



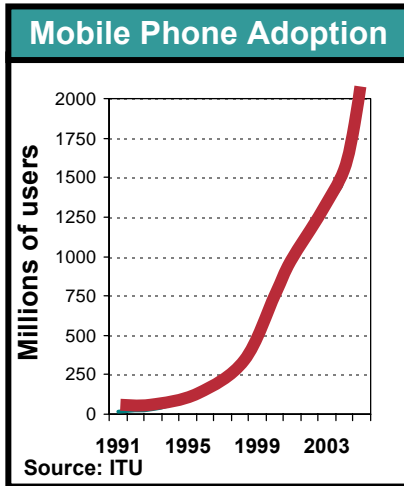
CONNECTED CAR - PARTNERING FOR VALUE

A Cisco Perspective

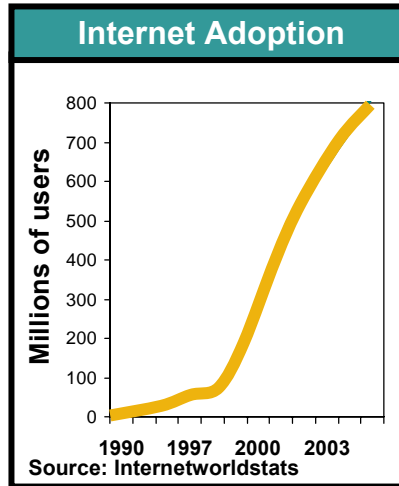
Marc Girardot - IBSG
Director EMEA
Automotive Lead

Geneva, March 1st, 2005

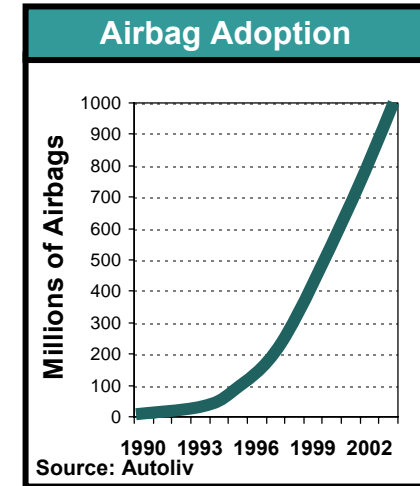
IT'S ALL ABOUT ADOPTION !



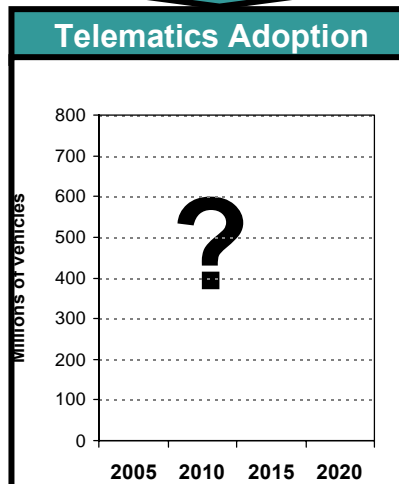
- GSM standard
- Nokia, Ericsson
- Mobility



