Trends & Changes in Vehicle Connectivity: November 2014 update

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About Spotam

- Knowledge and services center for:
  - Connected car
  - Vehicle Telematics
  - Location based services
  - Internet of things (IOT, WEB3.0)
- Services include:
  - Information & training services
  - Business development
  - Marketing consultation
  - Product consultation
  - Teaming
- Partner of Logtel in Connected car congress 2015

An Industry in Formation

Only 2.5% of vehicles are connected

- But B2B after market is here and threatened

The market is in stand by….

- CEs & MirrorLink are not yet in effect
- IVI platform availability is still limited

Market picture is not clear

- Market structure is changing
- Business models are not yet clear

New technologies take the focus

- V2X
- Autonomous vehicle

What's New ……

- Market structural change – CEs entry
- Learning the hard way – Infotainment functional crisis
- Big data – High potential tough challenges
- ADAS/V2? – basic concepts are challenged
- Autonomous car is stimulating technology & products
- Security becomes an issue
- Regulation at a test
- Insurance Telematics towards maturing
- Future automotive – different with Telematics at center

Today's Focus:

- **Market structural change – CEs entry**
- Learning the hard way – Infotainment functional crisis
- Big data – High potential tough challenges
- **ADAS/V2? – basic concepts are challenged**
- Autonomous car is stimulating technology & products
- Security becomes an issue
- Regulation at a test
- Insurance Telematics towards maturing
- **Future automotive – different with Telematics at center**

About Apple CarPlay

Launched March 2014
Ongoing large number of integrations (OEMs, Aftermarket IVIs)
ITunes Eco system

Wired connection
Full IVI takeover

SIRI voice Control

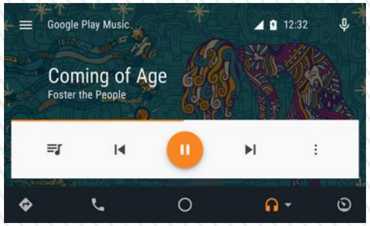
Knobs & controls integration

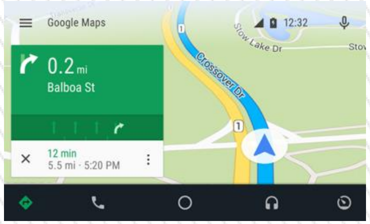
Touch screen & mirroring

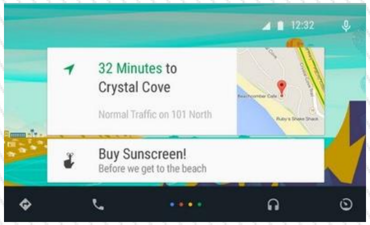
About Android Auto

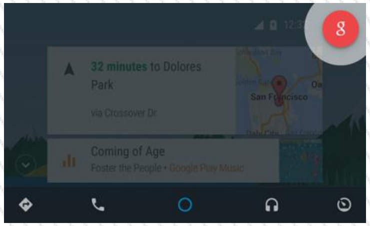
Market and Business Analytics

- OAA based
- Announced June 2014
- Android 5.0 – Lollipop
- Vehicle controls integration
- Car Mode
- Google maps (no LBS API)
- Music
- Simple cards HMI - Contextual approach
- Messaging (SR/TTS)
- Voice command (PS level)
- Voice Web search
- Applications - SDK/API









Mapping the Players

	Apple	Google	MirrorLink
Topology	Smartphone	Both ends	Smartphone
Market	Self	OAA	CCC
Car resources access	No access	Limited access	Access

<u>Other players to be considered</u>

- OEM embedded
- Windows for the connected car
- Livio
- OpenCar

Market Structural Change

- CEs entry – Acceptance, objection, shift
- Acceptance – OAA, Integrations
- Objection –
  - The battle is on branding & eco-system control
  - Change in approach – Fight instead of acceptance
  - Defining boarders - MirrorLink access, OBD,
- Shift –
  - Focus - Expanded vehicle centric applications
  - Full service packages from the vehicle into the cloud
- No functional crisis real conclusions – Branding constrain
  - Still wallen garden approach to applications
  - Still strong system fragmentation

Full Service Packages

- Owners portal
- Car locate
- Emergency: E-Call, B-call, dealer advisory
- Assistance
- Remote control / Preconditioning
- Remote info & analysis
- Mobility/Multimodal
- Remote diagnostics/health reports
- Wearables integration

ADAS & V2?

