Telematics current status and Future Trend

- Prepared for WOCC

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Why Telematics Matters
- Executive Summary

People Start to Play the Prelude of "Ubimatics" Loud and Sound

- GM Chairman & CEO Rick Wagoner deliver the first keynote by a car company executive in the 41 year history of the Consumer Electronics Show (CES), Jan 8, 2008.
  - He speaking at CES because electronics have revolutionized the car. Existing electronics are just the beginning.
  - OnStar has over 82 million subscriber interactions - a rate of one interaction about every two seconds.
  - OnStar in 8 generation in 11 years. In addition to car unclock service, OnStar Provides crash info to emergency responders. For 2009 they are adding stolen vehicle slow down.
  - 30,000 police chases resulting in 300 deaths annually System can remotely slow vehicle down during a chase.
  - In November 2007 GM signed agreement to bring OnStar to China.

People Start to Play the Prelude of "Ubimatics" Loud and Sound – Cont'd

- Currently has lane departure warning on the Buick Lucerne and Cadillac STS and DTS.
- V2V lets vehicles with transponders let others know when the situation changes. If brakes are applied they can notify neighbors to slow.
- GM and Carnegie Mellon University Bring Self-Driving Chevrolet Tahoe to DARPA Urban Challenge Qualifying Rounds.
- Electronics have helped reduce fuel consumption through direct injection, variable valve timing and other technologies.
- Mild hybrid Saturn Vue gets 27% boost in mileage, plug-in Vue announcement soon.
- fuel cells - the Cadillac Provoq

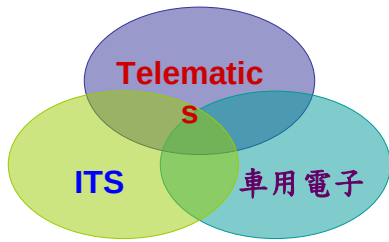
People Start to Play the Prelude of "Ubimatics" Loud and Sound – Cont'd

- Garmin Announced a Phone in a GPS – Nuvifone in Jan 30, 2008
  - a full-fledged GSM HSDPA smartphone built on its own operating system with GPS navigation at its core
  - Google local search
  - Garmin Online services - traffic, weather, fuel prices, hotel discounts, etc.
  - nuvi-like navigation on the road or in pedestrian mode
  - Email, text, IM functions
  - Camera, video camera, MP3 and MPEG4/AAC
- In Car and In Home Service will be the ONLY Growth Engines in the near future
  - Recently, Japanese Operators Pushing Telematics Hard
  - 2007年全球Wi-Fi晶片組出貨量可望突破3億套，比去年成長41%。In-Stat並預計，到2011年，內建Wi-Fi功能的消費電子產品和手機出貨量將會超越筆記型電腦
- Explore Your Ubi-matics vision is Now

What People Are Doing

Telematics系統演進

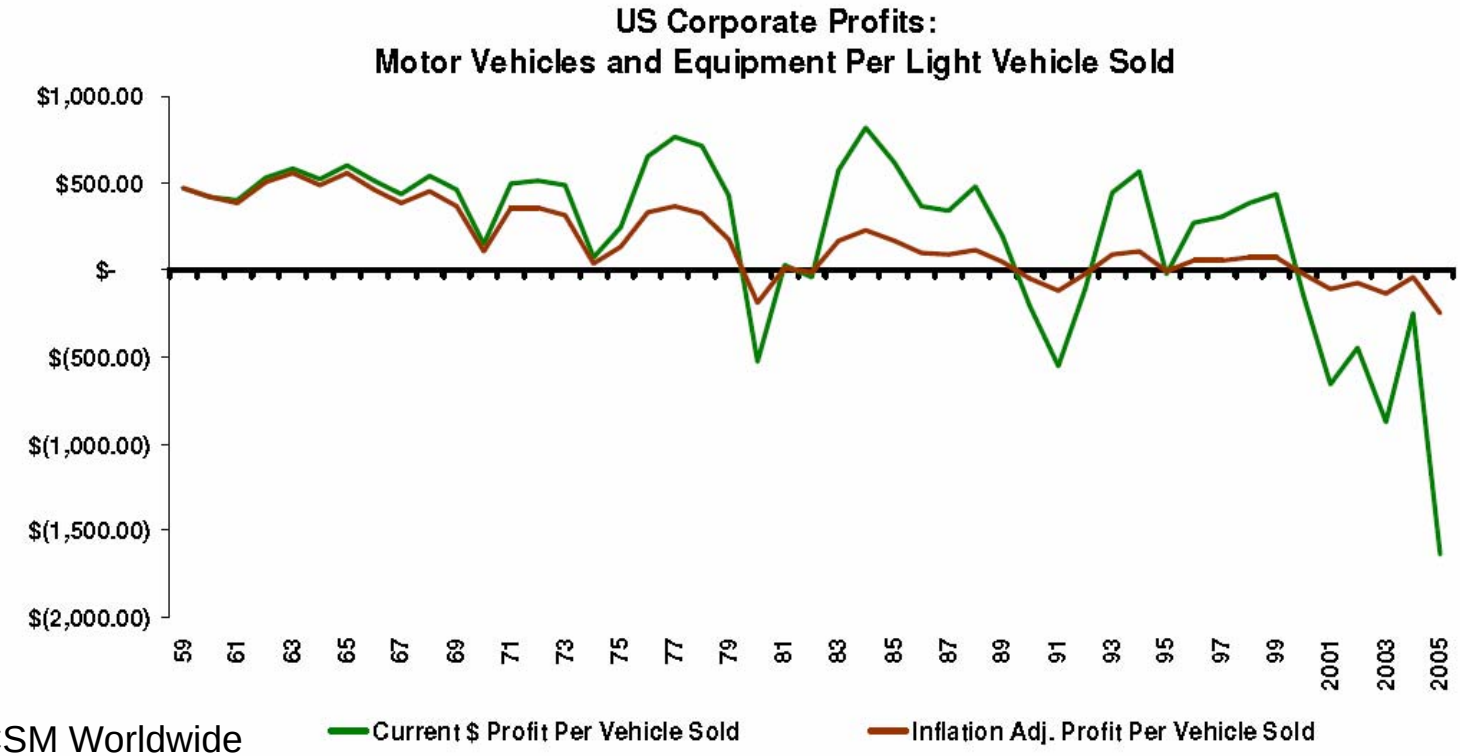
- 提升行車安全是各國以國家政策推動Telematics發展之最主要動機.
- **台灣Telematics系統與服務約停留在第一代、第二代**
- Telematics 演進：
  - 第一代 Telematics (V2Zero)
    - *為獨立運作之系統如Infotaiment，獨立導航系統*
    - *缺乏或僅有少部分無線通訊功能*
  - 第二代 Telematics (V2I)
    - *透過手機向駕駛傳遞應用服務*
    - *以GPS（Global Positioning System）為基礎提供駕駛行車安全及vehicle centric support應用服務*
    - *GM OnStar, KDDI G-Book, 裕隆 TOBE?*
  - **第三代Telematics (V2X)**
    - ***V2V, V2I, V2P 行車安全, 效能 與 殘障輔助（ Handicap Assistance）***
    - ***可運用無線寬頻多樣性應用服務***
    - ***Will Be AaMandatory Features for Vehicle***



