

# Autonomous mobility & regulation: a management approach

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**Rémi Maniak**

Professeur, HDR

Ecole Polytechnique

Chercheur au Centre de Recherche en Gestion – I3

[remi.maniak@polytechnique.edu](mailto:remi.maniak@polytechnique.edu)

- **Management Science / Innovation Management**
  - Studying how companies deal with innovation challenges.
  - Multi-industries: construction, defense, fintech, etc.
  - **15-year focus on the automotive industry** – following their organizational and managerial challenges dealing with more radical and more frequent product launches.
- **« Data » = Recently, shifting from « product centric » to more « systemic innovation » challenges:**
  - Data connection : H2020 Automat project (global carmaker data marketplace)
  - Energy connection : H2020 Corridor project (EV infrastructure deployment), Renault EV initiative
  - **Autonomous mobility (AM)** : Renault-Nissan Autonomous Mobility initiative
- **Today : aggregate different thoughts and results which point towards regulation issues (bottom up)**

1. Internal regulations: how AV imposes new forms of in-house organization
2. Value shift : from B2C to B2Many
3. The changing role of public authorities

# Imposes deep in-house transformations

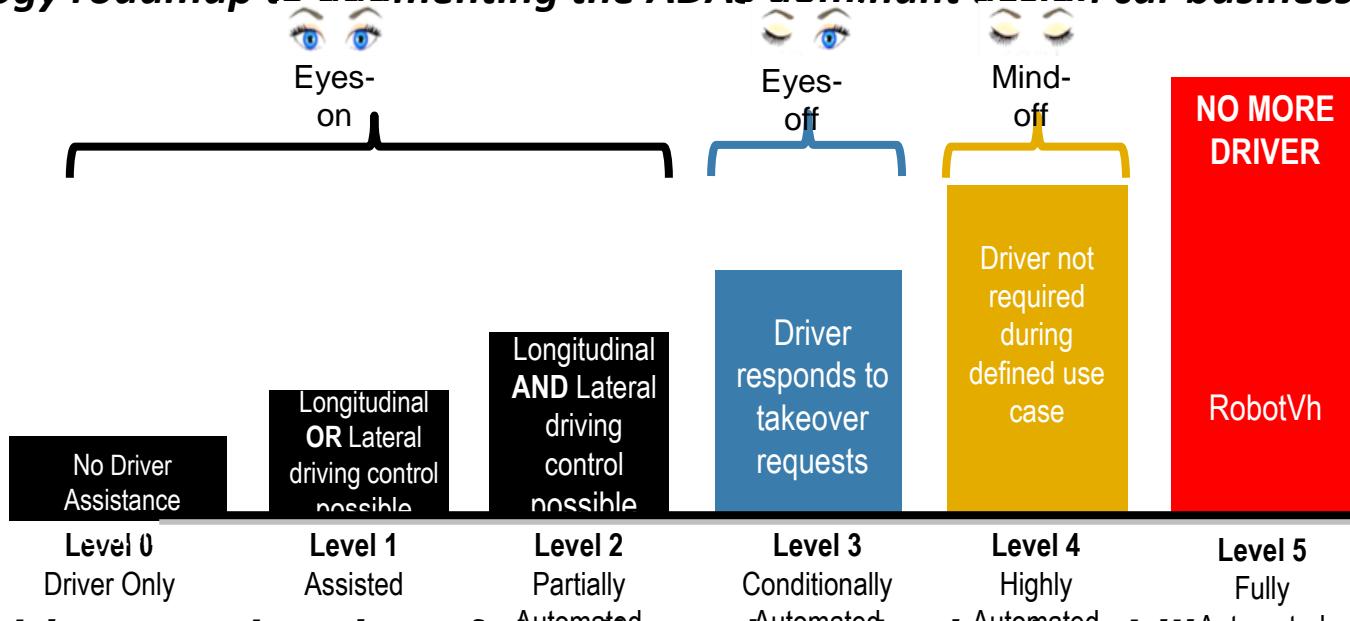
The carmakers' point of view

- Carmakers have to deal with AV within their internal regular organization.
- This involves unusually high investment in technologies (>10B€ vs 4B€ for electric vehicles, x00m€ for regular vehicle).
- These organizations are clearly oriented towards the development of new products (Fujimoto, 2000), or technology integration (Iansiti, 1998, Maniak and al. 2014), not for the development of such disruptive innovations.
- These firms have to modify their routines & structures to cope with the Autonomous Mobility Challenge.

