



Design Judith Kozinski / Quelle: M-Five

Session: Future labor market  
for the sustainable and livable cities

Rotterdam, 9.6.2021

## Employment implications of the mobility transition: sustainable mobility and connected and automated driving

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# Agenda

- Two periods of job changes in transport can be differentiated:
- 2020 until 2035: transition to sustainable mobility (electrification, new mobility services)
- (2030), 2035 until 2050: transition to autonomous mobility (self-driving trucks, automated sharing modes)

# Sustainable Mobility Scenarios for Germany

## REFERENCE

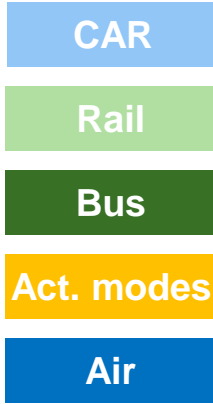
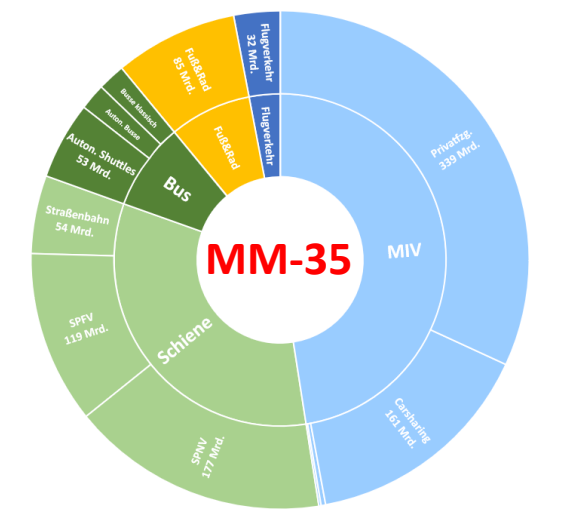
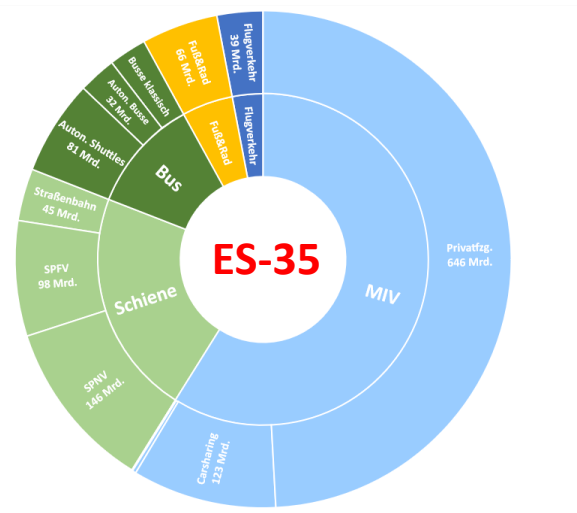
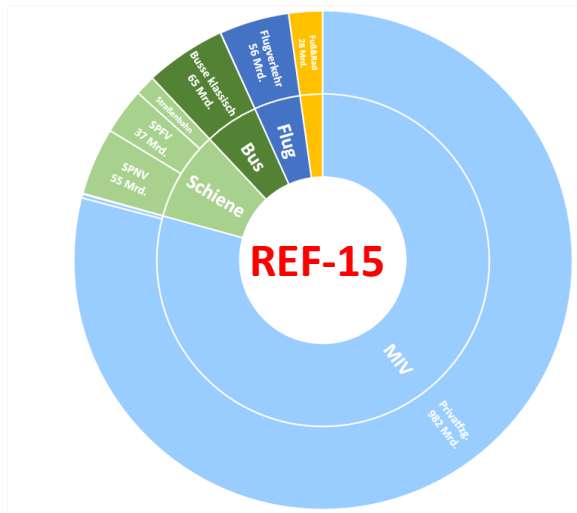
## Electrification – ES-35



