CONNECTED CAR - PARTNERING FOR VALUE

A Cisco Perspective

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Director EMEA
Automotive Lead

Geneva, March 1rst , 2005

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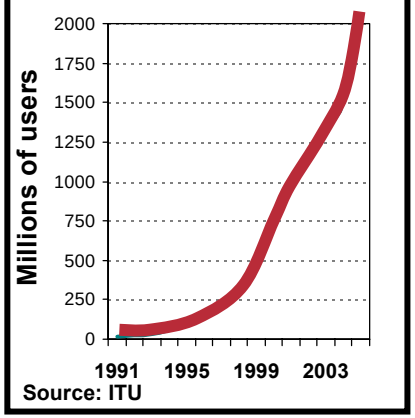
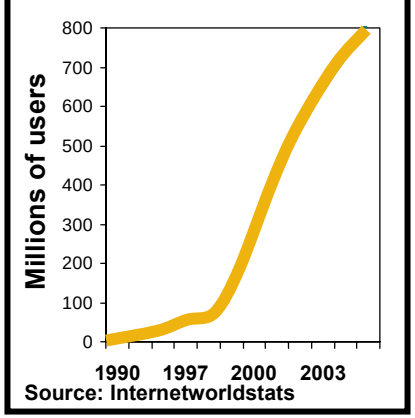
IT'S ALL ABOUT ADOPTION !

Mobile Phone Adoption



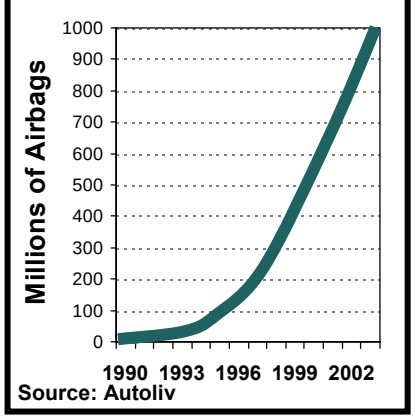
- GSM standard
- Nokia, Ericsson
- Mobility

Internet Adoption



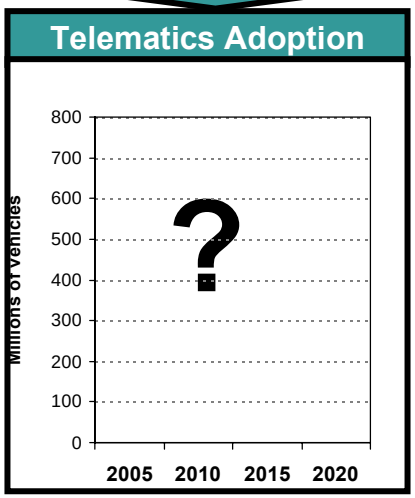
- IP & Ethernet
- Netscape, Microsoft
- Access Information