# Imposes deep in-house transformations

The duality of explorations within carmakers

- Technology roadmap to augmenting the ADAS dominant design car business*

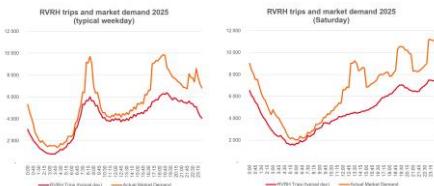


- Value driven exploration of the disruptive robotized mobility services business*

Design and produce Robotaxi vehicles



Operate robotaxi fleets

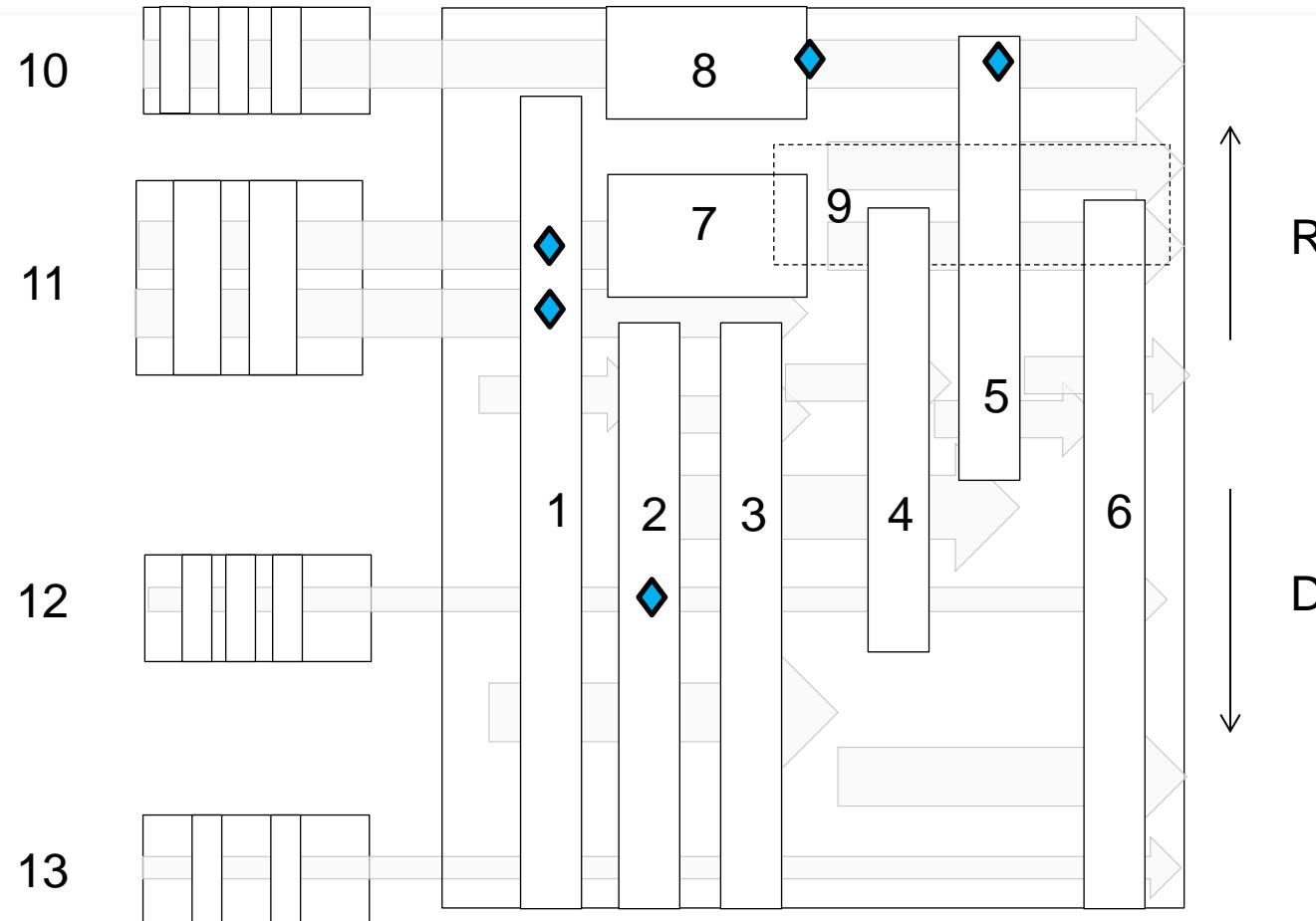


Run mobility platforms



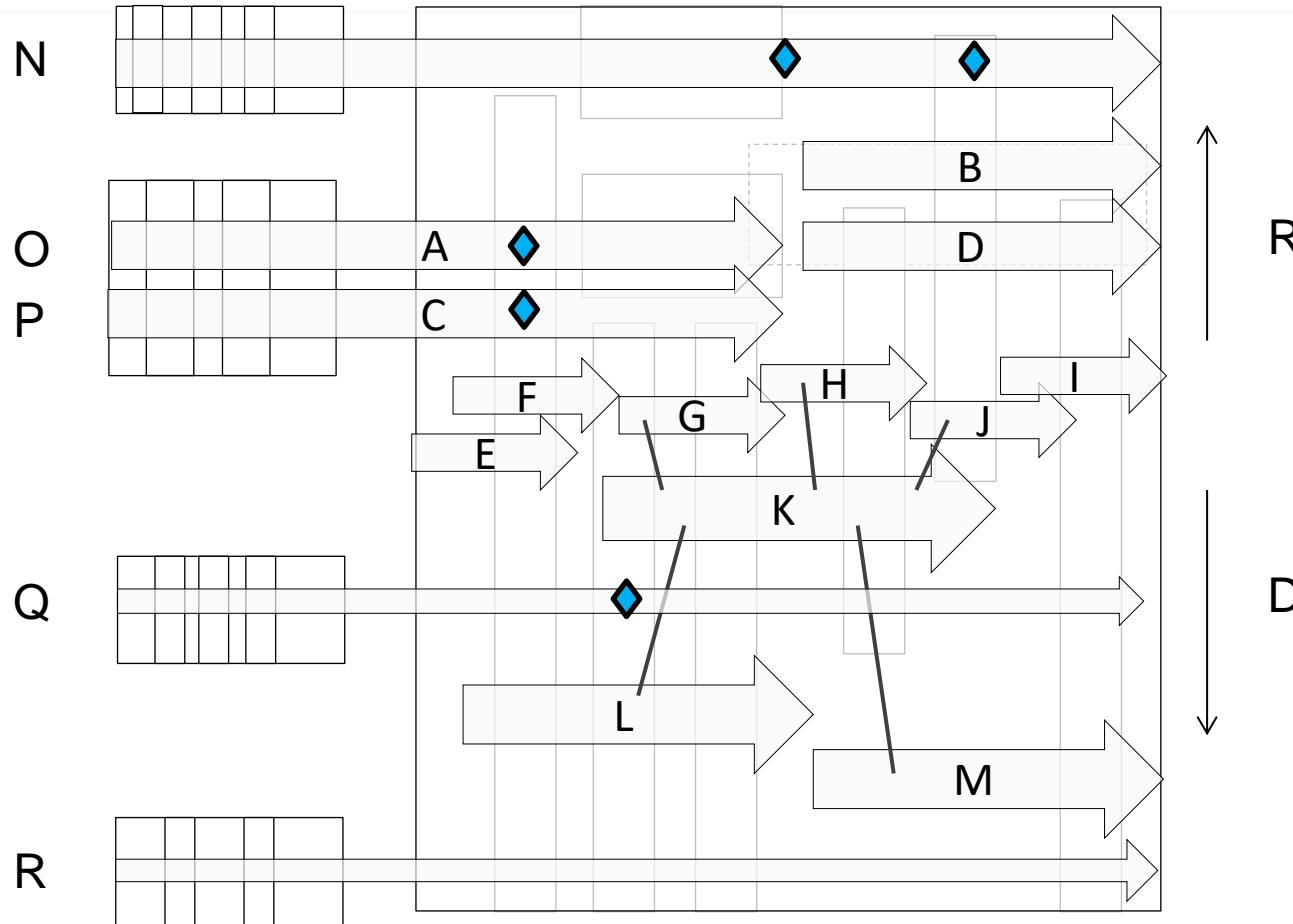
# Imposes deep in-house transformations

Carmakers : articulate various business units

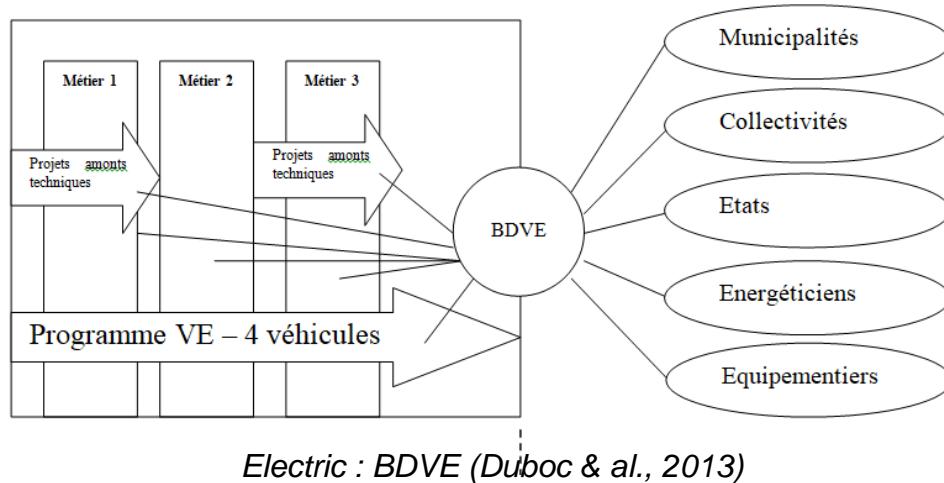