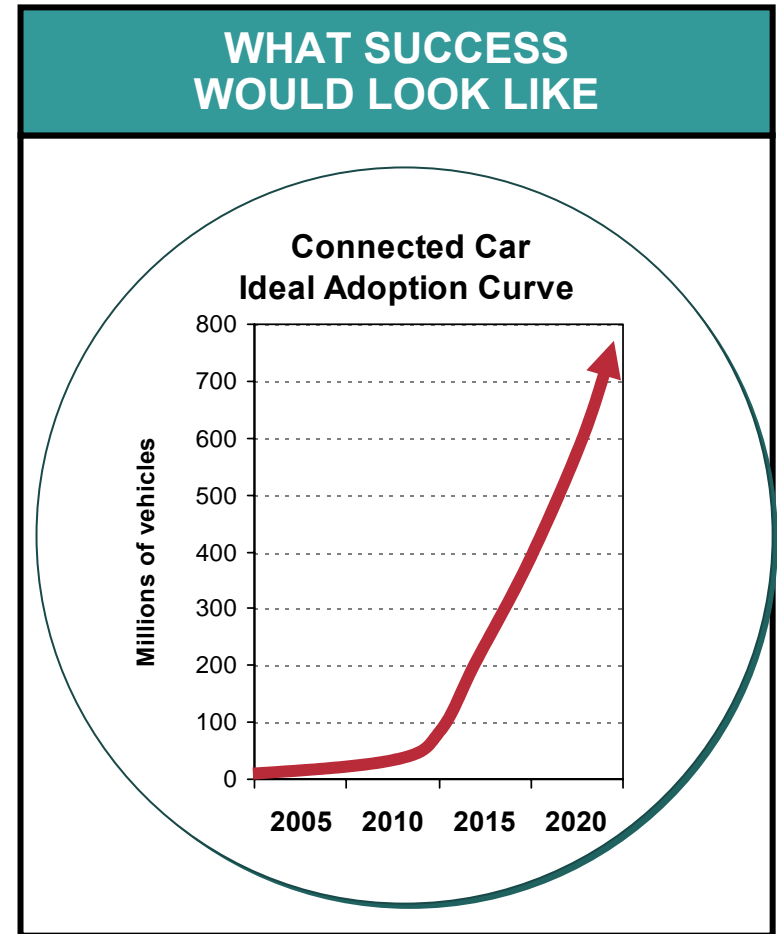
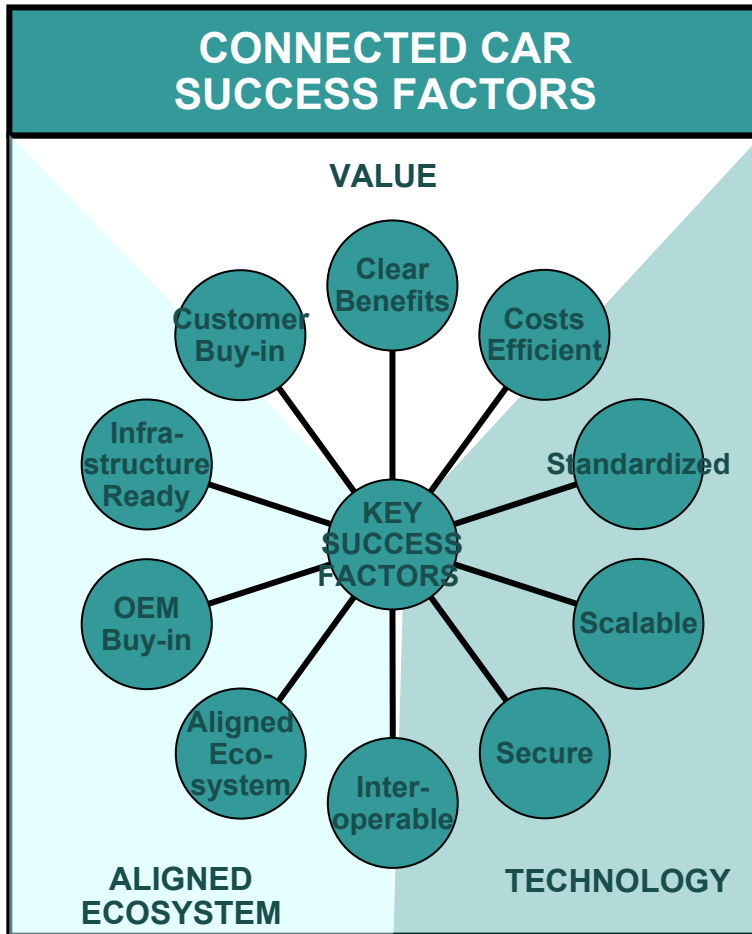
- IP & Ethernet
- Netscape, Microsoft
- Access Information



- NHTSA agreement (87)
- Autoliv, TRW, Takata
- Saves lives



ADOPTION SUCCESS COMES FROM CLEAR BENEFITS, STANDARD TECHNOLOGIES & ECOSYSTEM READINESS



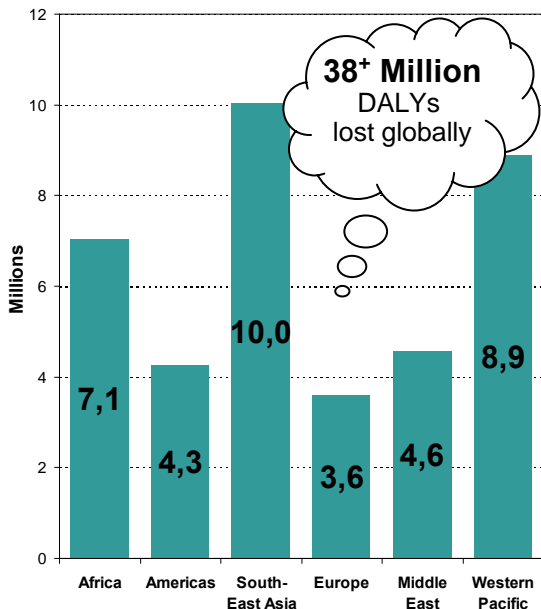


WHERE IS THE CAPTURABLE VALUE?

