Scaling up the impacts of automated driving

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23/01/2026 VTT – beyond the obvious

Hi-Drive Project Facts

€60 MILLION BUDGET

€30 MILLION FUNDING

48 MONTHS from July 2021 to June 2025

40 PARTNERS among them OEMs, automotive suppliers, research institutes, associations, traffic engineering, deployment organisations and mobility clubs

14 COUNTRIES involved: Belgium, France, Finland, Germany, Greece, Hungary, Italy, Israel, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom

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Research questions

What is **the impact of Automated Driving and its Enablers** on…

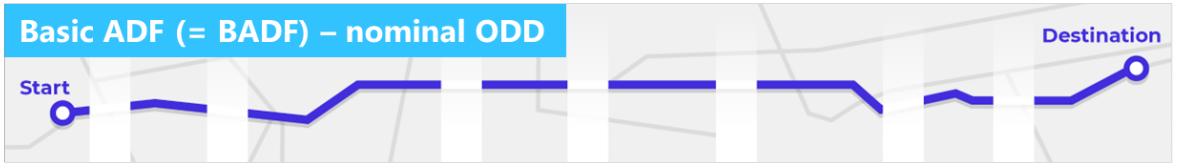
- safety?
- energy demand?
- emissions?
- traffic efficiency?
- personal mobility?
- transport system?
- socioeconomics?

Focus on

- The impacts between **Automated Driving** and manually driven fleet
- Contribution of the **Technology Enablers** to these impacts

Hi-Drive concept for automated driving

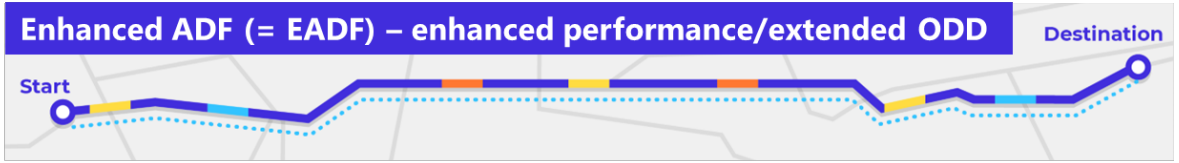
BADF



+ Enabler

Connectivity | High-precision positioning | Context learning via ML | Cybersecurity

EADF



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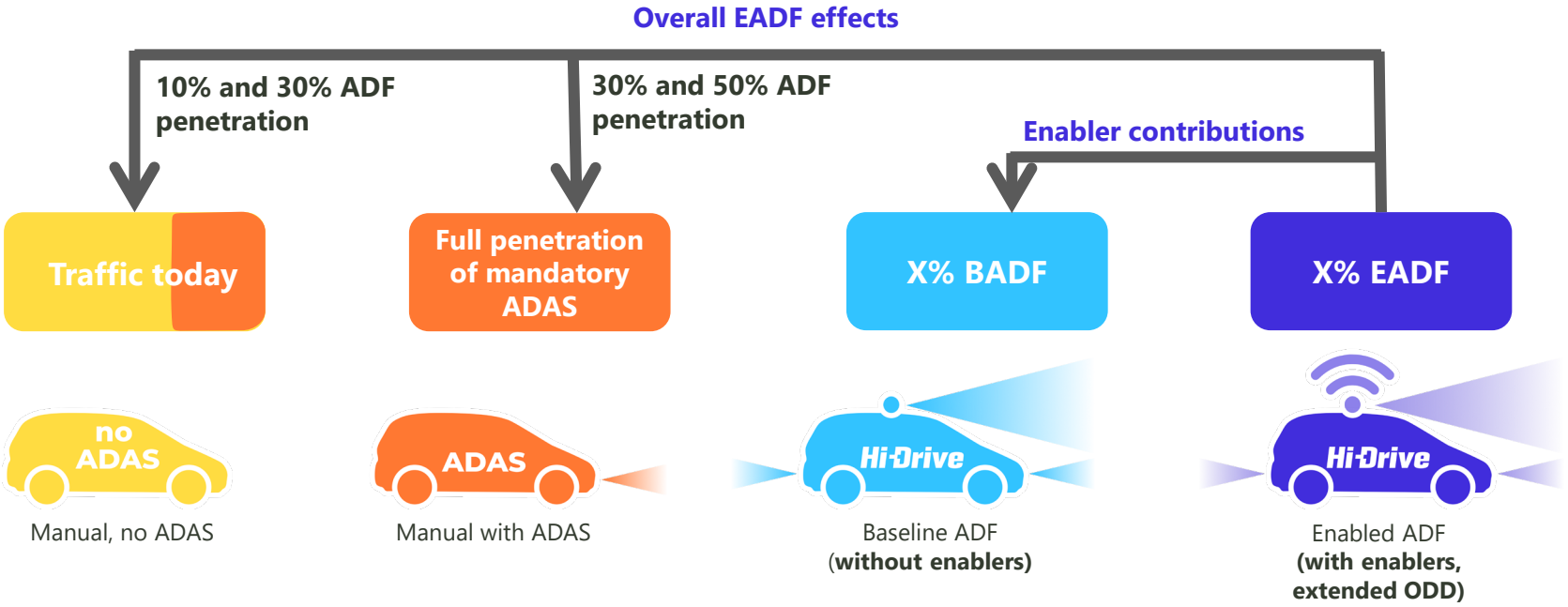
Hi-Drive baselines and treatment