# Imposes deep in-house transformations

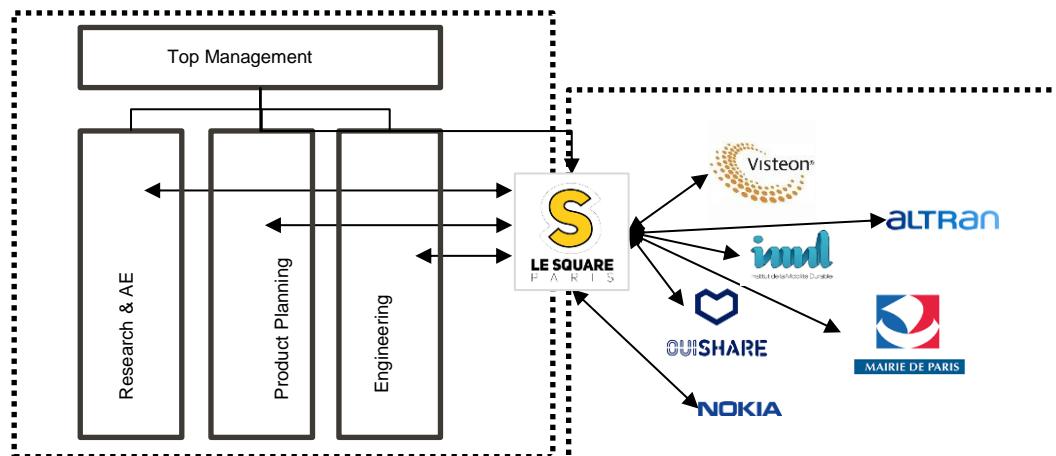
Carmakers : articulate various projects, with different time horizons



# Imposes deep in-house transformations



- Such systemic + public/private innovations require strong « platform leadership » approaches (Gawer & Cusumano).