Source: 資策會網多所 2007/12

Car Makers Are Losing Their Profit

- Car Manufactures will
  - Flatten Their Structures
  - Target Toward Service Market
    - *More Fashion (but "not" Less Durable)*



Source: CSM Worldwide

GM OnStar

Airbag Notification
800/Month

Advanced Automatic Crash Notification
1,000/Month

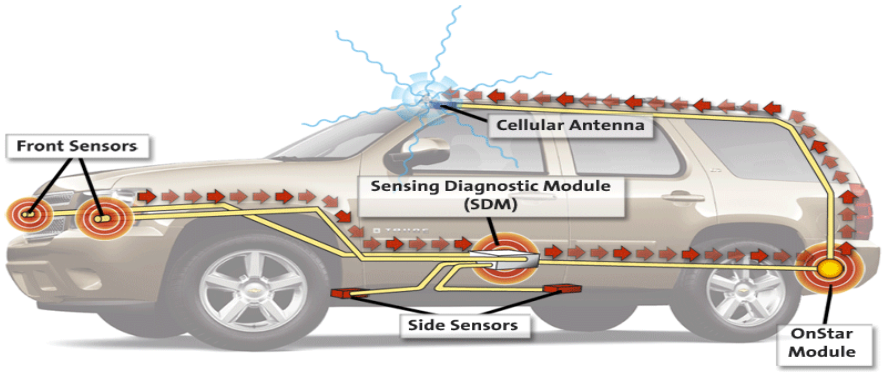
Emergency Services
11,000/Month

Roadside Assistance
35,000/Month

Stolen Vehicle Location Assistance
800/Month

Remote Unlock
67,000/Month

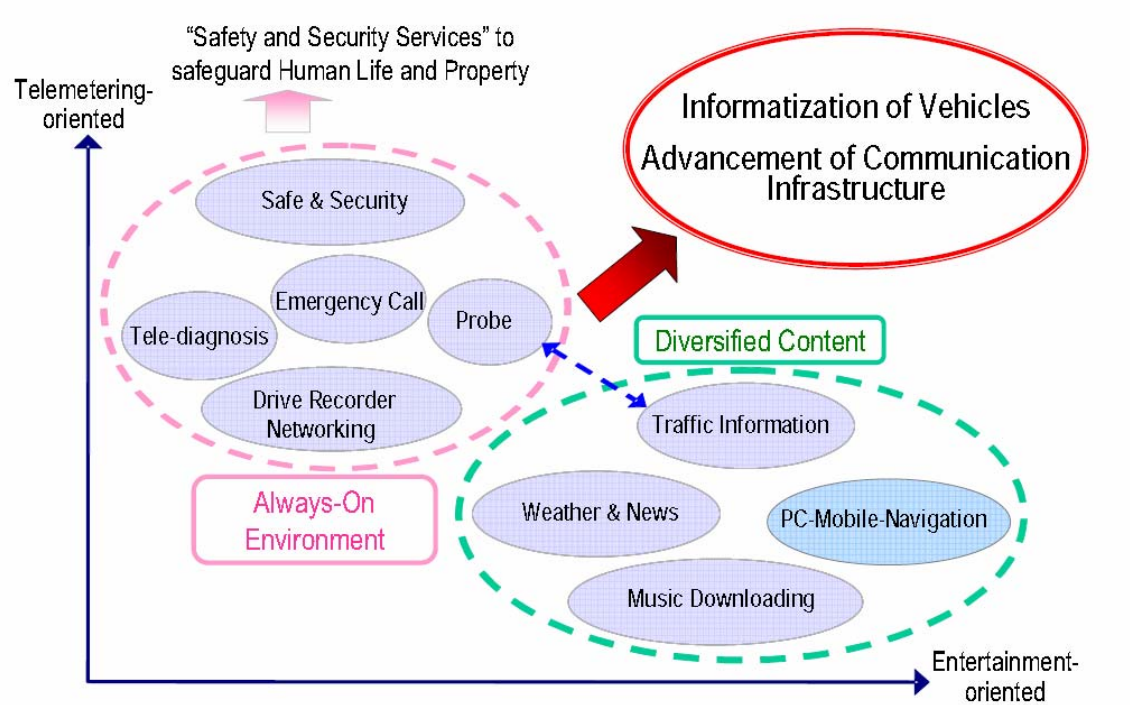
Good Samaritan
6,000/Month

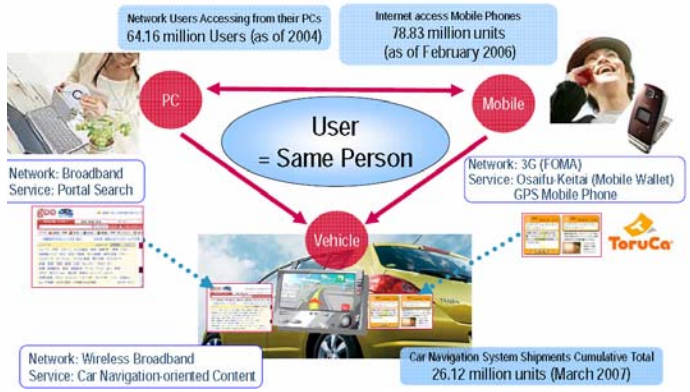


- **First customer in 1996**
- **Over 5 million active subscribers** (estimate over 10 million by 2010)
- **More than 80 million customer interactions to date**
  - ✓ **On average, an OnStar advisor interacts with a subscriber every two seconds**
- **Call center-based services**
  - ✓ **Safety, security and peace of mind**
  - ✓ **Routing and point of interest**
- **First year of OnStar service is included with the purchase of a new GM vehicle**
- **Becoming GM standard in the United States and Canada – MY 2008**

NTT Docomo Telematics VMC Service

- Linking Vehicle, Mobile Phone & Personal Computer, so that PC and Mobile Phone Services are also in a Vehicle.



