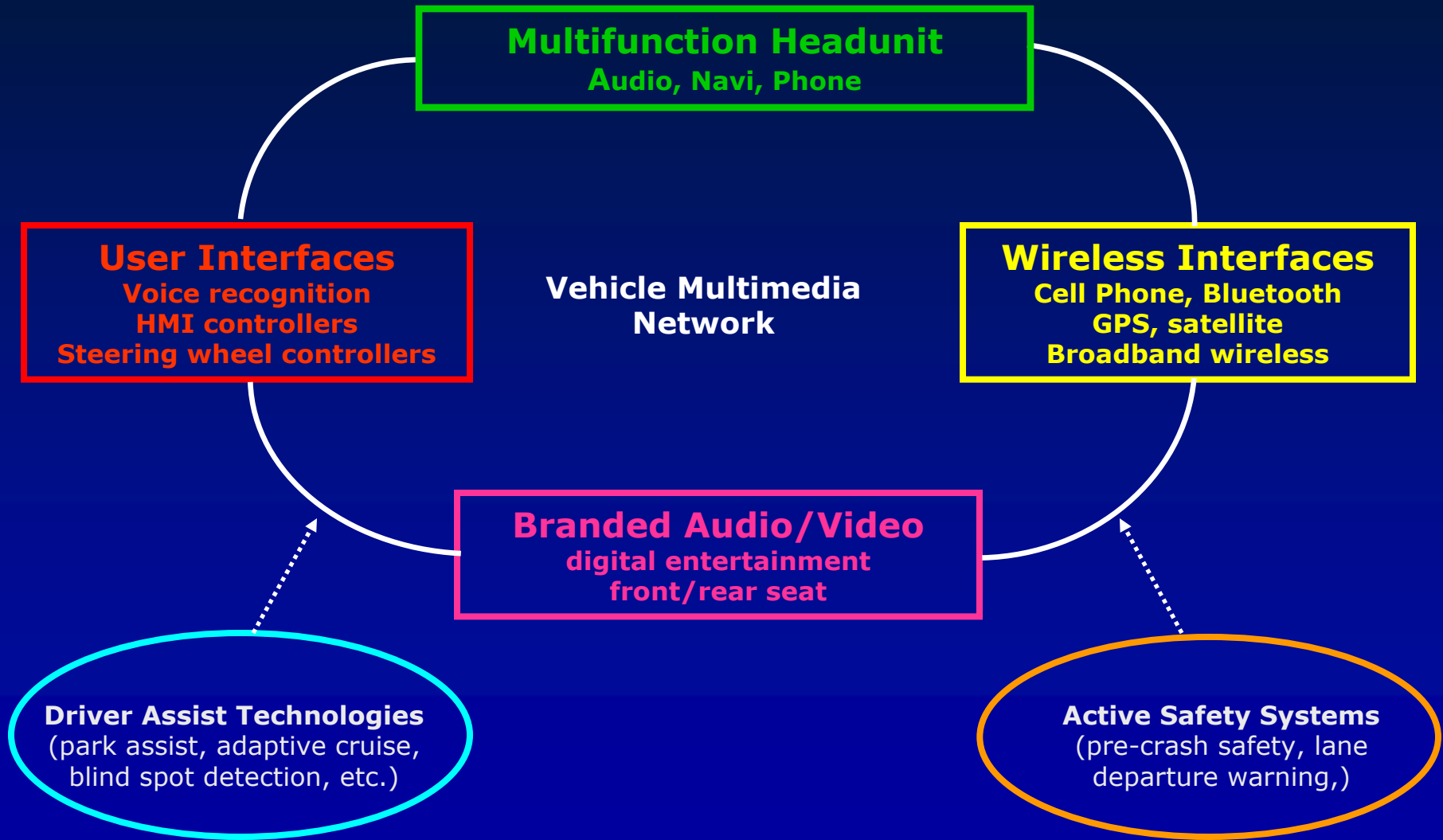
Personal Telematics – Smart Mobile Devices



Characteristics

- Available on “smartphones”
- Go-everywhere Telematics
- Off-board services
- Low-cost solutions
- Voice-based interface
- Aftermarket solutions

The New Telematics Hardware Portfolio



The Digital Car

Summary

Embedded auto electronics need telematics technology for future functionality

Intelligent Vehicles Functions

- Advanced sensor/computer systems
- Driver assist & active safety functions

X-by-Wire or Drive-by-Wire

- Electronics replace mechanics-hydraulics
- Steer-, brake-, throttle- & suspension-by-wire

Diagnostics Software & Systems

- ROM/MPU-based system and inter-system diagnostics
- Self-test, on-board, off-board, remote diagnostics & crash EDR

Chassis & Body Control

- Control of mechanical/electrical/hydraulic systems: brakes, suspension, steering, interior
- ABS, ESP, power steering, AC, wipers, windows, seat, mirrors, air bags, ACN, tire pressure

Engine & Power-Train Control

- Control of mechanical/electrical/hydraulic systems: Engine, transmission and their subsystems
- Spark ignition, electronic/direct fuel injection, control, transmission control, electronic valve control

← 1980 1990 2000 2010 →

Bridging Telematics with the Digital Car



Telematics Services

Personalization



Driver Assist

Digital Entertainment



Future Telematics – Concept Telematics



Future Telematics – Concept Telematics



Trends

- In-vehicle computing concepts
- Driver/passenger control of devices
- Rear seat entertainment
- Rear seat computing
- Rear seat printing!

Telematics -- Summary

- ✓ Hands free interfaces becoming increasingly important for operation of wireless services and other functions within the auto
- ✓ Consumer become increasingly dependant on wireless communication for content and access to services (voice, data, entertainment, safety)
- ✓ Auto electronics systems will need 2-way communication for software upgrades, remote diagnostics and other functions
- ✓ ITS (Intelligent Transportation Systems) applications will need 2-way communication for tracking and incident data
- ✓ Proliferation of mobile devices used within the auto increases (phone, PDA, IPOD, laptop)
- ✓ The value proposition of services improves as more options become available – some specifically designed for mobile devices (i.e. ViaMoto)
- ✓ Conclusion: Telematics technology & application deployment will be widespread by 2010

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