## Multi-Modality – MM-35



Quelle: WS



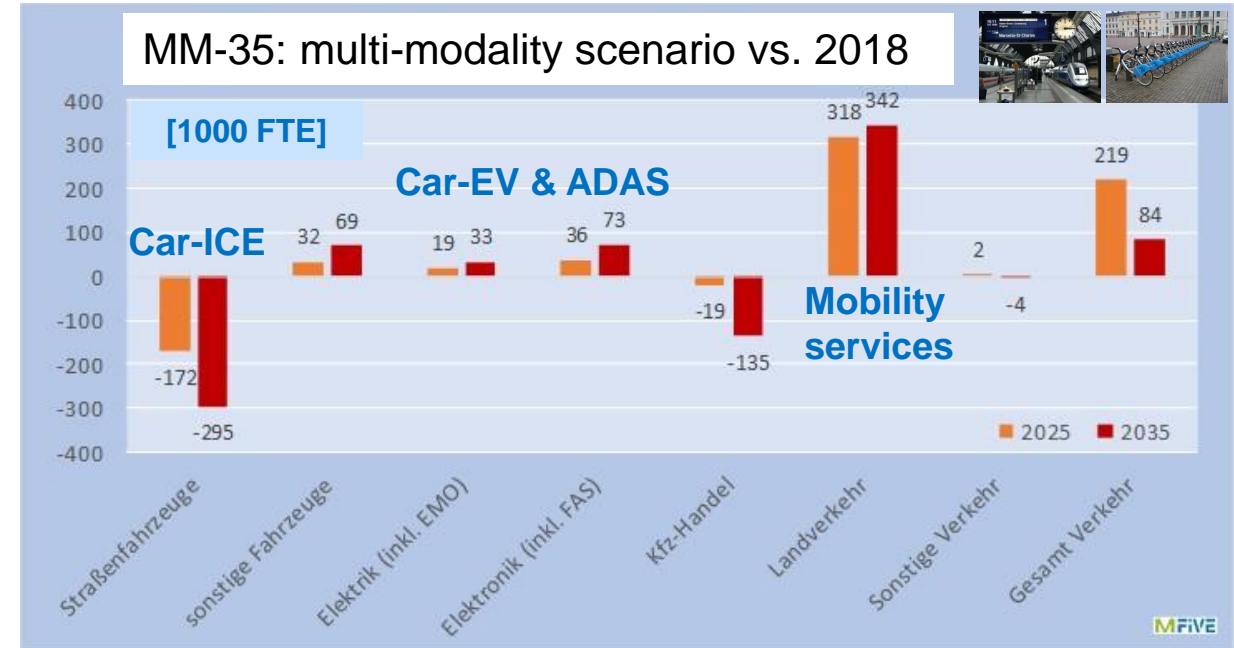
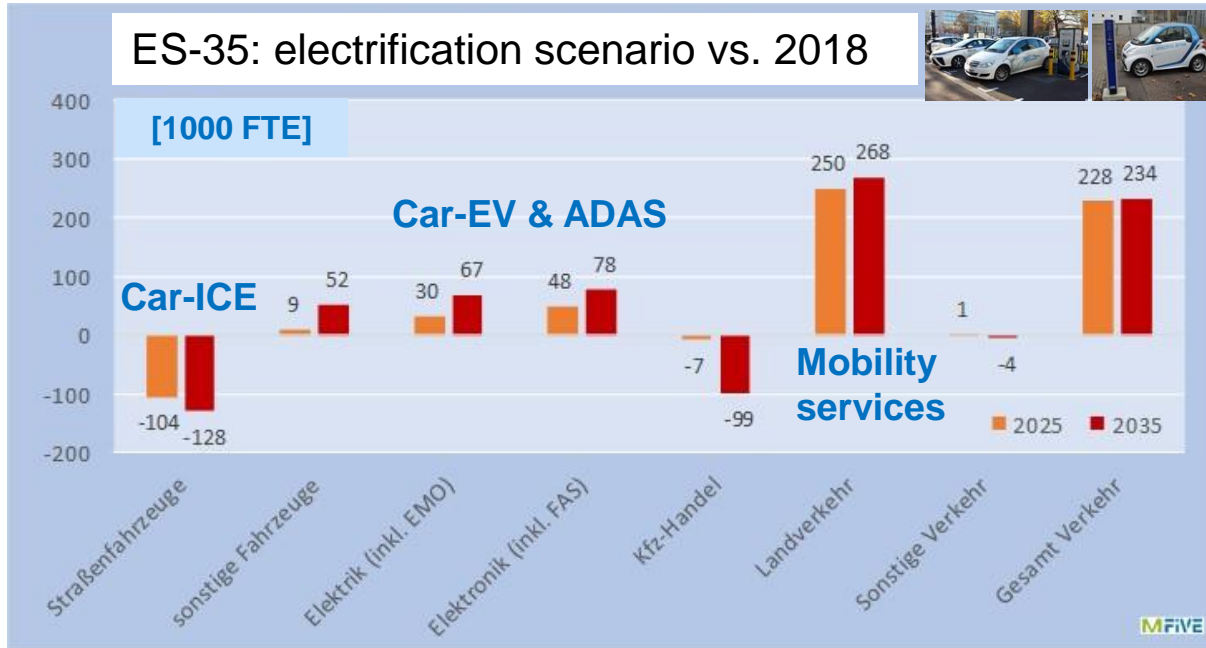
**2015:**  
Car modal-share: 80%  
Car-ownership rate: 560 car/1000 inh.