ADF = Automated Driving Function

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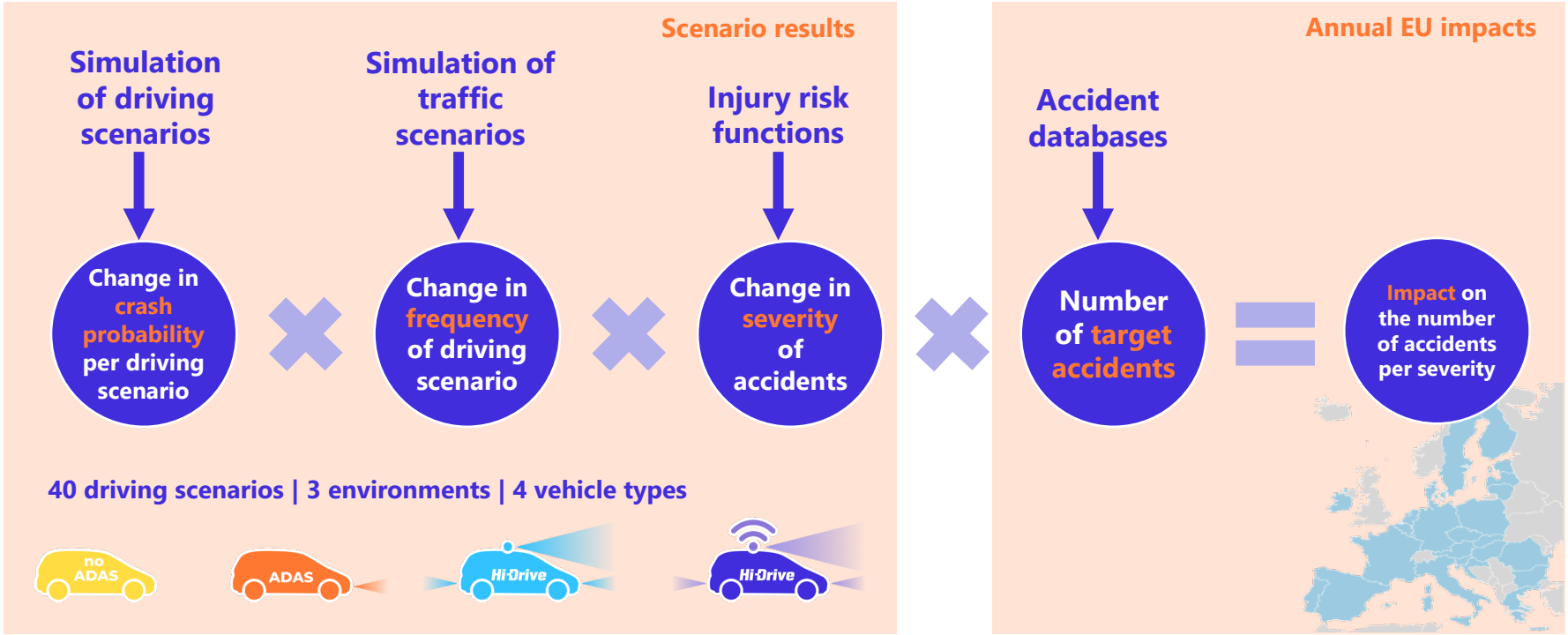
Use Cases Overview - Examples

