SELF-DRIVING CARS

A N D

RESPONSIBLE INNOVATION

FROM EASTERN EUROPEAN PERSPECTIVE

Miklós Lukovics PhD
Associate professor
University of Szeged, Faculty of Economicss and Business Administration, HUNGARY

Please try to estimate:

HOW FAR IS THIS FUTURE (YEARS)?

The answer of the Hungarians (n=101):

10 YEARS

FRAMEWORK OF THE PRESENTATION

- Facts about selfdriving cars
- Public opinion about selfdriving cars: developed countries vs. lagging behind country
- Opportunities and Threats
- Responsible Innovation – a solution?

FINAL-PHASE TESTS ARE CURRENTLY UNDER WAY ON THE PUBLIC ROADS OF

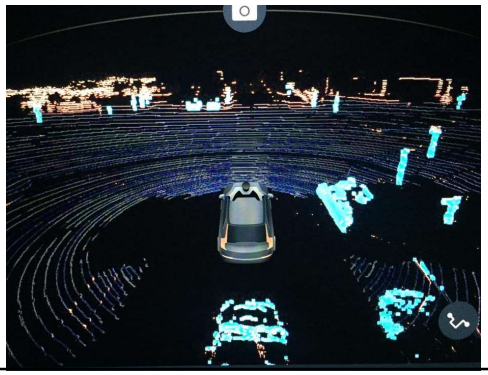
95

CITIES

SELF-DRIVING

VOLVO C90

2017. október 17. Tempe, Arizona, USA



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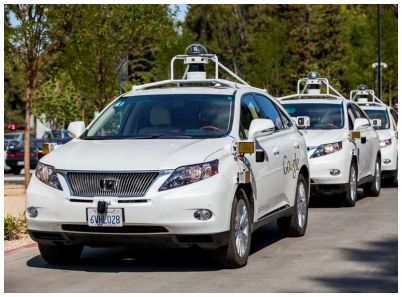


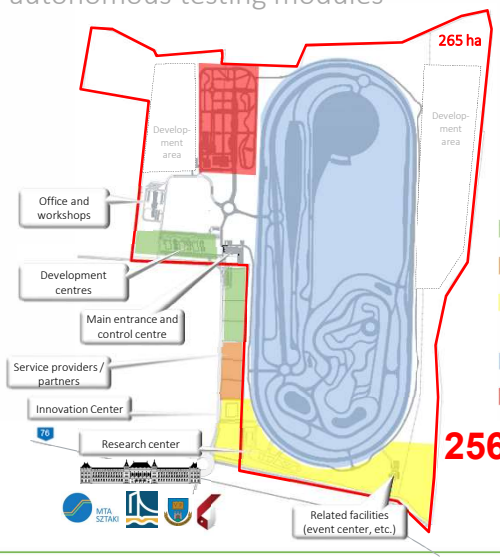
HUN

4 projects

Mainly unknown for the public

Layout of the Proving Ground – Zalaegerszeg, Hungary

Traditional and autonomous testing modules



256ha= 632ac 25690.50ft²

10

Project concept (2018-2019)

zone

Test track vision

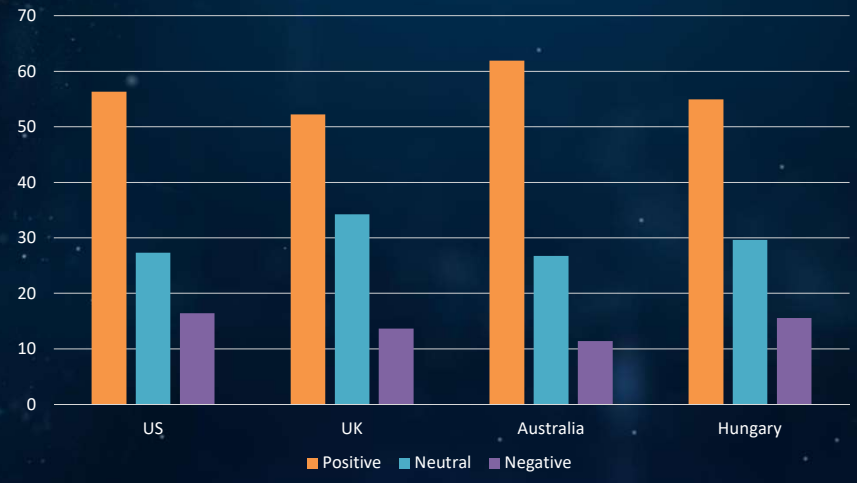
zone

FRAMEWORK OF THE PRESENTATION

- Facts about selfdriving cars
- Public opinion about selfdriving cars
- Opportunities and Threats
- Responsible Innovation – a solution?