Airbag Adoption



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

Telematics Adoption



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

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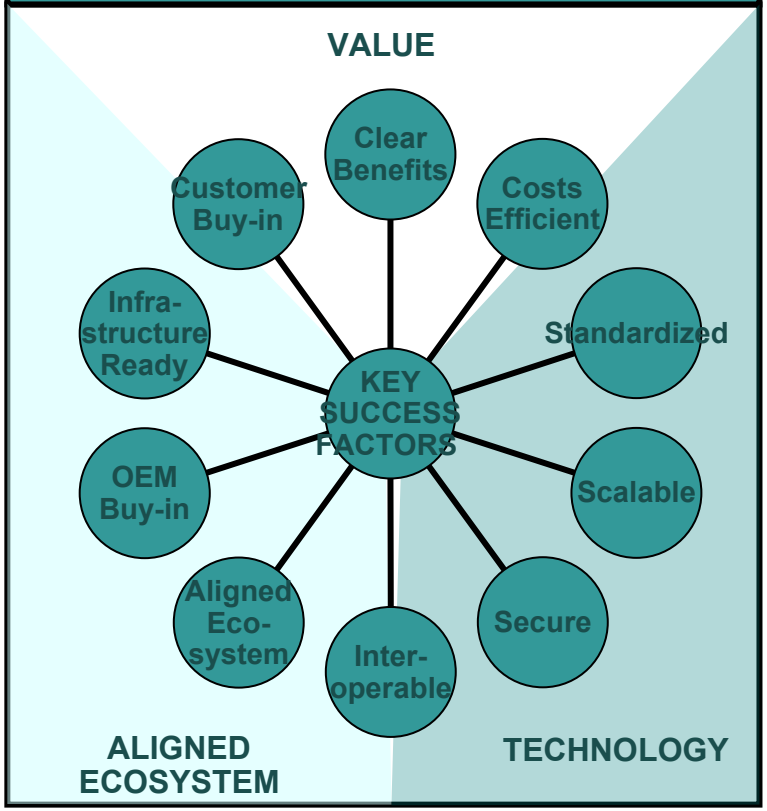
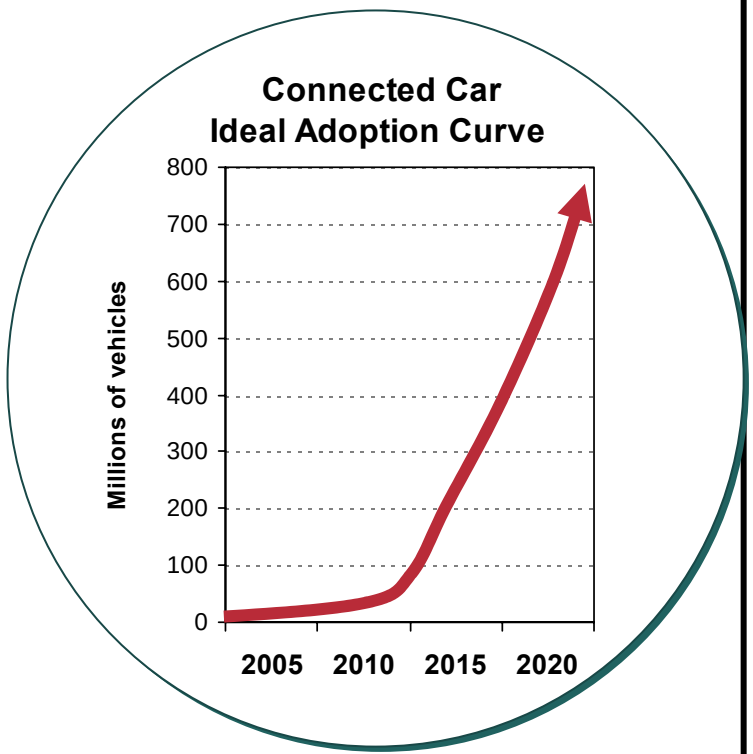
CONNECTED CAR SUCCESS FACTORS



WHAT SUCCESS WOULD LOOK LIKE



Source: Cisco IBSG analysis

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WHERE IS THE CAPTURABLE VALUE?

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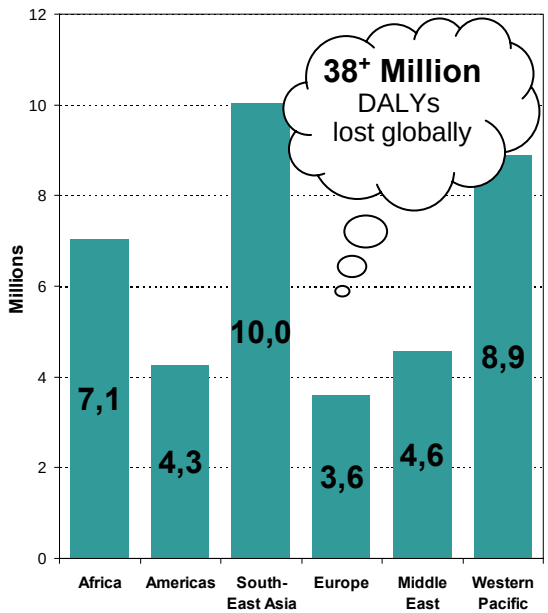
ROAD INJURIES AND FATALITIES ARE UNBEARABLE BOTH IN HUMAN AND FINANCIAL TERMS