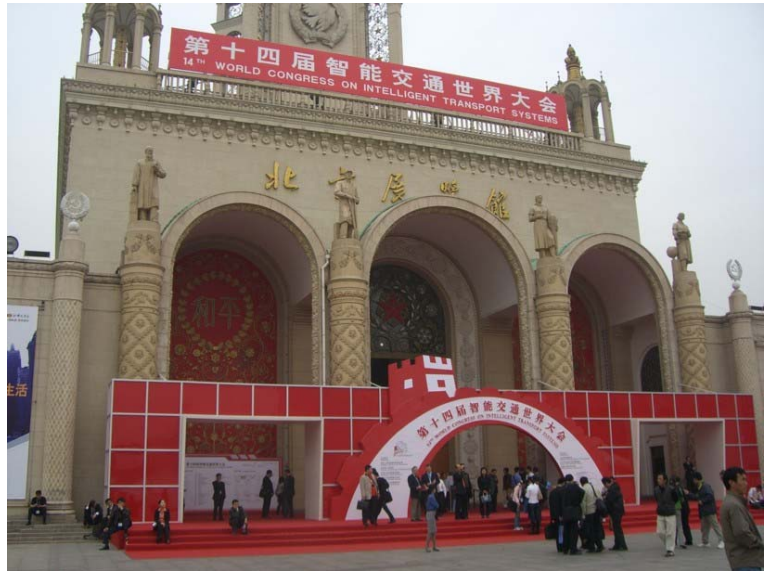


TOBE Service From Yu-Long

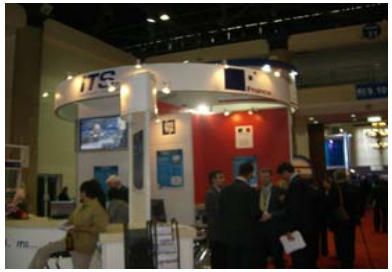
- Secretary Assistance Based Service
- Road Condition Info.
- POI Info
- GPS Car Tracking
- Vehicle Security Warning
- E-call (Airbag)

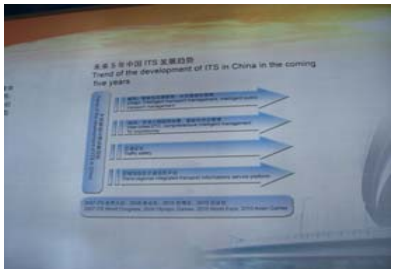
ITS Congress Beijing – Oct. 2007

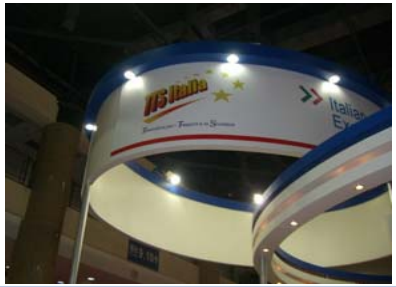
- Almost 20 National Initiates and Major Consortiums Attended the conference.
- Car Companies Target Safety Assistance, Driver Alertness and Telematics Service.
- “ITS Japan” is Ready. EU are aggressive.
- Lots of Japan DSRC Solutions, and one 802.11p/wave chipset.
- Video Applications for ITS are abundant.
- A Huge Crowd of PND Vendors are there, too.
- Chinese vendors cover from low end to high end products.



National “Initiatives” in ITS Congress Beijing 2007







Why Telematics/ITS is Mandatory from A Regulator Viewpoint

- Reduce Societal Costs of CRASHES
  - 43,000 deaths per year
  - 3 million people injured per year
  - $230 billion in property damage
  - Lost time, wages, higher insurance premiums
- Reduce societal costs of CONGESTION
  - Personal and business hours lost in traffic
  - Inconvenience of missed flights, meetings, schedules
  - Gasoline wasted
  - Freight costs higher, lost productivity

Source: Partially from “VII Strategy for Safety and Mobility” Ralph Robison, VII Consortium, 2006

Approaches to Mitigate "Mandatory"

Reduce CRASHES

Reduce Affects of Driver Distraction	Minimize Affects of Driver Error	Cars that refuse to crash
• Traffic Signal Warnings • Elec. Brake Light Warning	• Automatic Brake Activation • Emergency Intrusive Controls	• Automatic Driver assistance • Robotic Driver

Reduce CONGESTION

Improve traffic information	Improve Situational Roadway Awareness	Manage Traffic Flow
• Real time traffic information • Alternative route guidance	• Dynamic roadway condition info. • Emergency situation management	• Dynamic flow control • Dynamic roadway pricing

Timeline

Source: Partially from "VII Strategy for Safety and Mobility" Ralph Robison, VII Consortium, 2006