*Autonomous : Le Square @ Renault (Marcocchia & Maniak, 2018)*

- We observe for the autonomous mobility (as for the EV) the necessity to have « interface business units », to coordinate with other players.

# A shift in value creation

The old good days : B2C

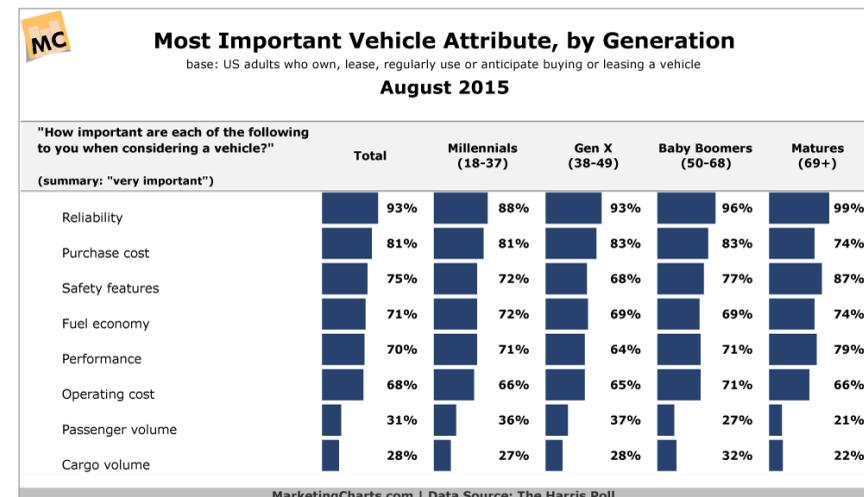
**Cars have been considered as a pure B2C product.**

**Assumptions are classical :**

- customers have preferences towards product attributes
- the willingness to pay depends on the total perceived value
- the final customer is the only one who benefits from the product's value.

Design, driving pleasure, comfort, HMI, innovative features... are the main attributes for purchase.

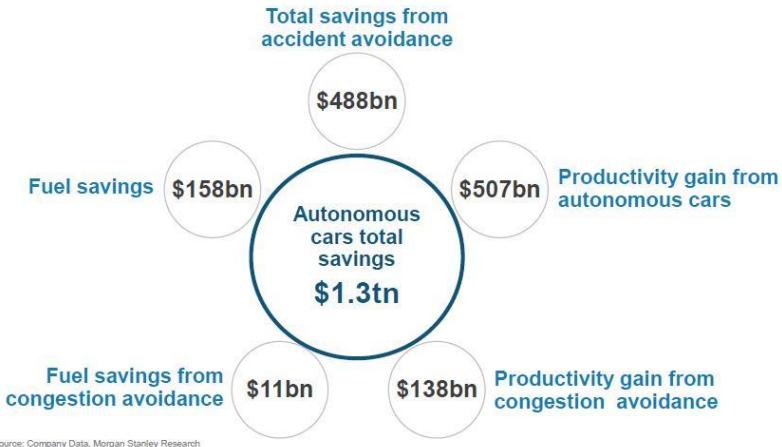
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# A shift in value creation

From B2C to B2Many

- **Current trend** : the connection and robotization of objects make their « value footprint » go far beyond the simple « B2C » value => autonomous vehicles become partially a « social good ».
- Speed, design, car dynamic, features,... will be determined by customer AND social value maximization.
- However, maximizing individual and collective value will lead to ugly, low-speed, ultra-cautious cars => Tradeoff between B2C value and B2Society Value.
- Without saying about GAFAs interests, which can influence also trips, car dynamic...