- Complex intersections and roundabouts
- Challenging ODD conditions
- GLOSA
- Cooperative manoeuvring
- Handling additional infrastructure elements
- Hazard warnings

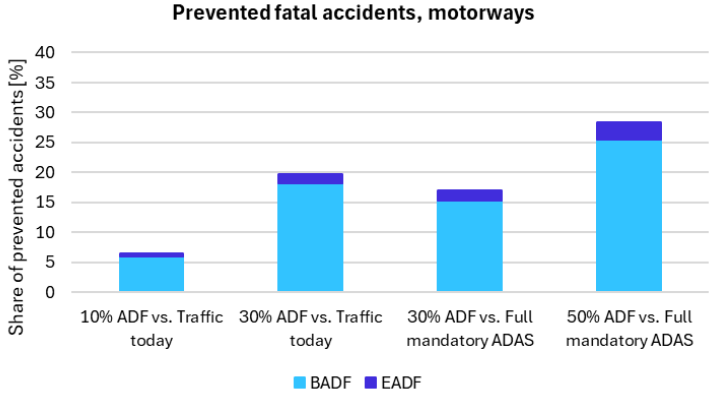
Use cases realised by multiple enabler implementations

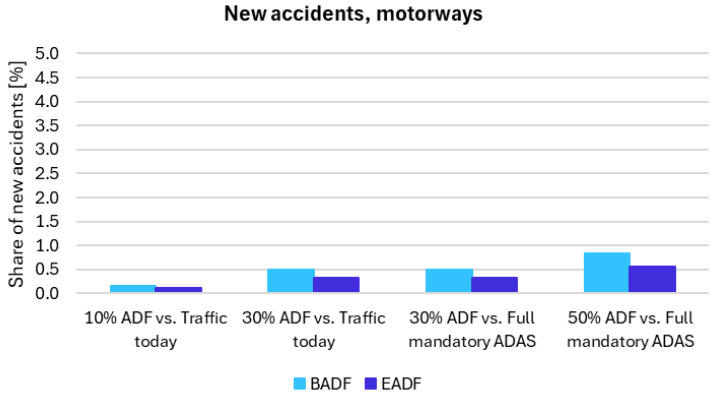
Safety impact assessment methodology



- Hi-Drive Deliverable D7.3
- Target country / state accident data

Examples of results

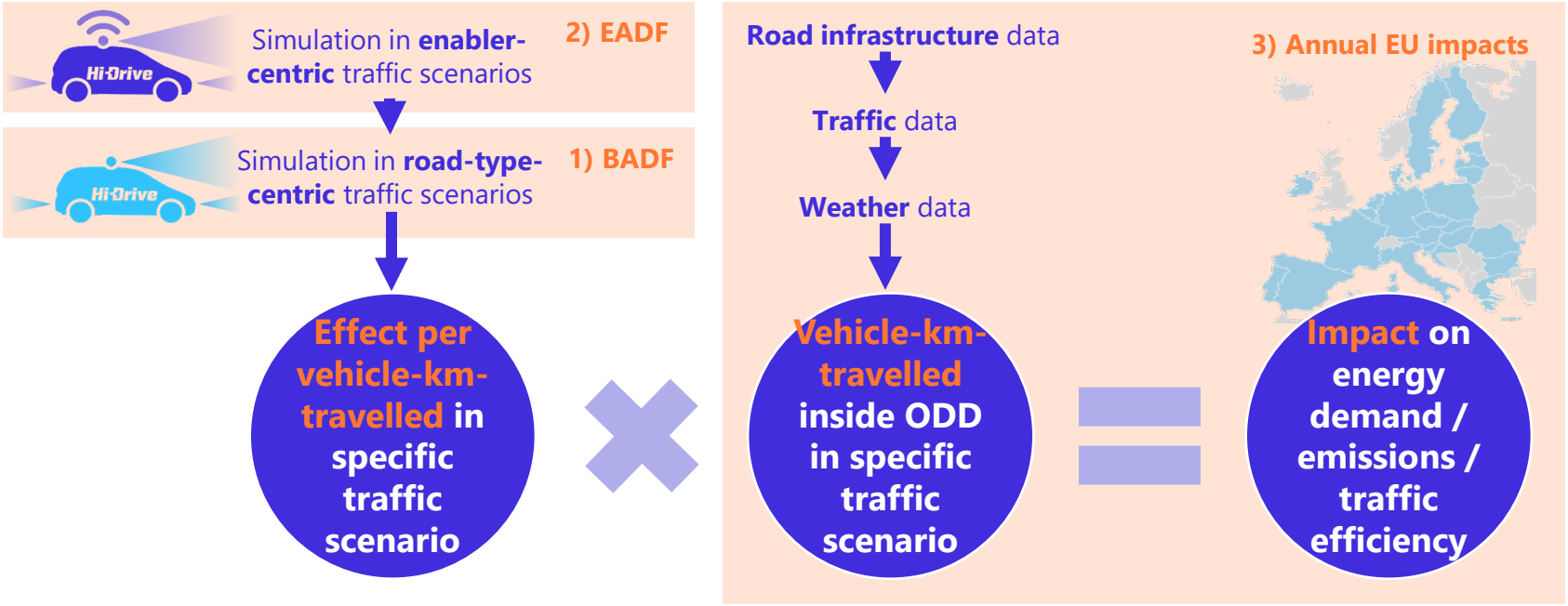




Prevented accidents		Traffic today		Full mandatory ADAS	
	% of EADF	10%	30%	30%	50%
Motorway	Fatal	6.3%	18.9%	16.2%	27.0%
	Severe	6.1%	18.2%	15.7%	26.2%
	Slight	6.5%	19.5%	17.1%	28.6%