**2035:**  
Transport demand: +5% pkm  
Car-ownership: 430 car/1000 inh.  
Policy objective: efficiency and electrification (**ES-35**)

**2035:**  
Transport demand: -15% pkm  
Car-ownership: 300 car/1000 inh  
Policy objective: Modal-shift and Multi-modality (**MM-35**)

Quelle: M-Five Abschätzung

# Change of transport related employment until 2035



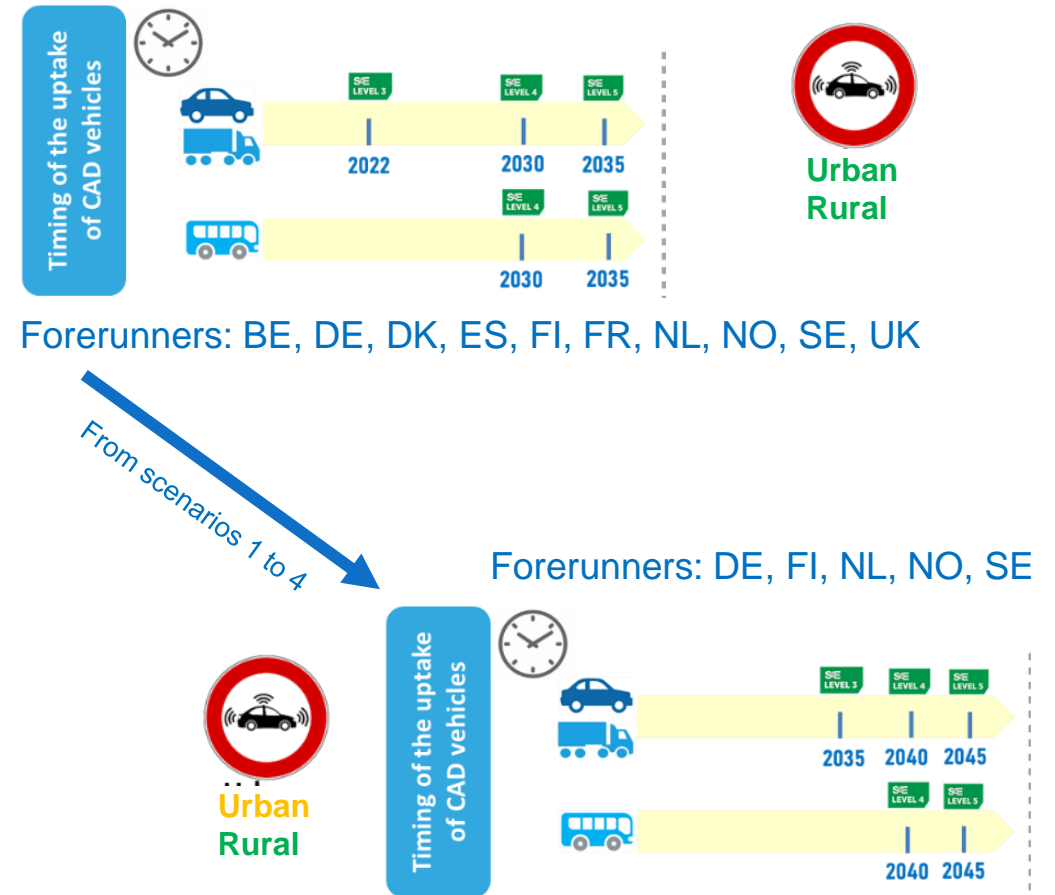
**Strong structural change of employment in sustainable mobility scenarios!**