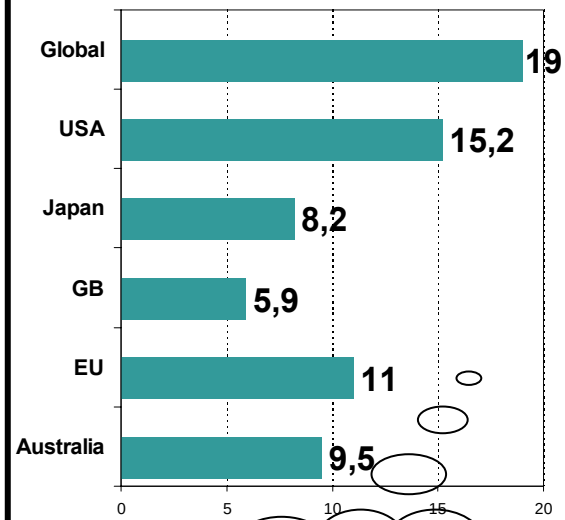
GLOBAL INJURY BURDEN

Disability-adjusted Life Years Lost in 2002



OECD ROAD MORTALITY

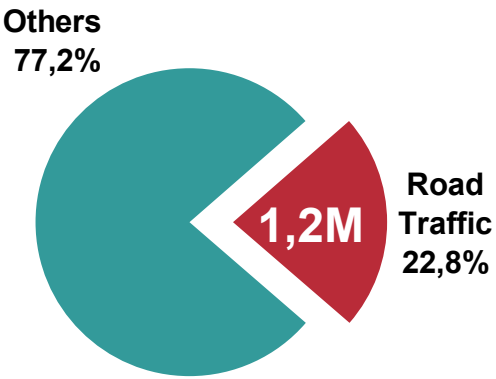
Fatality rates per 100,000 inhabitants



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

Source: WHO 2004, Global Burden Disease Project, OECD

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

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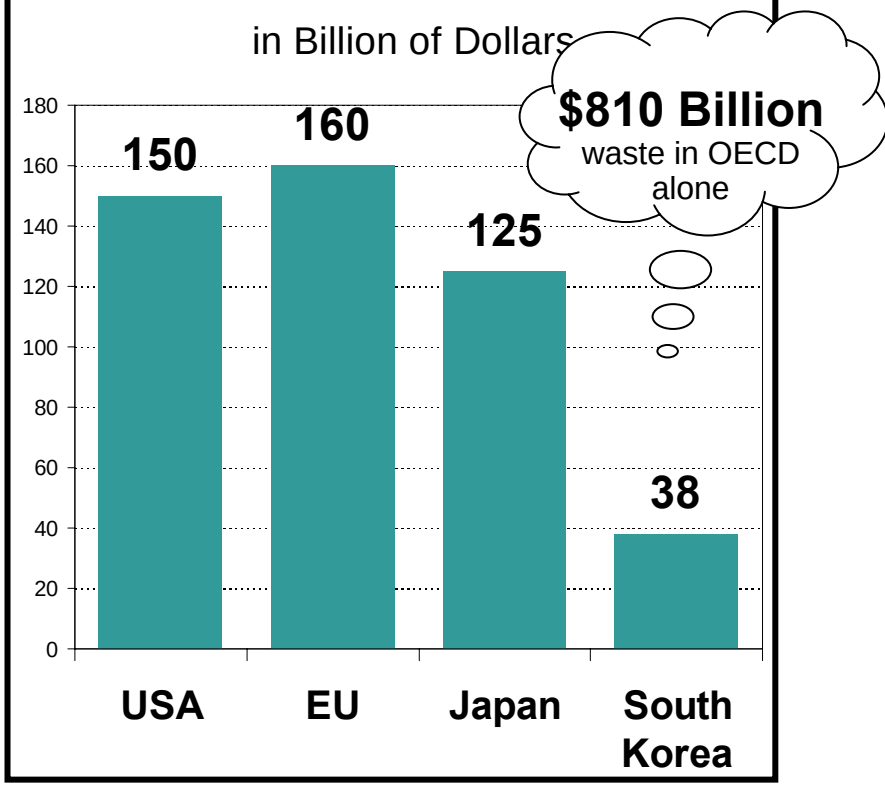
CONGESTION FACTS

- 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



Source: OECD, Texas Transportation Institute, US Dept. of transportation, Cisco analysis, TokyoMK, ePrinciples 2002