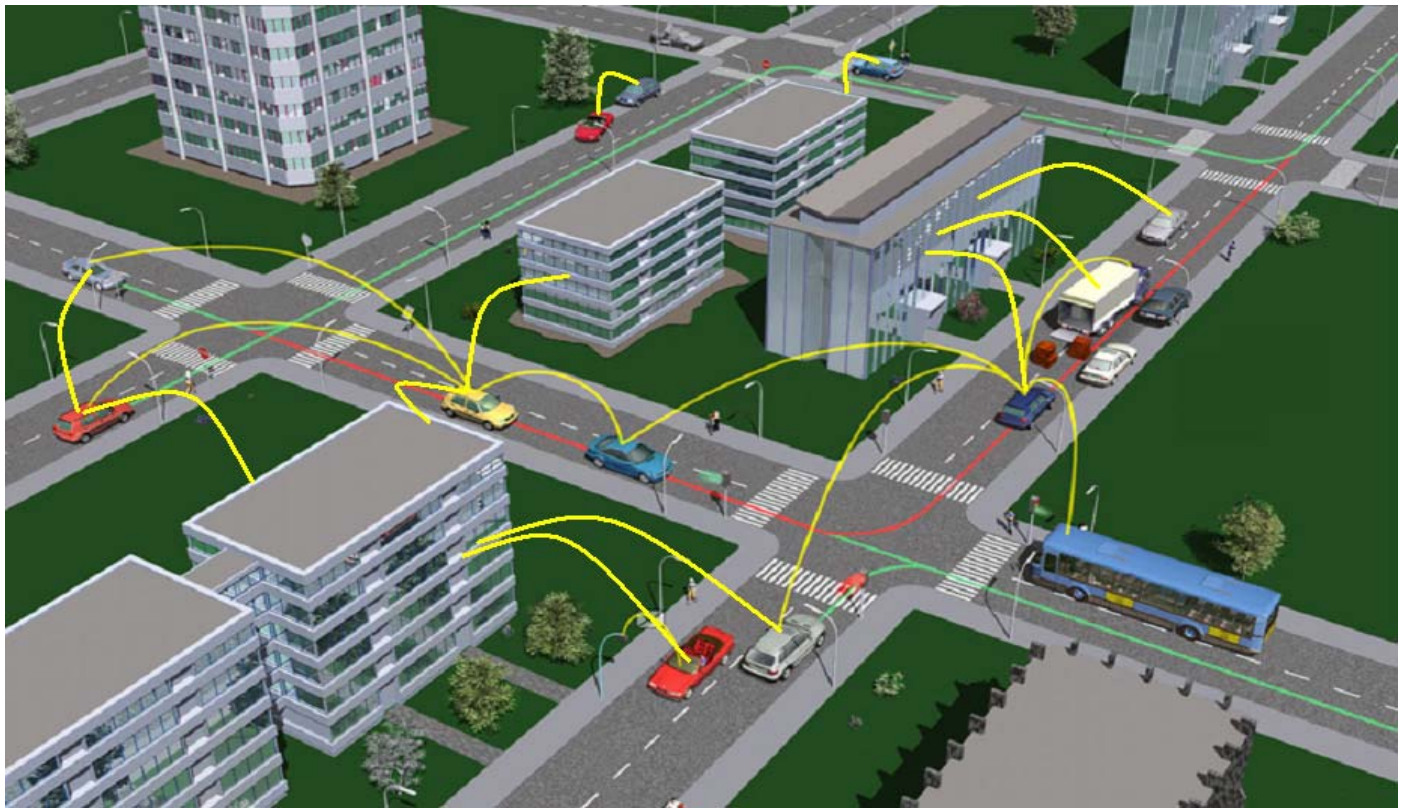
美、歐、日Telematics主要推動計劃

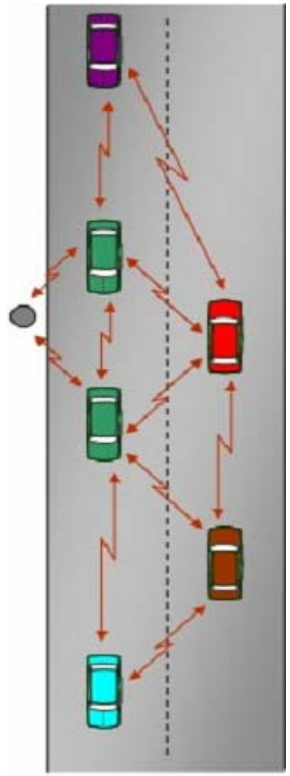
國家/地方	美國		歐盟		日本	
推動計畫	VII	CVPC	GST	CVIS	VICS	Smartway
主管單位	交通部	密西根州政府	歐盟委員會	歐盟委員會	國土交通省	國土交通省
開發系統	V2V, V2I	V2X	Online telematics open system	V2V, V2I	Real time traffic information	V2V, V2I
計畫期程	2006-after 2012	2007-	2004-2007	2006-2010	已交由車廠商業化推出應用服務	2004-2007
測試計畫	加州、密西根	密西根	英、法、德、義、瑞典	英、法、德、義、荷、瑞典	NA	東京
參與業者	八大車廠為主	GM, Ford, Daimler Chrysler, Intel, Cisco, Sun…	近50家業者	近60家政府單位及業者	NA	23家業者

