WORLD DMB

Defining the future of digital radio

WorldDMB European Automotive Workshop

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STRATEGY ANALYTICS

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The Old Connectivity Paradigm

- Connecting…with the consumer!

Source: Automotive Multimedia & Communications - AMCS

The New Connectivity Paradigm

- Connecting…with the consumer!

Source: Automotive Multimedia & Communications - AMCS

The New Paradigm: Examples

Phase I: Smartphone connections
BMW, Mercedes, Ford, GM connected smartphone apps BT A2DP -> Wi-Fi coming

Phase II: Embedded systems
SiriusXM TSP deal with Nissan
Toyota Motor Sales (N. Am.) shift to hybrid HD/IP solution
Tesla, Bentley IP delivery of Internet radio

The Automotive Cloud Has Arrived

Content

Apps

Services

Brought in

Built in

Beamed in

Gov't & Law Enforcement	OEMs & Dealers	Service Providers Wireless Carriers
Communication (incl. safety/sec'y)	Navigation	Entertainment
Satellite Infrastructure	Terrestrial Infrastructure	Telecom Infrastructure
Vehicle Status	Driver Status	Environment (Weather, Traffic)
Wireless carriers	Clouds: Apple, Google, etc.	Billing, Call Centers, etc.

DTCs

Position

Sensors

UGI

Status

Speed

Voice

Text

What is the Automotive User Experience?

Questions are:

How will connectivity be monetized?

How will the user experience change?

What will happen to the industry eco-system?

Source: Automotive Multimedia & Communications - AMCS

HMI Trends

- European automakers finally adopting touchscreens
  - Additional services make navigating menus through traditional controls complicated and time consuming
- Proximity sensors & gestures making their way into the vehicle
  - Proximity sensors in Cadillac CUE not compelling and potentially distracting
  - Gestures have limited intuitive gestures, and others would be hard for consumers to learn
- Natural language voice key to connected services
  - Limits on manual interaction due to driver distraction and complexity of menus call out for a voice solution
  - Natural language (e.g. Siri) step in the right direction
    - Still need usable and accurate solutions

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Connecting the Car: The Big Picture

Drives – OUT; Displays - IN

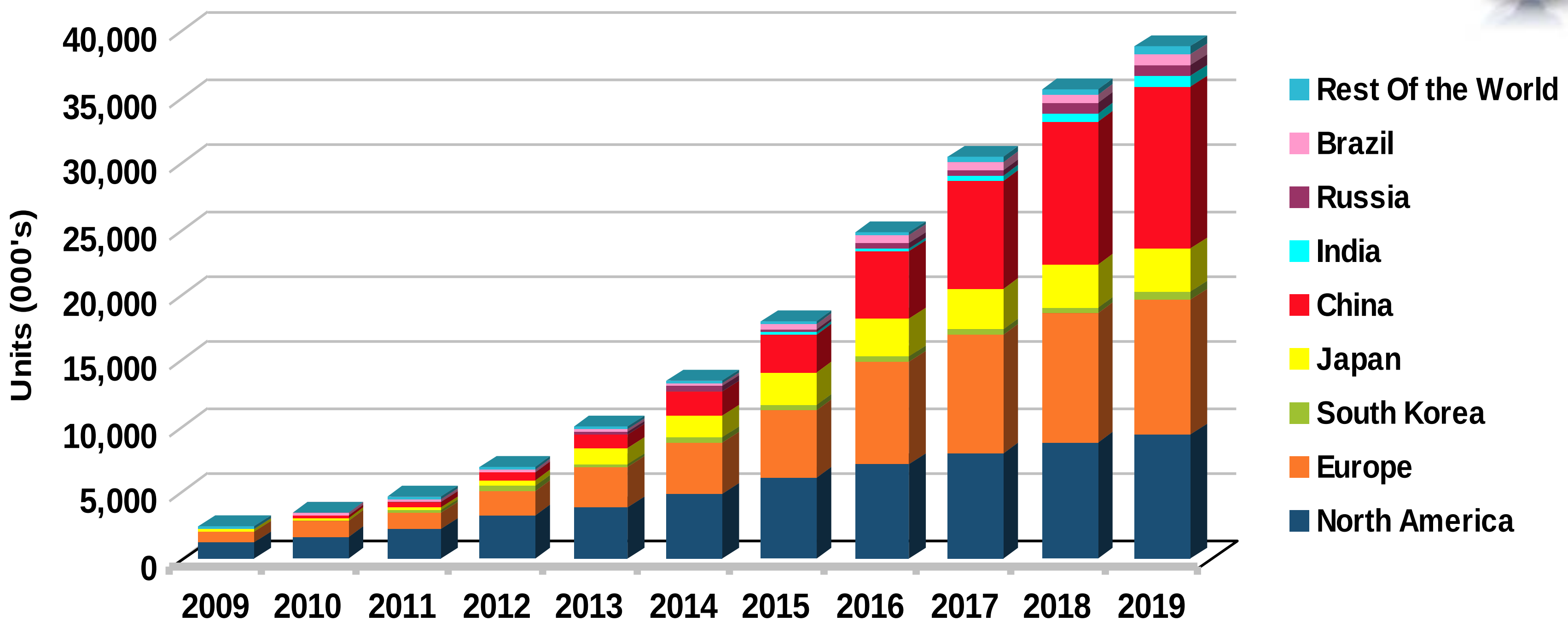
3G/LTE Connectivity on the way for CRM/VRM