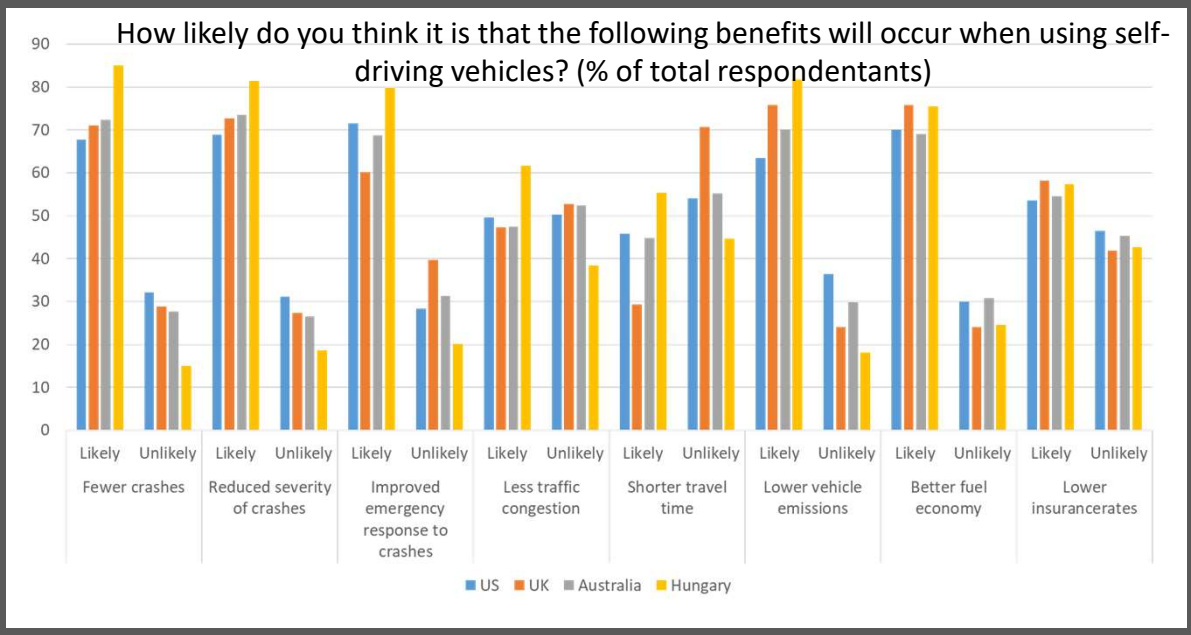
What is your general opinion regarding autonomous and self-driving vehicles?

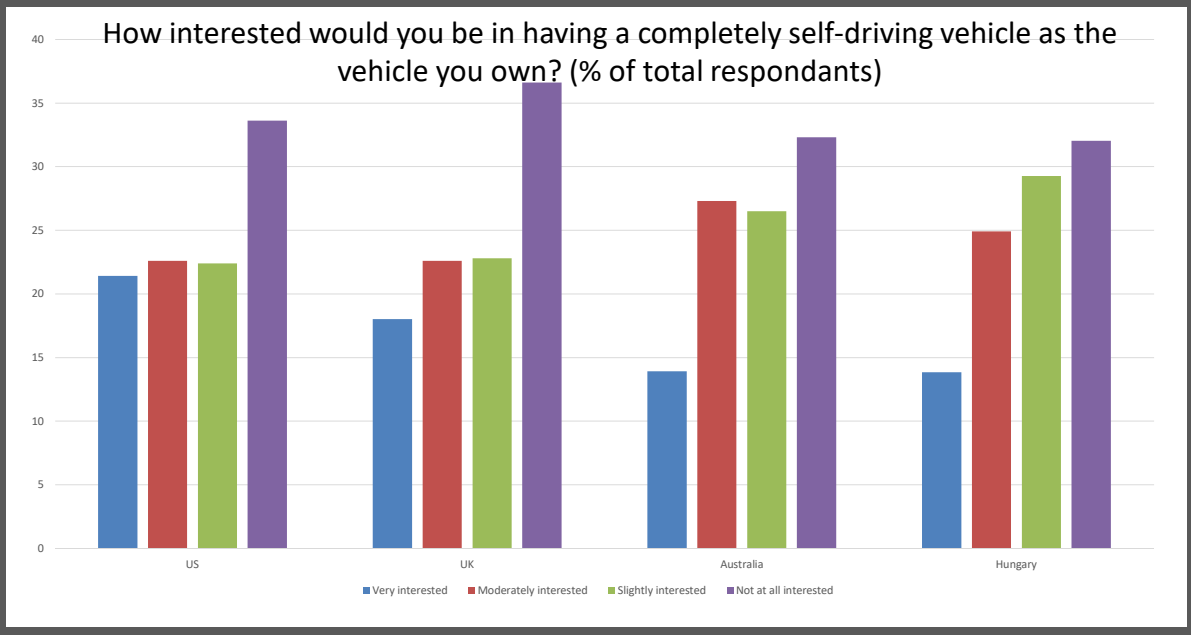
- Very positive
- Somewhat positive
- Neutral
- Somewhat negative
- Very negative



The total numbers of completed surveys by country were
501 for the U.S., 527 for the U.K., 505 for Australia, 243 for Hungary
Schoettle and Sivak (2014), Lukovics et al. (2018)

Age, sex, qualification level, proximity to self-driving cars' test


How likely do you think it is that the following benefits will occur when using self-driving vehicles? (% of total respondentants)
90
80
70
60
50
40
30
20
10
0
Likely
Unlikely
Fewer crashes
Reduced severity of crashes
Improved emergency response to crashes
Less traffic congestion
Shorter travel time
Lower vehicle emissions
Better fuel economy
Lower insurancerates
US
UK
Australia
Hungary


How interested would you be in having a completely self-driving vehicle as the vehicle you own? (% of total respondants)
40
35
30
25
20
15
10
5
0
US
UK
Australia
Hungary
Very interested
Moderately interested
Slightly interested
Not at all interested

Do you have

ANY KIND OF BAD FEELINGS

?

CONCERNING SELF-DRIVING CARS?

57%

DO HAVE ANY KIND OF BAD FEELINGS
CONCERNING SELF-DRIVING CARS?