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V2X & ADAS development

- Increasing ADAS/V2X focus
- Connected ADAS
- V2cloud, V2P
- Regulation - 8 NHTSA services
- Semi-autonomous solutions

Basic concepts are challenged

- DSRC vs V2Cloud
- ADAS IVI separation

8 NHTSA V2V Features

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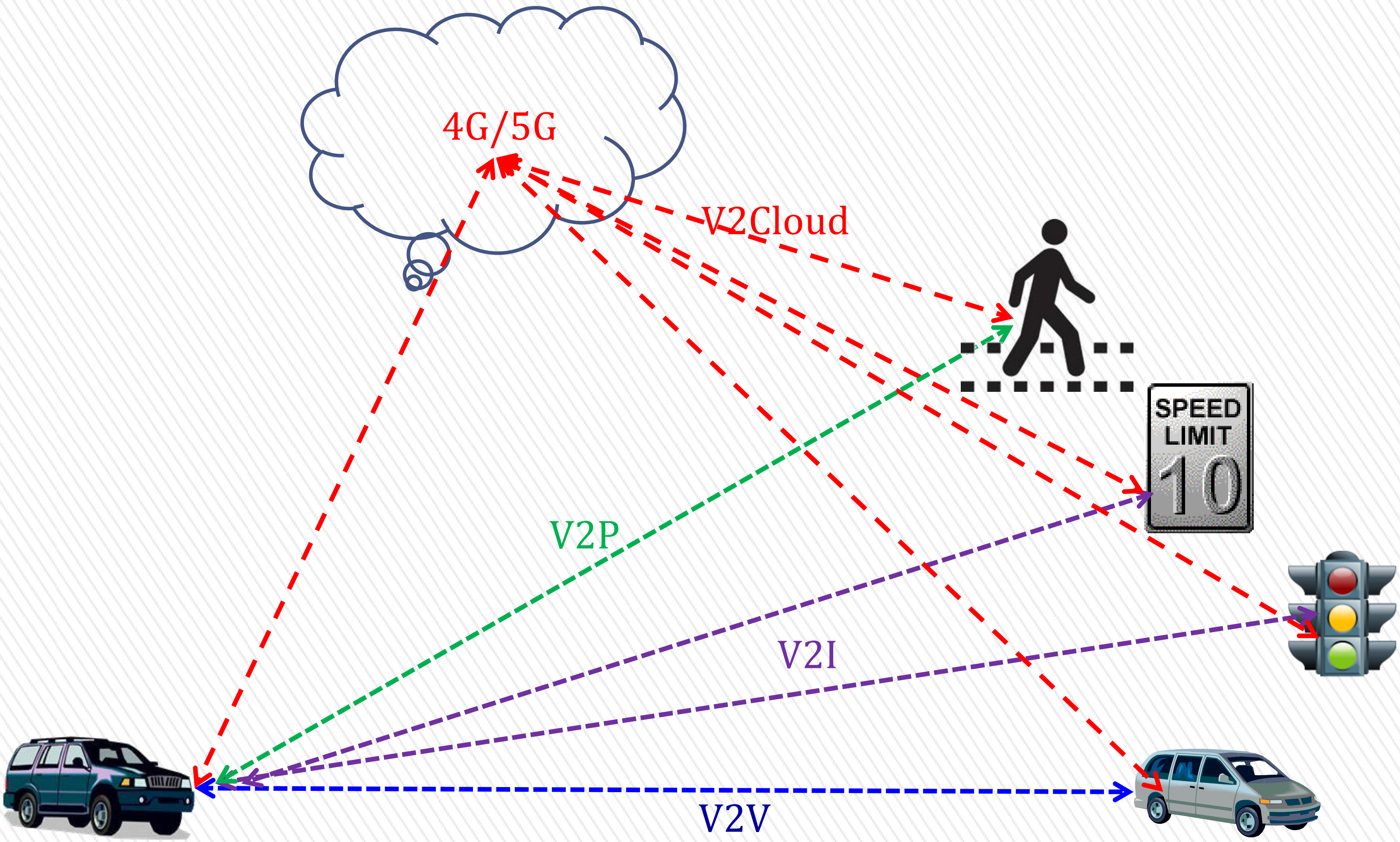
- Emergency break light warning
- Forward collision warning
- Intersection movement assist
- Blind Spot lane change warning
- Control loss warning
- Do not pass warning
- Vehicle stabilization activation
- Weather information

NHTSA
www.nhtsa.gov

V2Cloud vs. V2X

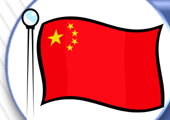


V2?