Urban	Fatal	7.2%	21.7%	18.0%	29.9%
	Severe	7.3%	21.9%	18.2%	30.3%
	Slight	7.4%	22.1%	18.3%	30.6%
Rural	Fatal	3.5%	10.6%	4.9%	8.1%
	Severe	3.7%	11.1%	6.6%	11.0%
	Slight	4.0%	11.9%	6.7%	11.2%

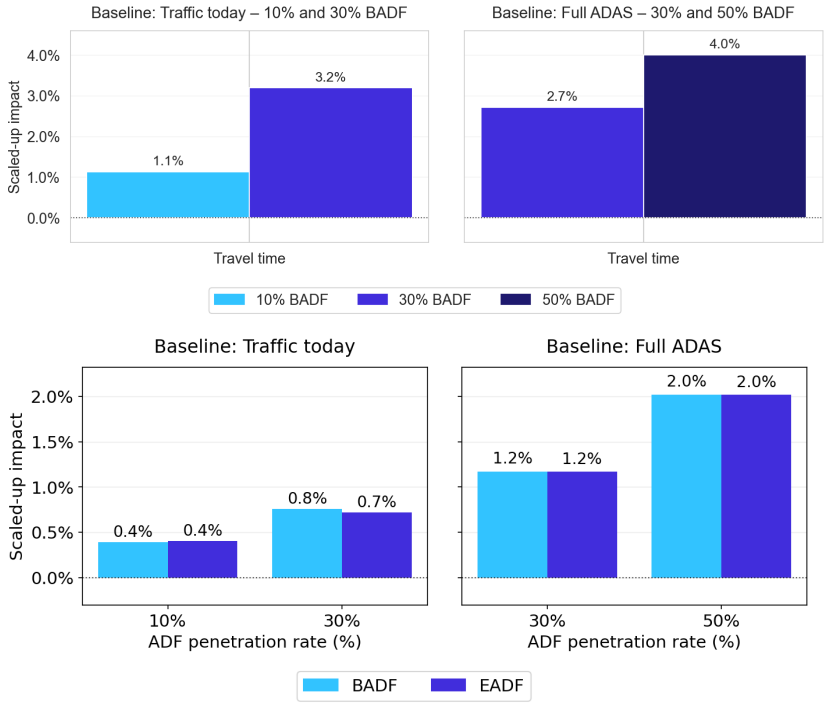
- Impact as number of accidents per year, by severity
- Results here as %, can be given also as absolute number

Efficiency & environmental impact assessment methodology



- Hi-Drive Deliverable D7.4
- Target country / state map, traffic and weather data

Examples of results



- Impact as (all vehicles)
  - Total vehicle-hours
  - Tons of CO2
  - kWh
- Results here as %, can be given also as absolute numbers