Smartphone accommodation to sell cars

Digital radio for low cost, low distraction content delivery

Connectivity ECU - OEM: Regional Shipments

STRATEGY ANALYTICS

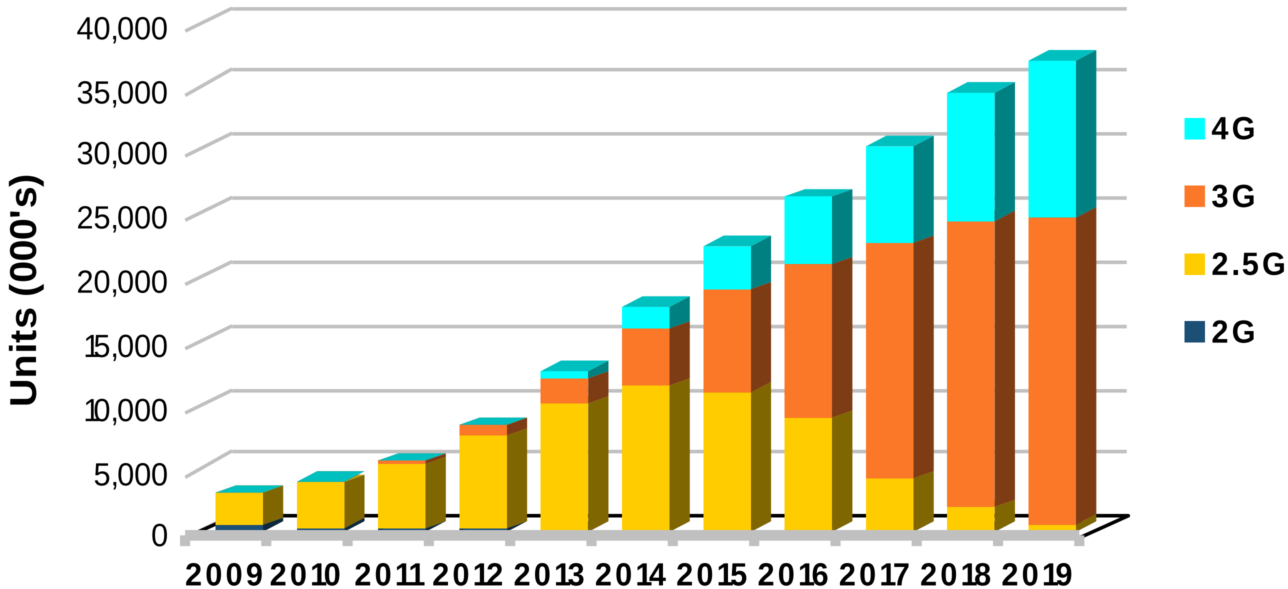


- Connectivity ECU growth opportunity 2011 vs. 2019:
  - ECU Shipments: 4.5 mil units in 2011 to 38.7 million units in 2019 (CAGR 31%)
  - ECU Revenues: $460 mil in 2011 to $2.9 Billion in 2019 (CAGR 26%)
  - Average Selling Price:
    - $100/unit in 2011 → $75/unit in 2019

Source: Automotive Multimedia & Communications - AMCS

Global Wireless Players in Automotive Embedded Telematics Demand

- New business models enable new growth phase
- Safety, CRM, advanced infotainment
- Long-term outlook - V2V, V2I, autonomous cars, etc.
  - Different regional strategies – Europe/Mobility, U.S./Safety



Global

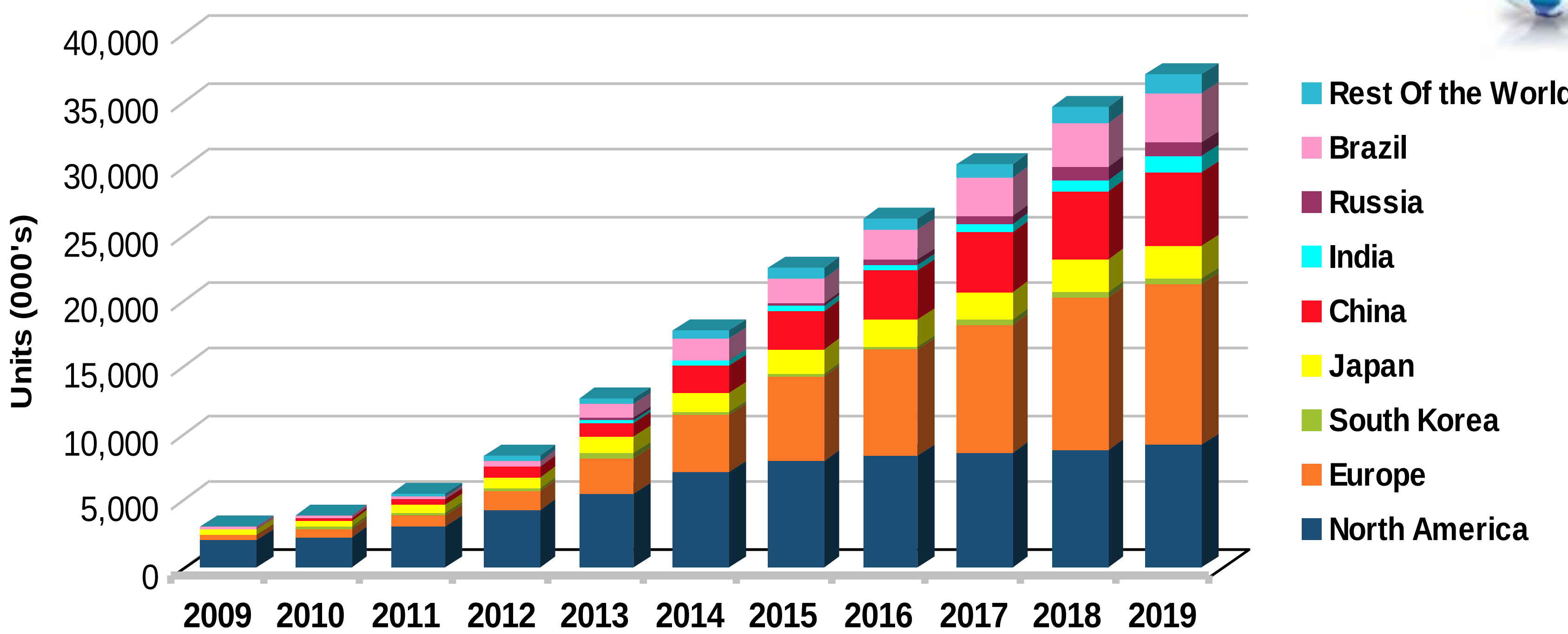
3G Wireless Network:
24 Mil units in 2019

4G Wireless Network:
12.3 Mil units in 2019

Source: Automotive Multimedia & Communications - AMCS

Telematics ECU: OEM Regional Shipment View

STRATEGY ANALYTICS



- North America: eCall/Telematics highly dependent on car maker strategies
- Europe: eCall telematics highly dependent on regulatory activity and selected OEMs
- Japan: Navigation is still dominant, Telematics roll-out is lead by Toyota
- China: Forecast to be #3 Player in embedded Telematics ECU Globally by 2014

Source: Automotive Multimedia & Communications - AMCS

Automotive HMI:
The Rise of the Display – 2012 update

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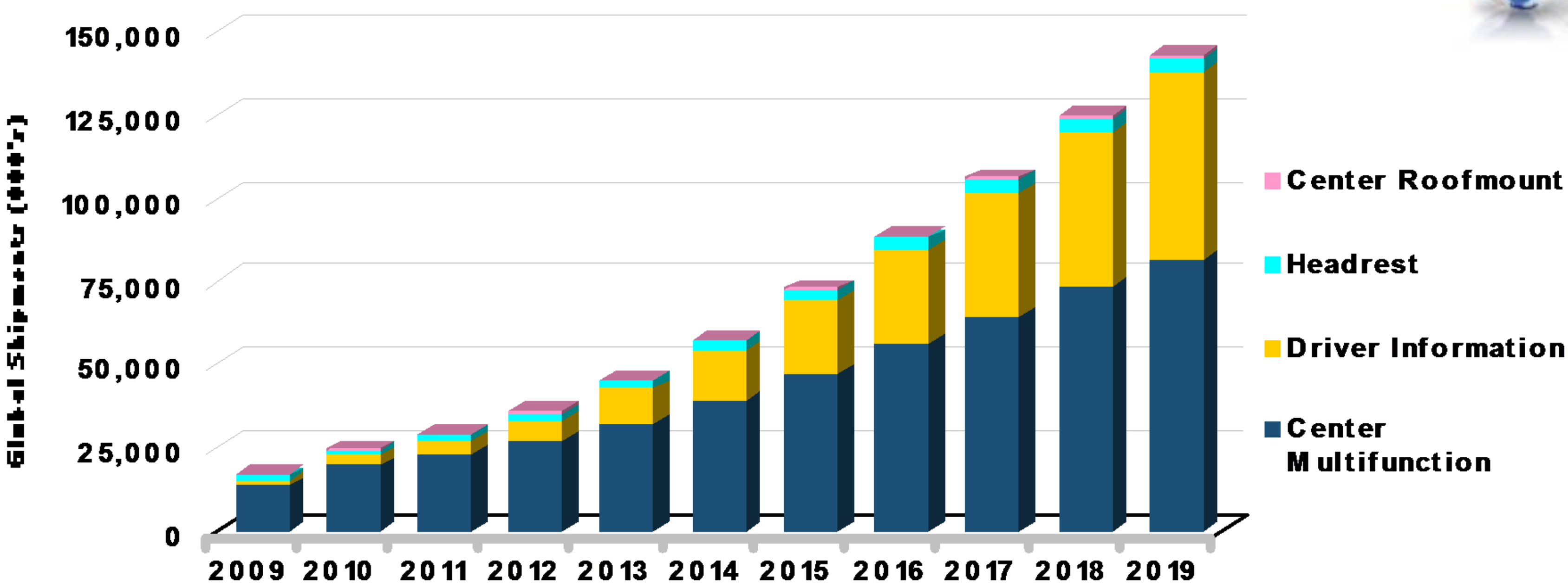
	Infotainment Display Requirement			
	<-- 1997	1998-2006	2006-2010	2010 -->
'Pre-iPhone' Phase →	1st Gen	2nd Gen	3rd Gen	4th Gen
ADAS	•			
Connected Services	•			
Telematics	•			
Enhanced Audio Control	•			
Audio/Phone Library Access	•			
Device Connectivity	•			
Digital/Satellite Radio	•			
Navigation	•			
AM/FM Radio Selection	● (Low)			
Volume Control	● (Low)			
Display Need ▶	• N/A	● Low	● Med	● Hi