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

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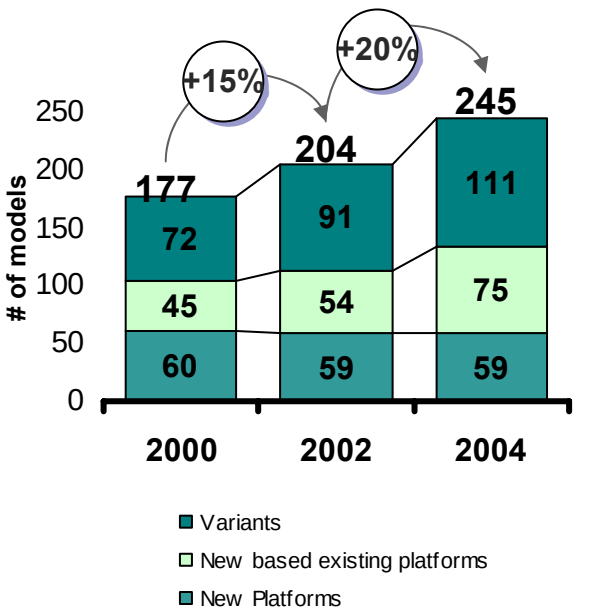
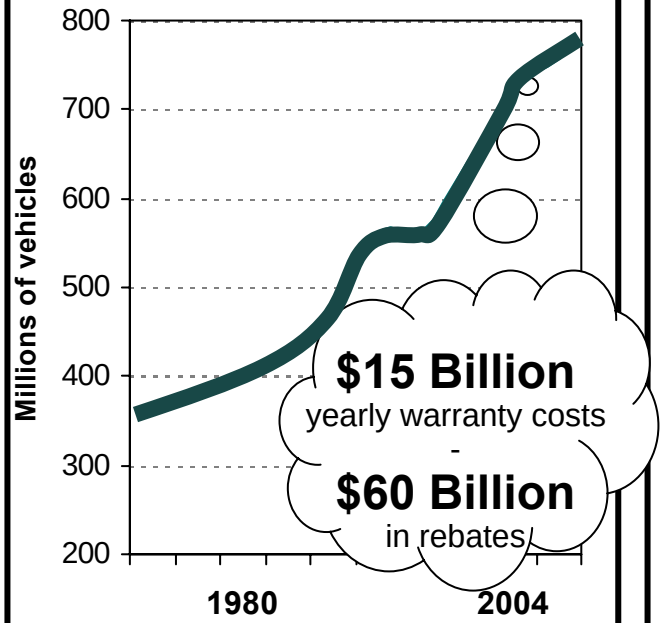
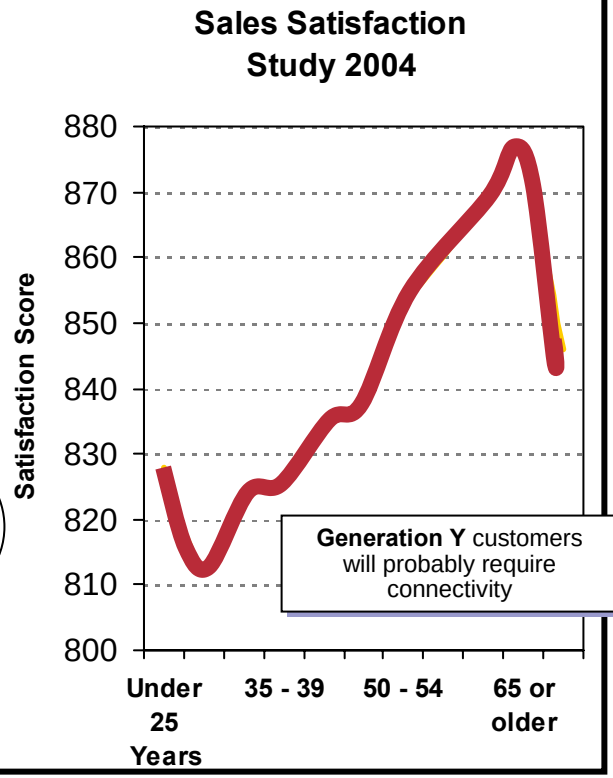
GROWING AUTO DIVERSITY



GROWING INSTALLED BASE



GENERATION Y HARDER TO SATISFY



Source: Anthony Downs, McKinsey, Deustche Bank, Detroit News, Cisco analysis, JD Power 2004 Survey