[https://m-five.de/wp-content/uploads/M-Five\\_AP5\\_Gesamtwirtschaftliche\\_Analyse\\_Nachhaltige\\_Mobilit%C3%A4t\\_200131\\_FINAL.pdf](https://m-five.de/wp-content/uploads/M-Five_AP5_Gesamtwirtschaftliche_Analyse_Nachhaltige_Mobilit%C3%A4t_200131_FINAL.pdf)

Quelle: ASTRA-HBS, eigene Berechnungen M-Five

# 4 Scenarios of CAD deployment in Europe

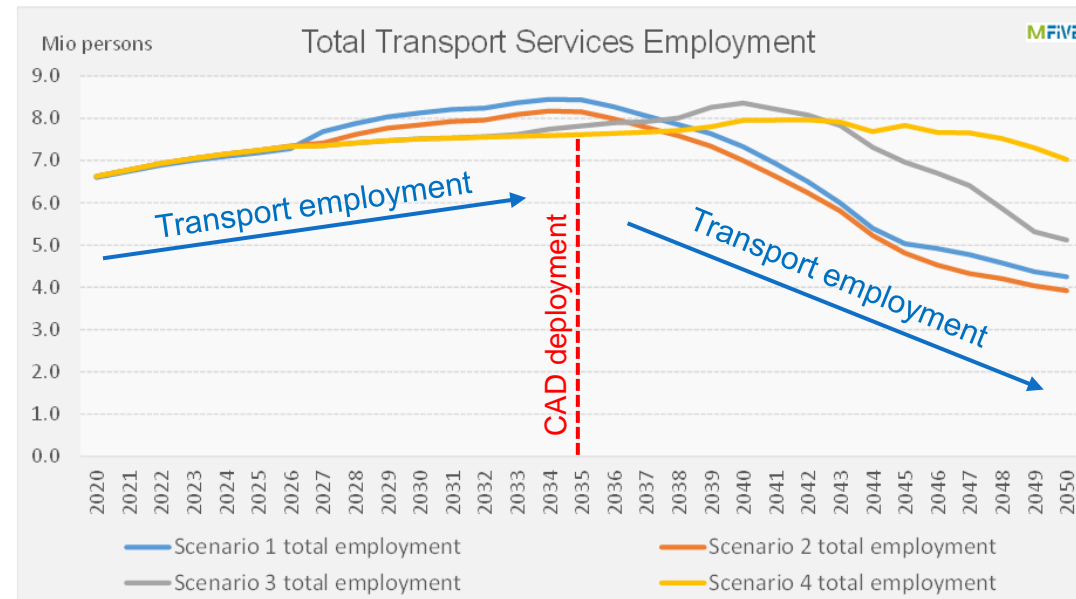
- **Scenario 1: Fast**, focused on **private** transport and **unrestricted** usage of CAD (maximum uptake of CAD);
- **Scenario 2: Fast**, focused on **private** transport and **regionally restricted** usage of CAD (intermediate uptake of CAD);
- **Scenario 3: Moderate**, with **emphasis on shared transport** and regionally restricted usage of CAD (moderate uptake of CAD);
- **Scenario 4: Slow**, some emphasis on shared transport and regionally restricted usage of CAD (low uptake of CAD)