Baidu self-driving cars



# A shift in value creation

Menace and opportunity for society

The point of view of the « Gendarmerie Nationale »

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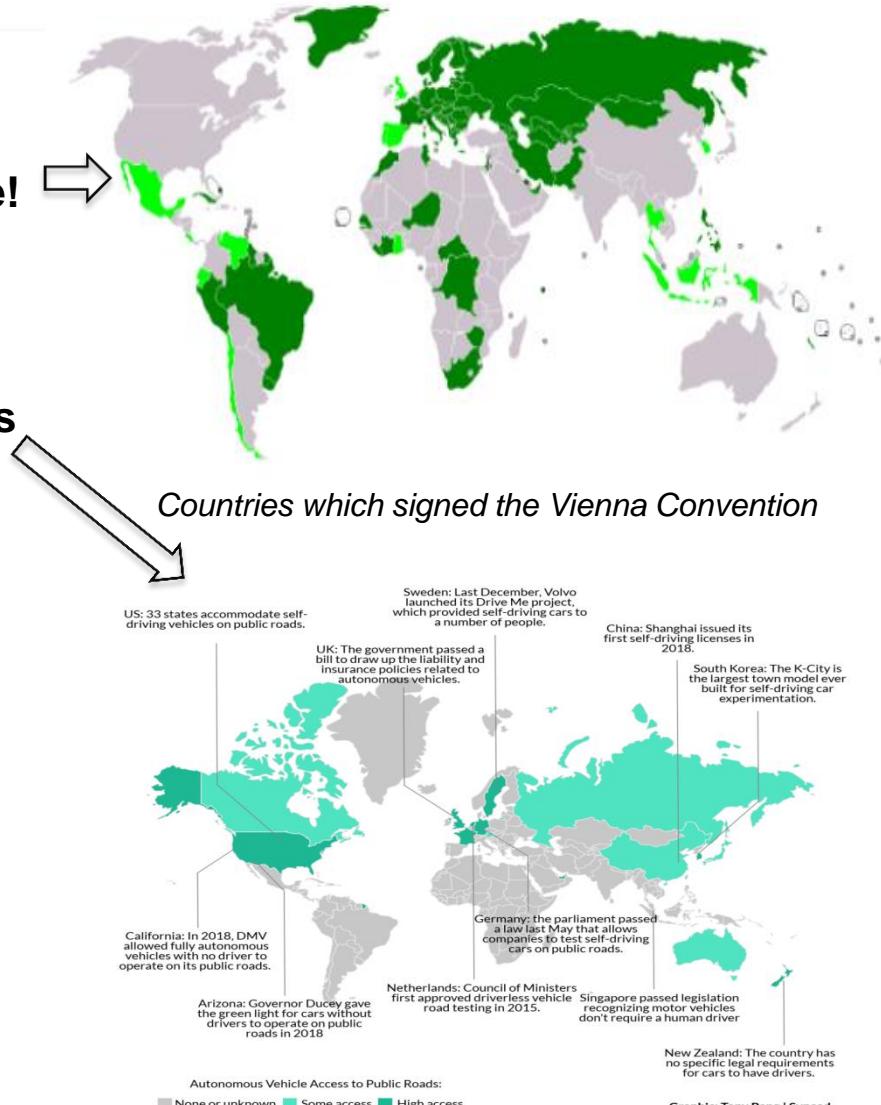
Autonomous cars brings (destroys) value for society

Ronze, 2018

# The changing role of public authorities

- **Going beyond the « Vienna Convention » (1968) : today every car must be controled by a driver anytime!**
- **Diversity of attitudes towards the adaptation of this regulation frame: allow players to test their autonomous fleets and make their algorihms stronger.**
  - **In the US** : no regulation! Fully autonomous cars are legal.
  - **In France** – « loi PACTE » (sept 2018) / « Loi d'Orientation sur les Mobilités » (nov 2018): allowing autonomous cars (level 4) to circulate.
  - **In China** – « Grey regulation », letting experimentation arise, will regulate ex post.