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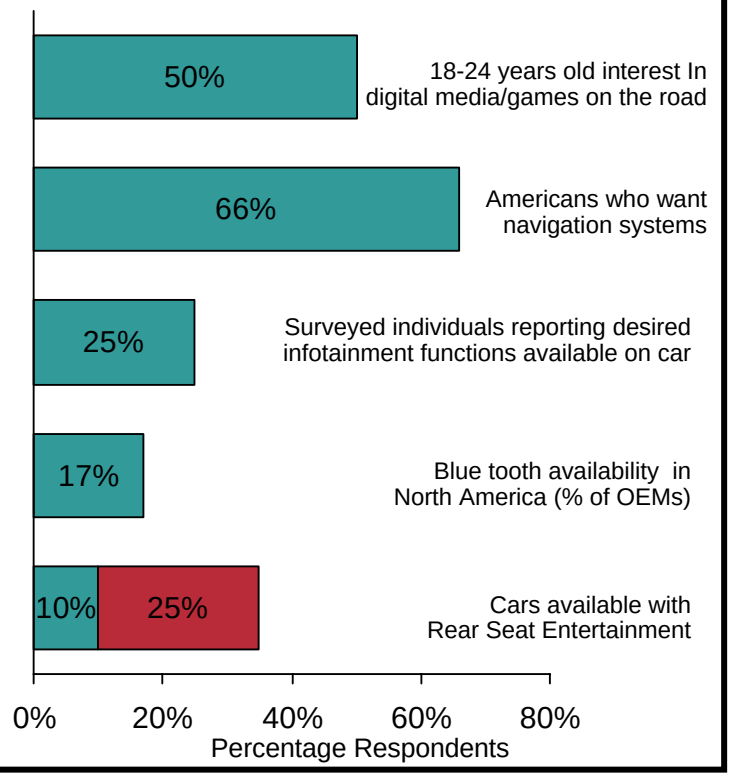
AND DESPITE INTEREST FOR ENHANCED CAR COMMUNICATION ENABLED FEATURES, THERE'S LIMITED WILLINGNESS TO PAY FROM END-USERS

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

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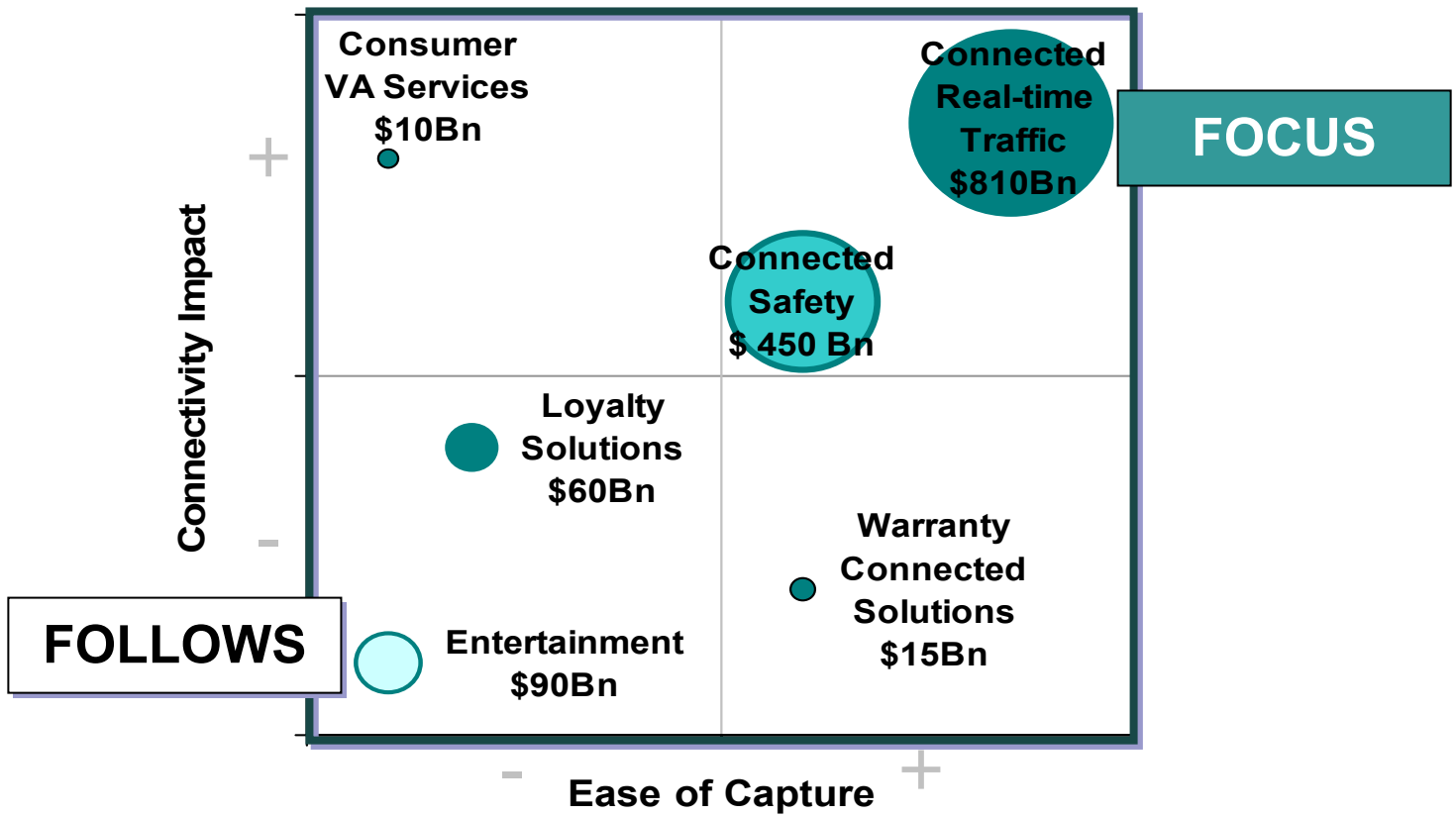
TRAFFIC & SAFETY SERVICES SHOULD BE THE DRIVING FORCE OF CONNECTED CAR INITITIATIVES