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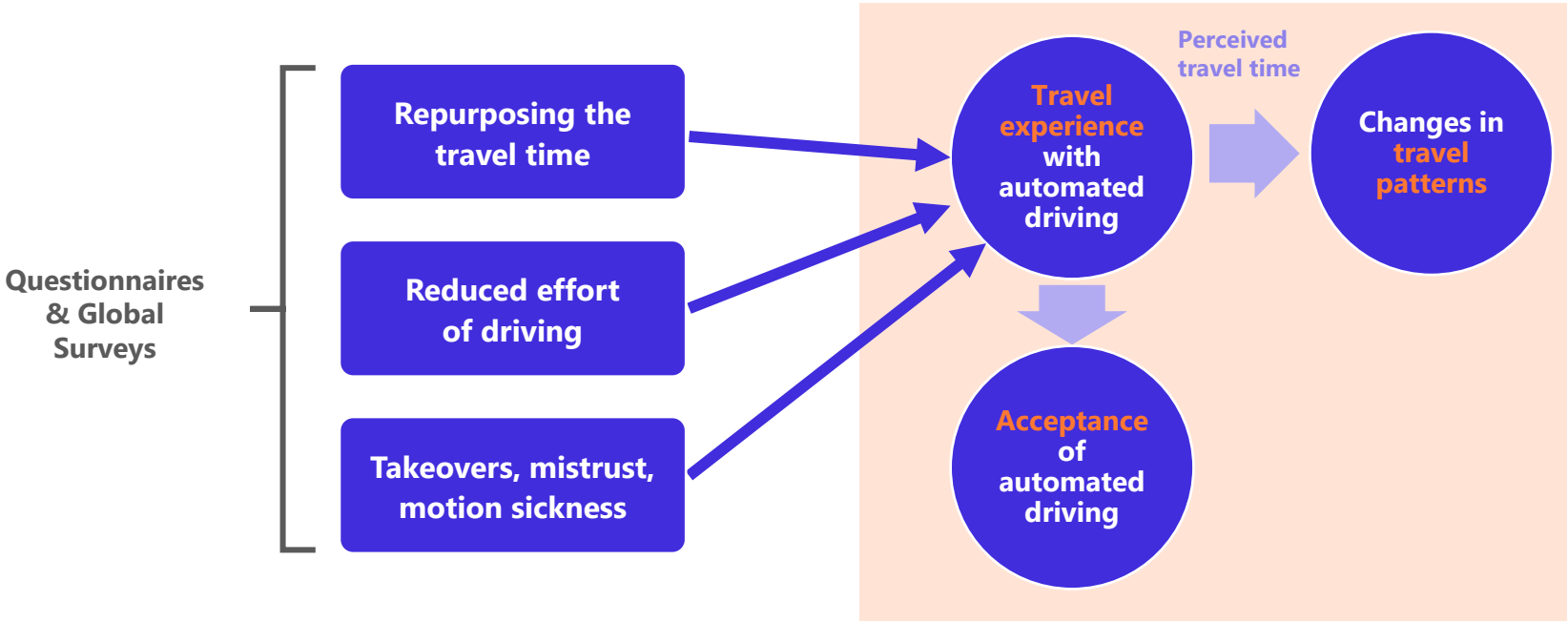
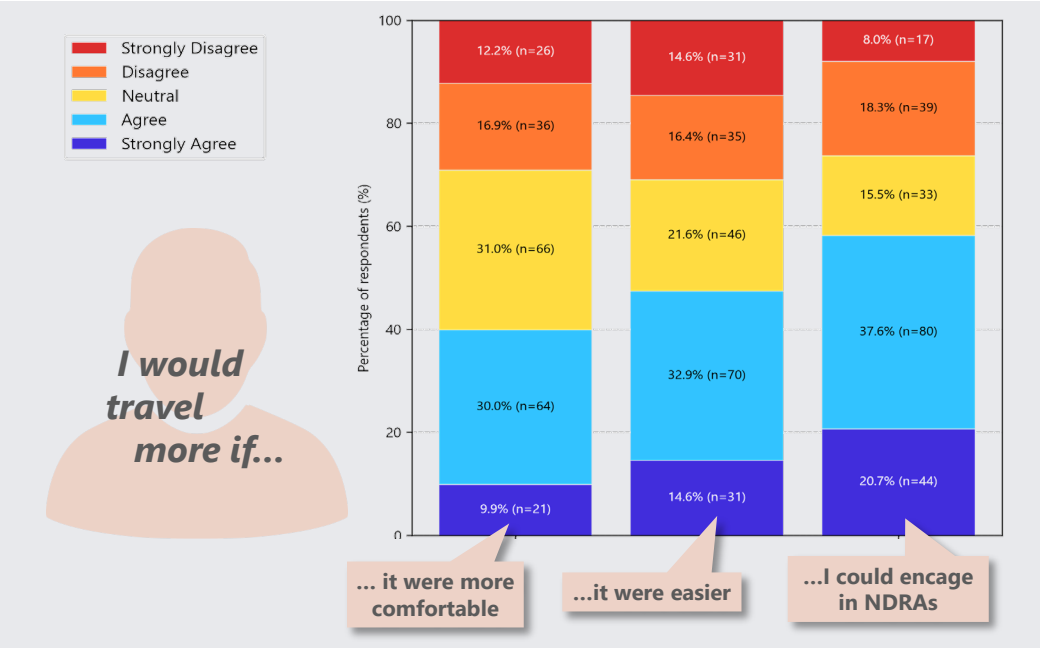
Mobility impact assessment methodology