•2007/12/07日本總務省決定爲汽車間通信系統分配**700MHz**頻帶

Source: adapted form 資策會產支處 2008/1

Dedicated Short Range Communication (DSRC) Comes to Rescue

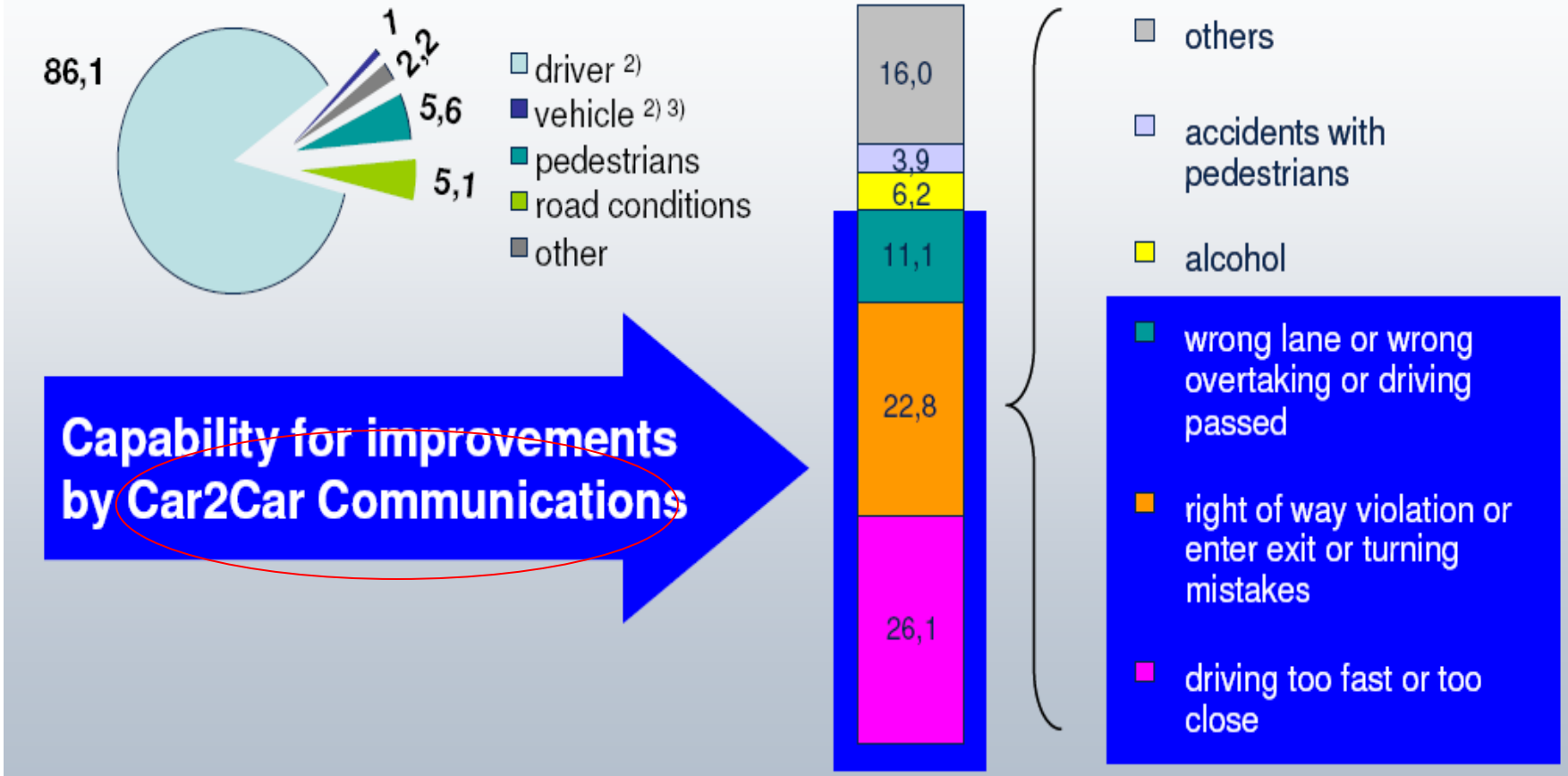




DSRC – A Multihop Ad Hoc Network

- ***DSRC*** is a natural Solution for fast, interactive and reliable communications (V2V and V2I)
  - Ad Hoc vs Infrastructure, V2V at Rural Area
- Accurate and fast **vehicle positioning** sensing, in part with help from Roadside Infrastructure
- A Disruptive Technology Makes **Paradigm Change** Feasible

