

The Triumphs and Tribulations of **Shared Micromobility & Public Transport integration**

11.10.2024
Urbanism Next Europe
Amsterdam



Our group



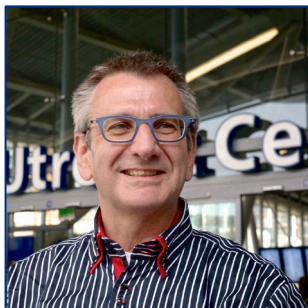
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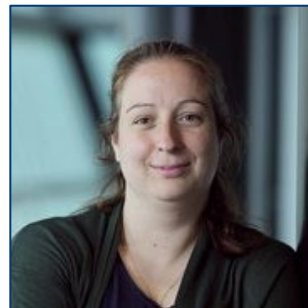
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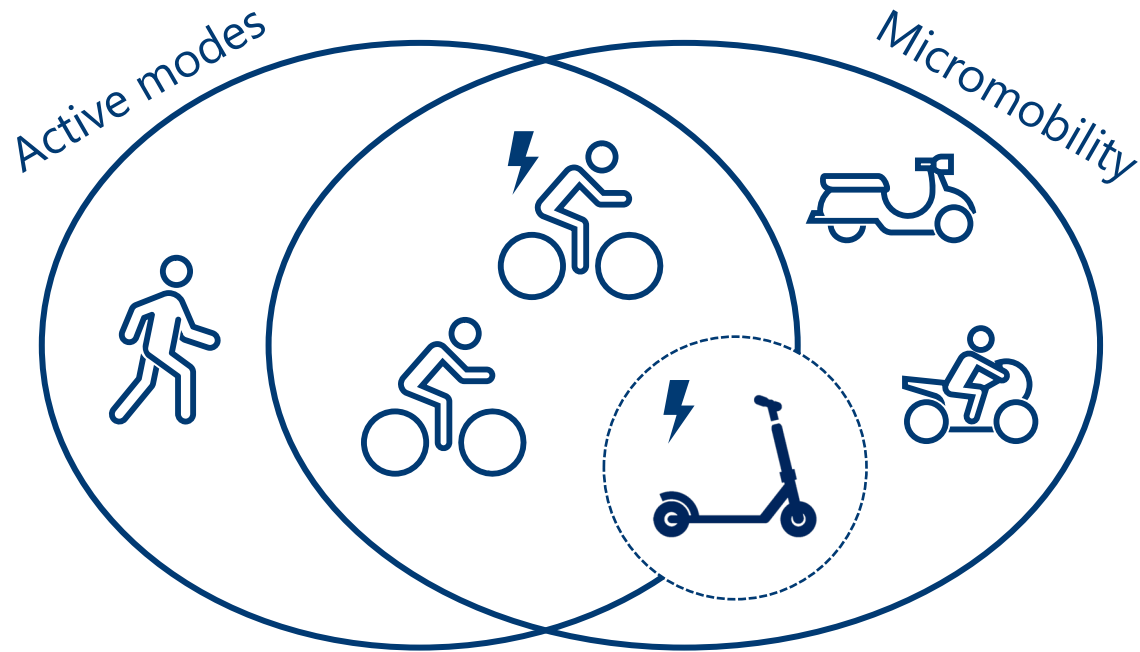
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What is micromobility?



What is micromobility?



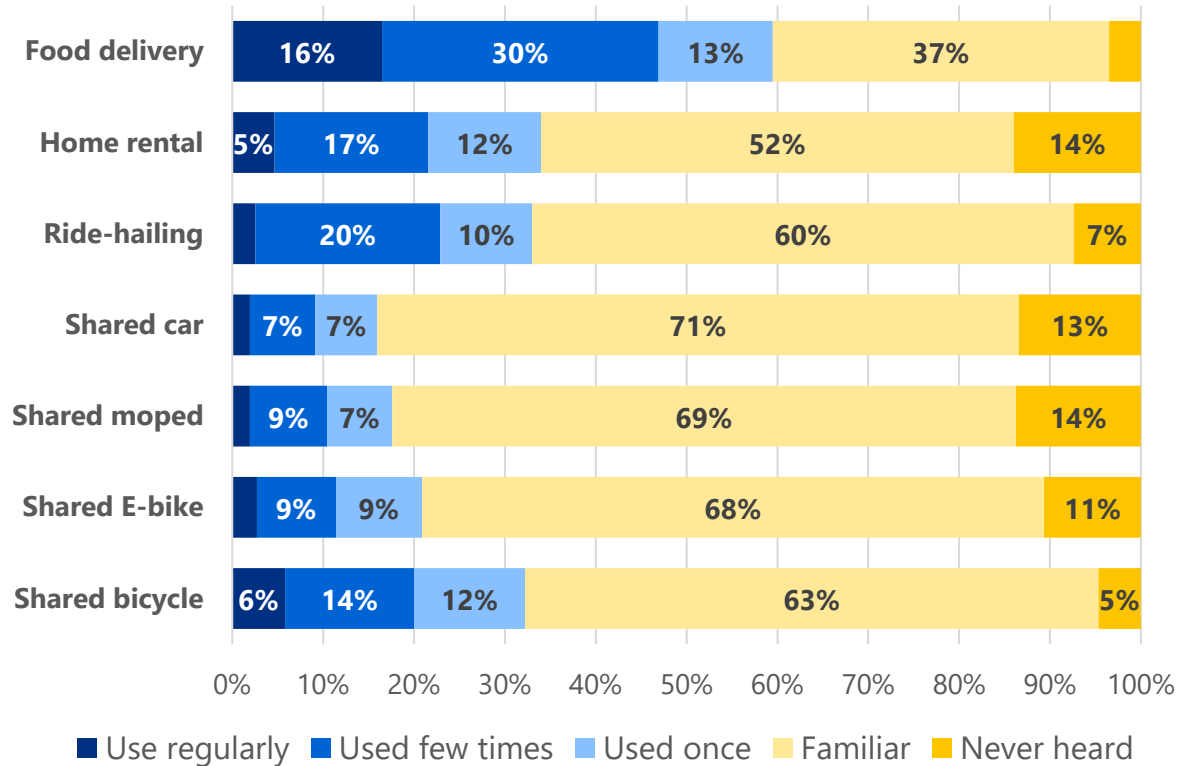
Micromobility



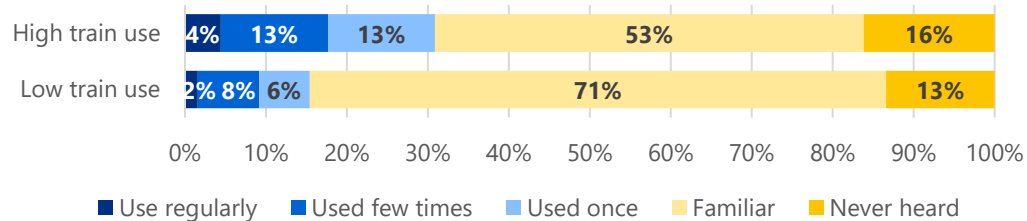
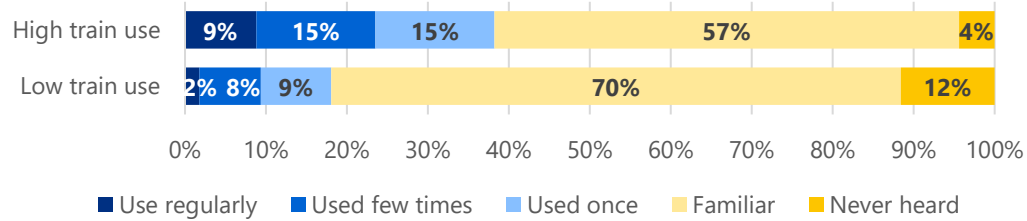
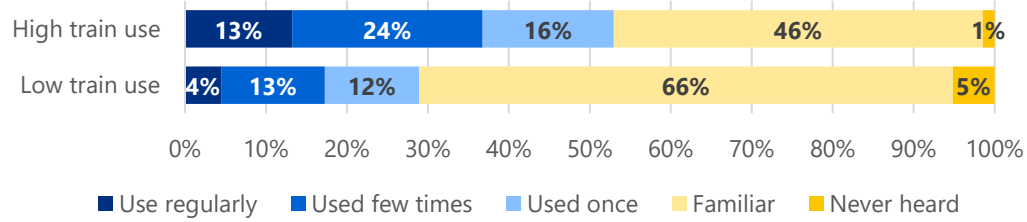
- ❖ Who has used micromobility before?
- ❖ Who has used **SHARED** micromobility before?



Experience



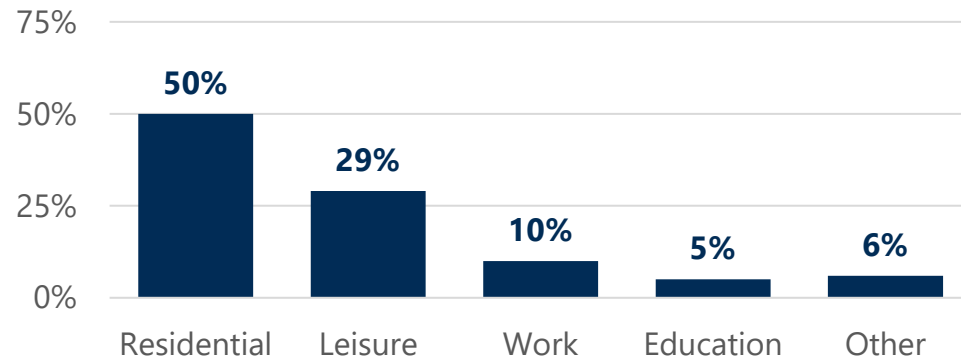
Difference in experience



Shared micromobility



- ❖ Primarily (exclusively?) within urban areas
- ❖ Majority of trips are unimodal
- ❖ **~20% of trips are access/egress trips**



De Wit, Ton, van Oort, Gavriilidou, Dijk, & Hoogendoorn. 2024. *The Shared E-Moped Train Combination: Factors Influencing the Usage of the Combined Mode*. SSRN