Source: Automotive Multimedia & Communications - AMCS

STRATEGY ANALYTICS

OEM Display Deployment: Global Shipments by Position



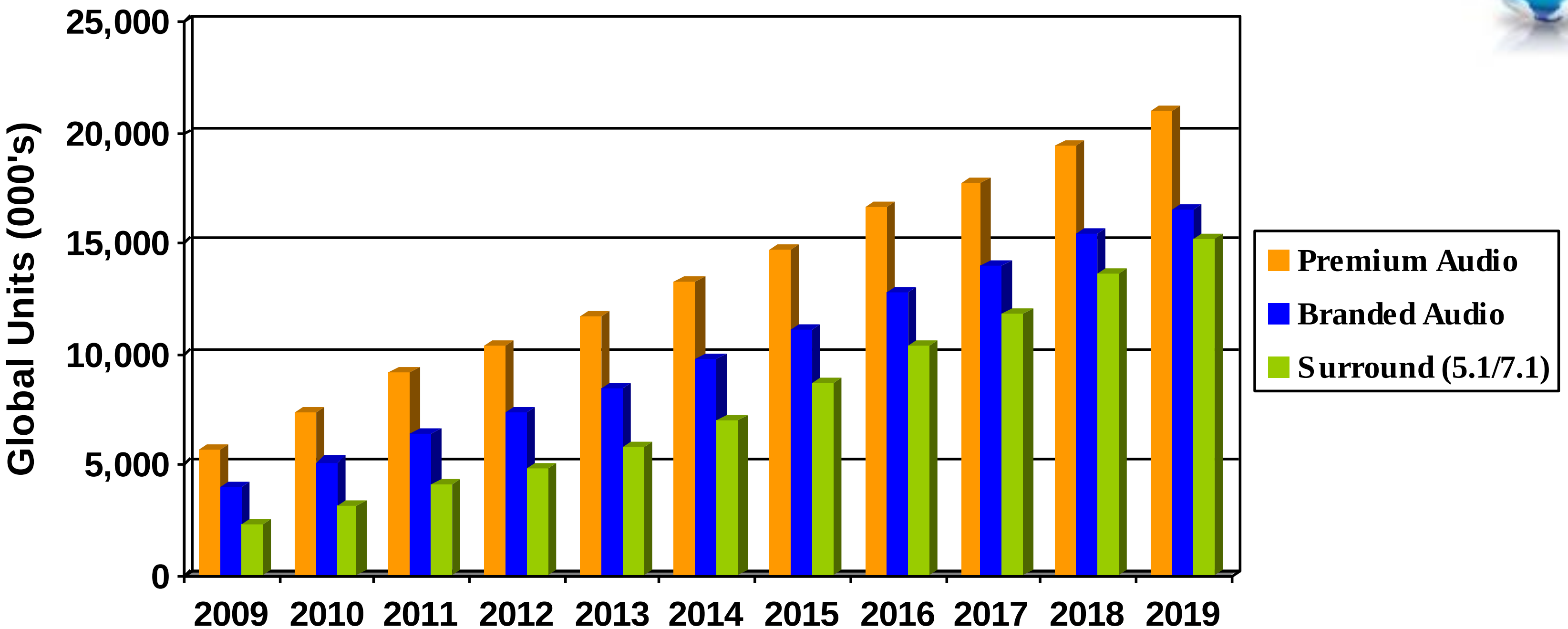
- **OEM Display Growth Opportunity 2011 vs. 2019**
  - Center Multifunction: **+250%** (23.3 Mil in 2011 → 81.7 Mil in 2019) CAGR 17.0% ✓ ✓ ✓ ✓ ✓
  - Driver Information: **+1000%** (4.4 Mil in 2011 → 56 Mil in 2019) CAGR 37.4% ✓ ✓ ✓ ✓ ✓
  - Headrest: **+123%** (1.8 Million in 2011 to 4.1 Million in 2019) CAGR 10.6% ✓ ✓
  - Center Roof mount: **+38%** (300,000 in 2011 to 420,000 in 2019) CAGR 4.1% ✓

→ **The Display becomes a key Human Machine Interface (HMI) point for: Audio, Media, HVAC, Telematics, Navigation, Social networking**

→ **The Display provides users with a flexible interface tool that will future proof vehicle systems**