Source: TRT, CAD employment project

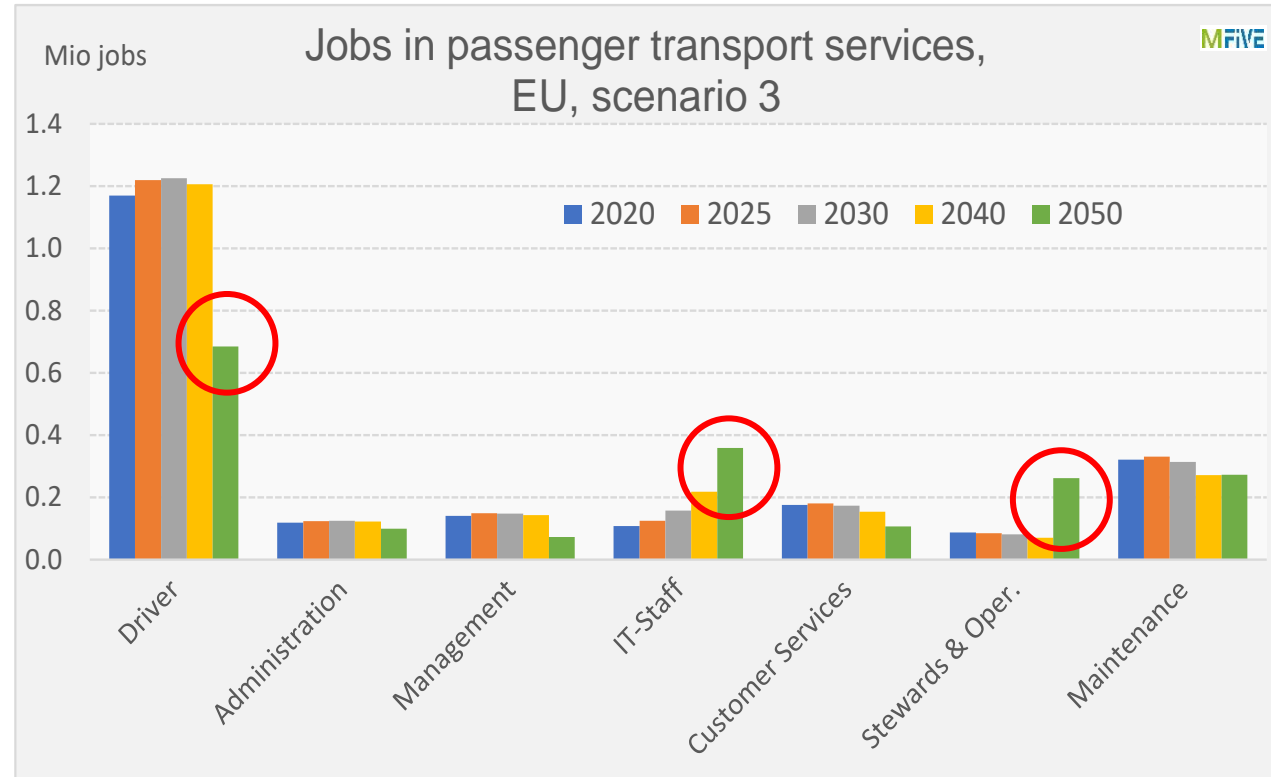
# Transport services labour market impacts longer term perspective 2035-2050

- Fast uptake in scenarios 1 and 2, moderate in sc. 3, slow in sc. 4 clearly visible in job development
- Largely driven by freight transport services development:
  - Higher overall employment
  - CAD transition much stronger and more rapid