ROAD INJURIES AND FATALITIES ARE UNBEARABLE BOTH IN HUMAN AND FINANCIAL TERMS

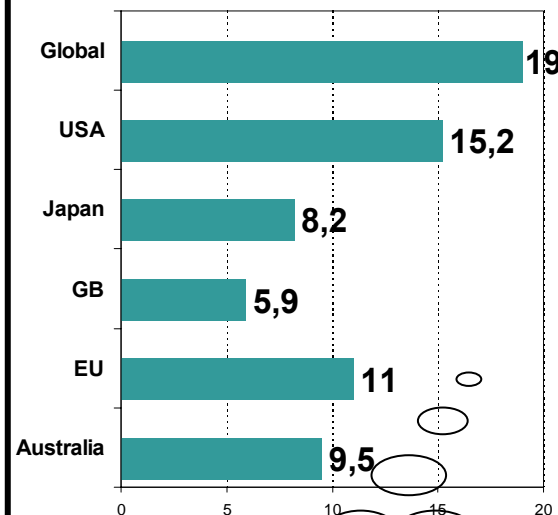
GLOBAL INJURY BURDEN

Disability-adjusted Life Years Lost in 2002



OECD ROAD MORTALITY

Fatality rates per 100,000 inhabitants

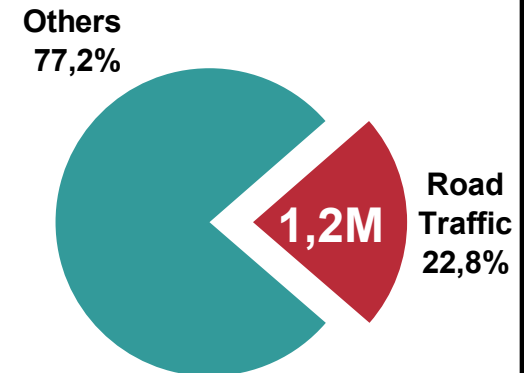


In OECD countries, cost of these fatalities is estimated at

\$450 Billion

GLOBAL ROAD MORTALITY

Distribution of Global Injury Mortality by Cause 2002



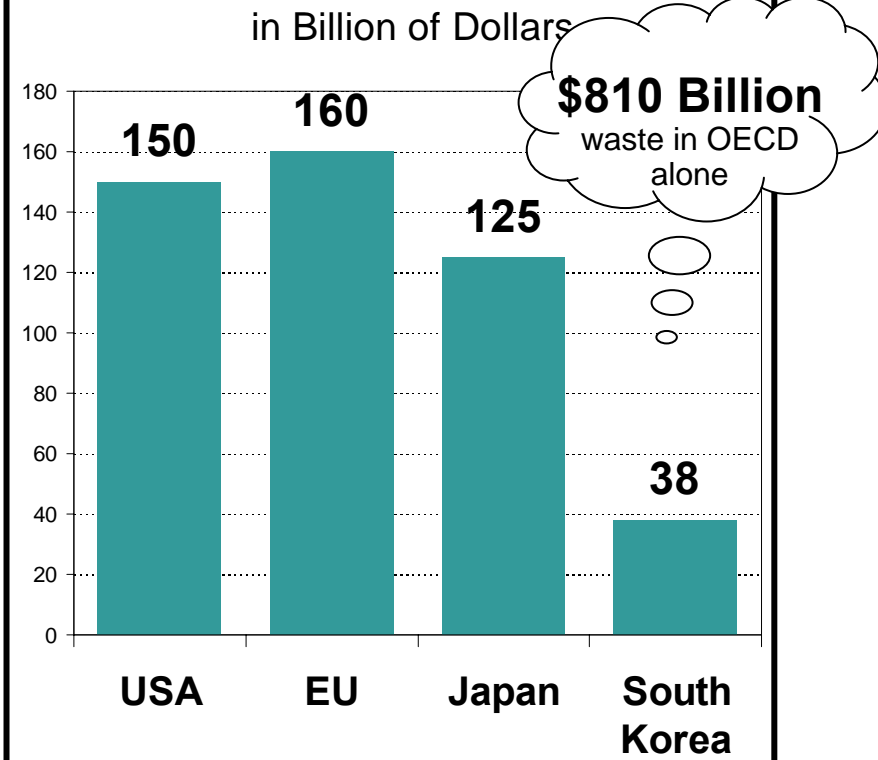
New technologies can reduce fatalities by **40%** OECD estimates

AND ROAD CONGESTION COSTS TO THE COMMUNITY AND THE ENVIRONMENT ARE ENORMOUS

CONGESTION FACTS

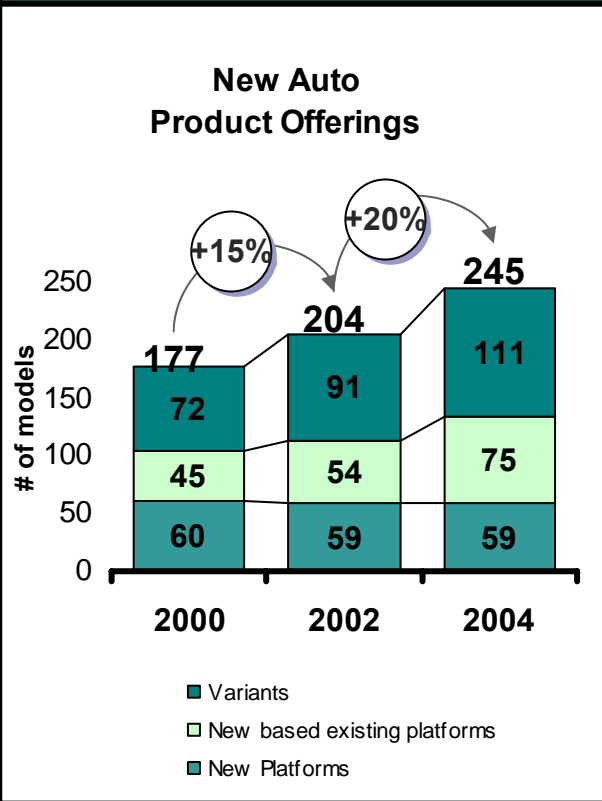
- Average urban motorist in the US spends **46 hours per year in traffic** and in EU countries around **66 hours per year** (30% of their commute time);
- Congestion results in **11+ billion-hours of delay** annually in the US and Japan
- **Fuel consumption** during congestions accounts for **1% of GDP**; the average urban motorist produces 4.9 tons of carbon dioxide a year
- **Time wasted in traffic** in OECD countries accounts for **2% of total GDP**;
- The impact of traffic congestion on the Tokyo economy is estimated at \$50Bn;