CONNECTED CAR VALUE* LANDSCAPE



Source: Cisco IBSG analysis

Note: * Number equals total waste or growth opportunity not all can be captured by Connected Car

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INTERDEPENDENCIES OR THE NEED TO PARTNER

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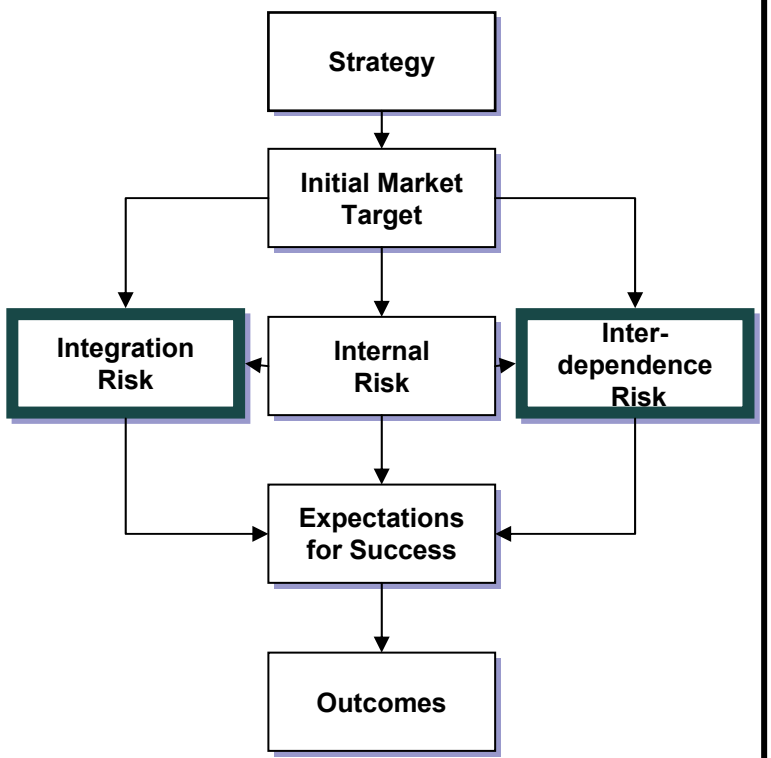
CONNECTED CAR HAS SOME SPECIFIC ROADBLOCKS TIED TO INTERDEPENDENCIES

INNOVATION RISK FRAMEWORK



Source: Ron Adler, INSEAD

SPECIFICS ABOUT TELEMATICS

- **Governments and emergency response** eco-system 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 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;

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

The more interdependencies, the higher the chances of failure !

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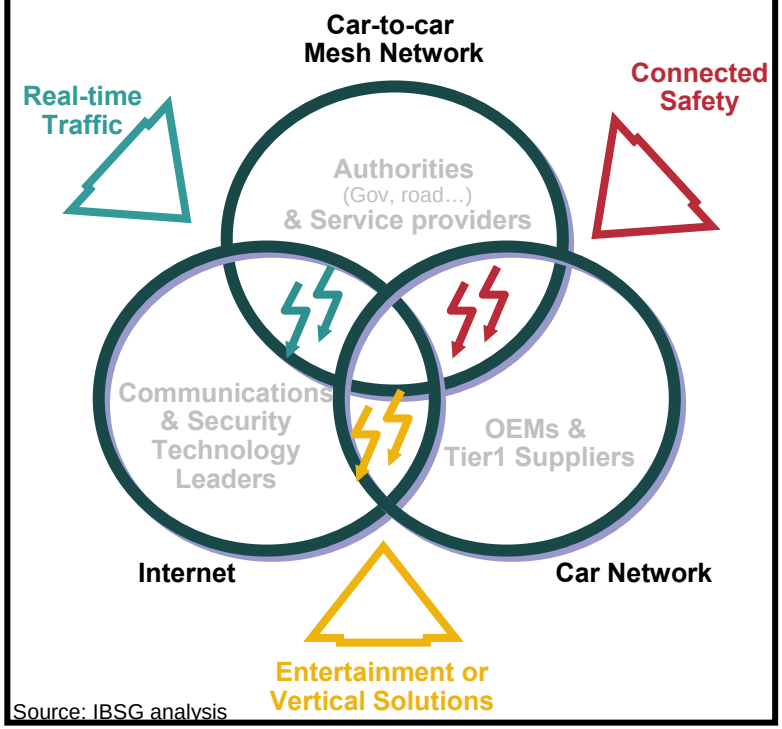
AREAS REQUIRE STANDARDIZATION AND FOCUSED COORDINATION FROM A LIMITED SET OF PARTNERS