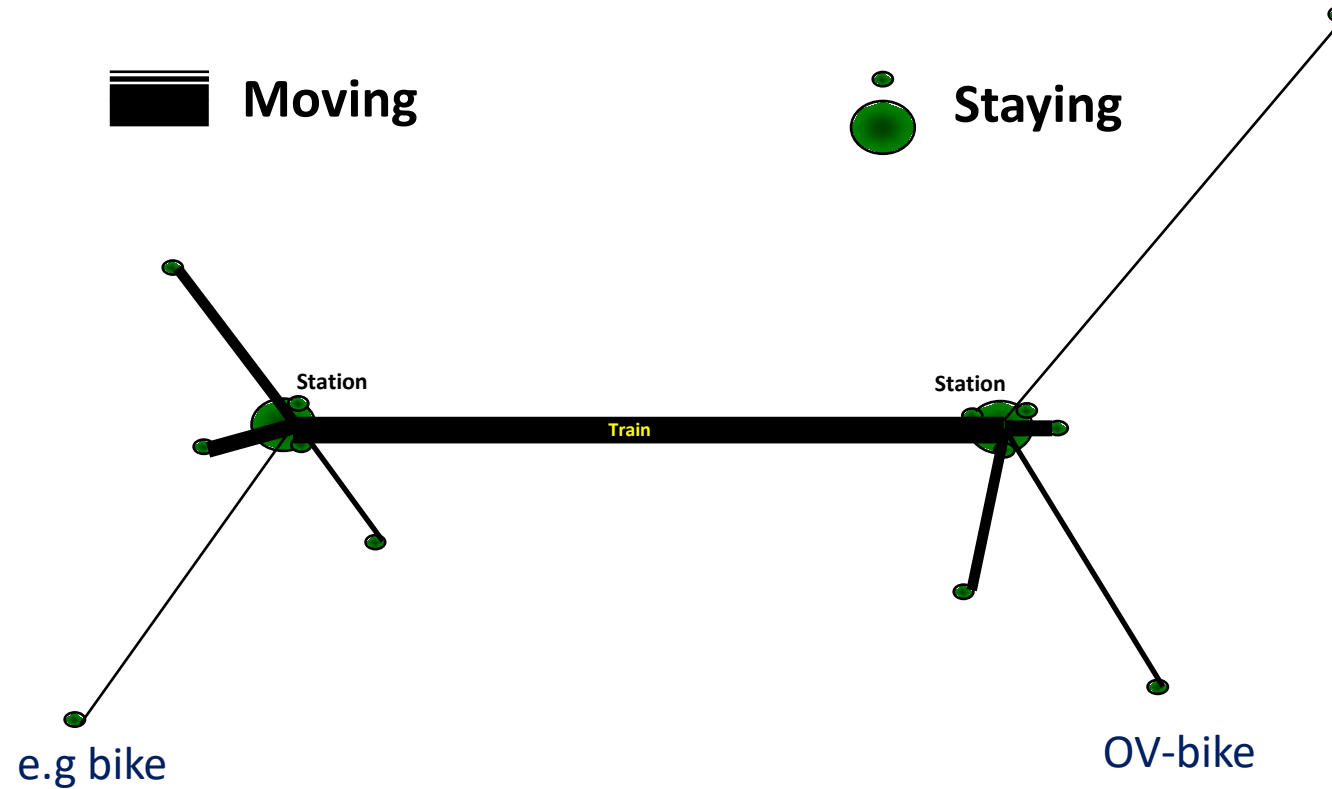


Multimodal trips



- ❖ Multiple modes in a single trip
 - ◇ Walking is part of any trip
- ❖ Particularly relevant for public transport
 - ◇ 400m nearest PT stop
 - ◇ 5.3km nearest train station
 - ◇ 10.8km nearest “important transfer station”
- ❖ Accessing the stop/station