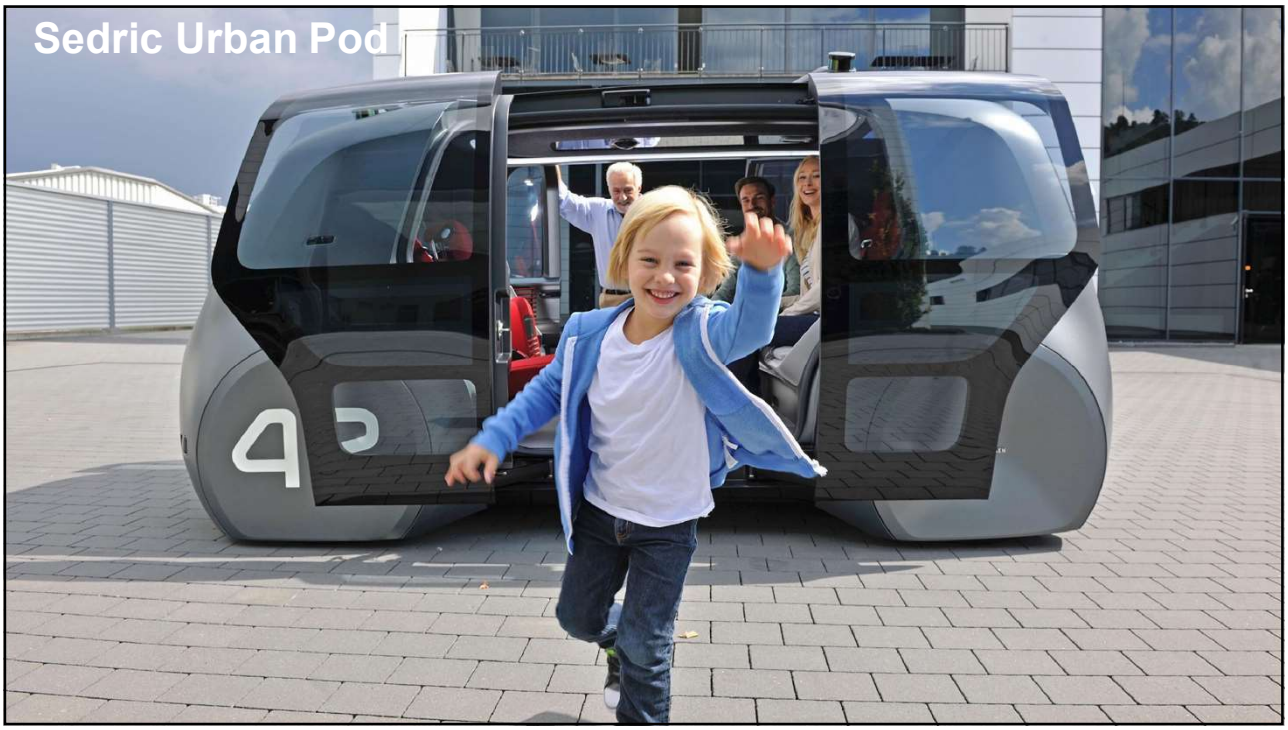
MOSTLY NOT CONCRETE

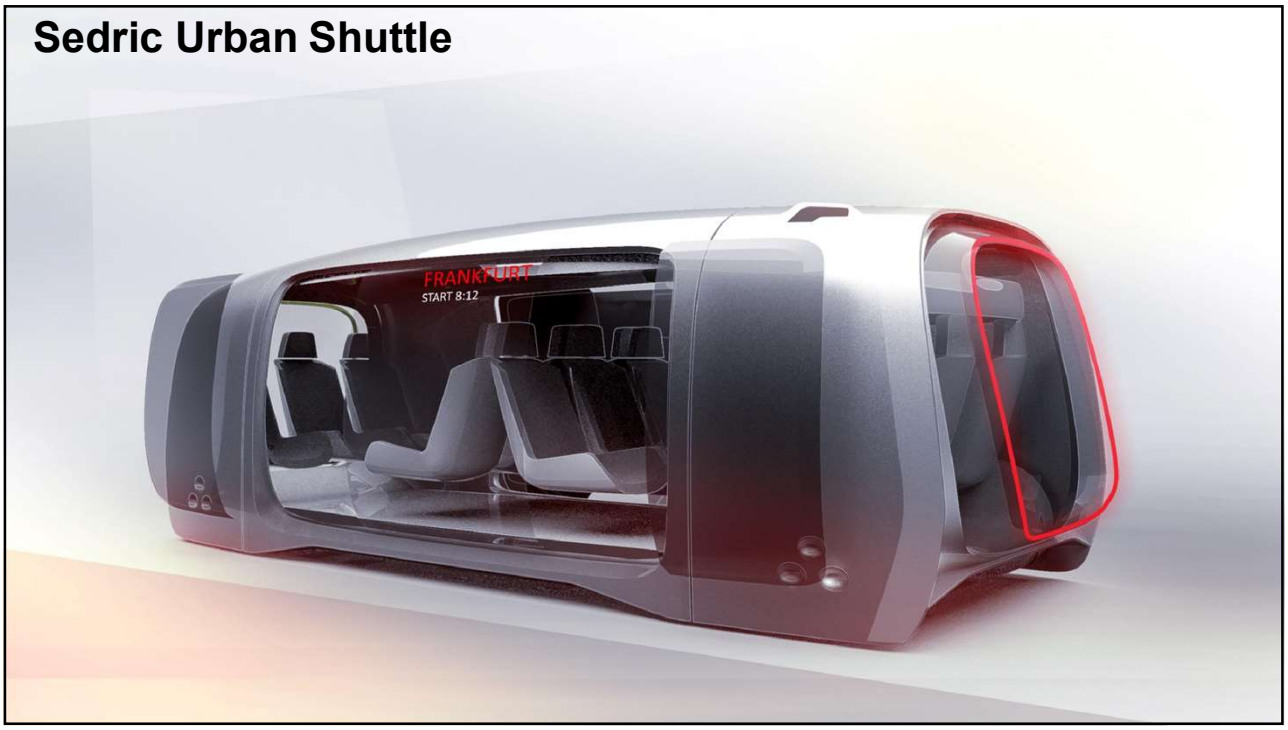
FRAMEWORK OF THE PRESENTATION

- Facts about selfdriving cars
- Public opinion about selfdriving cars
- Opportunities and Threats
- Responsible Innovation – a solution?