Allowing carmakers to test fleets



*Countries which make this convention evolve*

# The changing role of public authorities

## The role of federal authorities

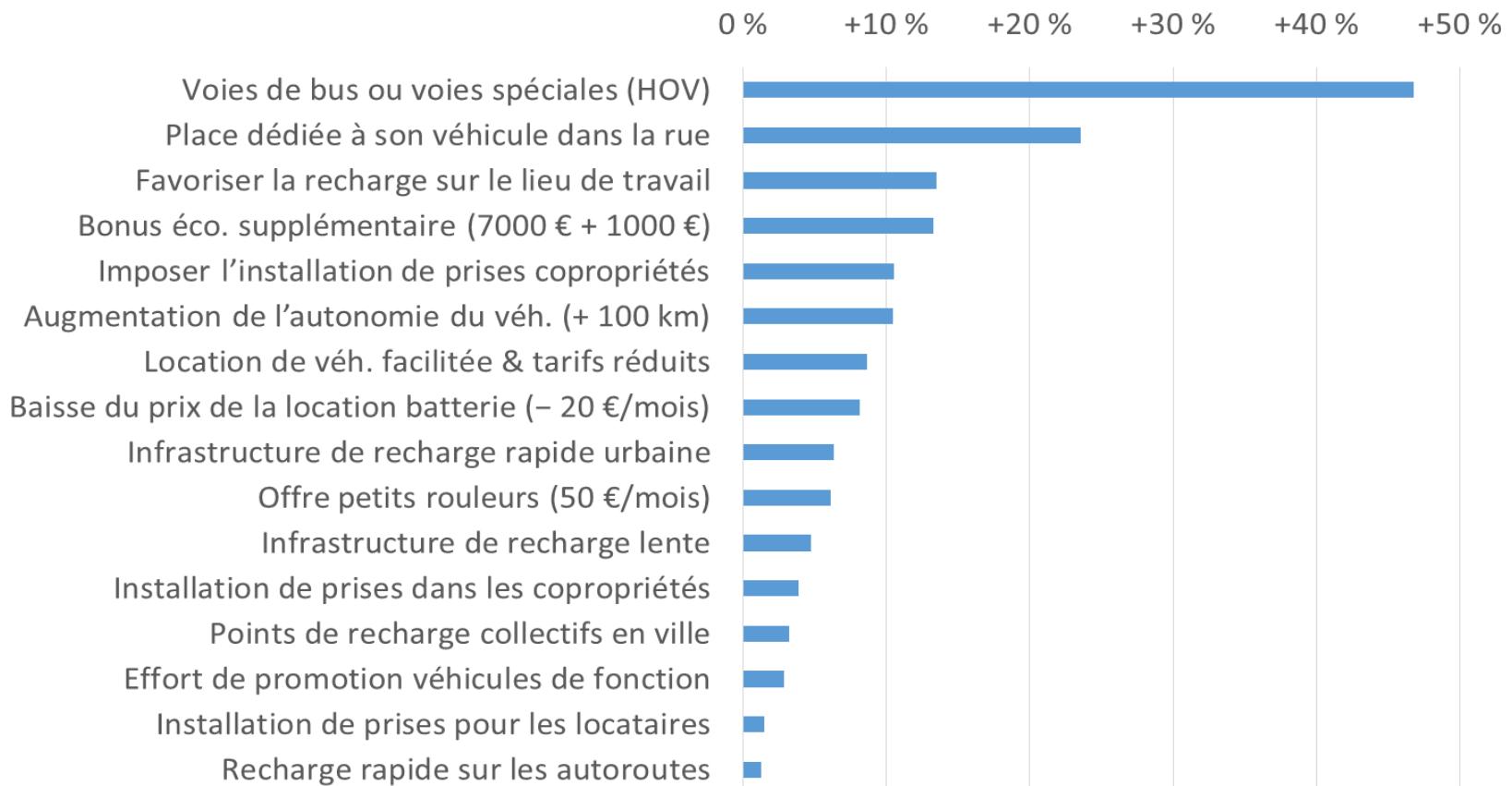
EVI MEMBERS	FINANCIAL	INFRASTRUCTURE	RD&D
Denmark	Exemption from registration and road taxes.	DKK 70 million for development of charging infrastructure.	Focus on integrating EVs into the smart grid.
Finland	EUR 5 million reserved for vehicles participating in national EV development programme, ending in 2013.	EUR 5 million reserved for infrastructure as part of the national EV development programme, ending in 2013.	---
France	EUR 450 million in rebates given to consumers buying efficient vehicles, with 90% of that amount from fees on inefficient vehicles. Remaining 10% (EUR 45M) is a direct subsidy.	EUR 50 million to cover 50% of EVSE cost (equipment and installation).	EUR 140 million budget with focus on vehicle RD&D.
Germany	Exemption from road taxes.	Four regions nominated as showcase regions for BEVs and PHEVs.	Financial support granted for R&D for electric drivetrains, creation and optimisation of value chain, information and communications technology (ICT), and battery research.
India	INR 100,000 or 20% of cost of vehicle, whichever is less. Reduced excise duties on BEV/PHEVs.	The National Mission for Electric Mobility will facilitate installation of charging infrastructure.	Building R&D capability through joint efforts across government, industry, and academia. Focus on battery cells and management systems.
Italy	EUR 1.5 million for consumer incentives, ending in 2014.	---	---
Japan	Support to pay for 1/2 of the price gap between EV and corresponding ICE vehicles, up to YEN 1 million per vehicle.	Support to pay for 1/2 of the price of EVSE (up to YEN 1.5 million per charger).	Major focus on infrastructure RD&D.
Netherlands	Tax reduction on vehicles amounting to 10-12% net of the investment.	400 charging points supported through incentives.	Focus on battery RD&D (30% of 2012 spending).
Spain	Incentives up to 25% of vehicle purchase price before taxes, up to EUR 6,000. Additional incentives of up to EUR 2,000 per EV/PHEV also possible.	Public incentives for a pilot demonstration project. Incentives for charging infrastructure in collaboration between the national government and regional administrations.	Five major RD&D programmes are operational with incentives for specific projects.
Sweden	EUR 4,500 for vehicles with emissions of less than 50 grams of CO <sub>2</sub> /km. EUR 20 million for 2012-2014 super car rebate.	No general support for charging points besides RD&D funding (EUR 1 million in 2012).	EUR 2.5 million for battery RD&D.
United Kingdom	---	GBP 37 million for thousands of charging points for residential, street, railway, and public sector locations. Available until 2015.	The UK Technology Strategy Board has identified 60 collaborative R&D projects for low-carbon vehicles.