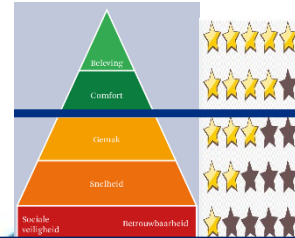
Two main activities



The traveller chooses the path of least resistance



Quality



Three budgets



MONEY

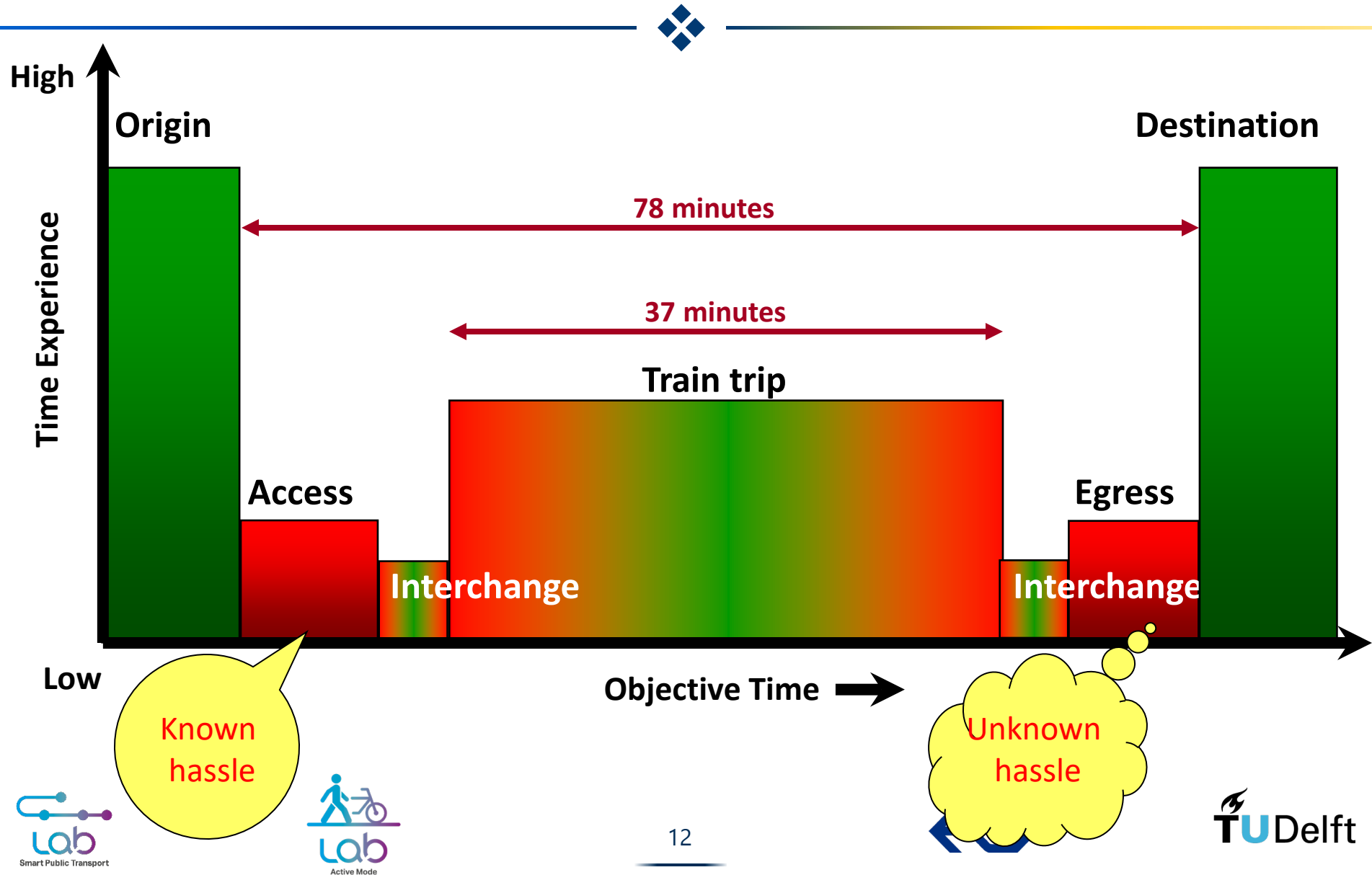


EFFORT

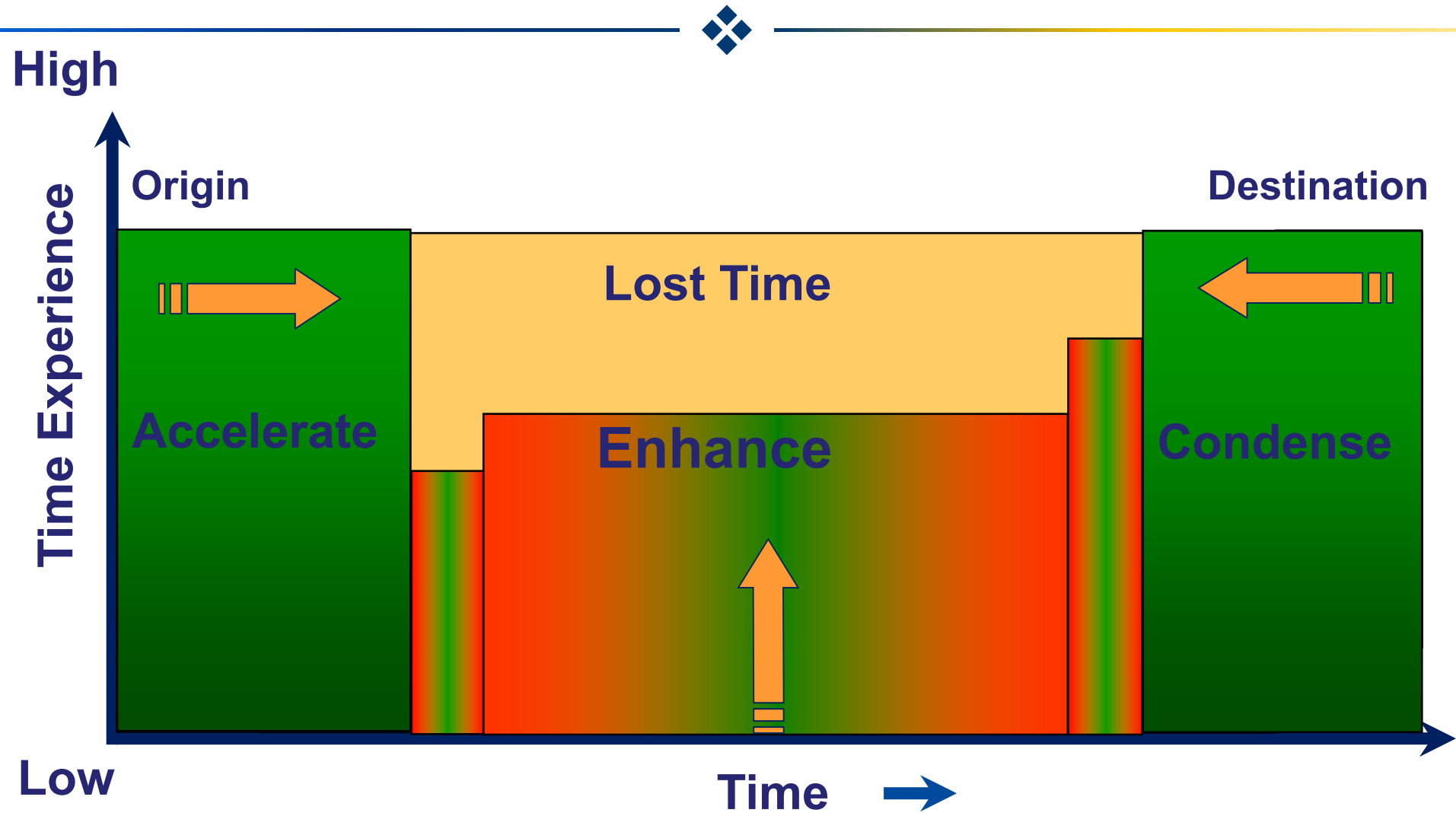


TIME

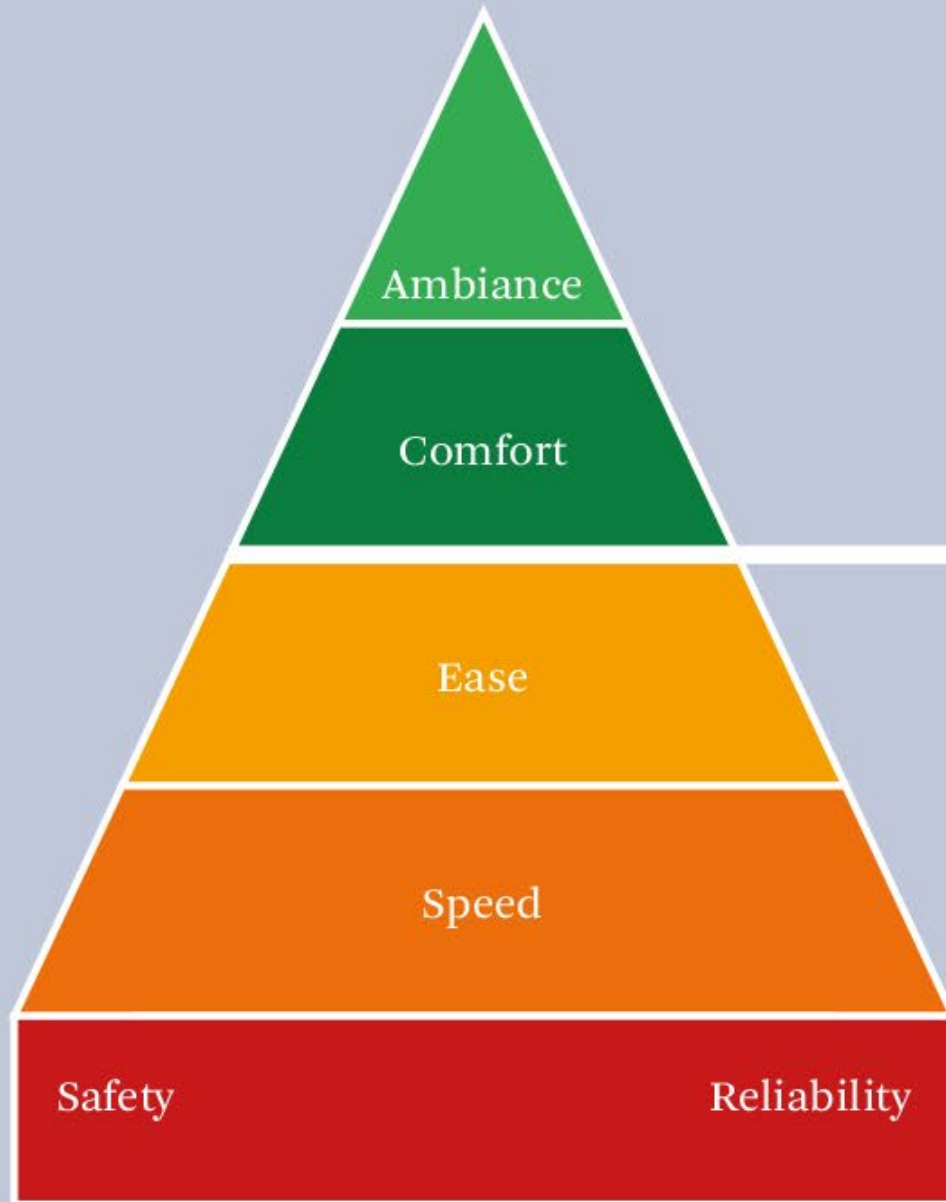
Time Experience of the Customer Journey



Experience Customer Journey



PYRAMID OF CUSTOMER NEEDS



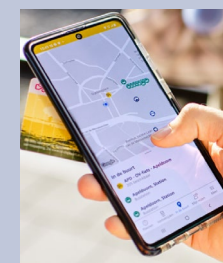
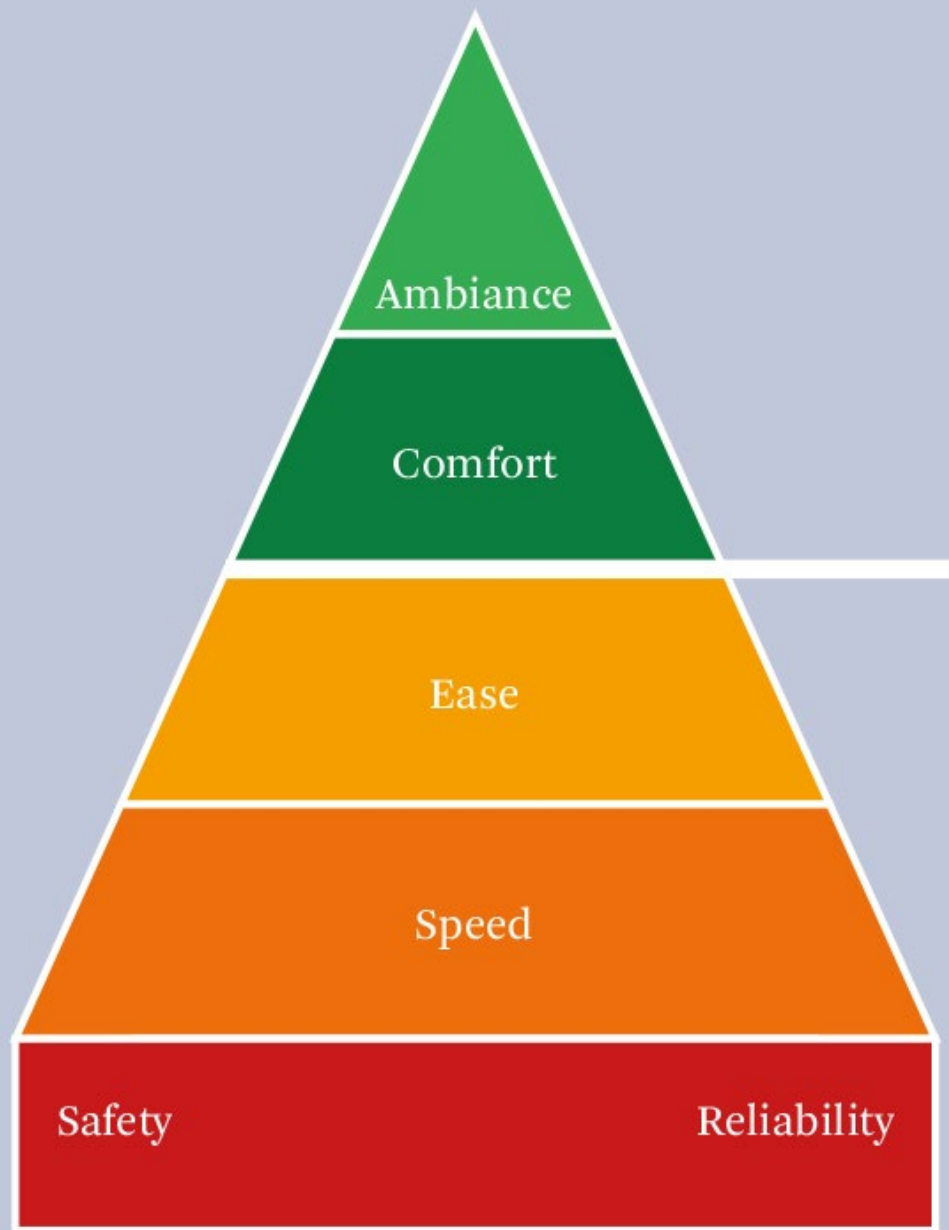
5. Emotions
Time is valuable

4. Physical effort
Personal convenience

3. Mental effort
No hassle, no stress

2. Traveltime door-to-door
The faster the better

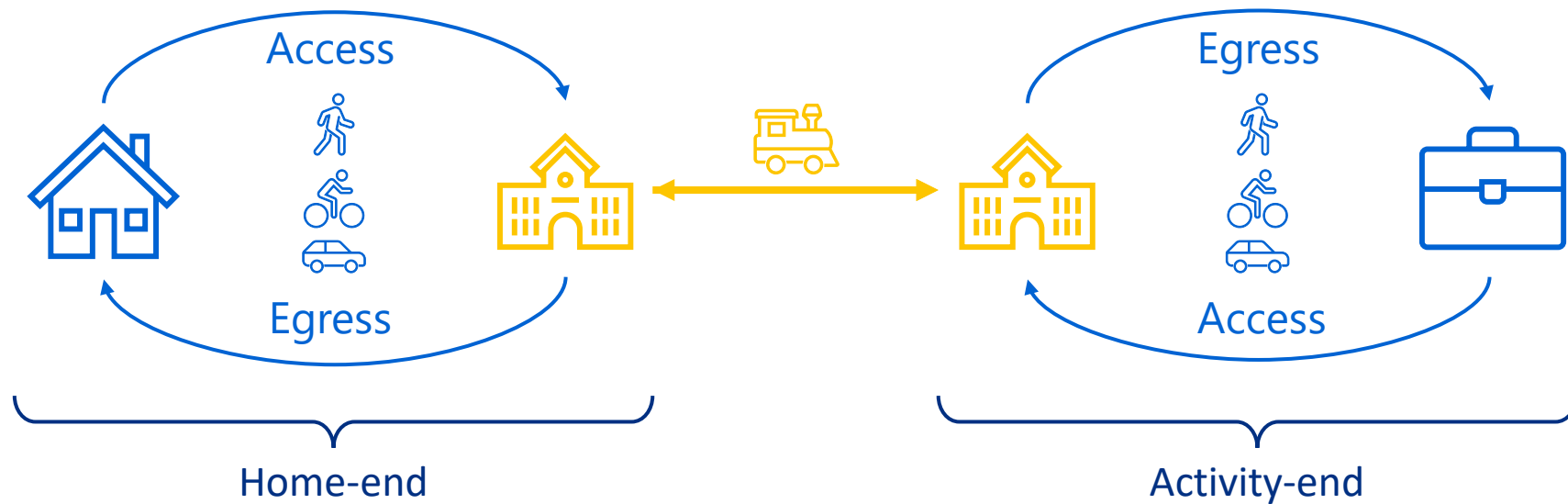
1. Trust
Safe and secure journey, get what you expect