Why V2V Helps - Causes of accidents in Europe

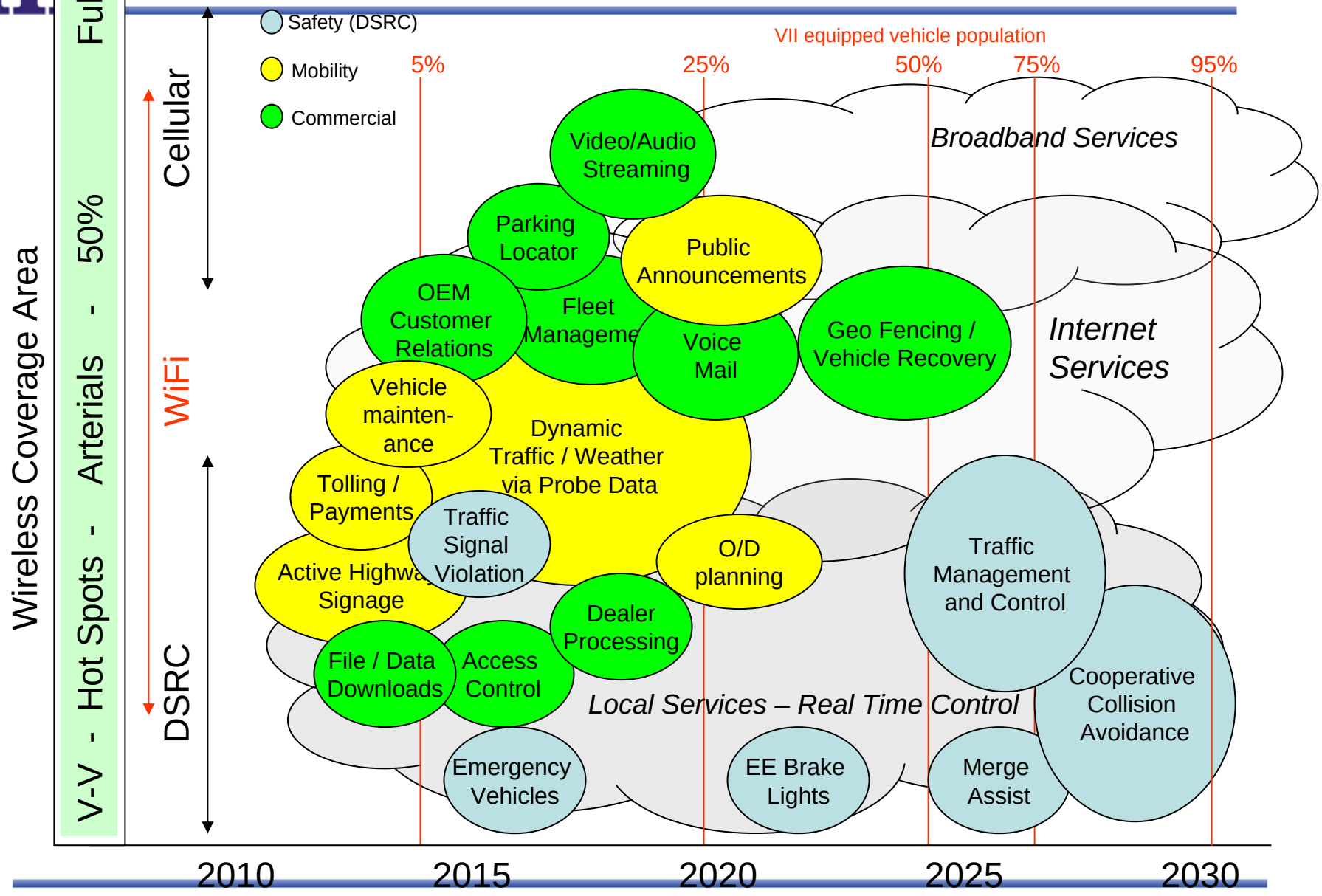


Source: Verkehr in Zahlen 2003, Deutscher Verkehrs-Verlag

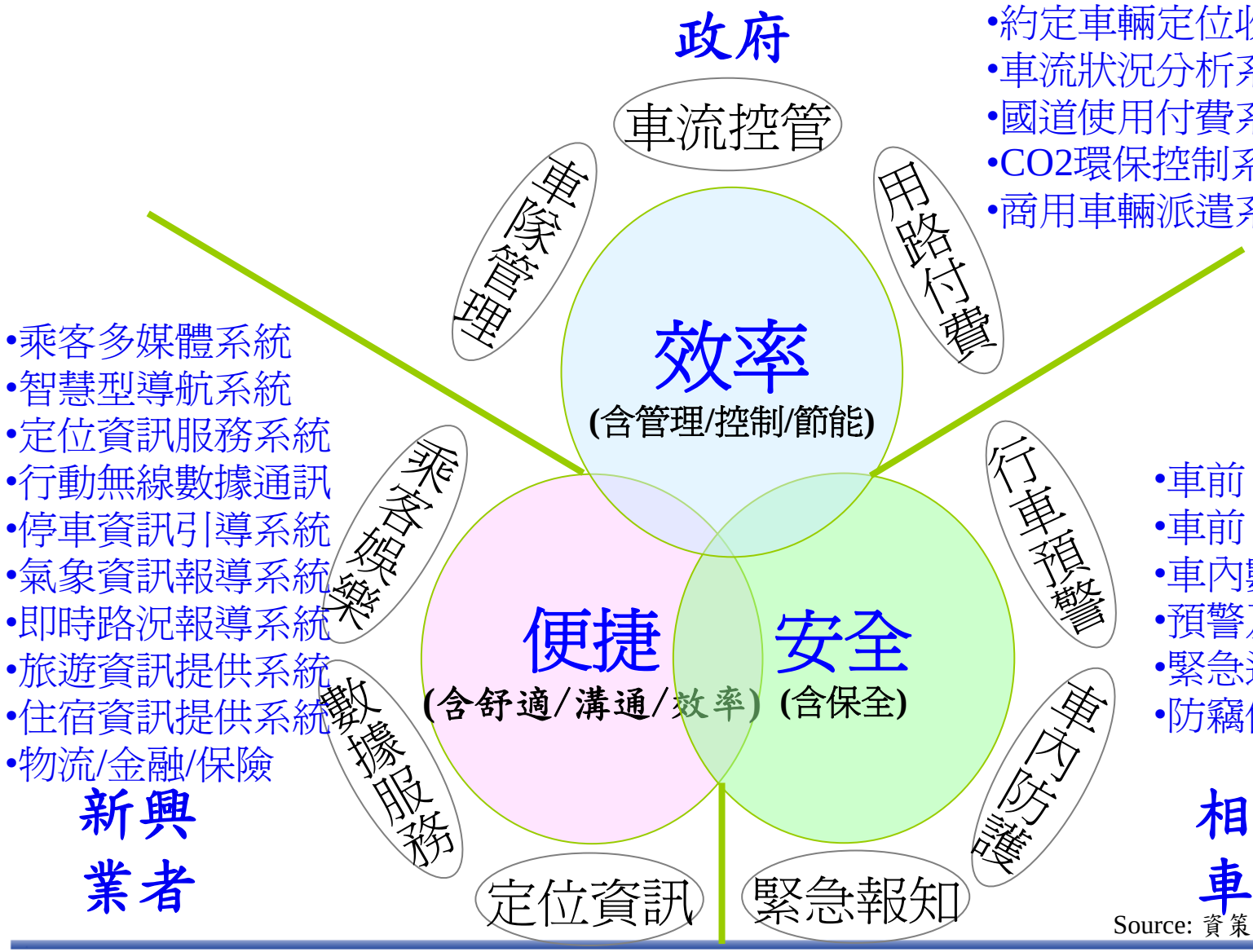
1) Cause of accident determined by the police 2) motor vehicles, motor cycles, bicycles and others 3) technical faults

On Telematics Application Deployment

(Illustrative example only)



車載資通訊發展訴求 (an III Viewpoint)



- 約定車輛定位收集
- 車流狀況分析系統
- 國道使用付費系統
- CO2環保控制系統
- 商用車輛派遣系統

- 乘客多媒體系統
- 智慧型導航系統
- 定位資訊服務系統
- 行動無線數據通訊
- 停車資訊引導系統
- 氣象資訊報導系統
- 即時路況報導系統
- 旅遊資訊提供系統
- 住宿資訊提供系統
- 物流/金融/保險