Source: Automotive Multimedia & Communications - AMCS

OEM Headunit:
Prem. & Branded Audio Shipments

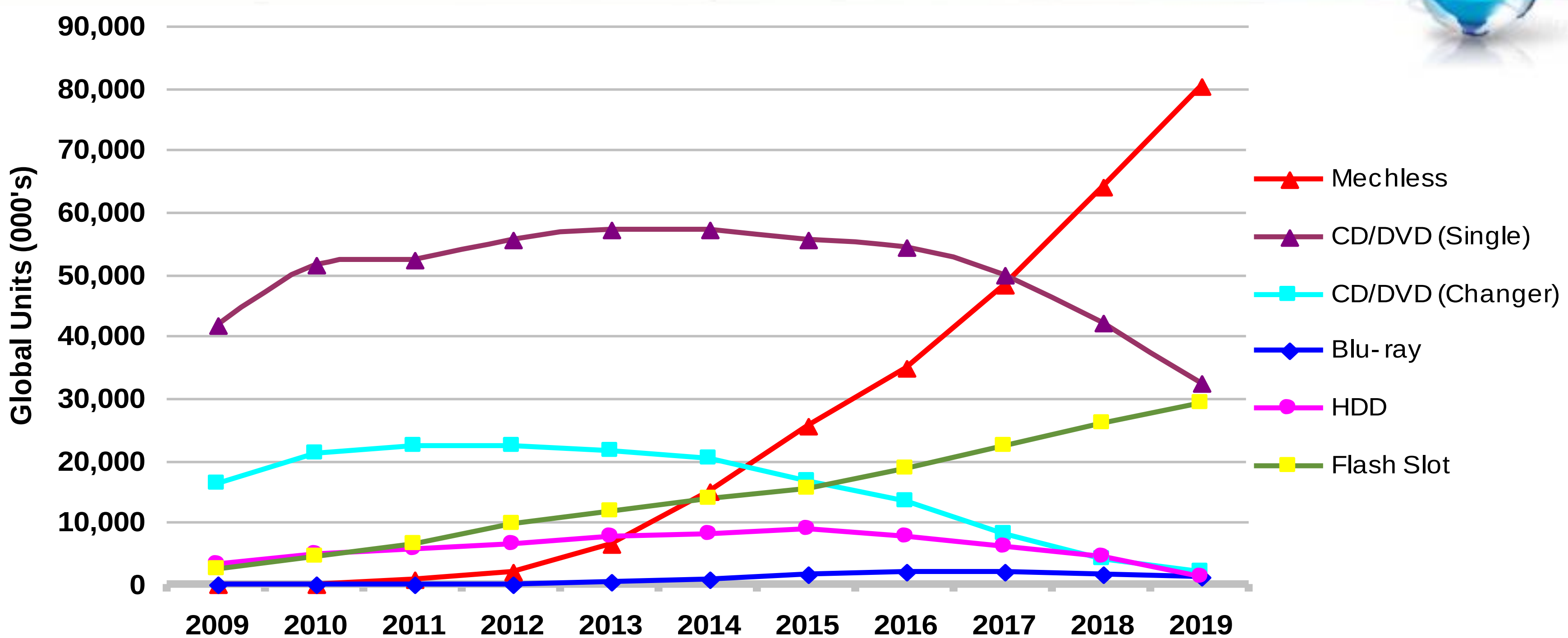


- Feature Trend/Opportunity: 2011 vs. 2019
  - Premium Audio: Growing interest in midrange vehicle segment
    - **Market Shipments: 9.0 Mil to 21 Mil units (130% Growth, CAGR 11%)** ✔ ✔ ✔ ✔ ✔
  - Branded Audio: OEM's are adopting 'Brands' to add value to Premium audio
    - **Market Shipments: 6.4 Mil to 16.4 Mil units (156% Growth, CAGR 12.5%)** ✔ ✔ ✔ ✔ ✔
  - Surround Sound (5.1/7.1): Currently low penetration across all vehicle segments
    - **Market Shipments: 4 Mil to 15.1 Mil units (270% growth, CAGR 17.9%)** ✔ ✔ ✔

Source: Automotive Multimedia & Communications - AMCS

OEM Headunit: Optical Media and Storage

STRATEGY ANALYTICS



- Headunit Feature Trend/Opportunity: 2011 vs. 2019

  Mechless: 69% of vehicles worldwide will be 'solid-state' by 2019 (2.6% in 2011) ✔ ✔ ✔ ✔ ✔

  – **CD/DVD Changer:** Headunit availability falls to 1.9% WW by 2019 (29% in 2011) ✘

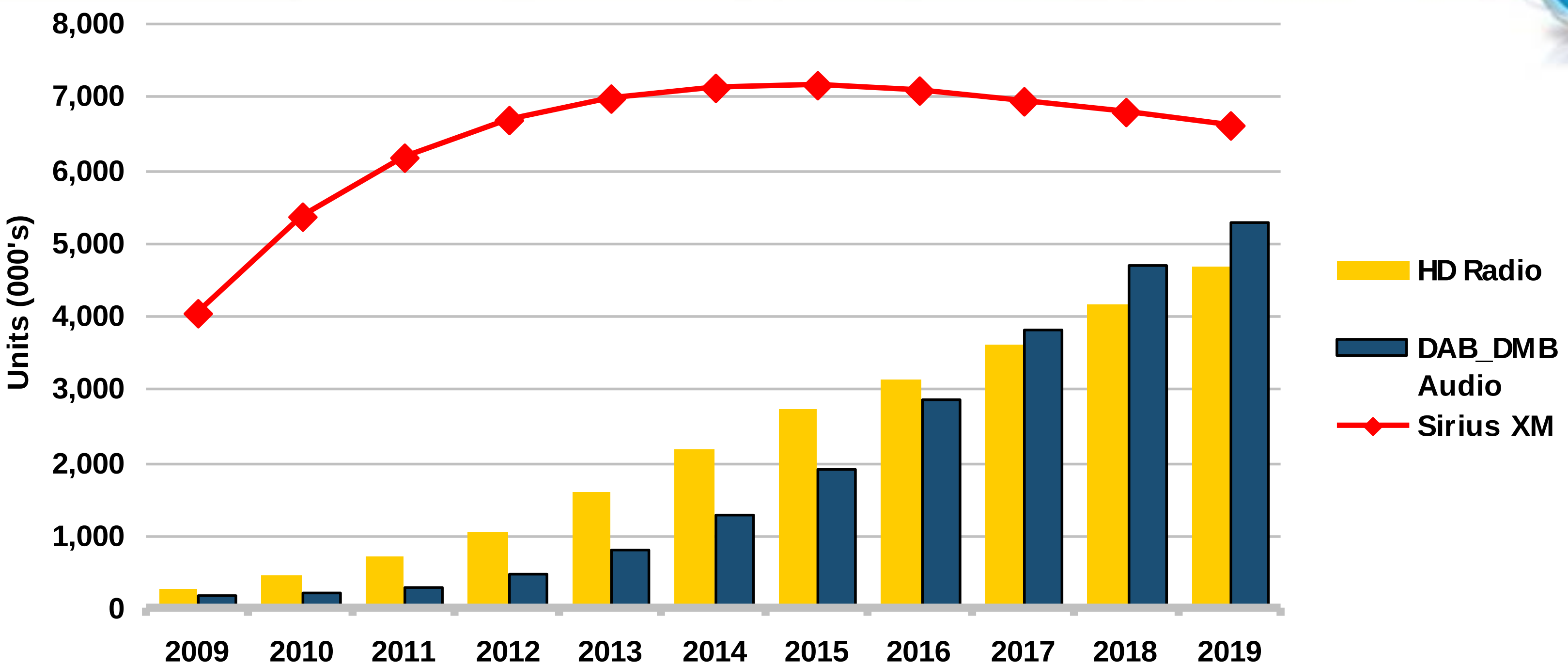
  – **Blu-ray:** Compatible drive in 1.0% of headunits WW by 2019 (0% in 2011) ✘

  – **HDD:** Available on 1.1% of headunits WW by 2019 (7.6% in 2011) ✘

  – **Flash card slot:** Available on 25% of headunits WW by 2019 (8.3% in 2011) ✔ ✔ ✔

Source: Automotive Multimedia & Communications - AMCS

OEM Digital Radio Terrestrial and Satellite



- Digital Radio Growth opportunity 2011 vs. 2019:
  - Sirius XM shipments will grow at a slow 1% CAGR between 2011 and 2019