- **Federal supporting actions have been focusing for decades on the « finance » side (R&D, customer incentives).**
- **It becomes more and more critical to invest in INFRASTRUCTURES which will allow such « systemic innovations » (Teece, 1986) to deploy.**

# The changing role of public authorities

The role of local authorities (example : electric vehicles)

Impact des leviers sur le nombre de personnes compatibles  
(par rapport au scénario de référence)



# The changing role of public authorities

Questions the role of public authorities within projects

- **We studied EU funded H2020 projects which tried to incent players to align towards common investments & common standards (Marcocchia, Maniak 2018)**
- **Result #1:** The strict project management frame (3-year project, predefined milestones and deliverables, self-profitable output, etc.) does not fit with project realities (requires flexibility in the perimeters of actors, more continuity in ecosystem structuring,...).
- **Result #2:** The standardization policy (e.g. data format, EV plugs) depends on which perimeter you imagine for the standard to apply on. Tensions among:
  - Regulation areas : Europe standards
  - Firm industrial footprint : Worldwide standards
  - Value footprint : City-driven standards

- Autonomous mobility implies important reorganizations both in the private and the public sectors: ambidexterity + platform leadership.
- Autonomous mobility makes the value shift from a pure « product centric » B2C traditional perspective to a wider « value footprint », encompassing value for society, for GAFAs...etc.
- Federal and local authorities have a great role to play in boosting the penetration of such an innovation, by developing relevant infrastructures and standards.