Introduction to the

TECHNOLOGY AND SOME EXPECTED POSITIVE EFFECTS


Sedric Urban Pod


Sedric Urban Shuttle
FRANKFURT
START 8:12

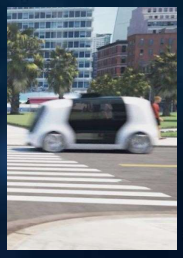
Sedric Long-haul Truck

Competitive Advantage:
Cover All Fields of Application

Passenger Cars

Trucks & Utility Vehicles

Busses

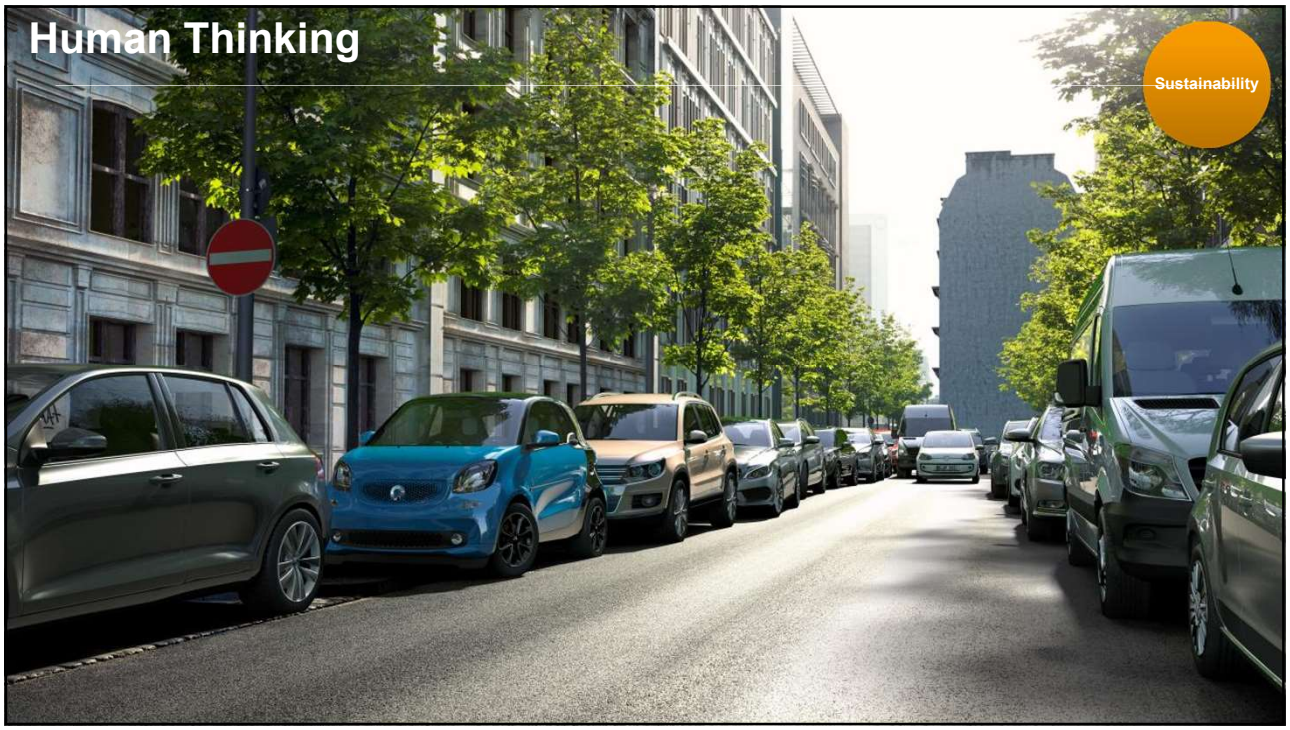


New Mobility-as-a-Service (MaaS) Vehicles

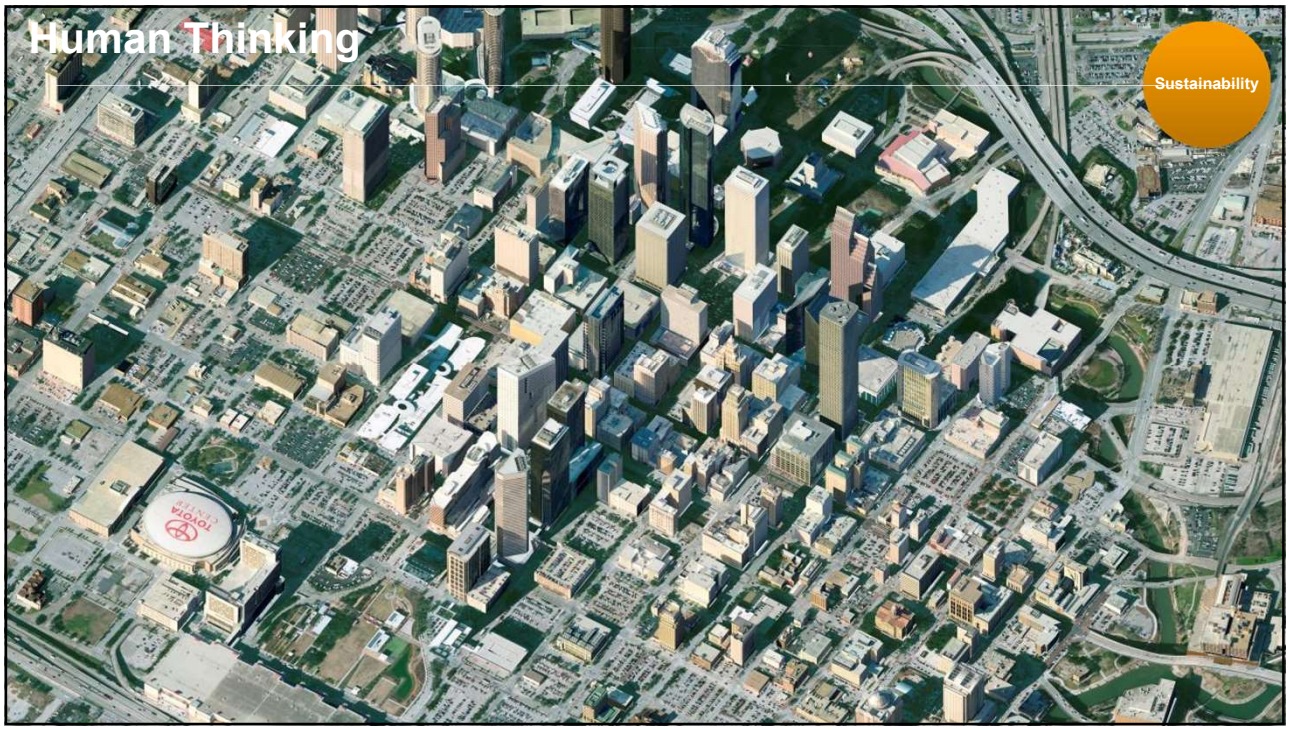
New Vehicle Concepts for Owned Autonomy

Safety – Self-Driving Vehicles

- don't drink and drive
- don't text and drive
- don't take drugs and drive
- don't get agitated and disappointed about others
- don't get distracted
- don't fall asleep while driving
- don't need a second reaction time
- don't run red lights
- don't have limited view
- don't speed…