Terminology



Terminology

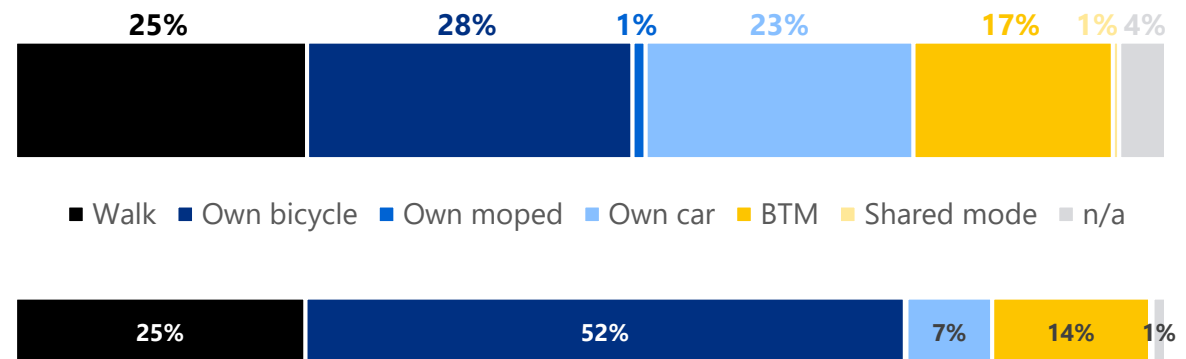




Home-end



❖ How do you (normally) get to the station when travelling from home?



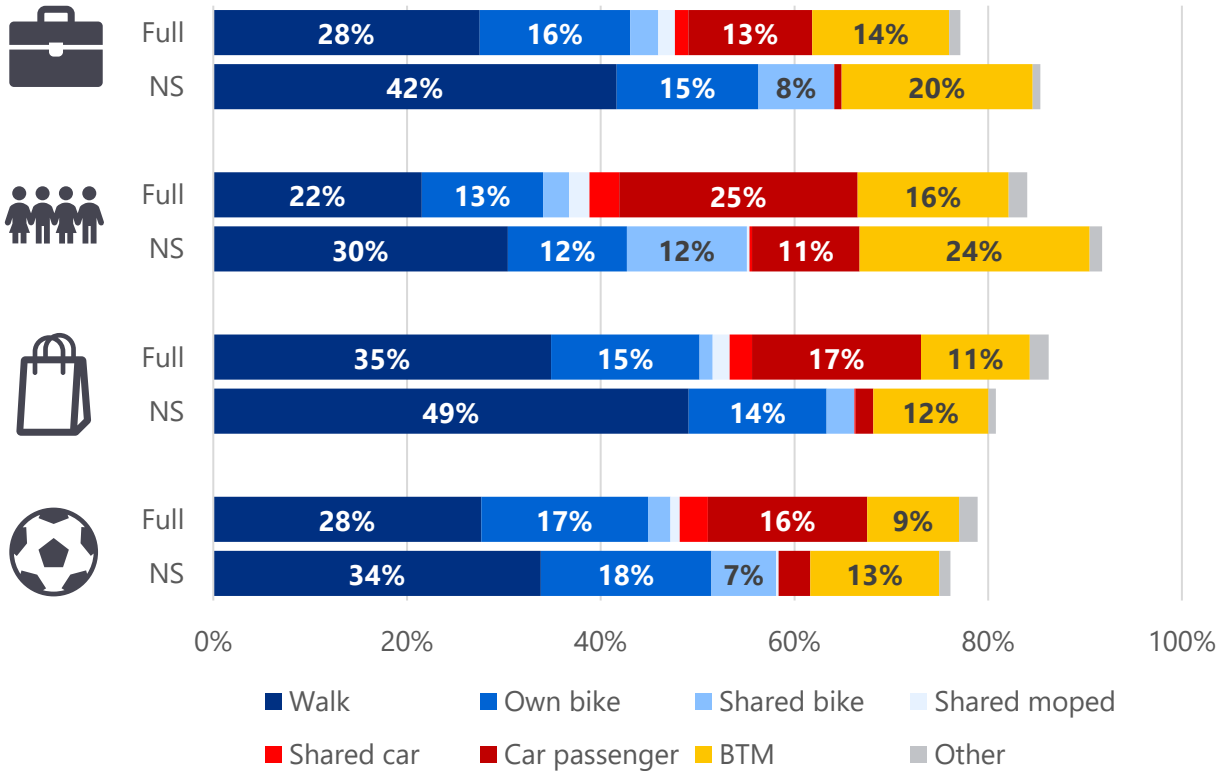
Activity-end



- ❖ How do you (normally) get to the station when travelling from home?
 - ◇ Does it depend on anything?
- ❖ Have you ever used a shared mode as an egress trip?



Activity-end



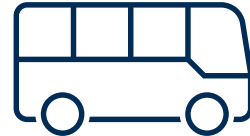
How would you travel?



How would you travel? (1)



30min walk



3min walk



5min wait

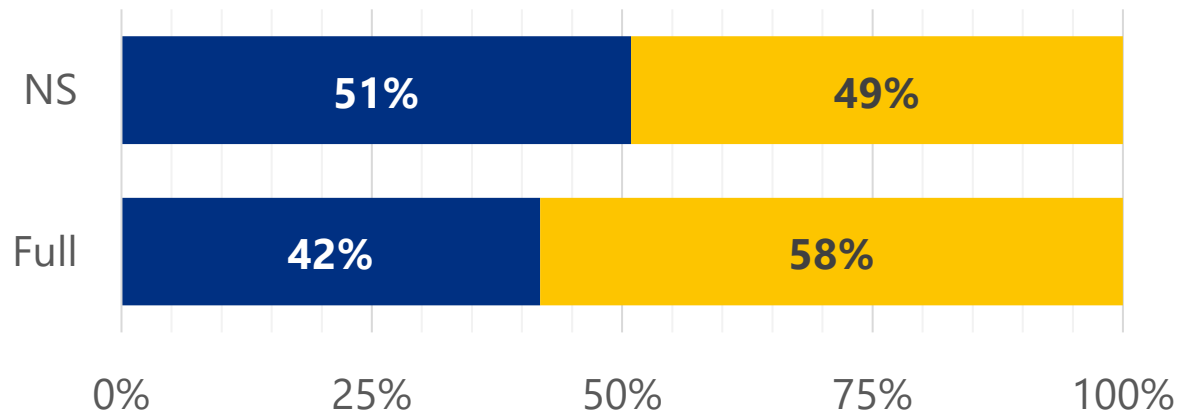
8min travel



€1.40 cost



How would you travel? (1)



How would you travel? (2)



3min walk



5min wait

8min travel



€1.40 cost



1min walk

12min travel

P

Central parking



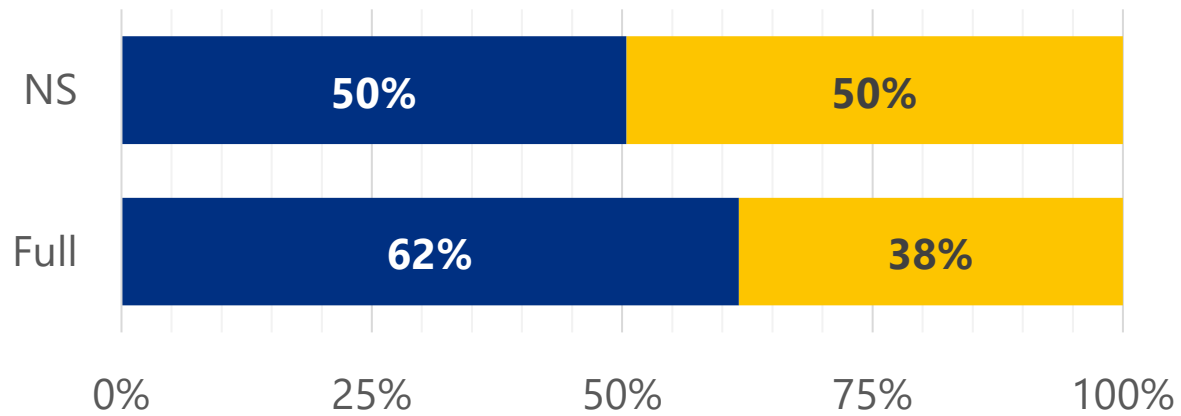
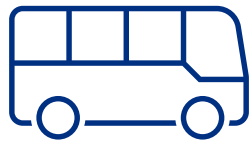
Return trip



€2.00 cost



How would you travel? (2)



How would you travel? (3)

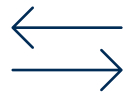


1min walk

12min travel



Central parking



Return trip



€2.00 cost



1min walk

8min travel



Central parking



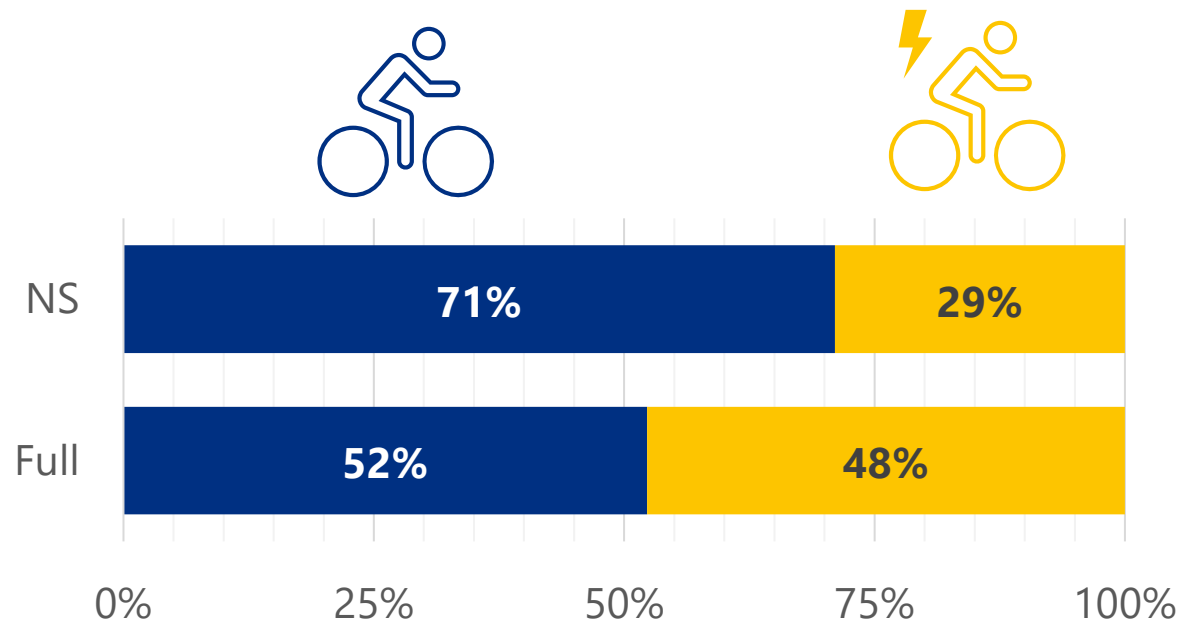
Return trip



€3.00 cost



How would you travel? (3)