CONGESTION FINANCIAL COSTS

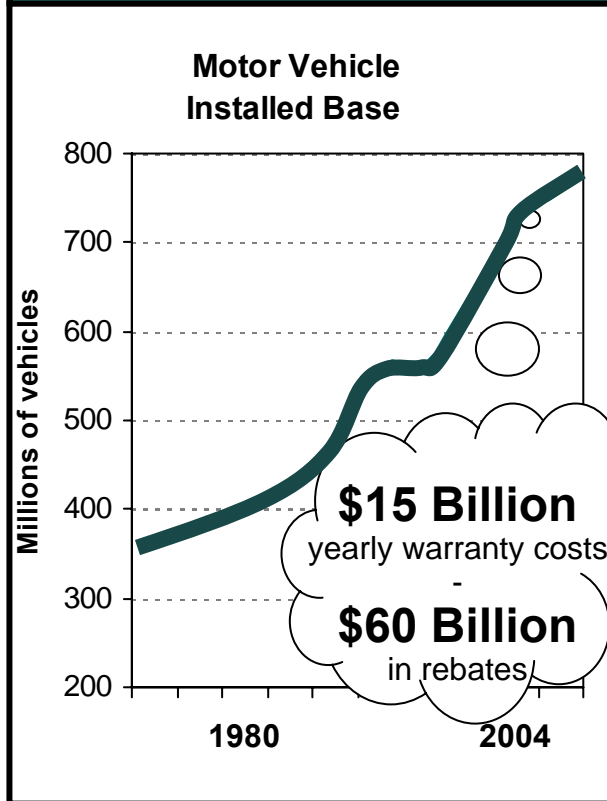


HOWEVER DIRECT BENEFITS/SAVINGS TO THE AUTO SECTOR – REBATES & WARRANTY- ARE MORE LIMITED

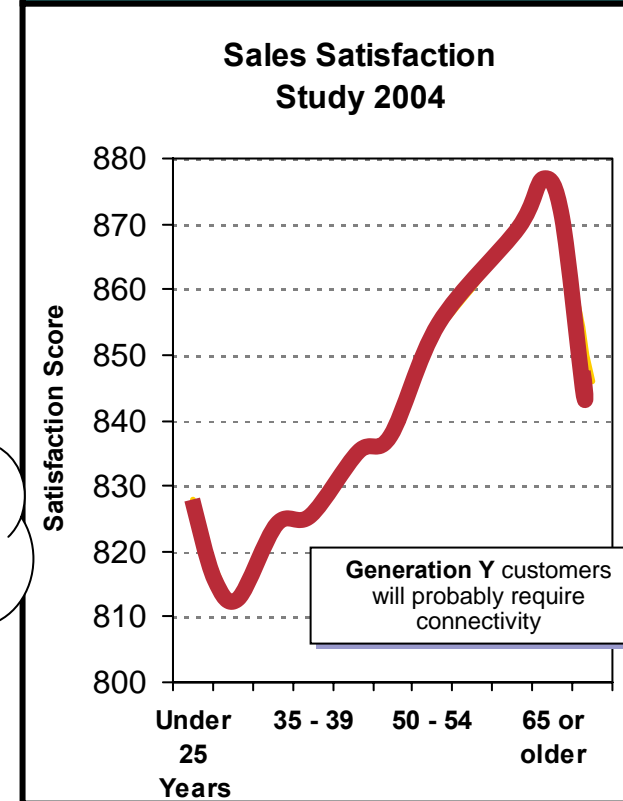
GROWING AUTO DIVERSITY



GROWING INSTALLED BASE



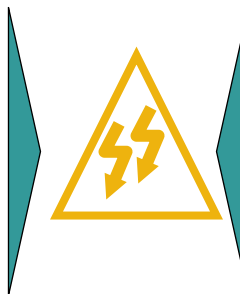
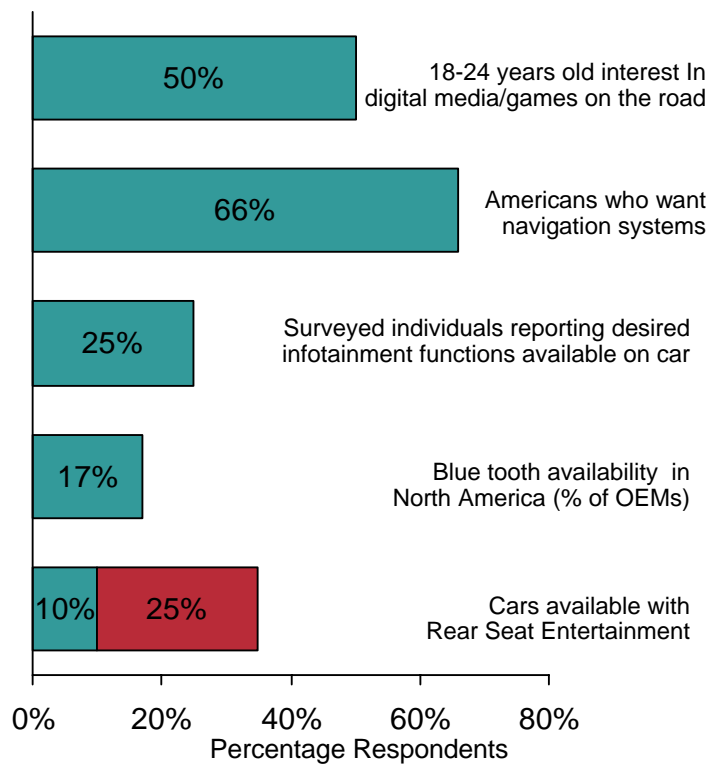
GENERATION Y HARDER TO SATISFY



AND DESPITE INTEREST FOR ENHANCED CAR COMMUNICATION ENABLED FEATURES, THERE'S LIMITED WILLINGNESS TO PAY FROM END-USERS