Human Thinking
Sustainability


Human Thinking
Sustainability


Human Thinking
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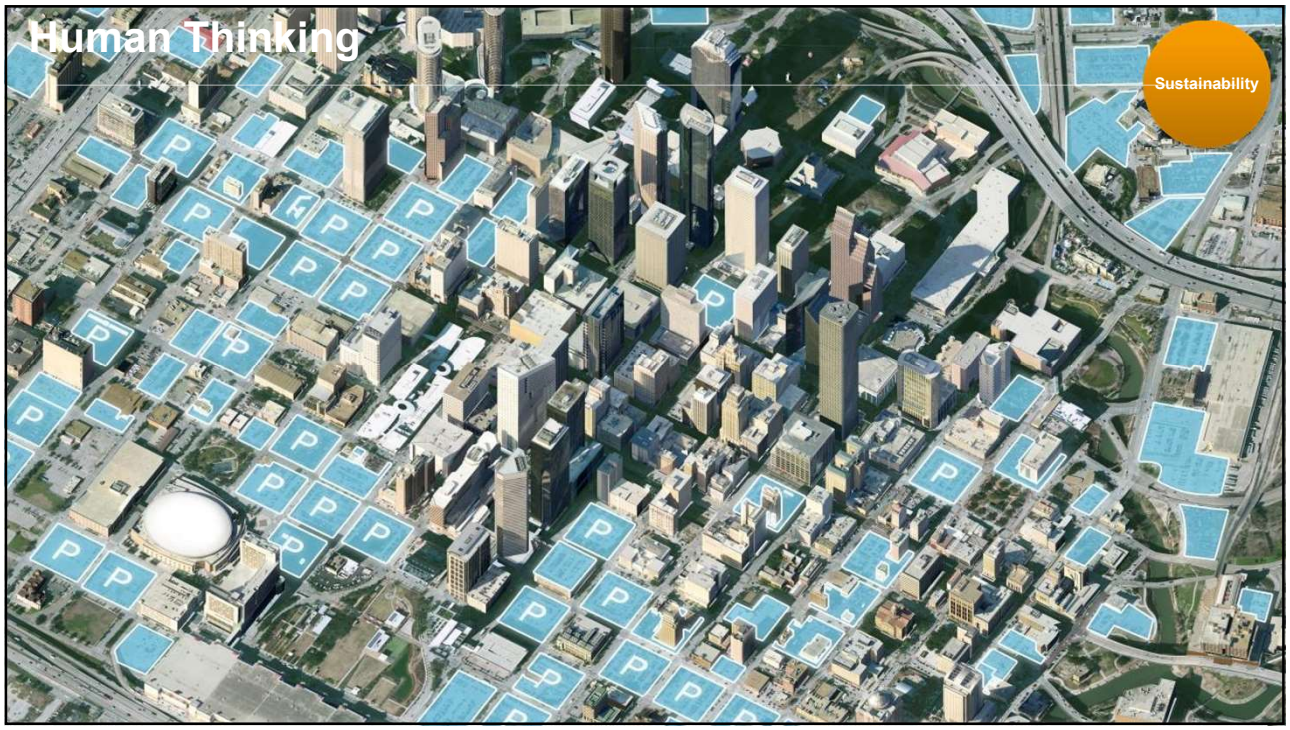
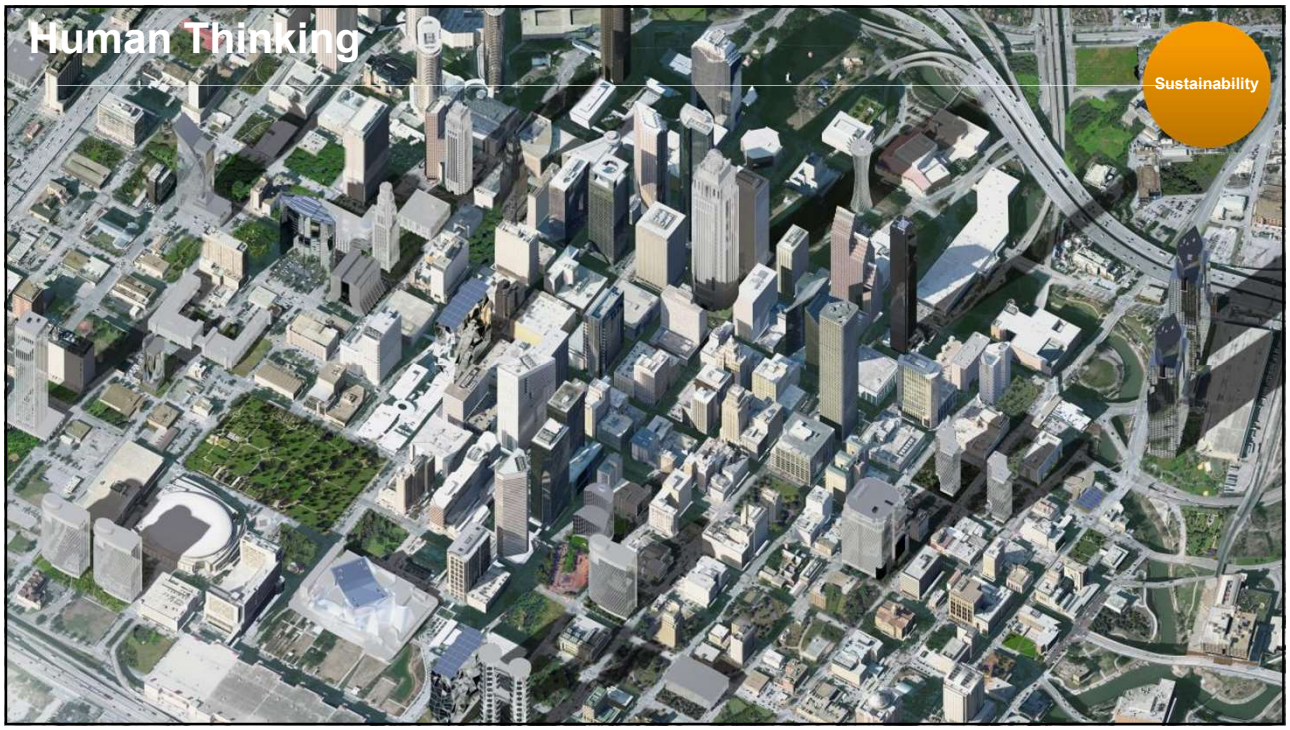

Human Thinking
Sustainability



ONCE AGAIN:

Do you have

ANY KIND OF BAD FEELINGS

?

CONCERNING SELF-DRIVING CARS?

•How will the car „make decisions” in unexpected situations?
• Who takes responsibility in case of an accident? There is no driver!
• Cyber security?
• Data privacy?
• Labour market?
• Trust?

18th March 2018 – „Uber self-driving car killed a pedestrian”

The tragic accident in Arizona, when an Uber self-driving car killed a pedestrian, highlights complex ethical questions that companies face as they develop self-driving cars in an environment that lacks a detailed federal framework.

What is your general opinion regarding autonomous and self-driving vehicles?

- Very positive
- Somewhat positive
- Neutral
- Somewhat negative
- Very negative

After the accident

- Self-driving car industry confronts trust issues after Uber crash