How would you travel? (4)



1min walk

12min travel



Central parking



Return trip



€2.00 cost



2min walk

6min travel



Free floating



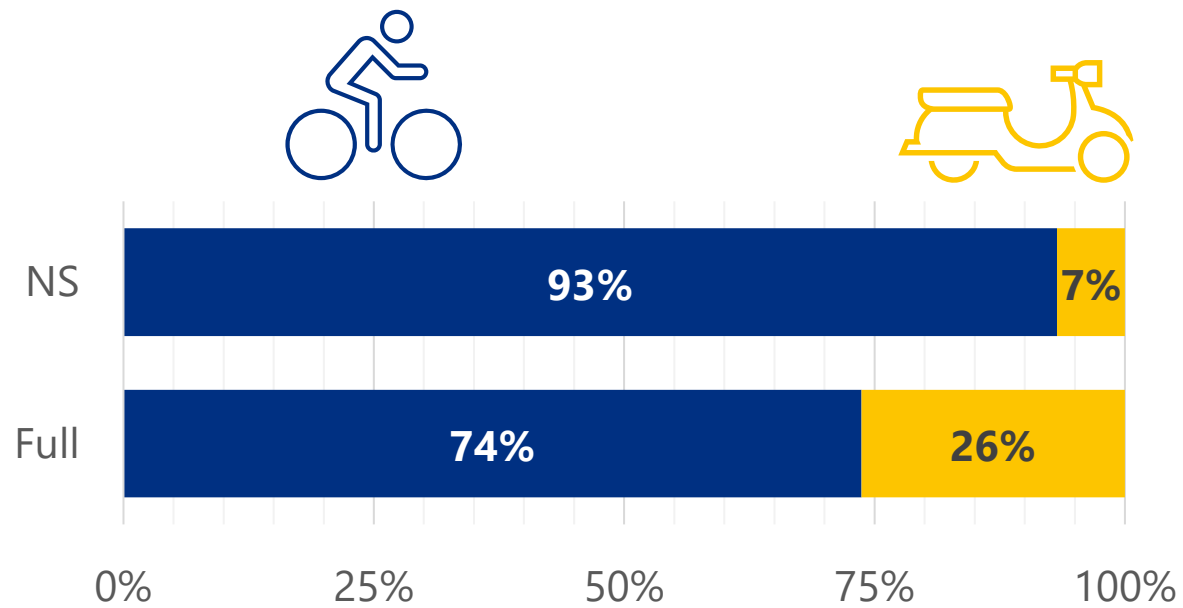
Oneway trip



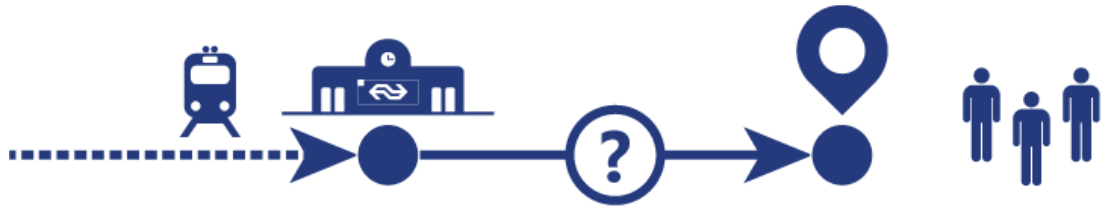
€4.00 cost



How would you travel? (4)

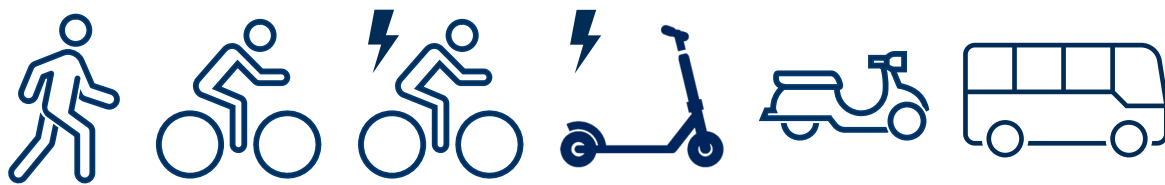


How would you travel?