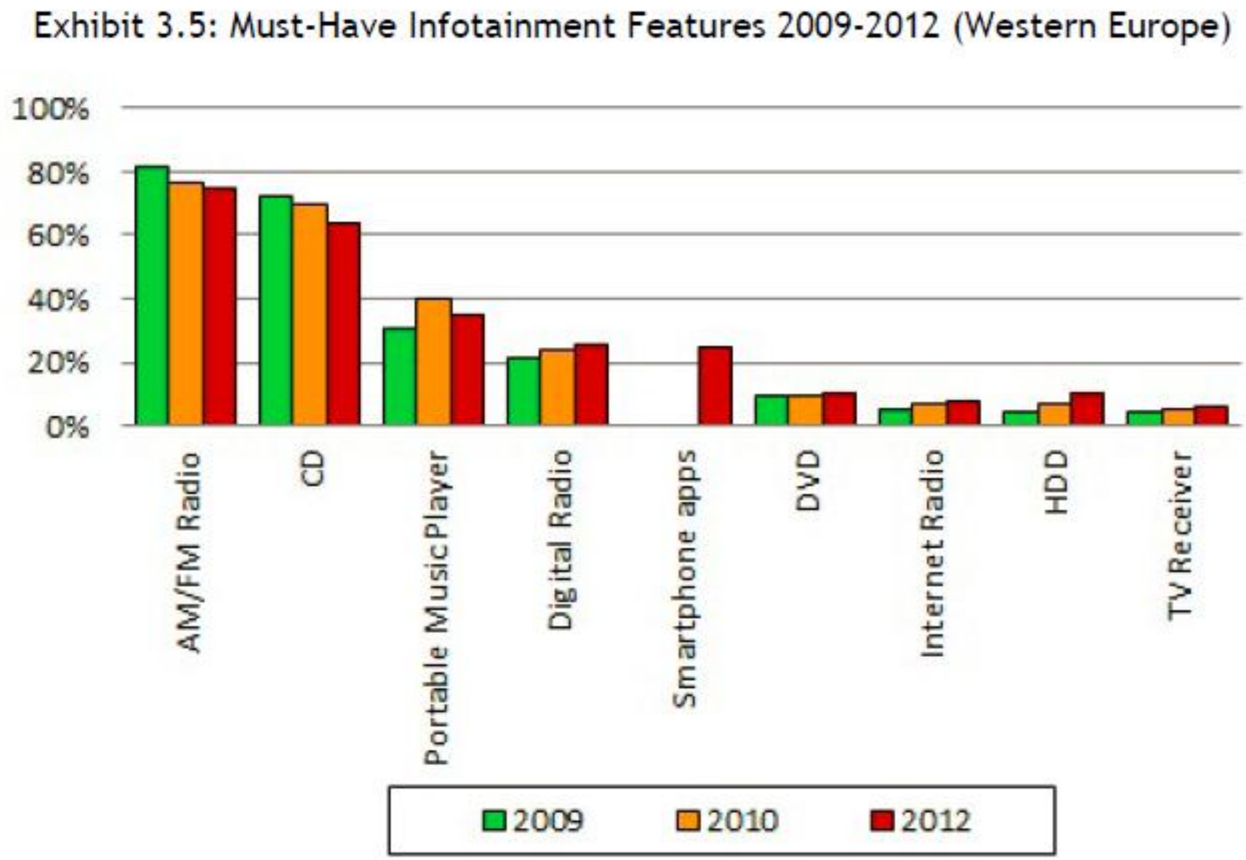
    → 6.1 million units in 2011 to 6.6 million units in 2018.
  - HD Radio shipments will expand at a CAGR rate of 27% between 2011 and 2019

    → 690, 000 units in 2011 to 4.6 million units in 2019.
  - DAB shipments will increase at a CAGR rate of 43% between 2011 and 2019

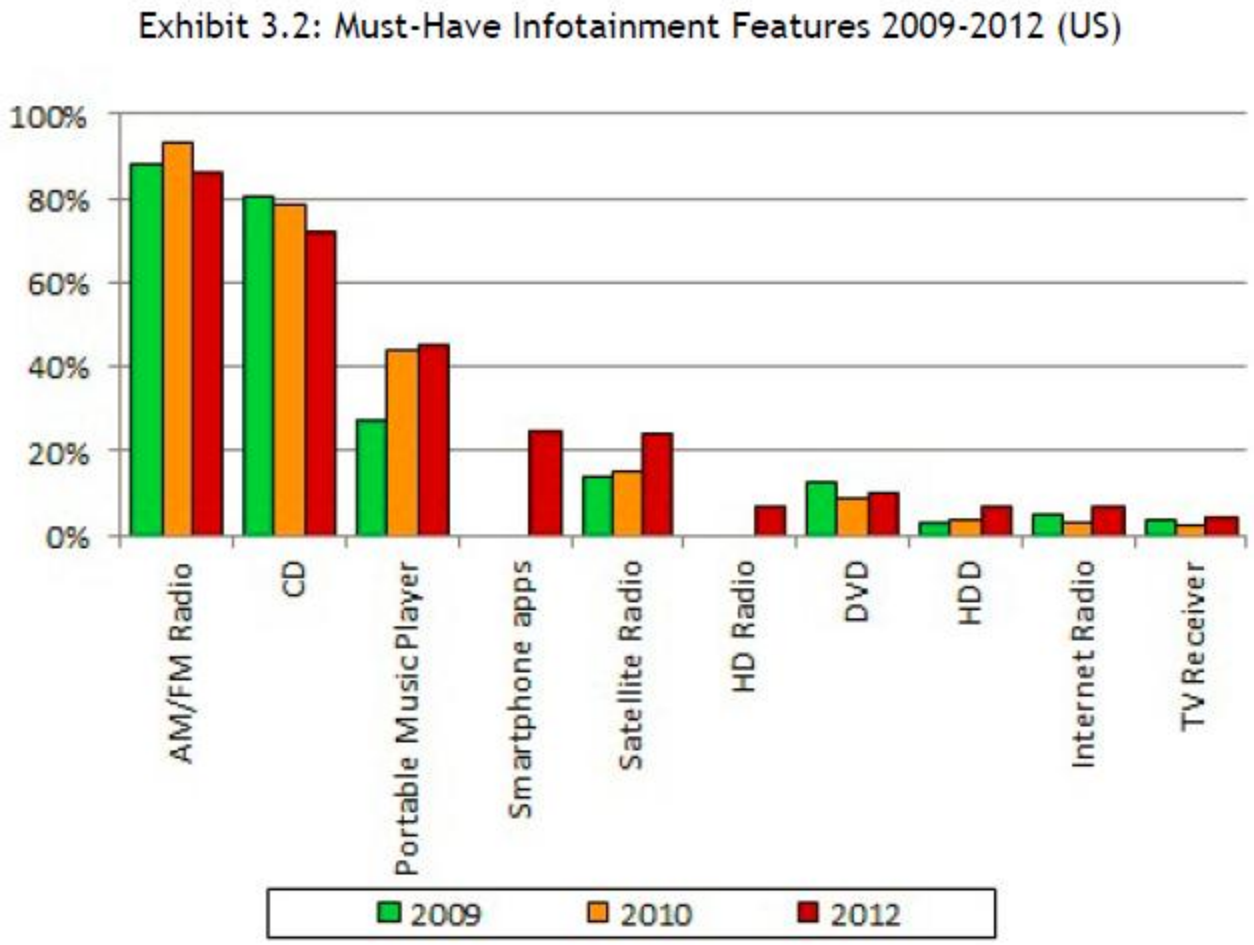
    → 300,000 units in 2011 to 5.2 million units in 2019.

Source: Automotive Multimedia & Communications - AMCS

Must Have Infotainment – Western Europe



Must Have Infotainment – U.S.