- The fatal accident involving an Uber self-driving car cranks up pressure on the self-driving vehicle industry to prove its software and sensors are safe in the absence of strong government standards
- Cities might be less willing to work with Uber. They might be less willing to trust Uber to do the right thing and make sure that their vehicles are safe."
- Public disclosure of self-driving car testing data is inconsistent and varies by state. California, for example, requires manufacturers to report instances when an autonomous vehicle system disengages. Arizona does not
- **Building trust is key**
- *everyone in the world is now focused more intently on autonomous vehicle testing, and the margin for error just got thinner*

http://www.govtech.com/blogs/lohrmann-on-cybersecurity/after-crash-tough-questions-to-consider-on-autonomous-vehicles.html

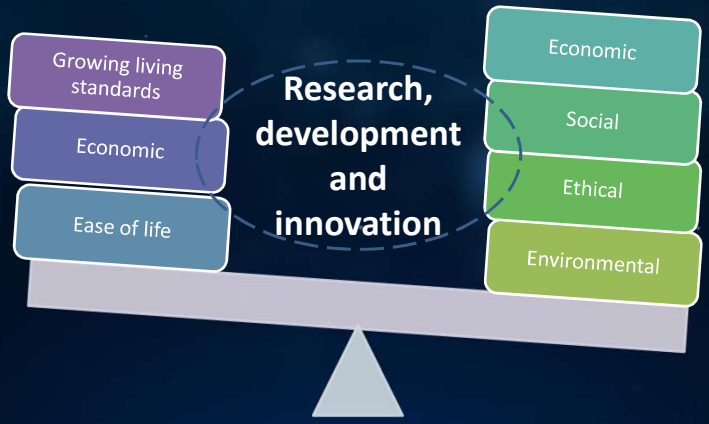
FRAMEWORK OF THE PRESENTATION

- Facts about selfdriving cars
- Public opinion about selfdriving cars
- Opportunities and Threats
- Responsible Innovation – a solution?