Impacts on travel behaviour

- Automated driving systems can enhance travel quality by enabling users to engage in **non-driving related activities** during automated driving

- This may lead to **more frequent or longer trips**



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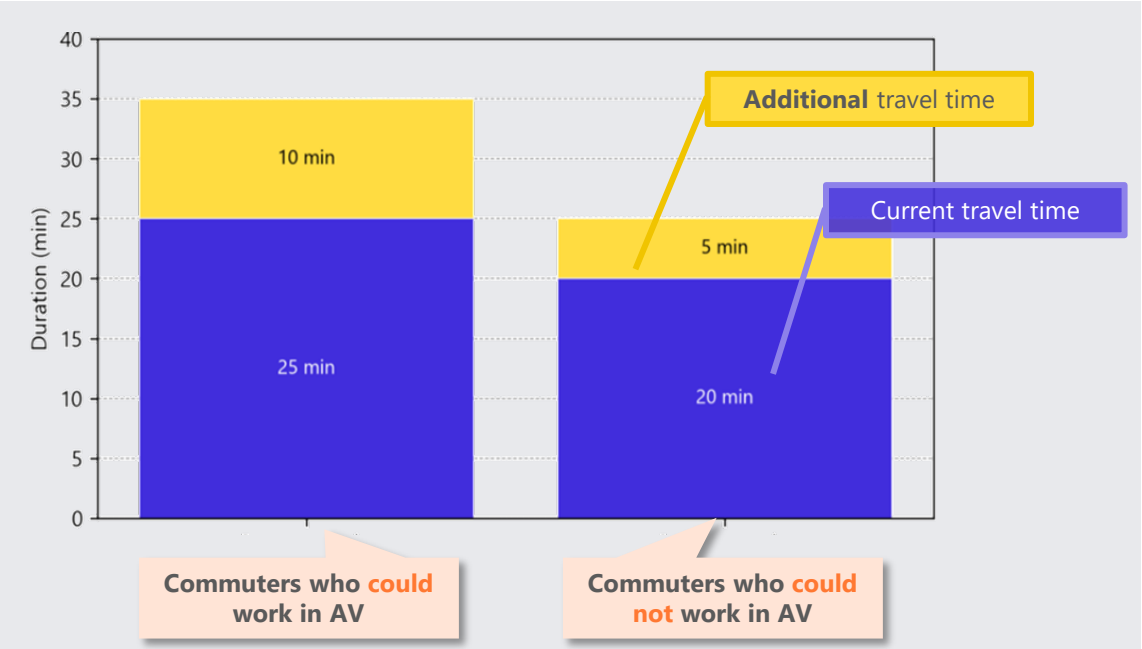
Ability to work while commuting may encourage to accept longer commutes (Global surveys)