# Job categories in **passenger** transport services

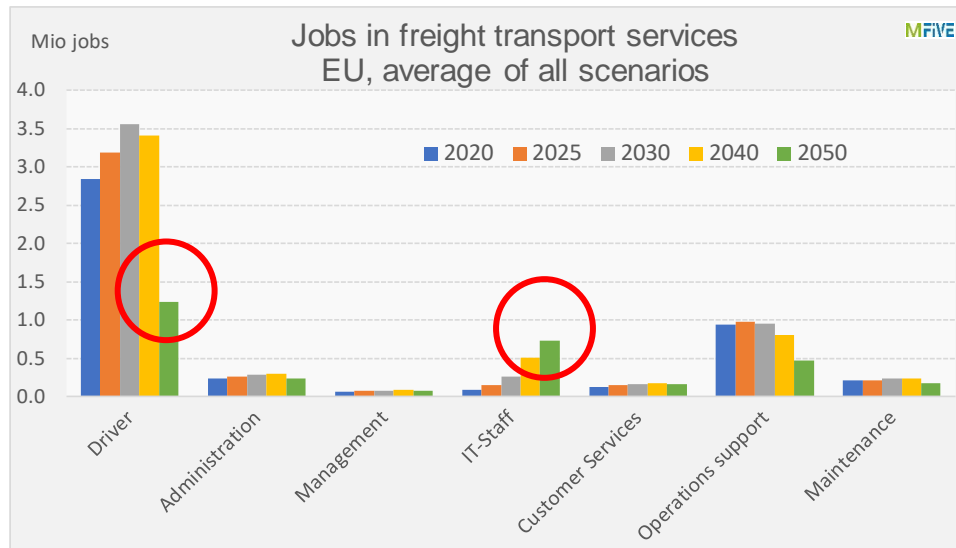
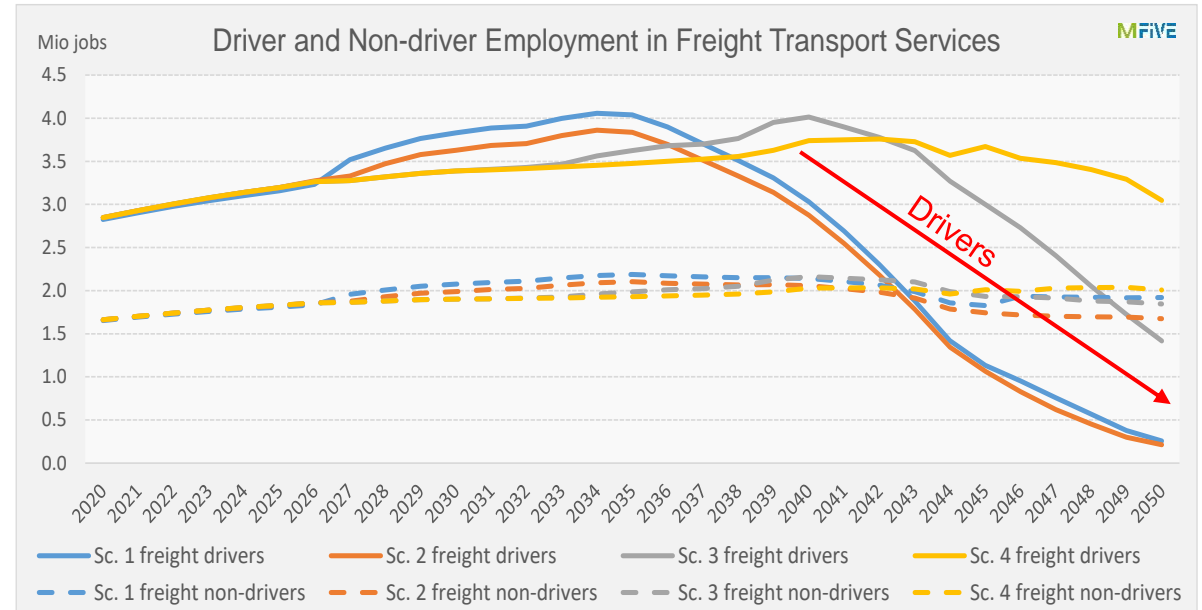
- Sharp decrease in driver employment
- Job growth in
  - IT and
  - Stewards (ride-sharing, robo-bus)
- Some structural adjustments in other job categories, mostly efficiency-related