About RRI

Positive impacts

Negative impacts



von Schomberg (2012, p. 9): "*A transparent, interactive process by which **societal actors and innovators** become mutually responsive to each other with a view to the (ethical) **acceptability, sustainability** and **societal desirability** of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society)*"

6 keys – European Commission

Engagement of all societal actors: researchers, industry, policymakers and civil society and their joint participation in the R&D process;

Gender equality: all actors – women and men – are on board;

Science education: increase number of researchers and adapt the education system to provide future researchers with RRI tools and knowledge;

Ethics: in order to adequately respond to societal challenges, research and innovation must respect fundamental rights and the highest ethical standards;

Open access: giving free online access to the results of publicly-funded research (publications and data);

Governance as an umbrella for all the others: policy makers also have responsibility to prevent harmful or unethical developments in research and innovation.

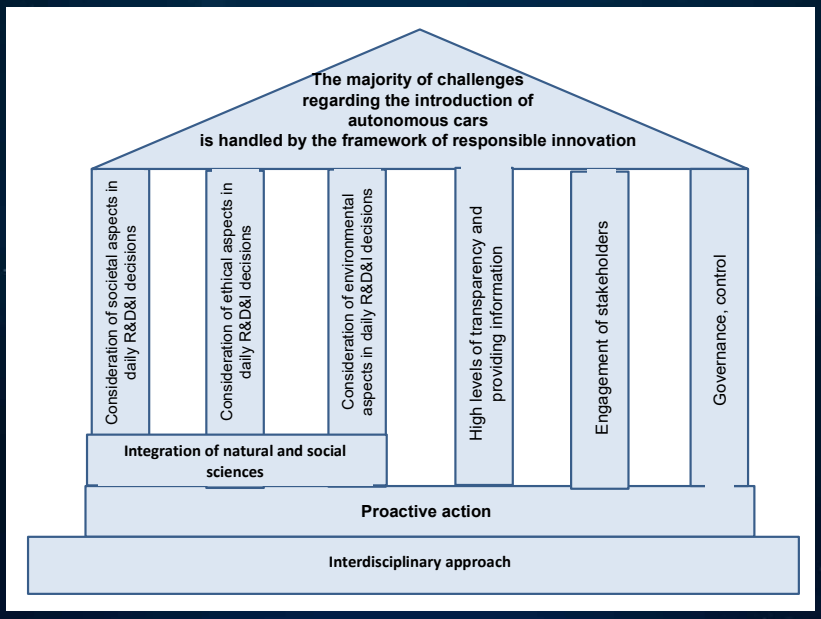
4 dimensions

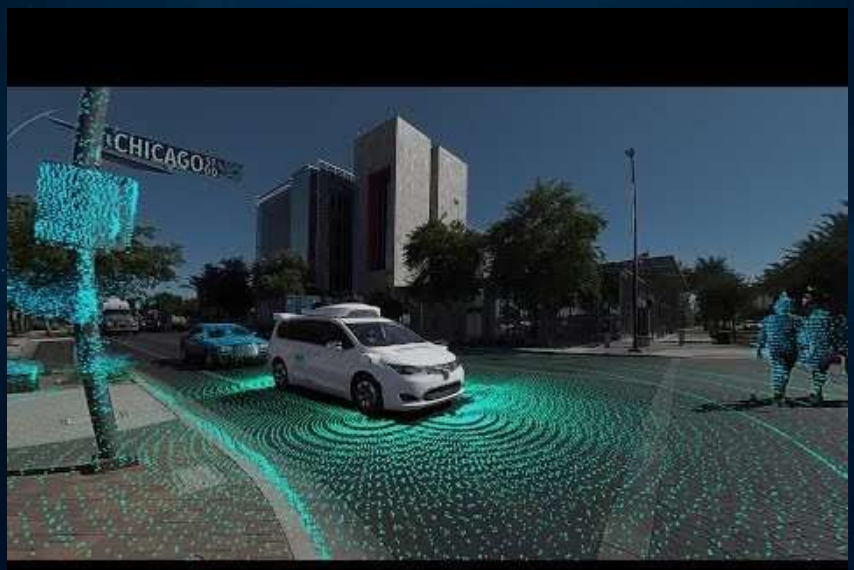
1. The dimension of **anticipation** refers to the fact that researchers must constantly think about the known and yet unknown, but potential dangers (i.e. adverse effects) with questions like "What if?" in mind. This significantly reduces risks to society.
2. **Reflexivity** examines the possible repercussions of the researchers' decisions, objectives, and motivations. In essence, it provides a mirror for the research process.
3. The dimension of **inclusion** refers to listening not only to the opinion of direct stakeholders, but to that of the wider public – through larger public forums and discussions.
4. **Responsiveness** is closely related to the previous items, as responsible innovation calls for the capacity to respond to opinions as well as to identified risks and hazards, and adjusting the course of research accordingly.