INTERACTION & INTERDEPENDENCY RISK AREAS



Source: IBSG analysis

SOLVING TELEMATICS BOTTLENECKS

- Car interaction with the Internet will require **scalable and evolutive 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.

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PARTNERING WITH CISCO

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

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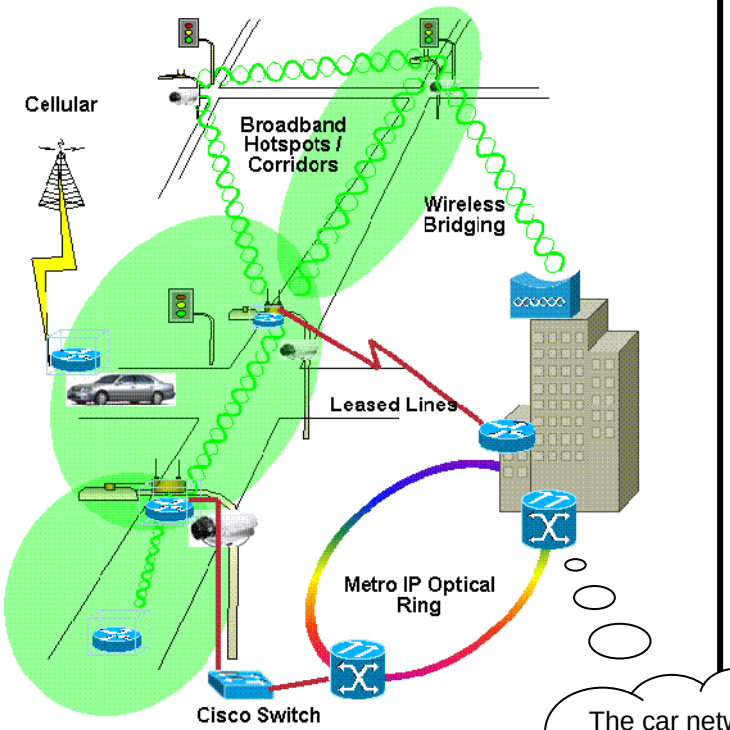
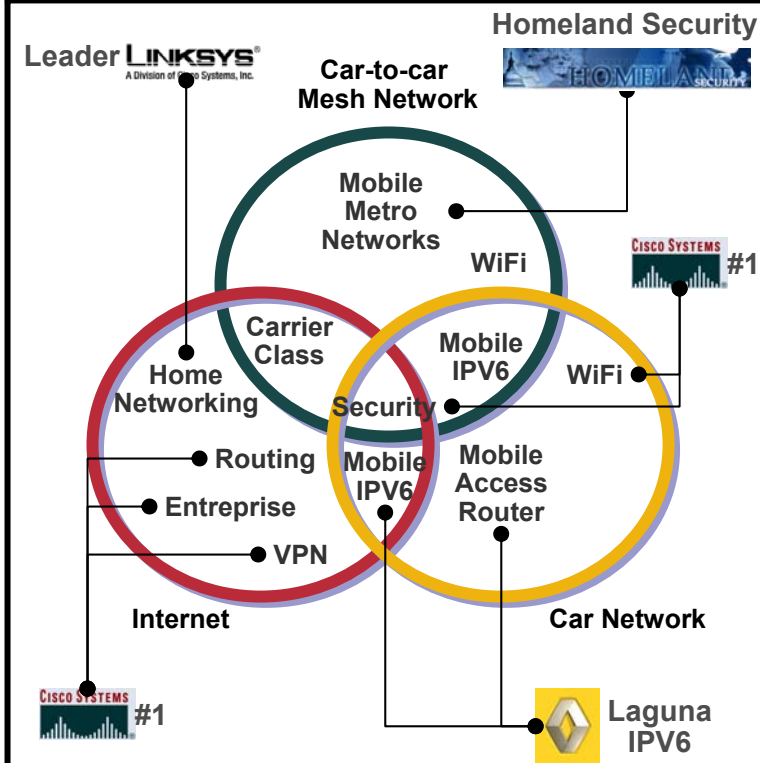
A NETWORK OF NETWORKS