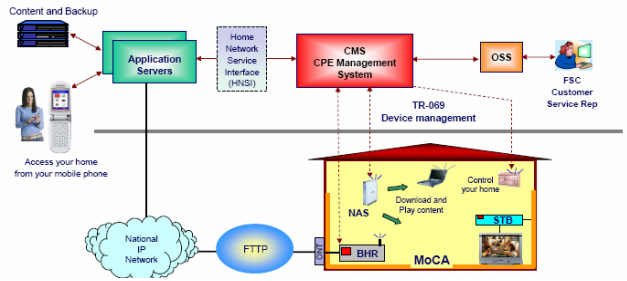
新興業者

- 車前、車後雷達
- 車前、車後攝影
- 車內數據通訊
- 預警及緊急事件通報
- 緊急通話系統
- 防竊保全系統

相關車廠

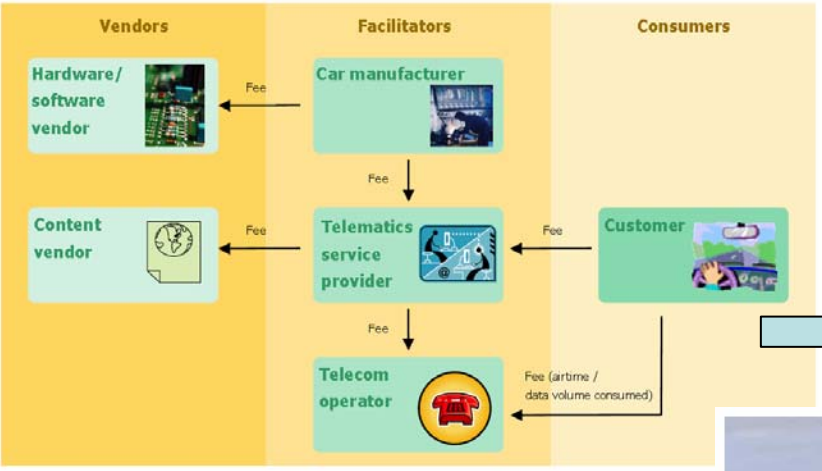
Source: 資策會MIC, 2007/12

以人為中心的Telematics服務



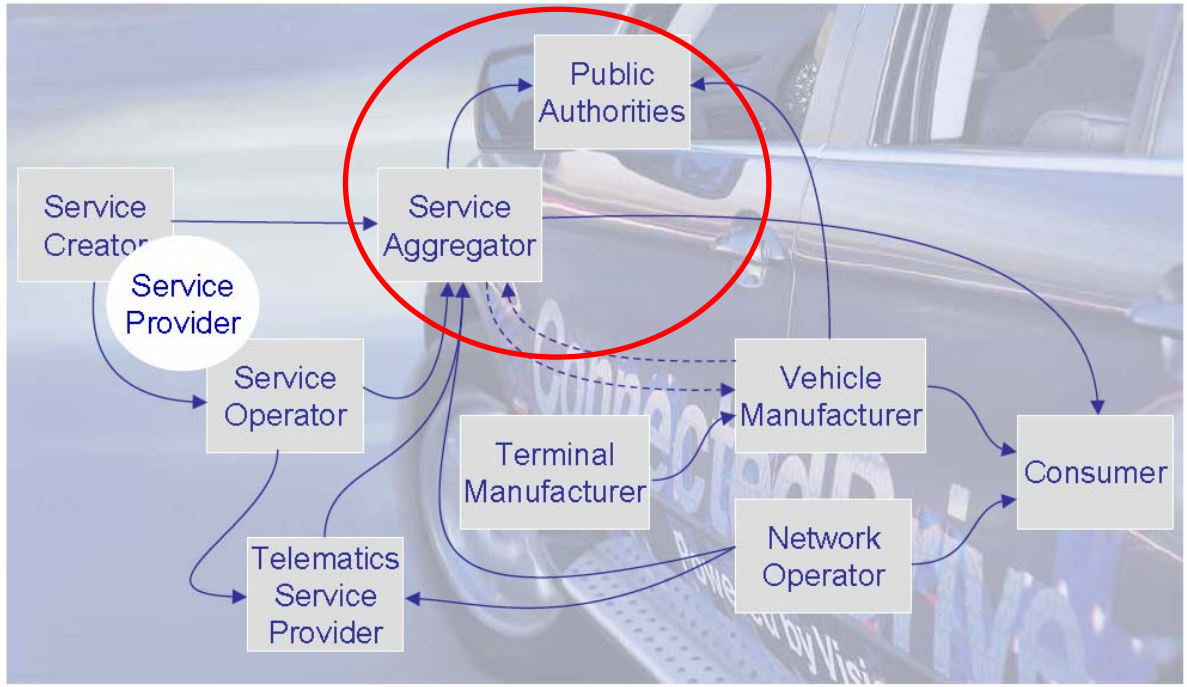
IBM相信，2015年時，車用內嵌系統的研發費用，會佔去汽車研發的60%。我國當仁不讓

Telematics Ecosystem is Transforming



- Private sector driven
  - Telco Controlled model
  - Car Company Controlled Model
  - Special markets model (Enterprise)
  - Service aggregator model (e.g. 運研所加值)

- Public sector driven
  - Mandatory applications
    - *Should Be Service Aggregator Model*
    - *IOT and After Market are important consideration*
  - A push for Telematics Market, open standard and aggregators



What Should We Do?

台灣Telematics設備與服務業佈局情形

資料、內容
（康訊科技、友邁科技）

具研發主導能力之車廠體系
（中華汽車、裕隆華創車電）

應用服務提供者
遠通電收－ETC
行毅科技、祥碩興業－TOBE

IT大廠投入車載設備業者
神達電腦－導航設備品牌、代工
台灣國際航電－導航設備品牌
英華達－導航設備代工
廣達電腦－導航設備代工
華碩電腦－導航設備代工
宏達電－車載設備代工
明基電通－車用多媒體影音
仁寶電腦－車用電腦

後端系統業者
崧旭資訊－全國路況資訊中心
華夏科技－陸海空客運資訊中心
正文、合勤、智邦－網通設備
安源資訊－車輛偵測器、
WIFLY設備建置

內容與應用服務

電信與系統業

車廠與車用電子

汽車零件廠投入車載設備業者
環隆電氣－導航系統、藍芽免持聽筒
航欣科技－車載設備代工
怡利電子－多媒體影音、藍芽免持聽筒
台灣松下－車用多媒體影音

通訊業者
中華電信－3G
遠傳電信－3G、WIMAX
大眾、創一、威邁思、威達
、大同－WiMAX

工業電腦廠投入車載設備業者
（研華科技、艾訊）

Source: adapted from 資策會產支處,2008/1

Taiwan is #1 in PND

Main Competitors by Business Segment

Auto/Mobile	Outdoor/Fitness	Aviation	Marine
TomTom (US & EU)	Polar	Honeywell	Simrad/Lowrance
Magellan (US)	Magellan	Avidyne	Navman
Mio/Navman (US & EU)	Simrad/Lowrance	Rockewell Collings	Raymarine
Sony (US & EU)	Cobra	Chelton	Cobra
ViaMichelin (EU)	Nike	Simrad/Lowrance	Furuno

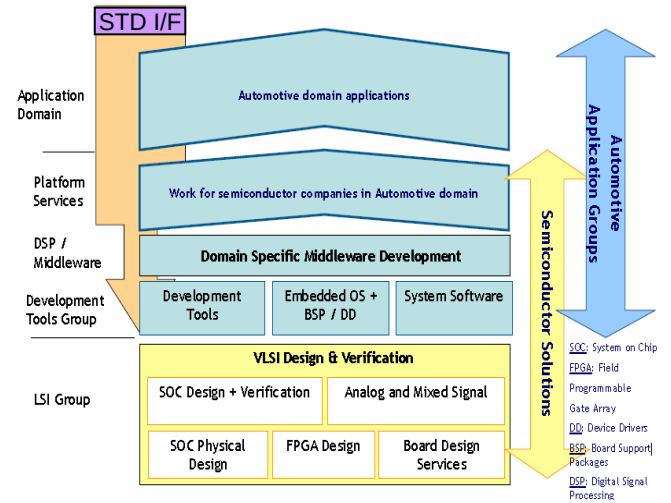
Top 5 GPS Vendors Q2 2007, Q2 2006

[13]

Rank	Company	Q2 2007 Shipments	% share	Q2 2006 Shipments	% share	Growth Q2'07/Q2'06
1	Garmin	**1,852,150**	**24.9%**	**699,370**	**20.3%**	**164.8%**
2	TomTom	1,806,970	24.3%	829,790	24.1%	117.8%
3	Mio Technology	683,500	9.2%	290,590	8.4%	135.2%
4	Magellan	421,080	5.7%	64,950	1.9%	548.3%
5	Navman	232,780	3.1%	171,410	5.0%	35.8%