Cisco.com

CONSUMER INTEREST



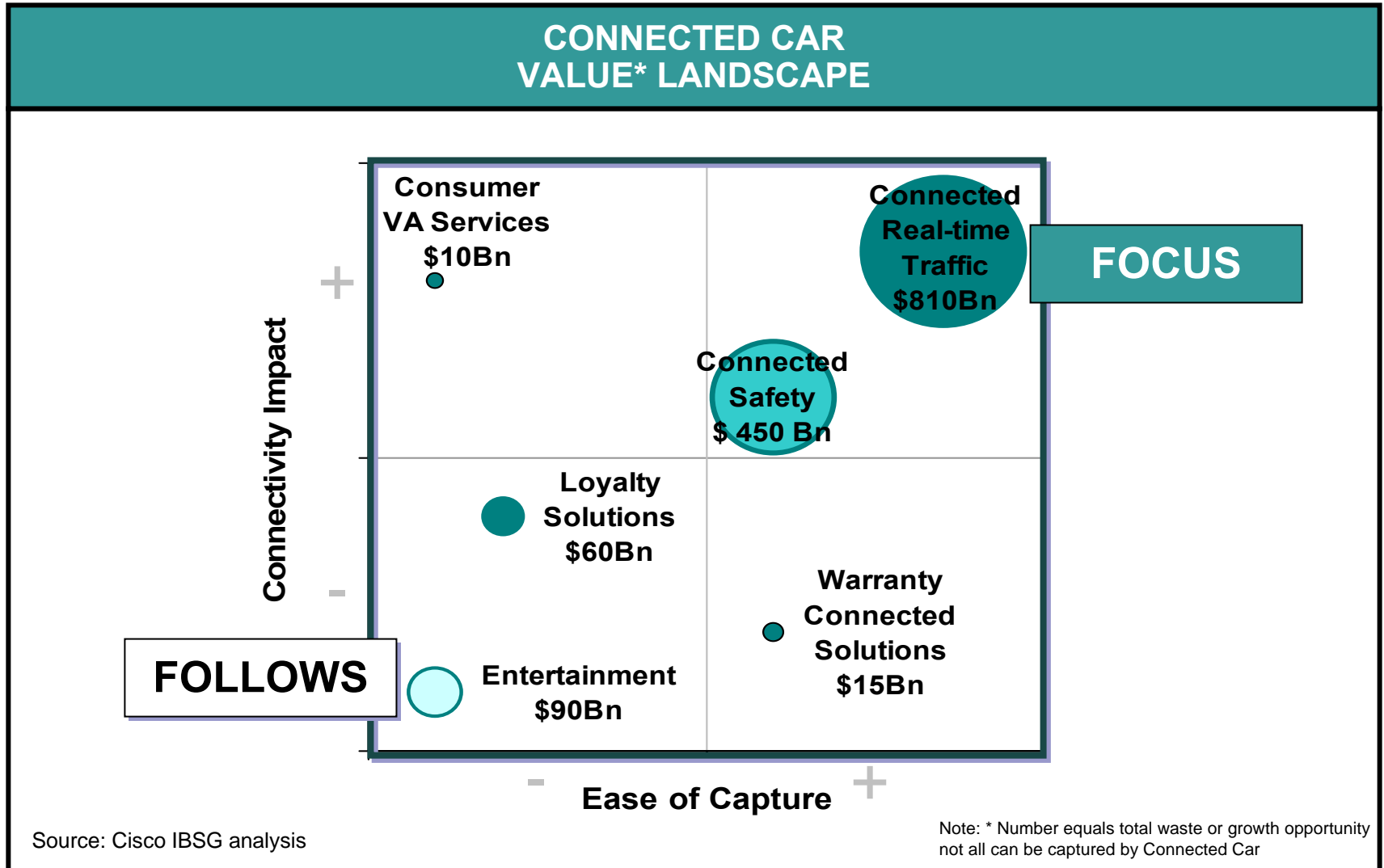
UNWILLINGNESS TO PAY

- Value-added services are limited to the developed world;
- Consumers bundle new technologies to overall price of the car;
- Relatively slow take-up of in-car GPS shows reluctance to pay;
- Mobile devices such iPods and mobile DVD players extend home entertainment at limited cost;
- Probably maximum monthly service subscription-fee can't be above \$10/m;