STRATEGY ANALYTICS

Smartphone's Impact on the In-Vehicle Experience

43%

Messaging = "Eyes Off Road Time"

- Need to look to decide if message is important
- Unaware or distrust voice control/read out
- Check messages at stop lights
- Keep phone low, so moving eyes more

41%

Inbound Calls are Usually Answered

- Need to pick up device to decide if call is important
- Bluetooth headsets are owned but not used because they are a pain to keep charged
- They try to use phone speaker, but max volume is too low

78%

Navigation Difficult to Interact With

- Don't use it enough to buy a dock/stand
- So keep it in cup holder and need to pick it up to look at it
- Or, put it in dashboard blocking the instruments
- Can't hear TBT because max volume is too low

40%

Streaming Media Difficult to Consume

- Want to listen to streaming music from smartphone apps (e.g. Pandora)
- Awkward to control app while driving
- Speakers on phone too quiet; want to connect to their car stereo speakers




Car Connectivity a Mobile Mess

STRATEGY ANALYTICS

Popular Mechanics

The Mobile Mess: Why Isn't Car Connectivity Better?

With smartphone integration and Internet connectivity, automakers are in unfamiliar territory. While systems such as Ford's Sync, Nokia's MirrorLink, and Cadillac Cue are bringing the Web and apps increasingly into the car, they are also showing the delicate line car companies must walk between connectivity and distracted driving.

"It's kind of a mess," says Roger Lanctot, a senior analyst at technology research firm Strategy Analytics. "Because all of these systems are proprietary, it's expensive to deploy content app by app. They are also all brand-new, and they all work differently, so you have usability issues and glitches galore."

Smartphone's Impact on the In-Vehicle Experience

Browse > Home / Car News, Home Page Featured, Industry news / Car Radio Makers Cite Problems with iOS6

Car Radio Makers Cite Problems with iOS6

September 25, 2012 by Amy Gilroy 2 Commen

Filed under Car News, Home Page Featured, Industry news

If you upgraded your iPhone 4/4S to the new iOS 6 you may lose Bluetooth control over your phone in many car radios.

According to Alpine and 200 complaints on the Apple user forums, certain radios from VW, Alpine, Pioneer, Kenwood, Clarion and others have Bluetooth issues. Some will no longer work with steering wheel controls and no longer show meta data info, nor let you control your phone from the radio buttons over Bluetooth.

MyFord Touch – Coming to China

GM CUE - Home


3:22
AUDIO
PHONE
NAV
SETTINGS
PANDORA
CLIMATE
OnStar
R. CLIMATE

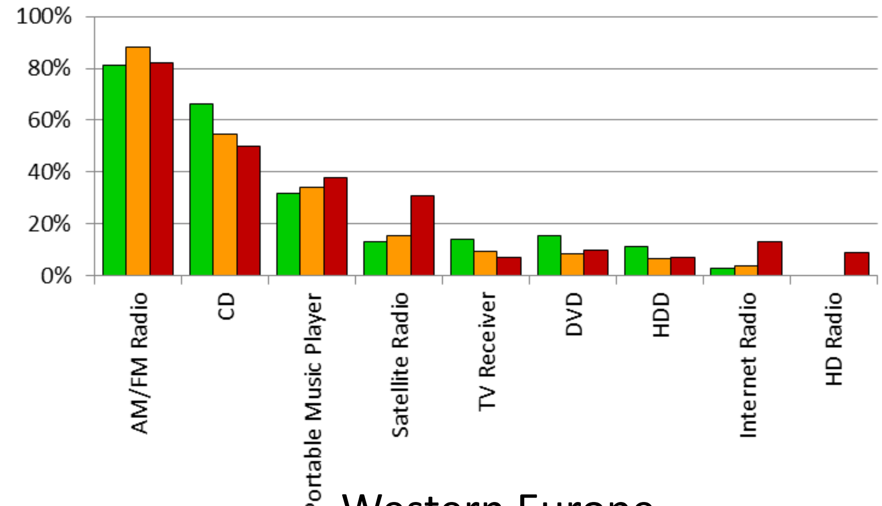
GM CUE – Radio Station Search

Portable Music Continues Steady Growth as Vehicle Entertainment Source

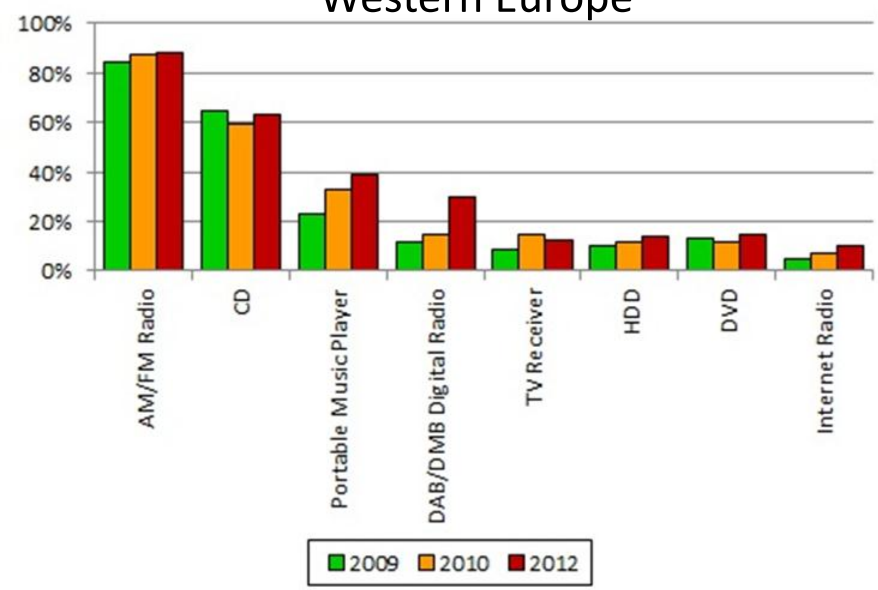
STRATEGY ANALYTICS

- Portable music player usage in US steadily increasing
  - 23% use it every day
- 25% consider smartphone connectivity a must-have feature
- Internet radio usage in US increasing due to smartphones
- AM/FM radio and CD player remain the two most-used infotainment features in US
  - AM/FM usage remains steady
  - Weekly CD usage dropping due to portable music player access