Challenges of Self-Driving Cars	RRI Key	Dimension	Recommended Action
- **Societal division** - **Lack of information and trust in Level 5 automation** - **Fear of immature technology and influence by extreme weather** - **Uncertainty of medium and long-term impacts on society**	1. Public engagement 2. Gender equality 3. Scientific education 5. Open access	1. Anticipation 2. Inclusion 3. Reflexivity	Consideration of societal aspects in daily decisions by R&D&I innovators High levels of transparency and providing information
- **Uncertainty of medium and long-term impacts on the environment**	1. Public engagement 4. Ethics		Consideration of environmental aspects in daily decisions by R&D&I innovators
- **Problems caused by system failures** - **Hacker attack, data privacy**	1. Public engagement 2. Gender equality 4. Ethics 5. Open access 6. Governance		High levels of transparency and providing information Engagement of stakeholders
- **The effect of interaction with other traffic partners** - **The "decisions" of cars in emergency situations** - **Uncertainty of medium and long-term ethical impacts**	4. Ethics		Consideration of ethical aspects in daily decisions by R&D&I innovators
- **Immaturity of the regulatory environment** - **Uncertainty regarding legal liability**	6. Governance	4. Responsiveness	Governance, control

Based on the above, two important aspects must be considered for responsible innovation to prevail, which, at the same time, also provide the basis for intervention:

- **An interdisciplinary approach**, which promotes collaboration among engineers, social scientists, policy-makers and stakeholders to determine the future direction for technological development.
- **Anticipating analysis** at an early stage of technical planning when a wider range of opportunities for planning are still available, thus technical development can easily be modified.

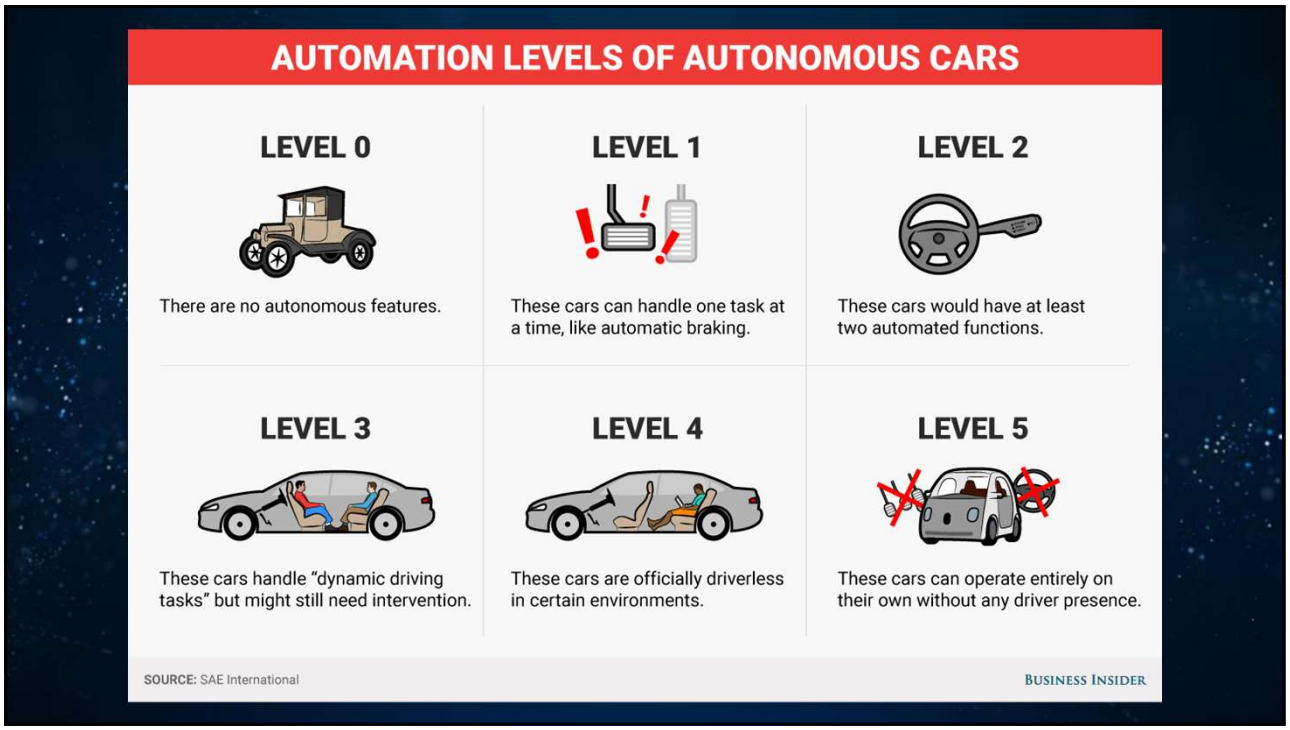




„This video is EXACTLY what the general public needs so that they can better understand the technology and begin to trust it!"

Thank you for your

KIND ATTENTION


AUTOMATION LEVELS OF AUTONOMOUS CARS
LEVEL 0
There are no autonomous features.
LEVEL 1
These cars can handle one task at a time, like automatic braking.
LEVEL 2
These cars would have at least two automated functions.
LEVEL 3
These cars handle "dynamic driving tasks" but might still need intervention.
LEVEL 4
These cars are officially driverless in certain environments.
LEVEL 5
These cars can operate entirely on their own without any driver presence.
SOURCE: SAE International
BUSINESS INSIDER