\$10 Bn
in added-value services,
\$90 Bn
games, video entertainment &
sports

Source: Telematics Research Group (TRG), PwC Global entertainment industry report, Cisco analysis

TRAFFIC & SAFETY SERVICES SHOULD BE THE DRIVING FORCE OF CONNECTED CAR INITIATIVES

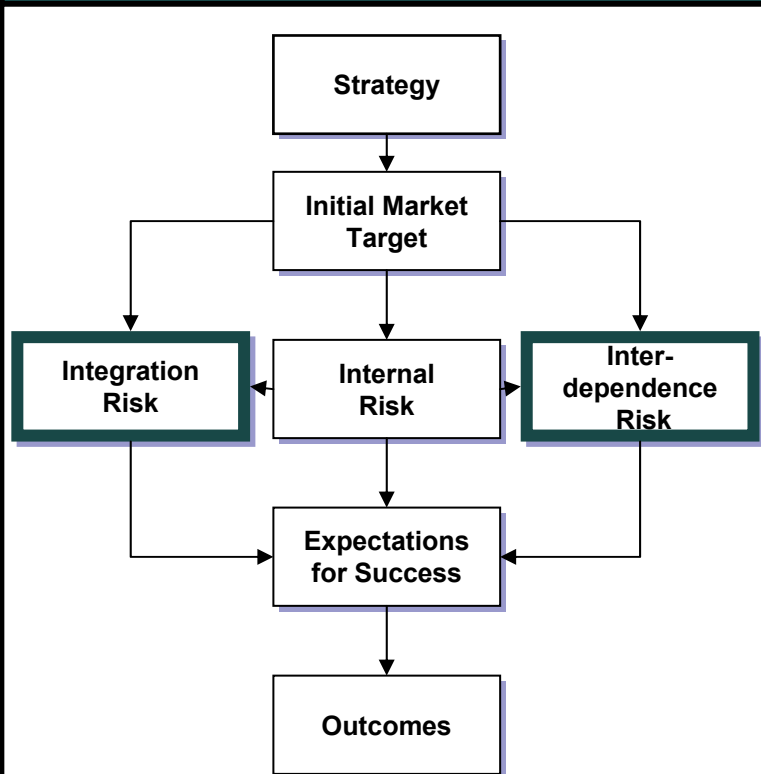




INTERDEPENDENCIES OR THE NEED TO PARTNER

CONNECTED CAR HAS SOME SPECIFIC ROADBLOCKS TIED TO INTERDEPENDENCIES

INNOVATION RISK FRAMEWORK



Source: Ron Adler, INSEAD

$$\text{Total P of success} = \prod_i (\text{P of success } i)$$

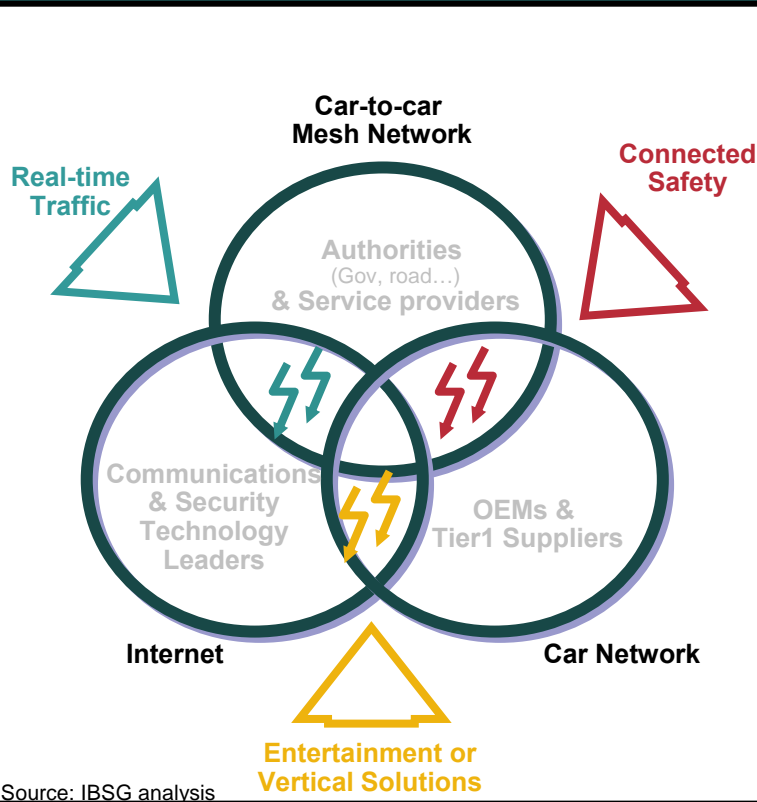
SPECIFICS ABOUT TELEMATICS

- **Governments and emergency response** ecosystem need to be integrated;
- Emergency **device suppliers** coordinated with communications platform;
- Platform need partly to be **crash-resistant** and fully mobility compliant (hand-over...);
- Frequencies used need to be **standardized internationally** and made available in major countries;
- Communications infrastructure need to be **multi-channel, pervasive** on a territory and 100% reliable and secure;
- Car software must be **110% secure** from outside or inside attacks, disturbance or false-manipulations;