US



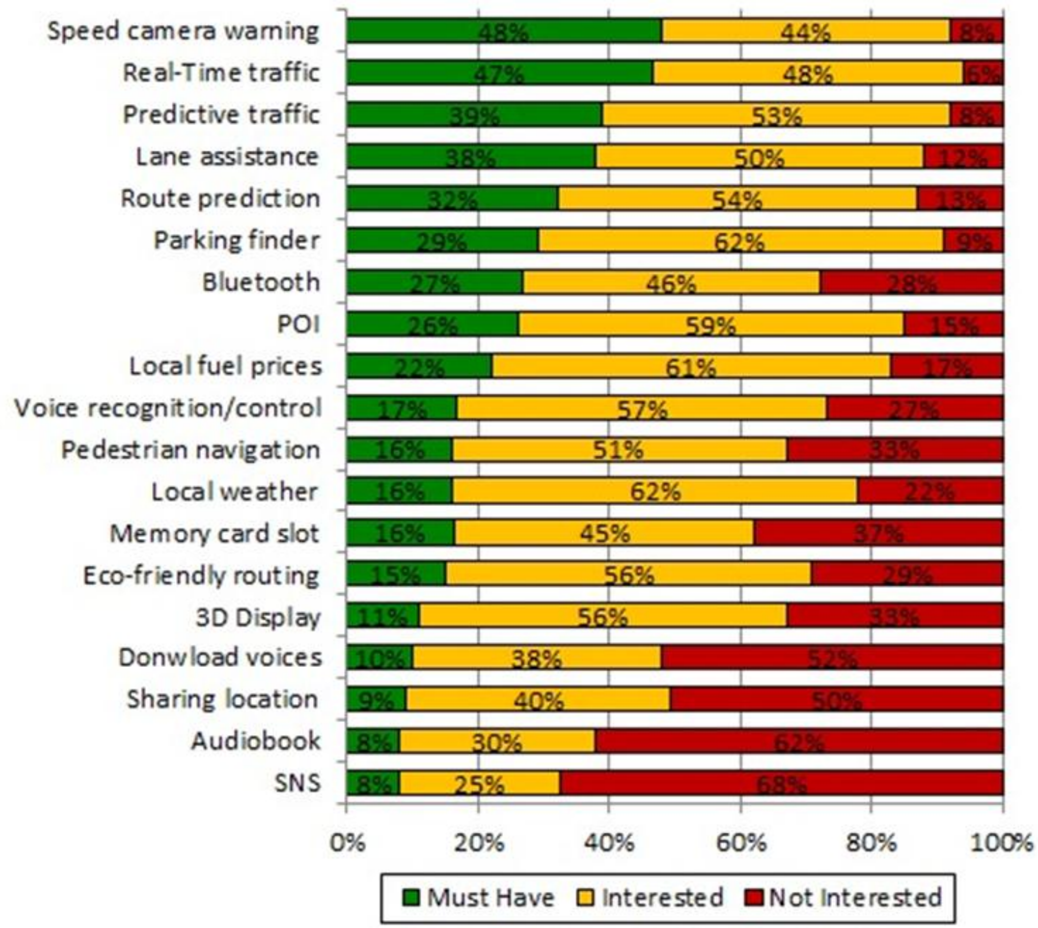
Western Europe



Context Awareness Becoming Key Feature for Navigation Systems

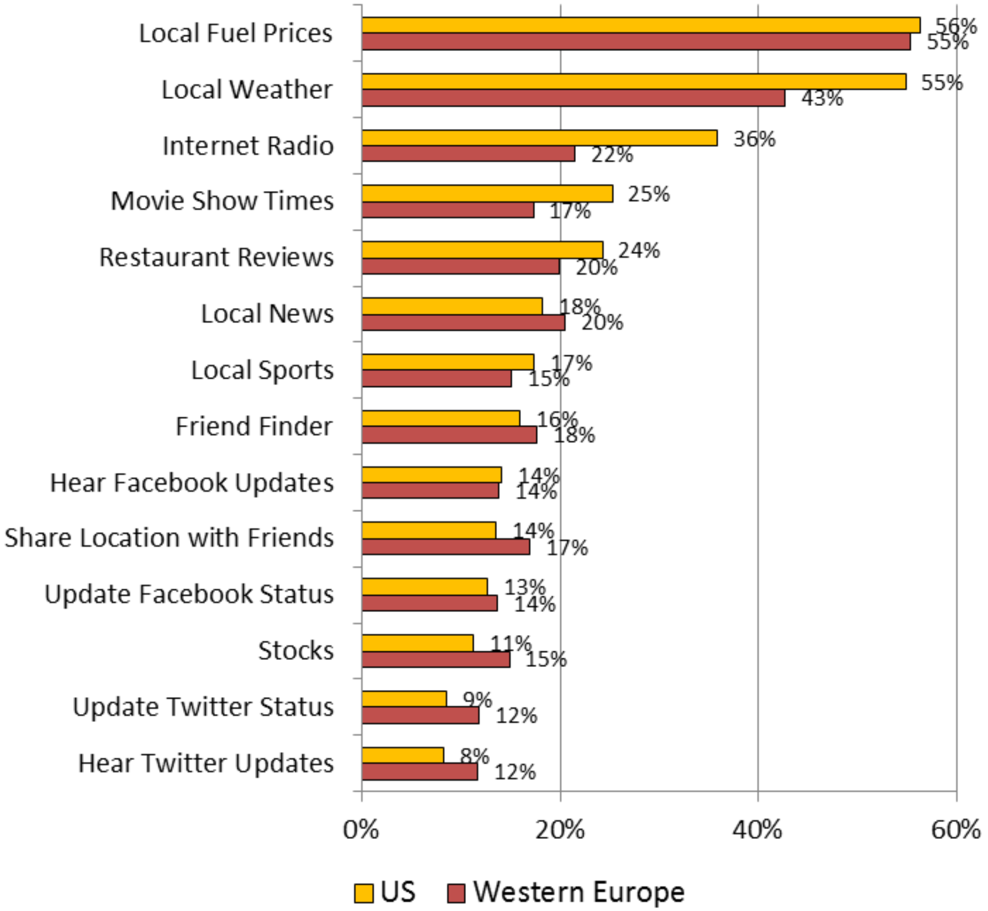
STRATEGY ANALYTICS

- **Predictive traffic and route prediction are in the top 5 most-wanted features for Western European navigation consumers.**
  - 39% consider predictive traffic a must-have feature
  - 32% consider route prediction a must-have feature
- **Speed camera warning and real-time traffic top 2 features.**



Interest in Connected Services: US & Western Europe

STRATEGY ANALYTICS



Source: Strategy Analytics Automotive Consumer Insights Jan 2012

- Consumers in US and Western Europe most interested in local fuel prices and local weather
- Social networking low on list of connected features
  - User testing shows UX in-vehicle is poor
- Stripped down versions of Facebook and Twitter cause them to be passive experiences instead of interactive

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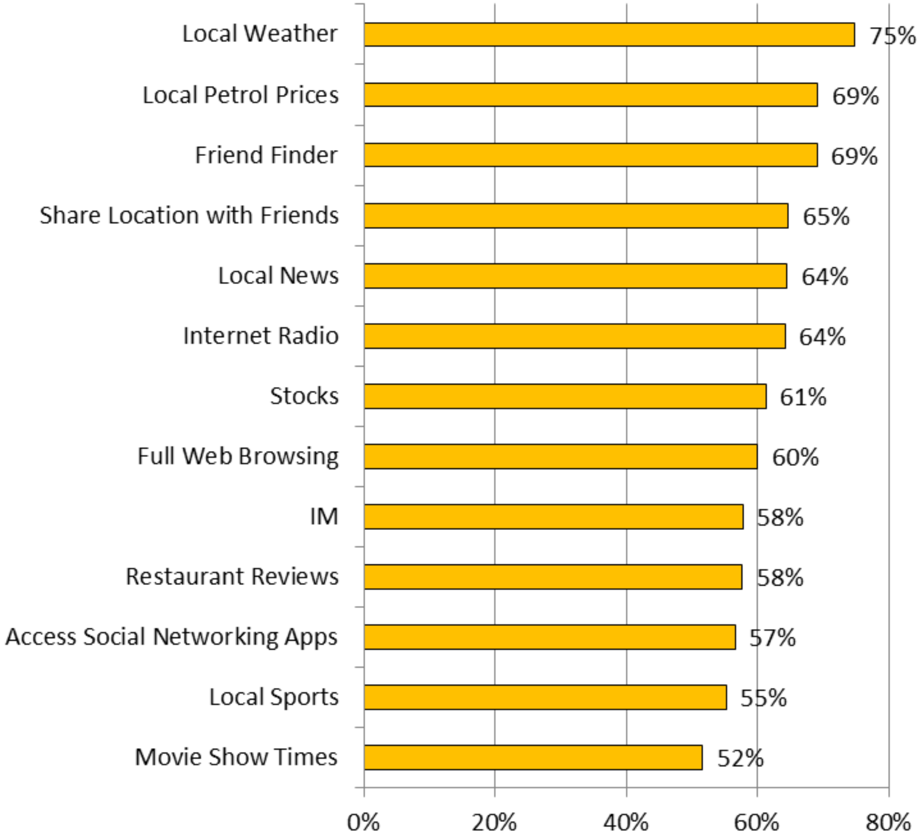
Interest in Connected Services: China