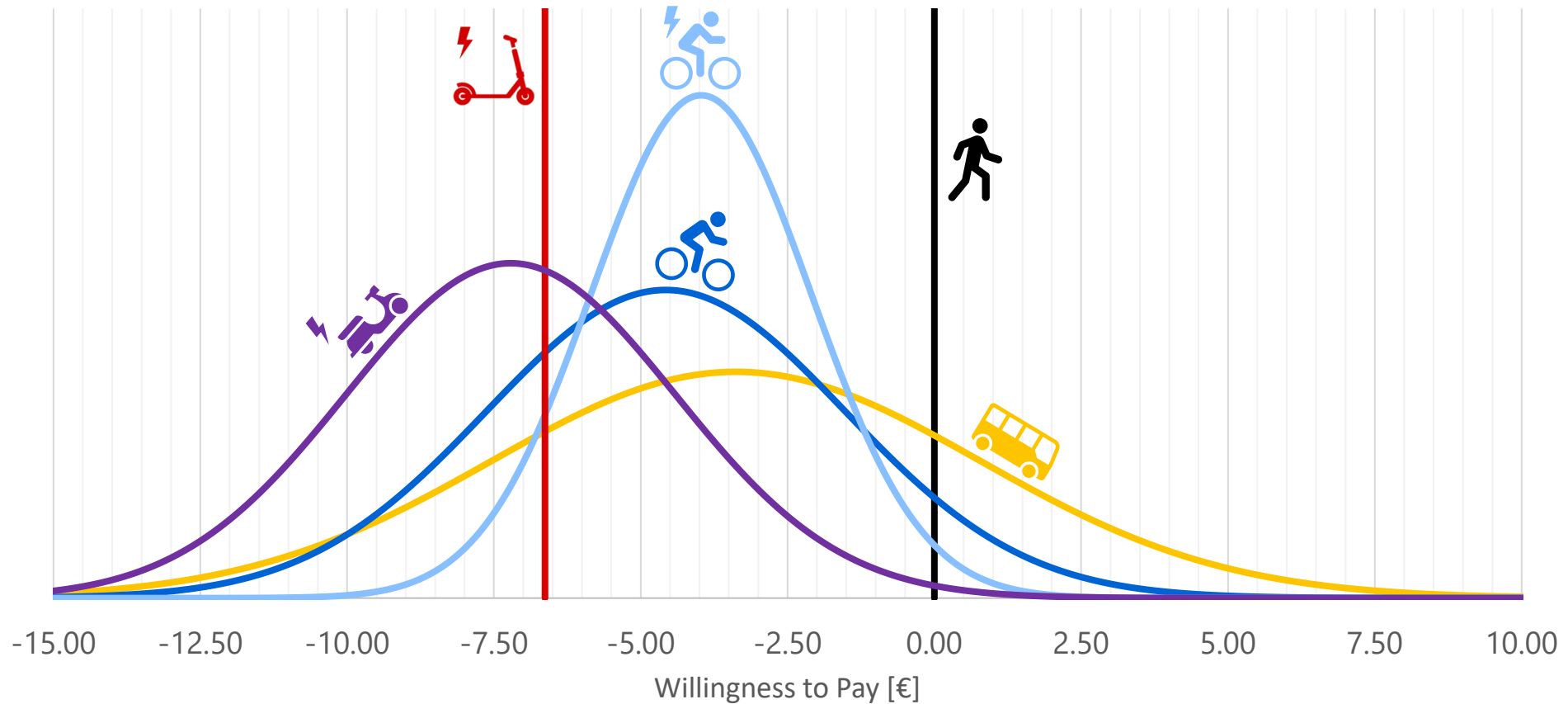


Je hebt al
45 minuten met
de trein gereisd

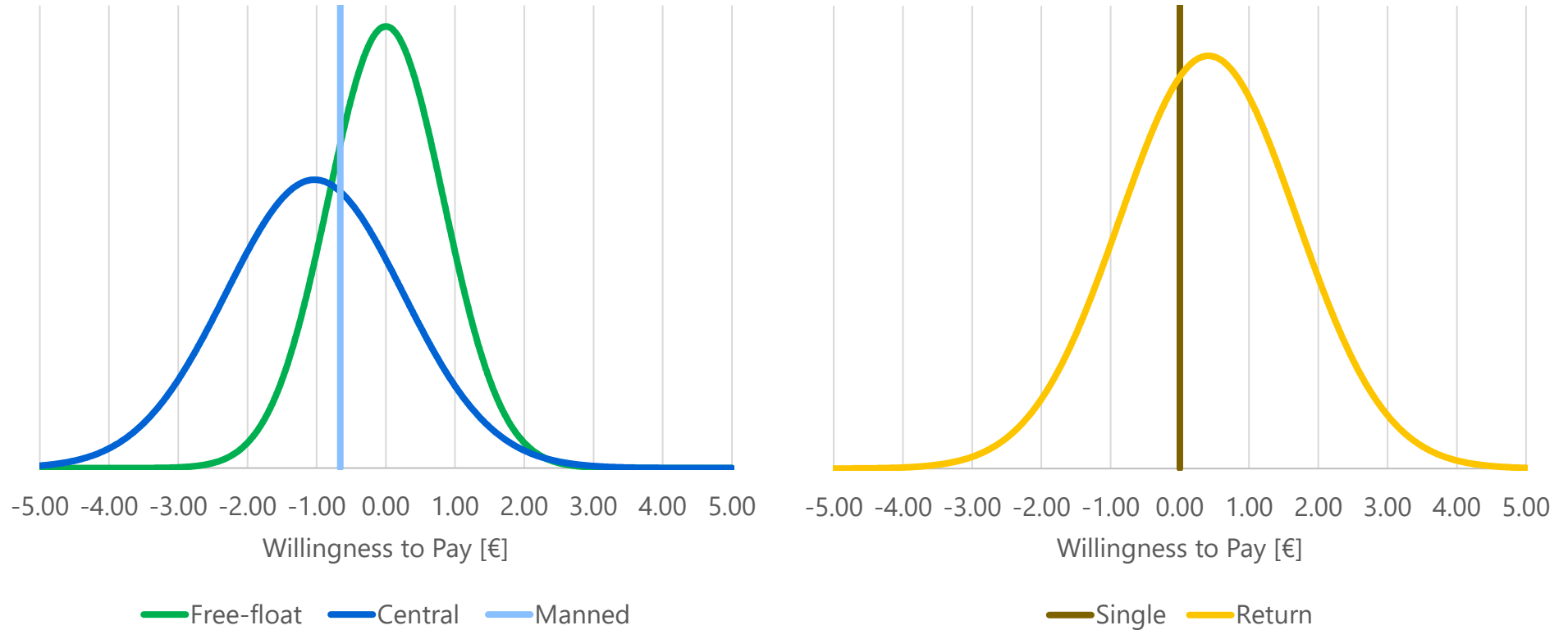
Je gaat op
bezoek bij
vrienden/familie



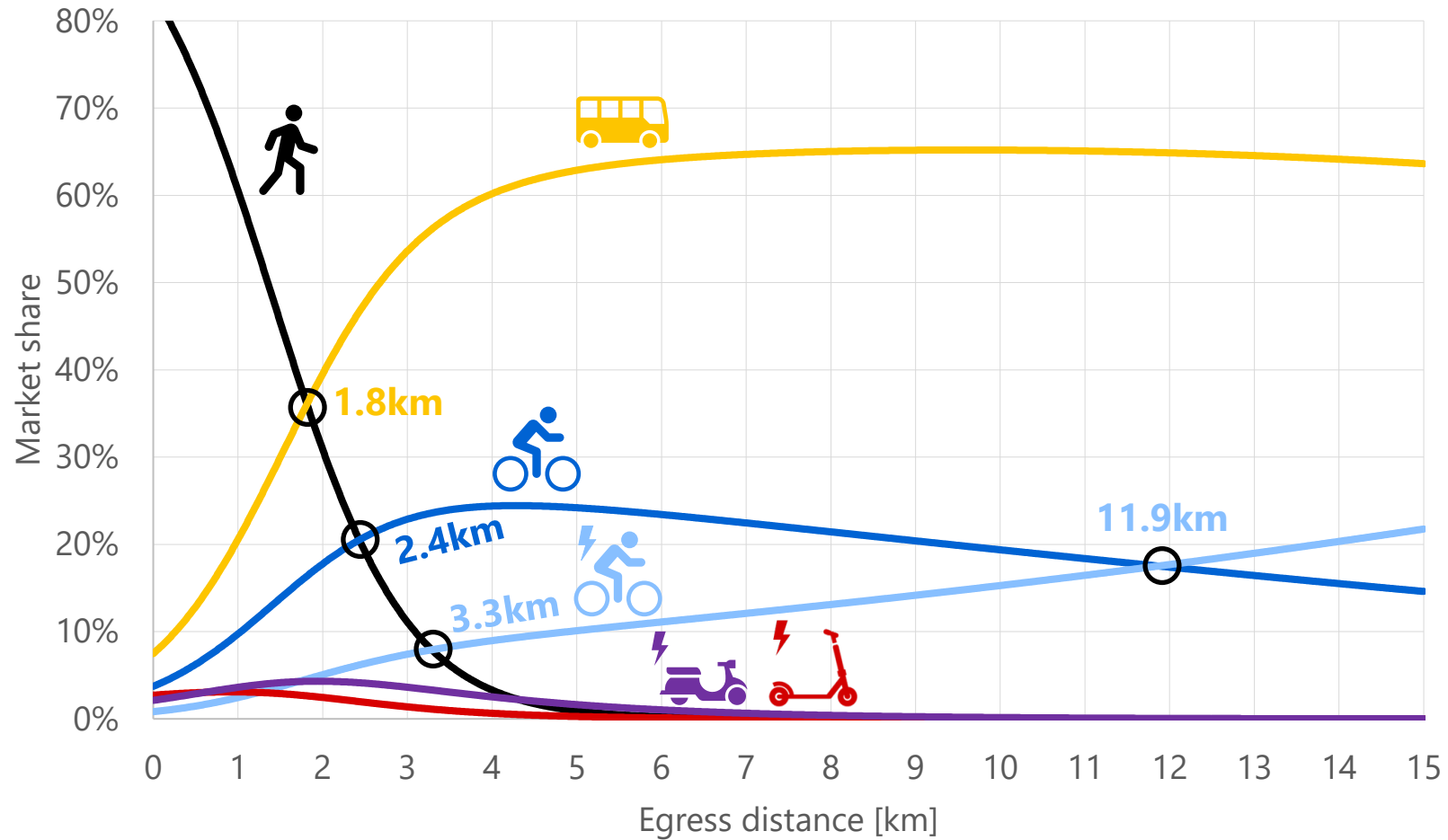
Overall modal preferences



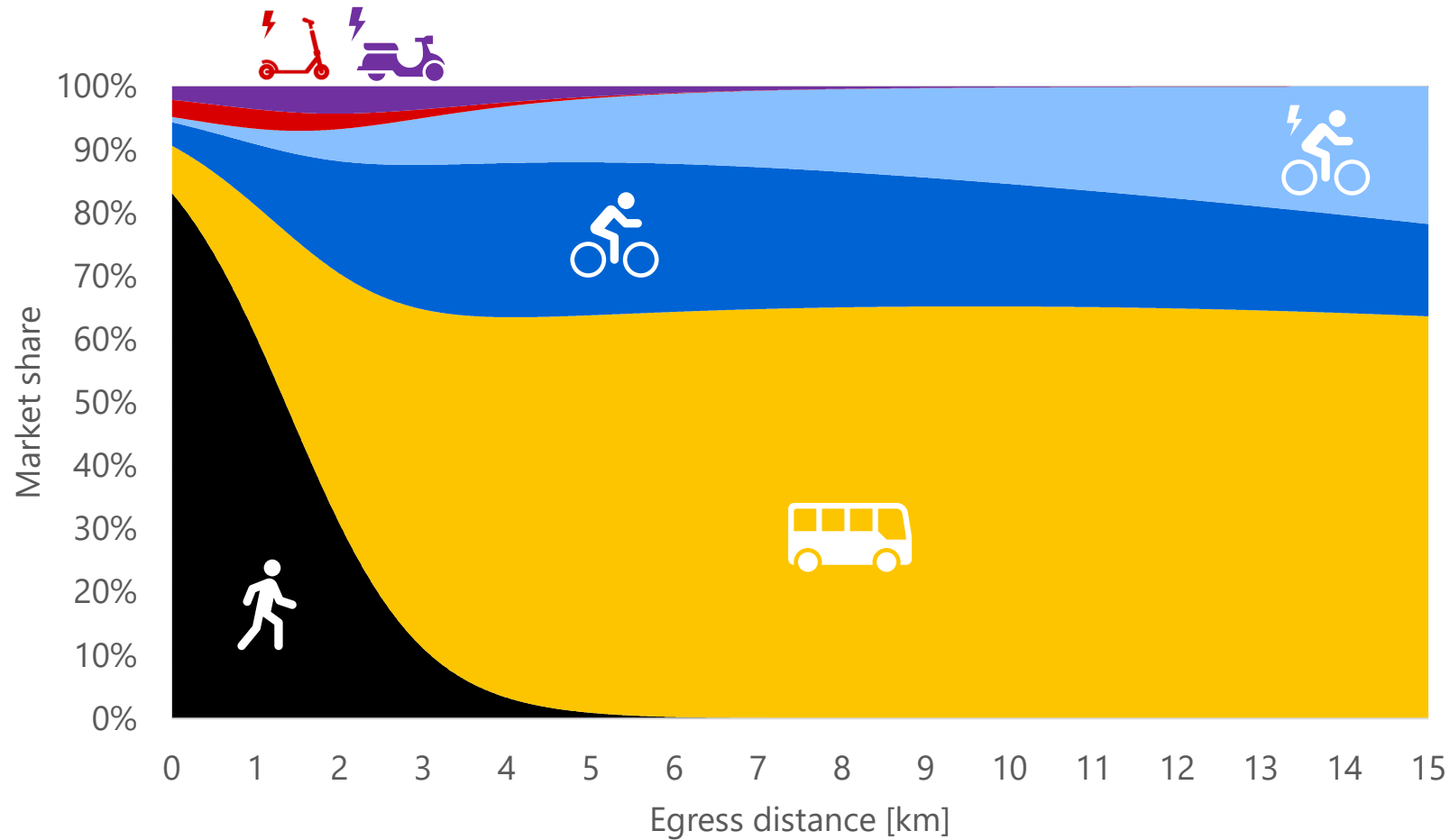
Parking and rental preferences



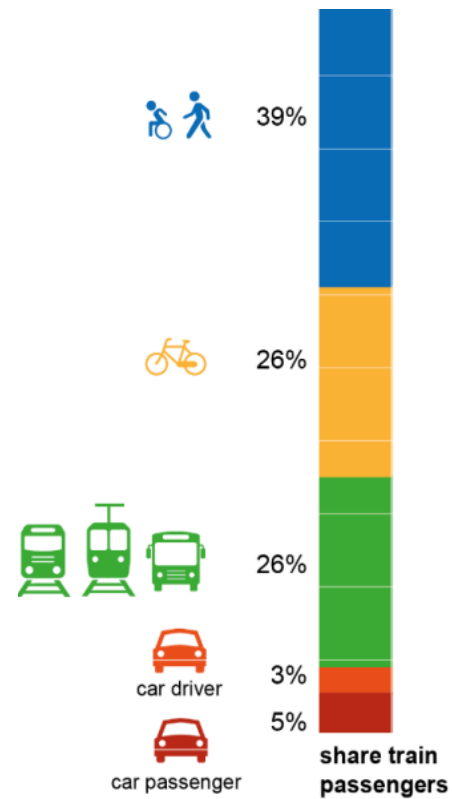
Egress mode preferences



Egress mode preferences

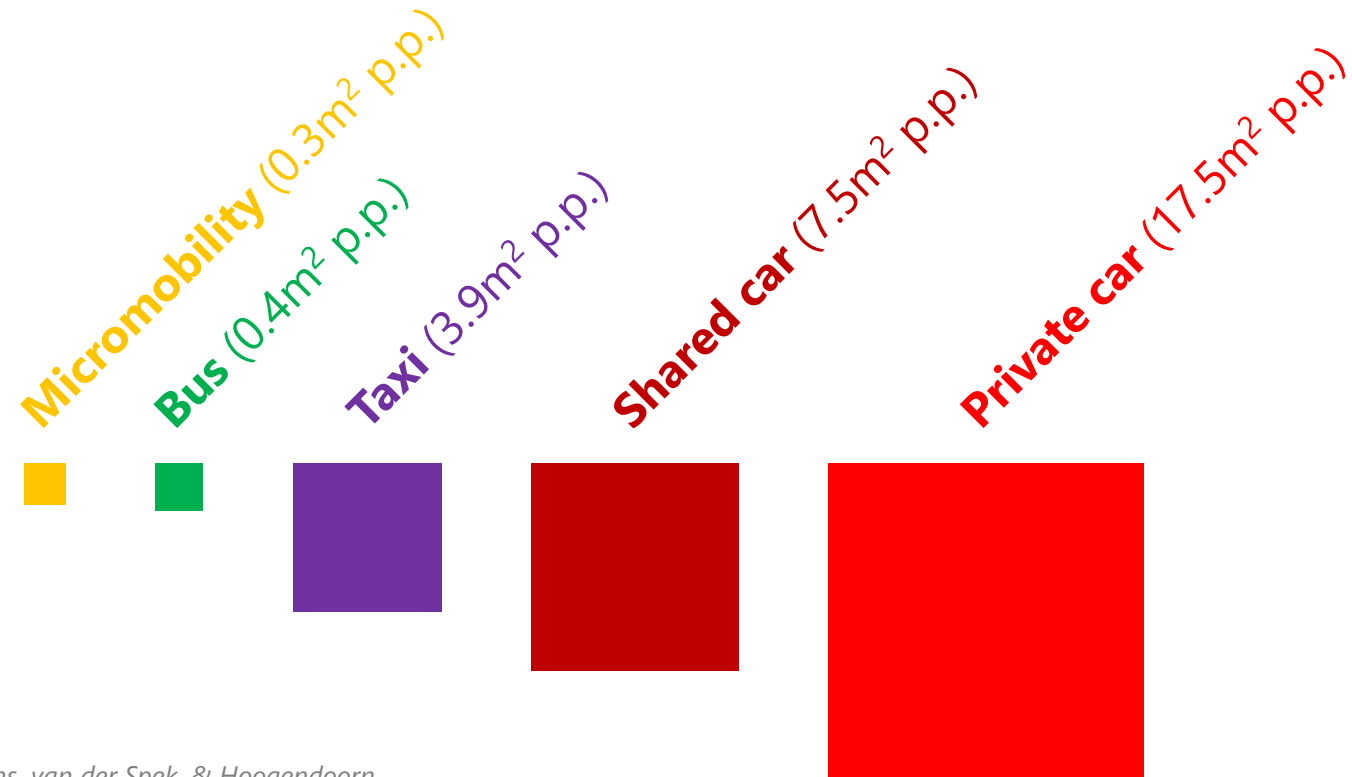


Space consumption



Schakenbos & Ton. 2023. Is de fiets-treincombinatie wel de passende oplossing voor de toekomst? CVS congres 2023

Space consumption

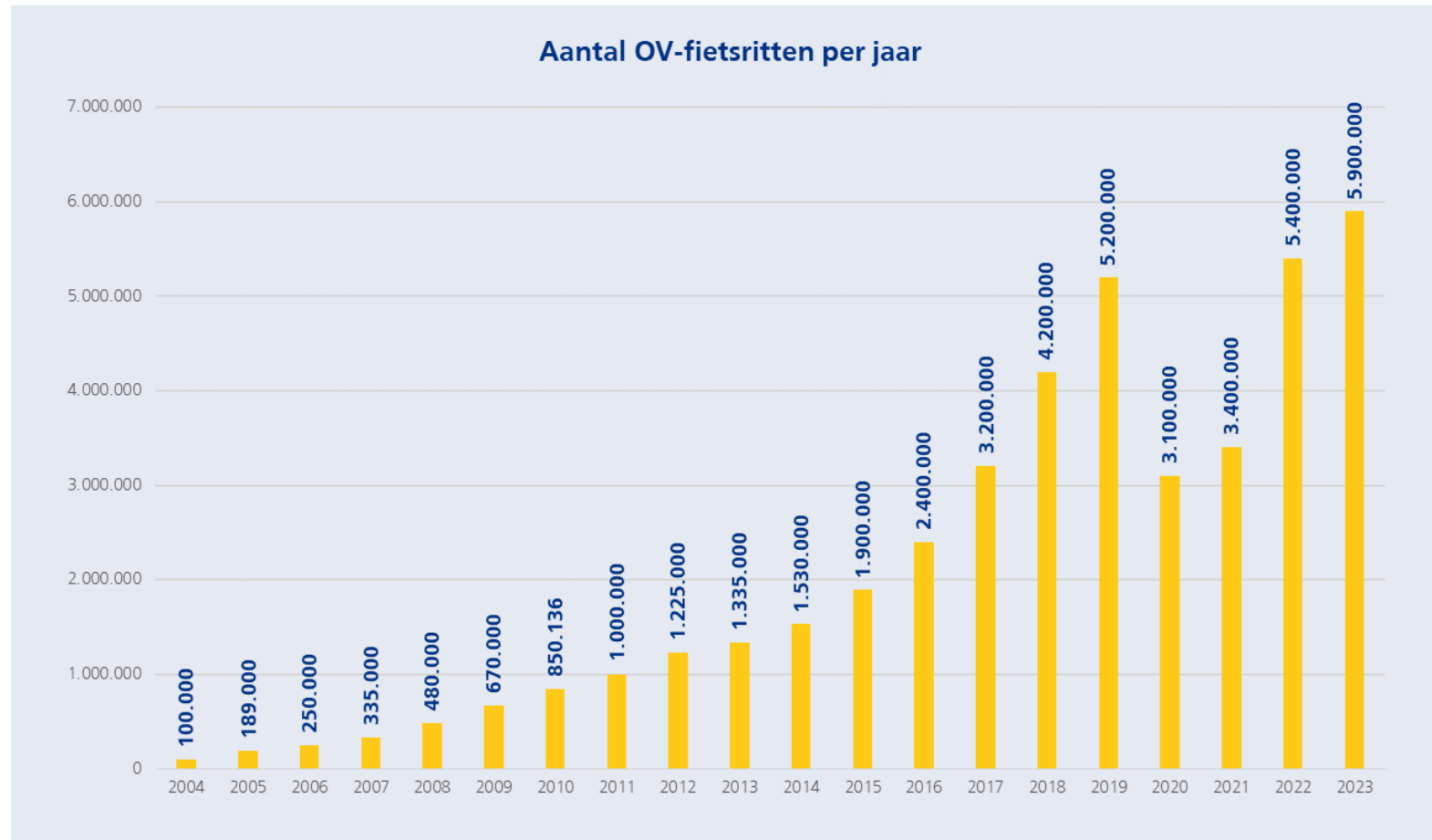