- Car is an extension of the office or the home, thus all this will need to be **interoperable over time**;
- **Dealers will need to be trained** to maintain and upgrade these platforms,
- Devices have different lifecycles than the car and thus need to be car-agnostic as well as robust and evolutive;

The more interdependencies, the higher the chances of failure !

AREAS REQUIRE STANDARDIZATION AND FOCUSED COORDINATION FROM A LIMITED SET OF PARTNERS

INTERACTION & INTERDEPENDENCY RISK AREAS



Source: IBSG analysis

SOLVING TELEMATICS BOTTLENECKS

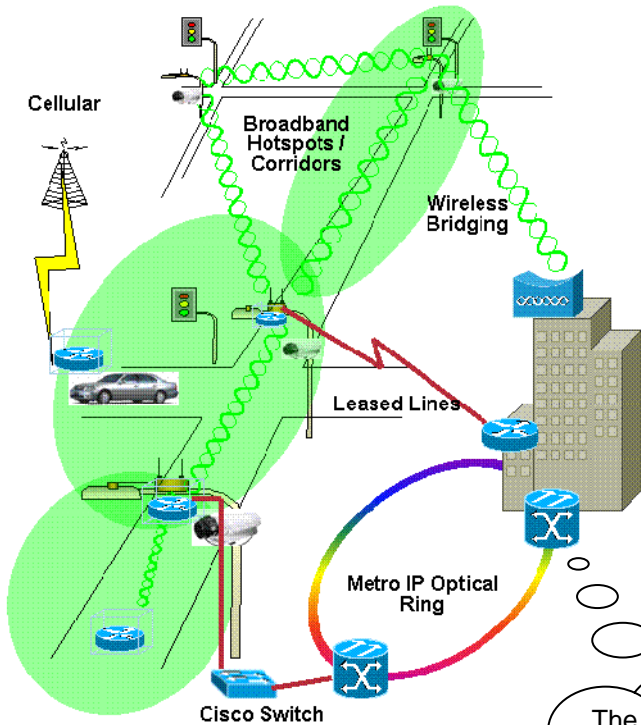
- ⚡ Car interaction with the Internet will require **scalable and evolvable interface/security** with car BUS CAN;
- ⚡ Car-2-Car and Car-2-Infra-2-Car communications require **standards in protocols as well as in technologies for road infrastructure**;
- ⚡ So-called seamless communications to and from the car will require to **build and mutualize wireless infrastructures** (notably in the countryside) for the car as well as a clearing-house process/ organization to enable access-roaming across different service providers and technologies.