Source: WS

# Impact on different job professions in freight transport

- Almost complete displacement of drivers in scenario 1 and 2
- Advanced transition in scenario 3, mostly in forerunner countries



- Non-driver employment relatively stable over
- This includes mobility operators:
  - Level 4 transition between traditional drivers and fully automated vehicles



Source: WS

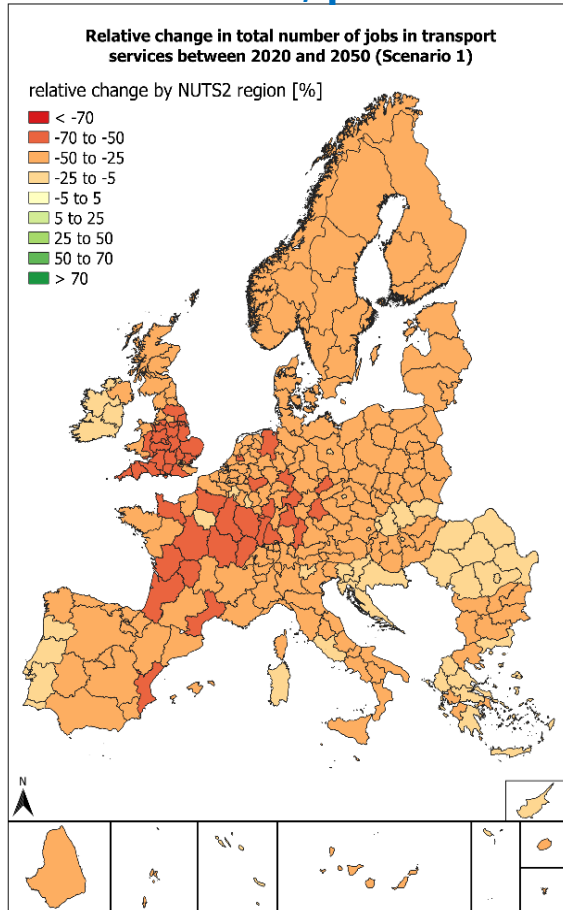


# Transport services employment in European regions



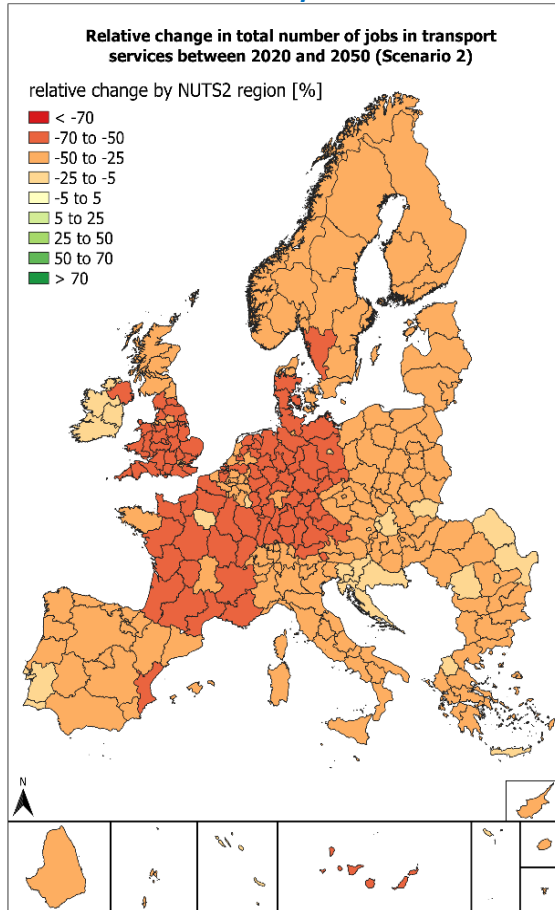
Source: WS

## Sc-1: CAD fast, private



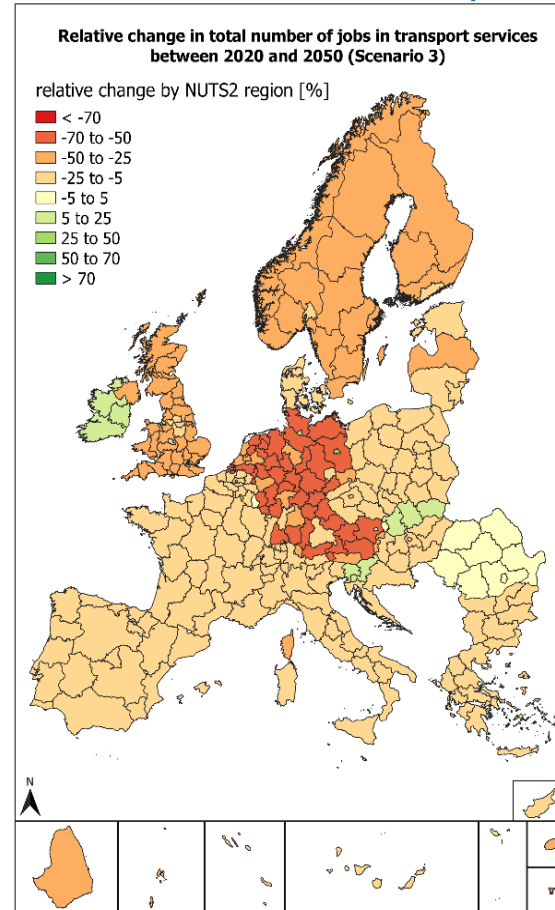
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## Sc-2: CAD fast, restricted