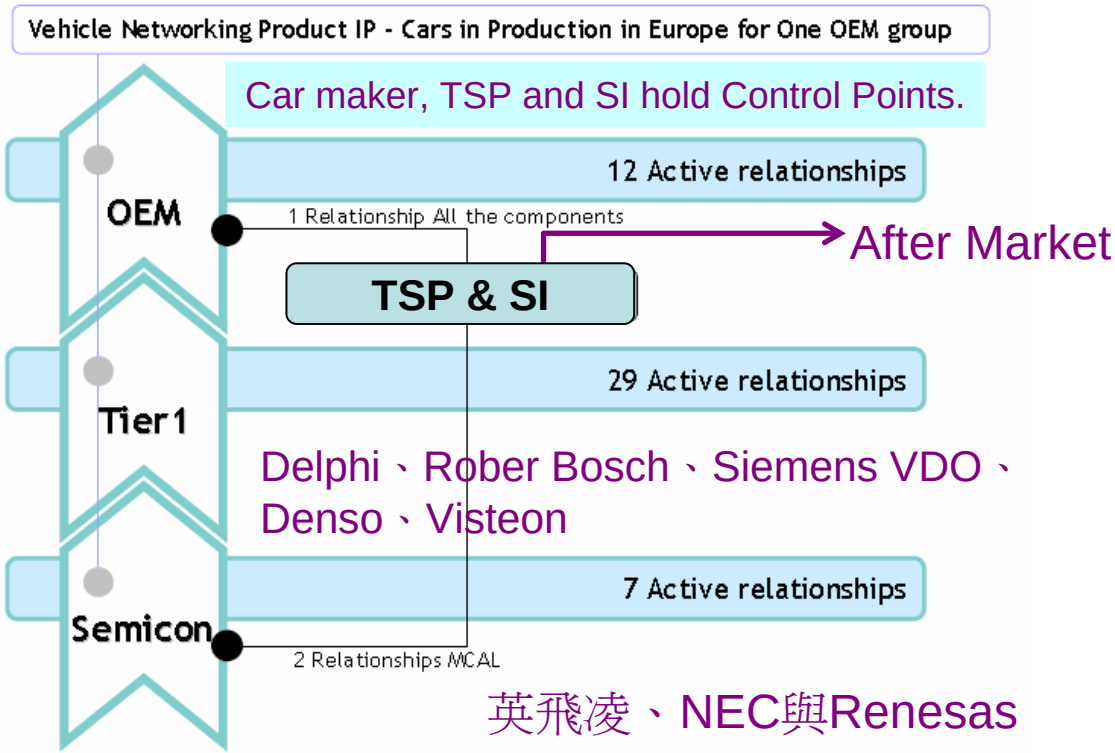
Since Garmin & MIO are PND leader in the World,
We have Great Potential to Challenge Delphi, Denso & Panasonic

Telematics Equipment Supply Chain



- There are (1) Equipment & subsystem providers and (2) Semi-conductors.
- Subsystem providers has their hierarchy – Tier 1/2/3.
- In addition to Business Negotiation, SI or TSP hold "certification" – technical barrier.

- TSP (Telematics) and System Integrators are stakeholder to approve Telematics Equipment Spec on behalf of Car Company



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Japan Telematics Industry Development

- Japan is the Largest Vehicle Production Country
- Starting from Navigation Related Services, Telematics Service is also populated in Japan. By Dec. 2006, there are 26M Telematics enabled Vehicles.
- By Jan. 2007, there are 16M ETC enabled Vehicles.
- VICS: A standard Traffic Info Access API and Aggregation Center are extremely popular and effective.
  - A National Telematics Standard and Aggregation Center.
- In addition to Car Makers, Telecom operators are also deeply involved in Telematics Services.
- For Advanced Telematics Services, Smartway (AHS, V2I) and Smartcars (ASV, V2V) project are planned.
- Currently, Japan Focuses on Smartway (i.e. V2I Services) Technologies.
  - A Deployable Safety enabled Telematics System (via Single Hop DSRC, and including Traffic optimization used in Olympic 2008)
  - Car Markers works on Active Safety Technology to pave the hole of communication based V2V Safety Applications.
  - 700MHz is planned for V2V Communication
  - AHS Phase 2, and forthcoming ASV projects is expected to work on DSRC based V2V technologies.
- Strategy Summarization
  - Establish Traffic Info aggregator and ETC in parallel
  - Joint effort of Government, private Sector and non-profit organization
  - Quick Return Safety enhancement technology first but also support revenue generating
    - *Single hop DSRC, Active safety System*
  - Large Scale Demo: Smartway 2007, AHS Trials
  - Work on Advanced Safety enhancement Technology (ASV project cover both active and passive systems)
  - Toward a part of U-Japan (Ubiquitous Life, New IT Reform Strategy)

Korea Telematics Industry Development

- Telematics is one of the eight emerging Service, one of the nine growth engine in the Korean IT 839 Strategy.
- Korea manufactures 3.84M Vehicles, is ranked No. 5 of the Global automotive Industry world wide.
- Korea started Telematics Service & Technologies development 2002.
  - Vision Toward U-city
  - Domestic Telematics Service Development
    - *875,725 subscribers, 115.6Bn Won Service Sales and 291.3Bn Won Devices Sales in 2006*
    - *10.5M Subscribers, 1,388BN Won Service Sales, 2,475Bn Won Devices Sales are expected in 2011.*
  - Invest 91,000,000 USD for Jeju Telematics Model City Project
  - KTSF Domestics Standard and TELIC telematics Aggregation Center (analog to VICS in Japan)
  - Telematics Eco-system in Korea covers car makers, service providers, device manufactures, content provider, System and solution providers.

Public Transportation Gains its Importance

- Public Transportation regains its importance
  - Developing country and under developed country are short of transportation infrastructure
    - *Commercial Vehicles is comparative against private passenger cars*
  - Pricy Petroleum makes public transportation important in developed countries such as EU and Japan
- EU SIMBA Project, Polish government and India government consider bus based Telematics System as a priority.
- BUS makers are Component Integrators. ICT influence is strong, relative to passenger car.
  - Adequate for Taiwan which do not have strong Traditional automotive Industry
- A Regional and Vertical Market
  - Automotive/Telematics Giants do not have their superior advantage
  - A Replicatable Marketplace
- A Sector to integrate IT vendors, Broadband Wireless service providers, ITS vendors, Car electronics vendors in Taiwan
- Win-Win Integration of Taiwan ICT and 3rd world automotive Industry
- Important milestone for progressive impact strategy of Telematics

Why Not Telematics

- 汽車之石油用量佔50%、其中50%是在都會區。
- 汽車是市區有30%是置於Searching Mode
- 台灣都會區計程車70%時間處於尋客空轉狀況
- 都會區公眾交通工具有其重要性
  - “Ubiquitous” Telematics已在日本興起
  - 日本之Handset/PND Based Telematics可望慢慢超越前瞻市場

Your Suggestion!