** Who will pay the bill?

	V2X/DSRC	V2Cloud
Financing		✓
In-vehicle cost		✓
Infrastructure complexity		✓
Deployment		✓
Speed	✓	4G+/5G ?
Network availability	✓	
Technology maturity	✓	
Regulations	✓	

Automotive Long Term Road Map



China is going to play a main role. Chinese OEMs & Chinese taste will have major impact on the Automotive market

Emission and environmental regulation & consumer preferences will lead to a shift towards EV

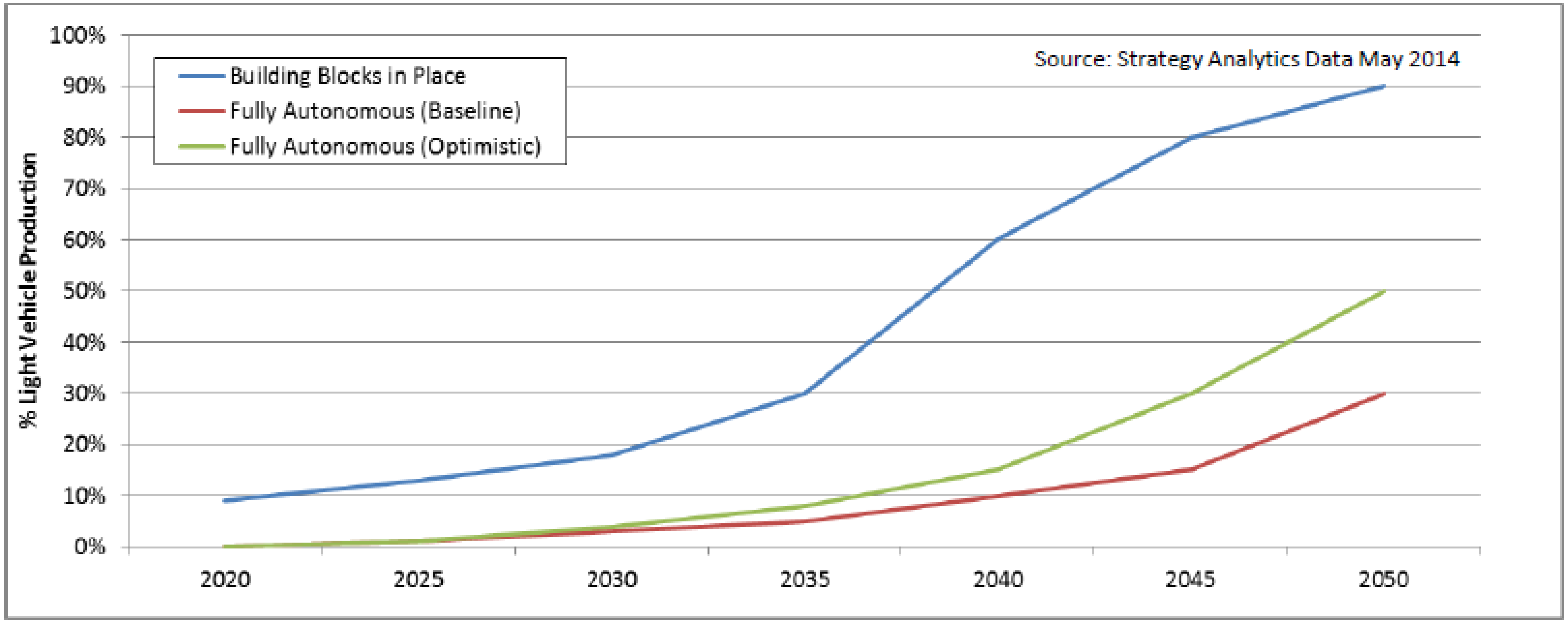
Car connectivity will become a major aspect (V2X, Cloud). Big data use will improve marketing & costs.

Car ownership paradigm and market business model will change . Going into CAAS and services based approaches

Autonomous cars will have major impact on all related industries and regulation.

<u>Source:</u> McKinsey: A road map to the future for the auto industry, Oct 2014

Autonomous Adoption Scenarios



- "Building Blocks in Place" = vehicles with multiple cameras / RADARs / LIDARs / Comms technology etc .– but not fully autonomous under NHTSA level 4 definition

Thank You

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