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

CISCO RELEVANCE



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

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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;

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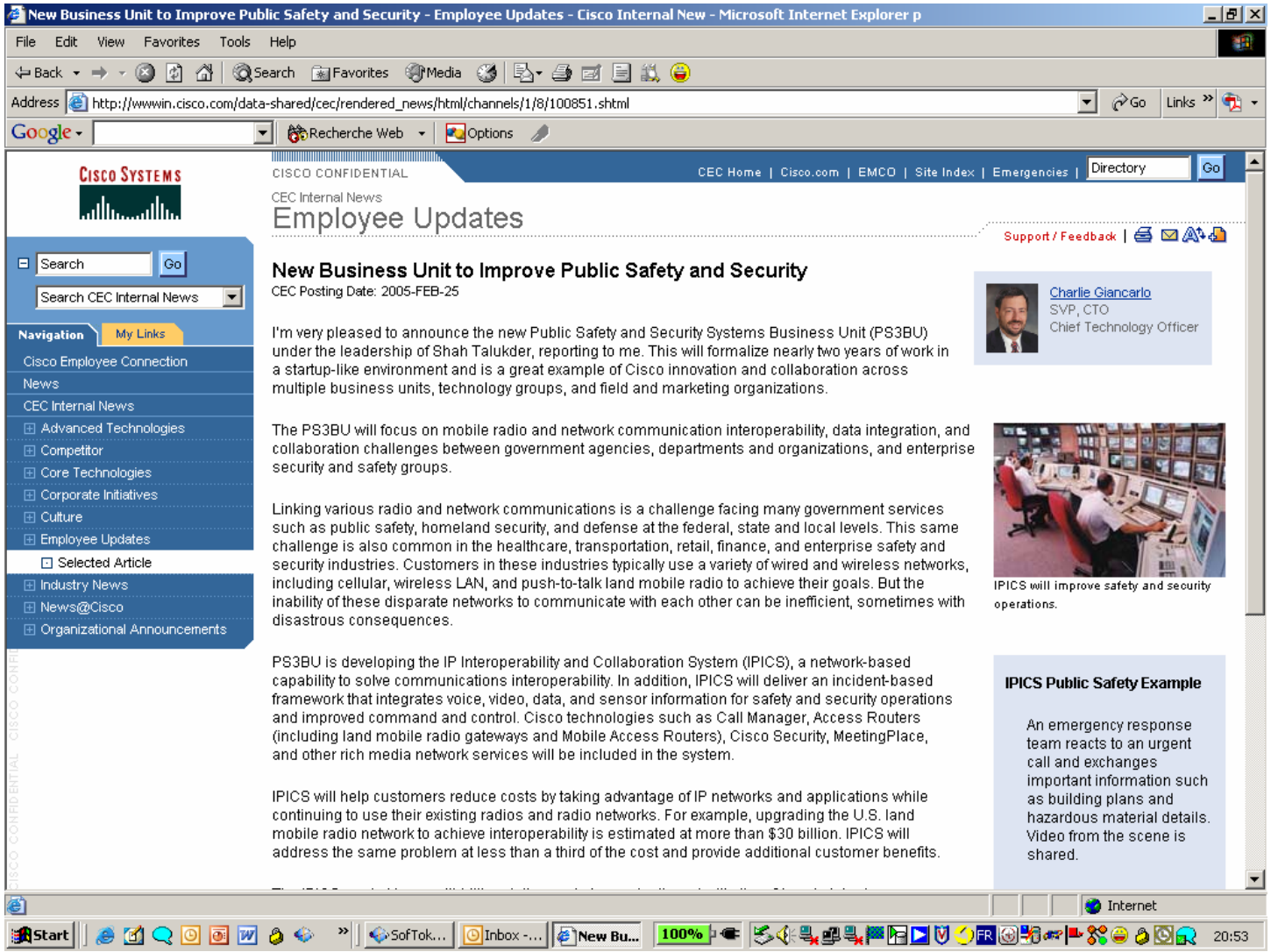
CISCO HAS RECENTLY ANNOUNCED AN ORGANIZATION DEDICATED TO PUBLIC SAFETY WHICH INCLUDES MOBILE ACCESS ROUTING



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CONCLUSION

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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.**

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