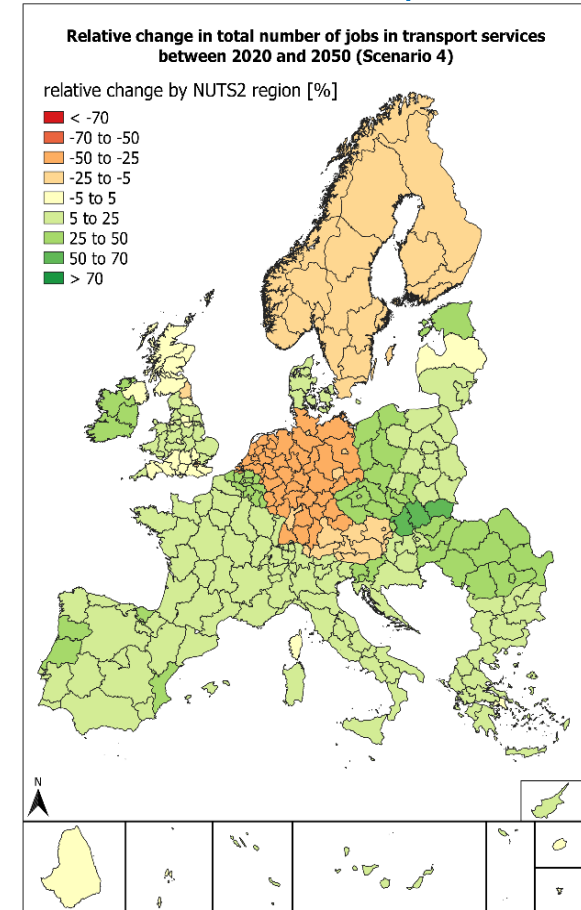
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## Sc-3: CAD moderate, shared



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## Sc-4: CAD slow, shared



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Source: M-Five, CAD employment project

# Conclusions on changes of skills

## Increased need of:

- Supervision and selective intervention skills
- Coordination, cooperation and collaboration skills
- Awareness of the performance of the AV and the environment

## Decreased need of:

- Dexterity
- Autonomy
- Routine
- Use of machine

# Thank you for your kind attention!



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