Stam, van Oort, van Strijp-Harms, van der Spek, & Hoogendoorn. 2021. Travellers' preferences towards existing and emerging means of first/last mile transport. European Transport Research Review, 13.

Added value



Border of success
Published on 21-06-2019 at 09:31



These days, experts
say public transport
is the blue-yellow
trend.



Societal Impact

OV-fiets case study

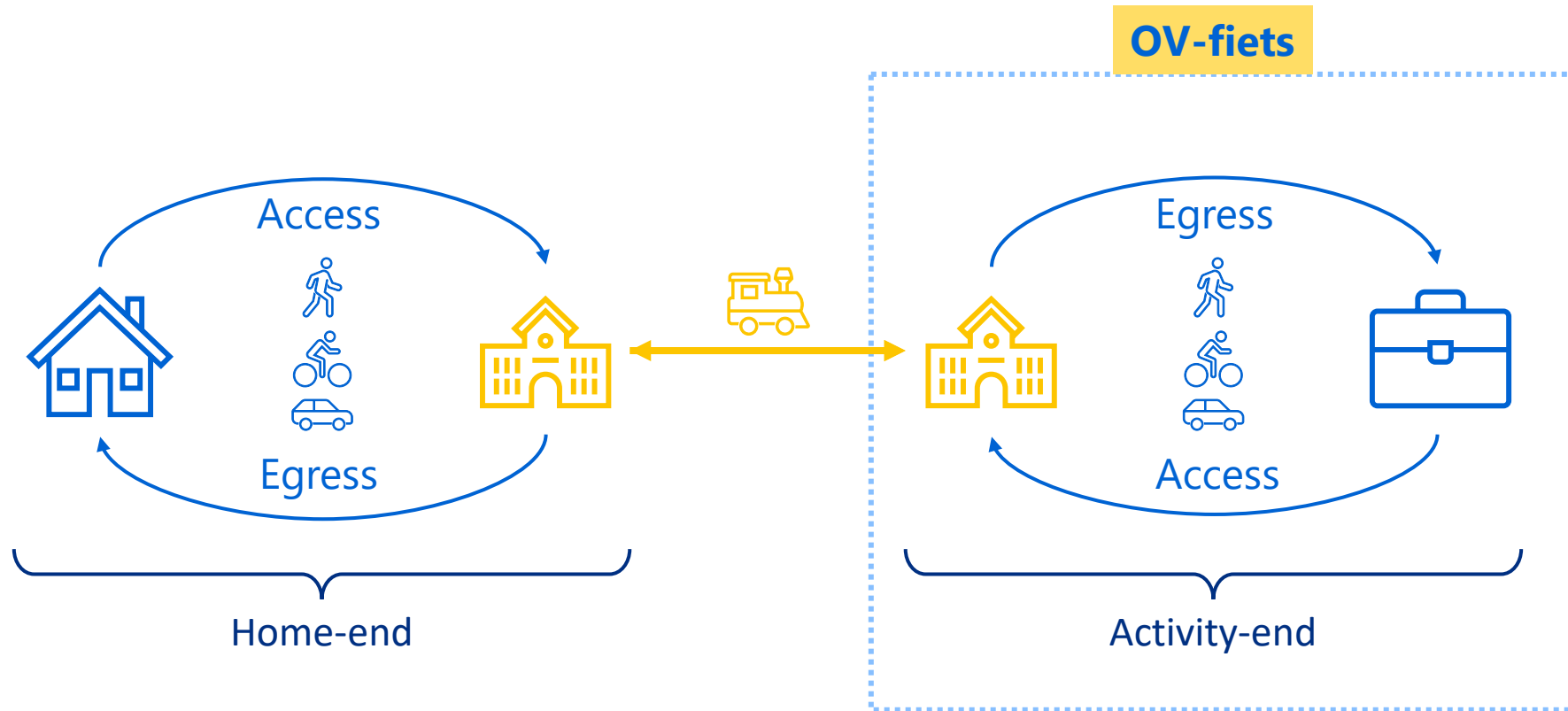
About OV-fiets



- ❖ Station-based shared cycling system
- ❖ Developed in the early 2000s: pilot program launched in 2003
- ❖ Located at train stations nationwide
- ❖ 22,500 bikes in about 300 locations (2023)
- ❖ Flat rate for a 24-hour period
 - ◇ 4.55 euros currently
- ❖ Designed primarily as a last-mile solution for train users