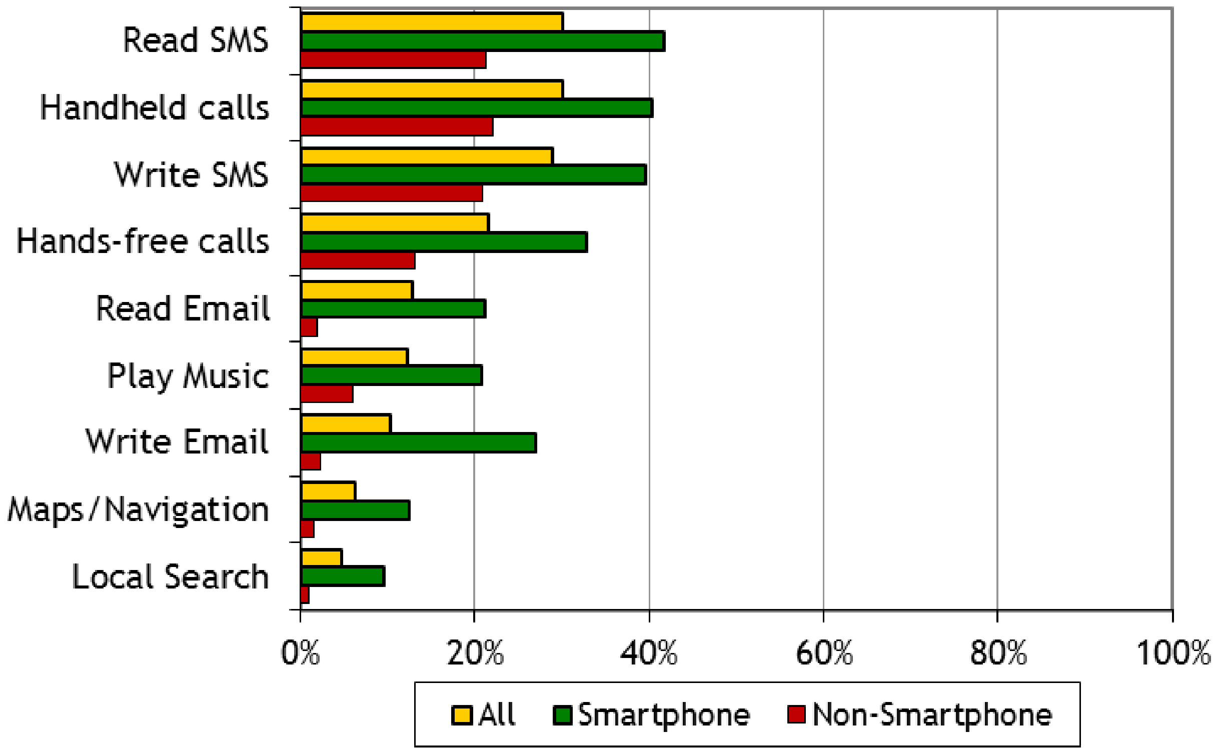


Source: Strategy Analytics Automotive Consumer Insights Jan 2012

- Consumers in China most interested in local weather
- Social networking features show higher interest, but they are domain specific
  - Seeing friends locations and sharing their locations with friends instead of seeing social network feeds

Mobile Phone Usage in Vehicle – Western Europe

STRATEGY ANALYTICS

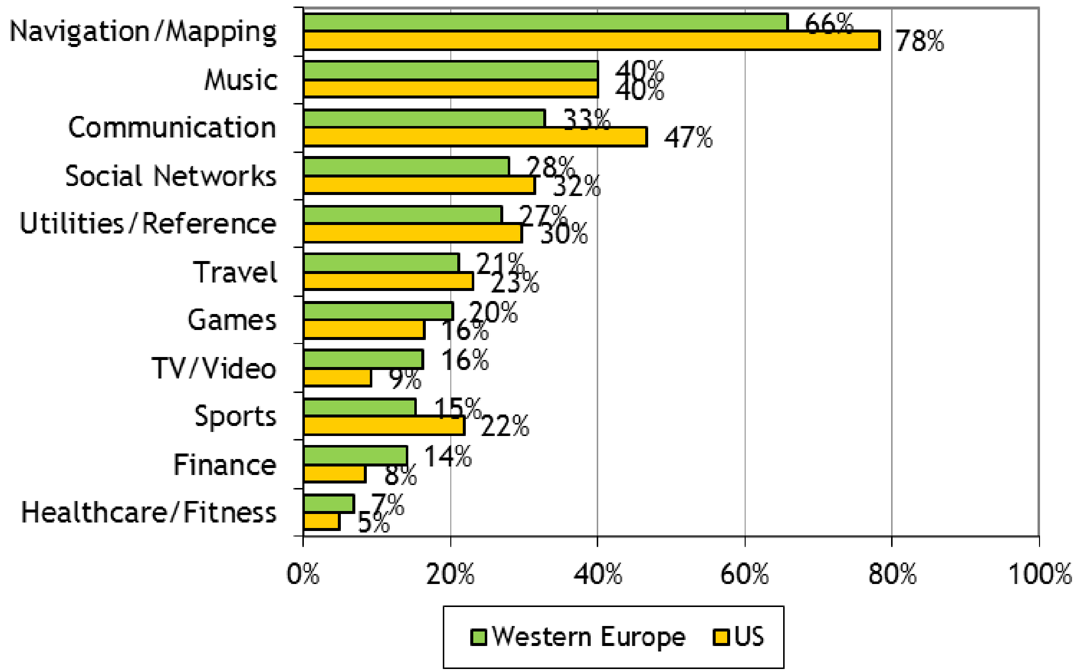


Source: Strategy Analytics Automotive Consumer Insights, Feb 2011

- In Western Europe, about 40% of smartphone owners read and write at least one SMS while driving per day

Smartphone App Usage While Driving

STRATEGY ANALYTICS



Source: Strategy Analytics Automotive Consumer Insights Feb 2011

- **More than two-thirds of smartphone owners in the US and Western Europe currently use navigation and mapping applications on their smartphone in the vehicle.**
  - 66% of smartphone owners in Western Europe and 78% in the US use navigation or mapping apps in the vehicle.
  - 40% of smartphone owners use music applications while driving
  - 32% of smartphone owners in the US and 28% in Western Europe use social networking applications in the vehicle.

The Last Word

It’s all about the user experience.

Get the user experience right – u win

Solve a problem, fulfill a need – u win

Thank you!

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