PARTNERING WITH CISCO

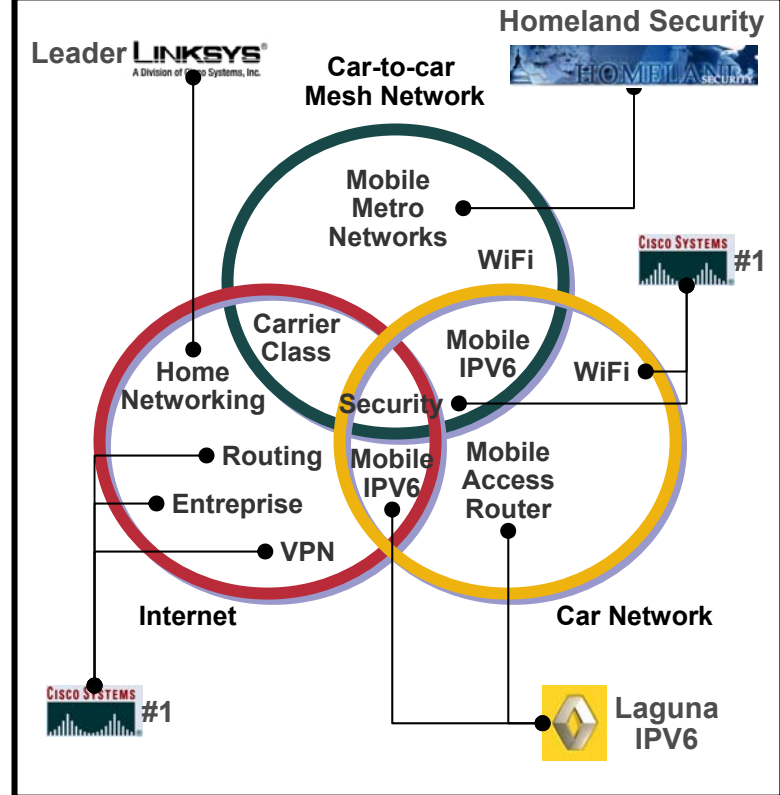
THE CONNECTED CAR BUILDS WELL INTO CISCO'S VISION ON A NETWORK OF NETWORKS

A NETWORK OF NETWORKS



The car network becomes the natural extension of Home NW and Enterprise NW

CISCO RELEVANCE



CISCO'S MOBILE IP AND TECHNOLOGY MAKE THE CAR ARCHITECTURE APPLICATION AND ACCESS AGNOSTIC

Cisco.com

CISCO'S IP V6 TECHNOLOGY ENABLING CONNECTED CAR



**Cisco 3200 Series
Wireless & Mobile Routers**



**Cisco 3200
Mobile Router
for Vehicles**



**Cisco 3200
Wireless Router for
Infrastructure**

Source: IBSG analysis

ADVANTAGES

- **Avoid “reinventing the wheel!”** in networking technology, wireless communications and security;
- **Scale Cisco innovation** resources (\$3,7Bn) in networking technologies, wireless and security;
- Leverage Cisco's unique **experience in traffic prioritization** and quality of service;
- Leverage existing and future wireless infrastructure (Homeland security infrastructure in the US) and **roam over different channels of communication**;
- Extend usage of existing and future IP applications and devices from home (Linksys by Cisco) or the office (Cisco) to the car;
- Evolution of applications or devices doesn't depend on upgrade of platform;

CISCO HAS RECENTLY ANNOUNCED AN ORGANIZATION DEDICATED TO PUBLIC SAFETY WHICH INCLUDES MOBILE ACCESS ROUTING

The screenshot shows a Microsoft Internet Explorer browser window displaying a Cisco internal news article. The browser's address bar shows the URL: http://www.cisco.com/data-shared/cec/rendered_news/html/channels/1/8/100851.shtml. The page header includes the Cisco Systems logo, navigation links (CEC Home, Cisco.com, EMCO, Site Index, Emergencies, Directory), and a search bar. The article title is "New Business Unit to Improve Public Safety and Security" with a posting date of 2005-FEB-25. The author is Charlie Ciancarlo, SVP, CTO, and Chief Technology Officer. The article text discusses the formation of the PS3BU, its focus on mobile radio and network communication interoperability, and the development of the IP Interoperability and Collaboration System (IPICS). A sidebar on the left contains a search bar and a navigation menu. A photo of a control room is included, along with a caption: "IPICS will improve safety and security operations." A callout box titled "IPICS Public Safety Example" describes an emergency response scenario. The Windows taskbar at the bottom shows the Start button, several open applications, and the system tray with the time 20:53.

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New Business Unit to Improve Public Safety and Security

CEC Posting Date: 2005-FEB-25

I'm very pleased to announce the new Public Safety and Security Systems Business Unit (PS3BU) under the leadership of Shah Talukder, reporting to me. This will formalize nearly two years of work in a startup-like environment and is a great example of Cisco innovation and collaboration across multiple business units, technology groups, and field and marketing organizations.


The PS3BU will focus on mobile radio and network communication interoperability, data integration, and collaboration challenges between government agencies, departments and organizations, and enterprise security and safety groups.

Linking various radio and network communications is a challenge facing many government services such as public safety, homeland security, and defense at the federal, state and local levels. This same challenge is also common in the healthcare, transportation, retail, finance, and enterprise safety and security industries. Customers in these industries typically use a variety of wired and wireless networks, including cellular, wireless LAN, and push-to-talk land mobile radio to achieve their goals. But the inability of these disparate networks to communicate with each other can be inefficient, sometimes with disastrous consequences.

PS3BU is developing the IP Interoperability and Collaboration System (IPICS), a network-based capability to solve communications interoperability. In addition, IPICS will deliver an incident-based framework that integrates voice, video, data, and sensor information for safety and security operations and improved command and control. Cisco technologies such as Call Manager, Access Routers (including land mobile radio gateways and Mobile Access Routers), Cisco Security, MeetingPlace, and other rich media network services will be included in the system.

IPICS will help customers reduce costs by taking advantage of IP networks and applications while continuing to use their existing radios and radio networks. For example, upgrading the U.S. land mobile radio network to achieve interoperability is estimated at more than \$30 billion. IPICS will address the same problem at less than a third of the cost and provide additional customer benefits.

Charlie Ciancarlo
SVP, CTO
Chief Technology Officer



IPICS will improve safety and security operations.

IPICS Public Safety Example

An emergency response team reacts to an urgent call and exchanges important information such as building plans and hazardous material details. Video from the scene is shared.

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Marc Girardot – Automotive Lead – mgirardo@cisco.com

CISCO SYSTEMS



CONCLUSION

CONCLUSION

- **The industry has failed so far;**
- **Greater standardization is the right direction...**
- **...but there needs to be much much more focus on value;**
- **Government, traffic authorities and environmental agencies are also critical stakeholders;**
- **We all need to partner intelligently coming with our respective forces...**
- **...and Cisco invites you to a balanced partnership to a clear vision.**