- Correction factor for perceived travel time

  AD *vs* Manual driving: 0.8

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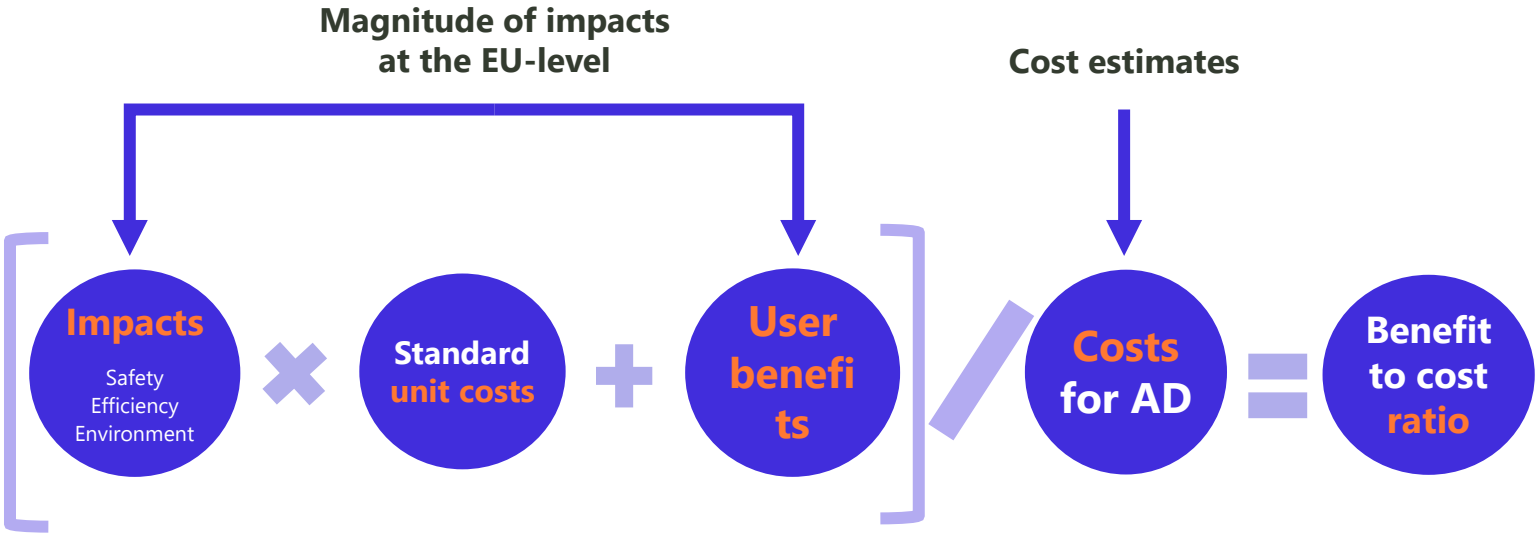
Method for socioeconomic impact assessment



- Hi-Drive Deliverable D7.5
- Target country / state impact results and unit costs

User benefits: Relative importance

Relative importance of different attributes for respondents with **willingness to pay >0**

Hi-Drive Global Survey:	Relative importance (%)
Increased safety	40.6
Increased comfort (less stressful driving)	22.6
Spending travel time on recreation	12.2
Fewer and shorter delays	11.2
Spending travel time on work-related activities	10.7
Other	2.7
N	3,372 = 100%

Example of results

Traffic today scenario, 30% EADF			
Impact	**Million €**		
• **Total accident cost savings**	39,900		
• **Travel time efficiency**	-6,800		
• **Consumption of fossil fuels**	900		
• **CO_2 emissions**	900		
• **Users' benefit: comfort**	11,300		
• **Users' benefit: relax instead of driving**	6,100		
• **Users' benefit: work instead of driving**	5,400		
Economic value of all impacts in total	**57,800**		
	Minimum cost estimate	Maximum cost estimate	Average cost estimate
Cost of implementing CAD	**19,200**	**43,800**	**31,500**
Net benefits	38,600	14,000	26,300
Benefit/cost ratio	**3.0**	**1.3**	**1.8**

Assumptions and limitations

- Automation of passenger cars, SAE level 3-4 with limited ODD
- ODD in urban environment and on motorways – set in line with views of European OEMs
- No impacts on mode choice considered in safety, efficiency or environmental impact assessment
- Simulation covered many scenarios but naturally not all possible scenarios that may take in real life could be considered
- Match between the scenario and parametrisation of data in scale up is not perfect
- Traffic data does not cover all urban areas, but only some cities where data is available
- Price estimate based on expert assessment, no real prices set for this technology yet

Conclusions

- Summary of impacts
  - Substantial benefits with reduced **number of accidents**
  - Small increase in **travel time**
  - Small decrease in **CO_2 emissions**
  - Substantial decrease in **tractive energy use**
  - Enhancement in **travel quality**
  - Negligible impact on **modal split**
  - **Rerouting** to outside ODD with increase in vehicle-km and hours travelled
  - Profitable from **society**'s point of view
- For **limitations**, see Hi-Drive Deliverables D7.3-5
- **Most complex and extensive** impact assessment for ADF with advancements in state of the art