FUTURE MOBILITIES : THE MAJOR DISRUPTION FOR AUTOMOBILE

Rémi BASTIEN - Chairman of VEDECOM Institute for Energy Transition
VP Automotive Prospective at RENAULT

AMA 2018, Sept 12, Berlin
6 DRIVING FORCES FOR FUTURE MOBILITIES

- Mobility and Living
- Customer Values
- Energy and Environment
- Global Economic and Demographic Changes
- Technical Disruptions
- Transport Infrastructure
DISRUPTIONS IN VALUE CHAIN AND TECHNOLOGIES

1) SAE automated driving classification

Source: Roland BERGER
MOBILITY AND CONNECTIVITY SERVICES TO GROW BY 30% P.Y

AUTOMOTIVE REVENUES
2015 ➤ 2030

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2030</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility &amp; conn.</td>
<td>3,500</td>
<td>6,700</td>
<td>+30% p.y.</td>
</tr>
<tr>
<td>After market</td>
<td>720</td>
<td>1,200</td>
<td>+2.2% p.y.</td>
</tr>
<tr>
<td>One time sales</td>
<td>2,750</td>
<td>4,000</td>
<td>+30% p.y.</td>
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In 2030 for every 100 USD, 22 USD are generated through mobility and connected services.

The services will become a major revenue pool by 2030: >50% of today’s vehicle sales.

Source: McKinsey, Goldman Sachs

In USD B.

AMA 2018, Sept 12, Berlin
VEDECOM 360° VISION & EXPERIENCE

3 programs to answer major society challenges
VEDECOM’S VISION: TO PREPARE THE SUSTAINABLE MOBILITY FOR ALL

VEDECOM: a **cooperative** research hub

Towards...

- 0 emissions
- 0 fatalities
- 0 stress
- 0 left out (access to mobility)
- 0 waste (energy, time, space)
VEDECOM’S MISSION: TO ADDRESS 3 MAJOR SOCIETY CHALLENGES

Mission

Develop disruptive technologies and a cross-disciplinary vision of new usages, for sustainable, safe, efficient and affordable mobility

Challenges

Electric vehicle

Autonomous drive

Connected car

VEDECOM Domains

Vehicle electrification

Driving delegation and connectivity

Shared mobility and energy
BENEFITS OF ELECTRIC VEHICLE

Dynamic performance
Quietness
Running cost
Zero emission

VEDECOM’s Mission

Vehicle electrification

Contribute massively to air quality in urban areas and CO2 reduction by moving electric vehicle from niche to mass market
BENEFITS OF AUTONOMOUS AND CONNECTED DRIVE

Autonomous Drive Mode

- Safety
- Stress-free
- Free time

Manual Drive Mode

Let’s keep it for driving pleasure!

VEDECOM’s Mission

Offer sustainable, safe and efficient mobility by accelerating the introduction of automated cars, with or without driver.
BENEFITS OF SHARED MOBILITY AND ENERGY

VEDECOM’s Mission

Optimize mobility systems on territories by analysing and experimenting new services linked with clean, autonomous and connected vehicles.
VEDECOM, A PIONEER FOR AUTONOMOUS DRIVING
TWO MAJOR FIELDS FOR AUTOMOTIVE CAR MAKERS

User Value

B to B

Partnership with IT industry

B to C

Level 2: assistance to the driver
Level 3: conditional automation
Level 4: high automation
Level 5: full automation

Technical & Legal Complexity

City Driving

Highway
Incl. City highway

Traffic jam

Long run

Valet park

Tele-op.

Commuting

driver-less
PERI-URBAN DEMONSTRATION IN STRASBOURG - JUNE 2017
CROSS-BORDER Automated On-demand MOBILITY SERVICE

1. Robot taxi station
2. Control station
3. Pick up point
4. Drop off
PERI-URBAN DEMONSTRATION IN STRASBOURG - JUNE 2017
CROSS-BORDER Automated On-demand MOBILITY SERVICE

Service order

Automated driving

Remote Control Center

Service optimization
AD SAFETY APPROACH – FRENCH NATIONAL PLAN

1. SAFETY SCOPE
   SOTIF

2. METHODOLOGY
   GAME +

3. SAFETY QUANTITATIVE TARGET
   Accidentology
   Improvement factor

4. SAFETY QUALITATIVE PRINCIPLES
   - Perception
   - Safe behavior
   - MRM
   - Driver monitoring
   - Alert
   - Take Over request

5. SIMULATION METHODS & TOOLS

6. SCENARIOS DATABASE

7. SAFETY VALIDATION & VERIFICATION
MOOVE PROJECT: COLLECTION & SCENARIO DATA BASE

1. Real world driving safety critical scenarios (SCS)
2. SCS occurrence statistics
3. New SCS

0. Use case Definition & Targeted scenarios
1. Data collect
2. Data transformation at common format
3. Calculation of high level parameter (Sensors independant)
4. Scenario searching and clustering

- More than 700.000 km and 15.000 h recorded
- 2Tb of raw data collected each day
- Several interesting sequences extracted like accidents, hazardous driving situations, etc.
AT A GLANCE

• The game is changing: from car business to mobility solutions
• The vehicle of future will be zero emission, connected and autonomous
• Partnerships in this new eco-system are key for this mutation

=> VEDECOM : a centre of excellence for this mutation
Thank you for your attention

Together to accelerate the mobility of tomorrow!