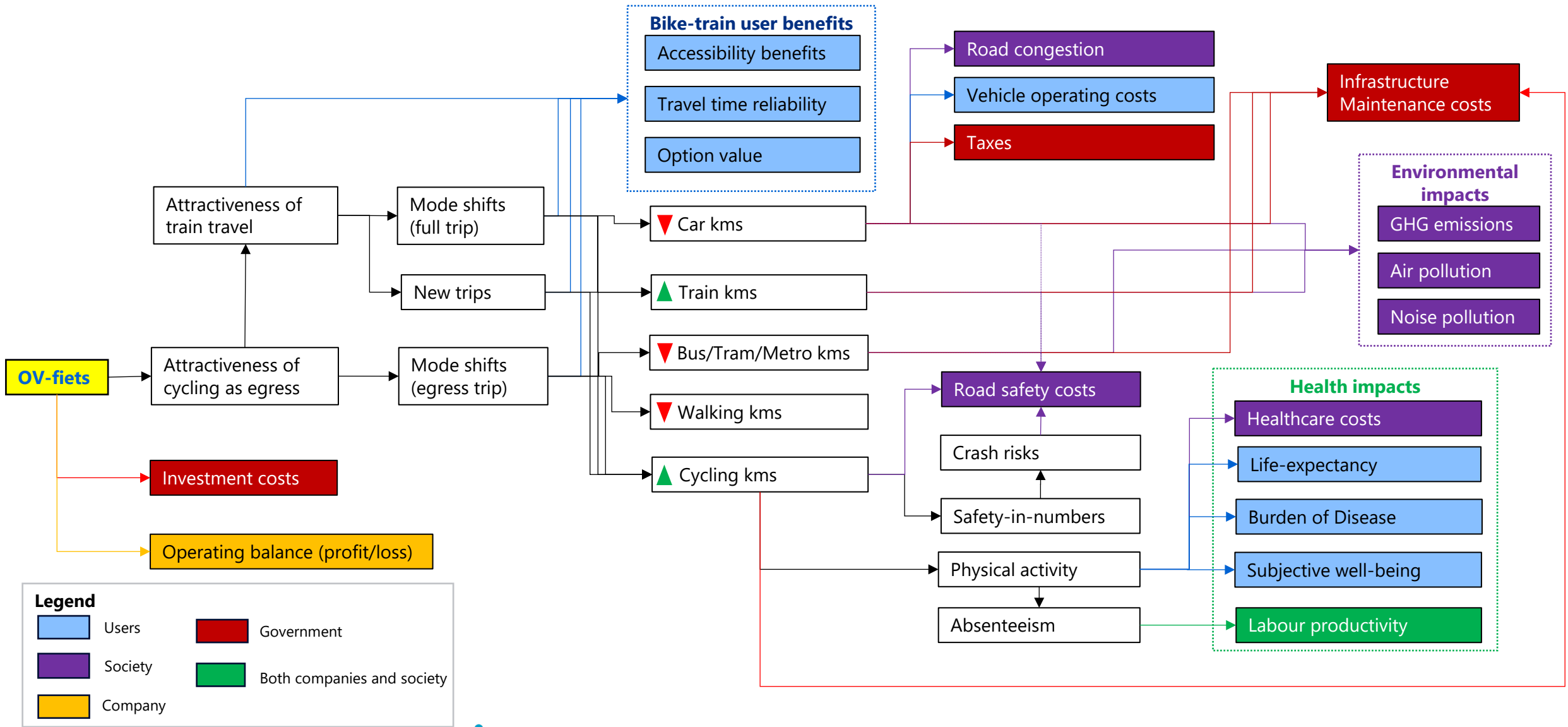


About OV-fiets

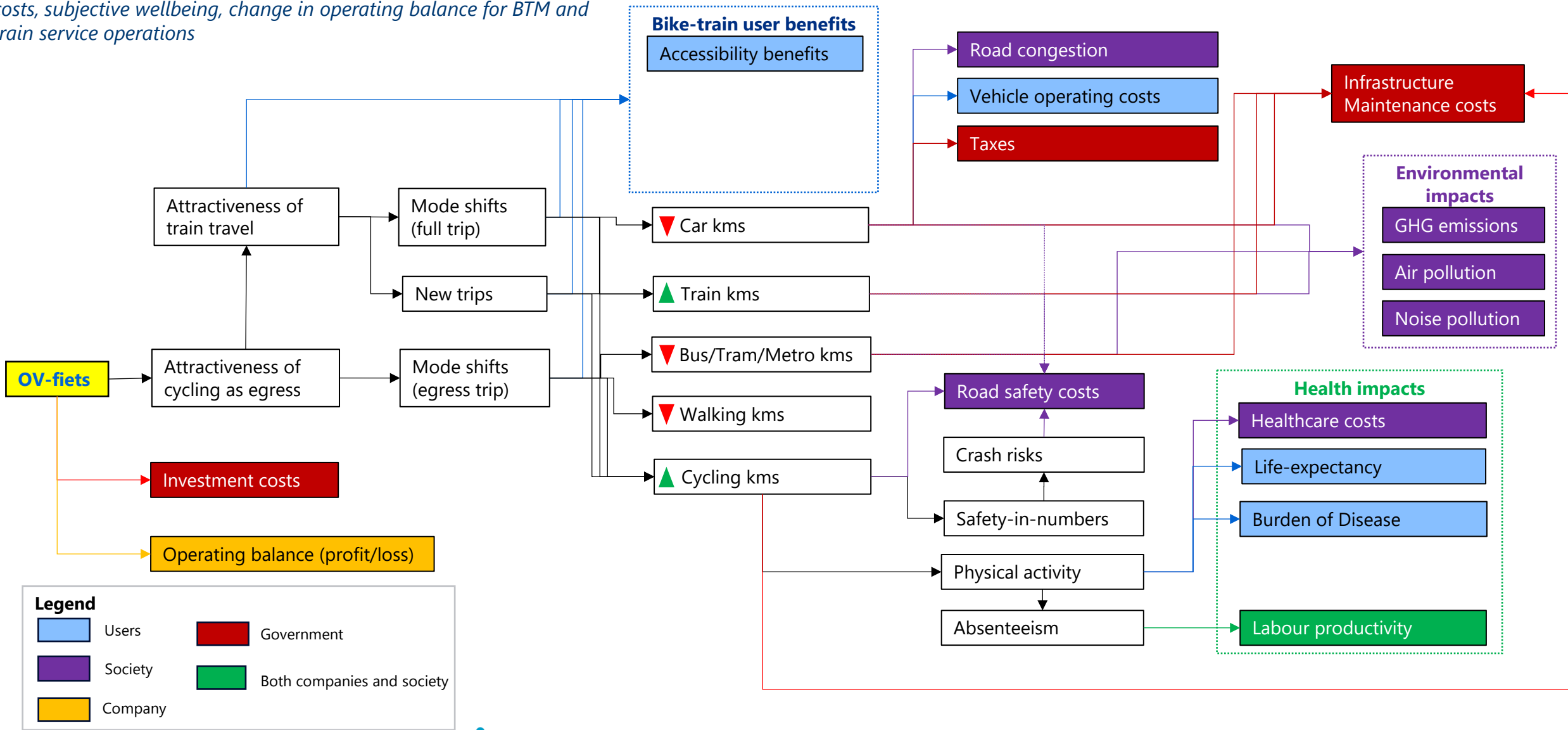


CONCEPTUAL MODEL





*Excluded effects: Travel time reliability, option value, vehicle-operating costs, subjective wellbeing, change in operating balance for BTM and train service operations

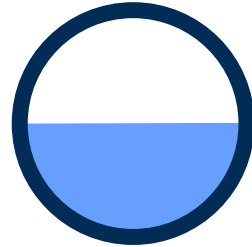


Legend

 Users	 Government
 Society	 Both companies and society
 Company	

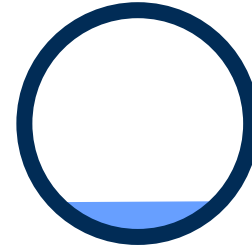


Results



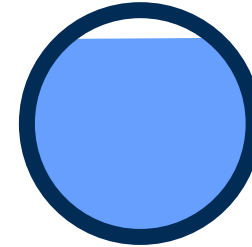
Balanced Scenario

*Median values
(for costs & benefits)*



Pessimistic Scenario

*Upper bound of costs
Lower bound of benefits*



Optimistic Scenario

*Lower bound of costs
Upper bound of benefits*

Benefit/Cost ratio

1.5

1.1

2.4

Total benefits (million €)

204

166

259

Total cost (million €)

-136

-157

-107

Net present value (million €)

68

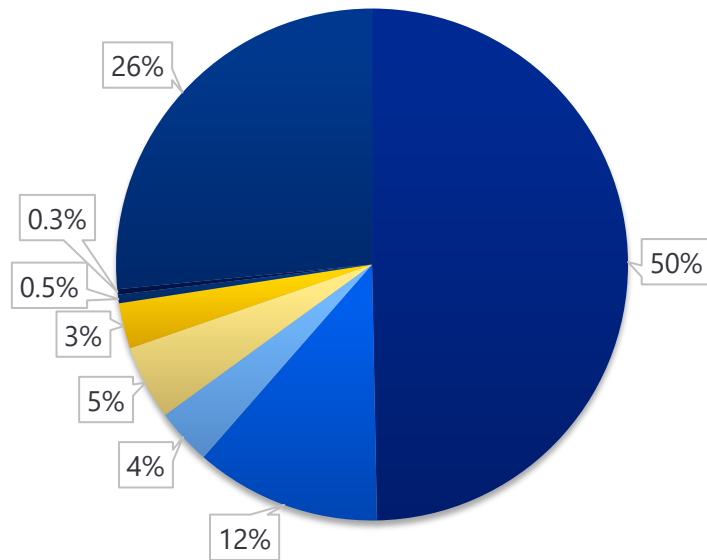
9

153

Results: Breakdown of costs and benefits

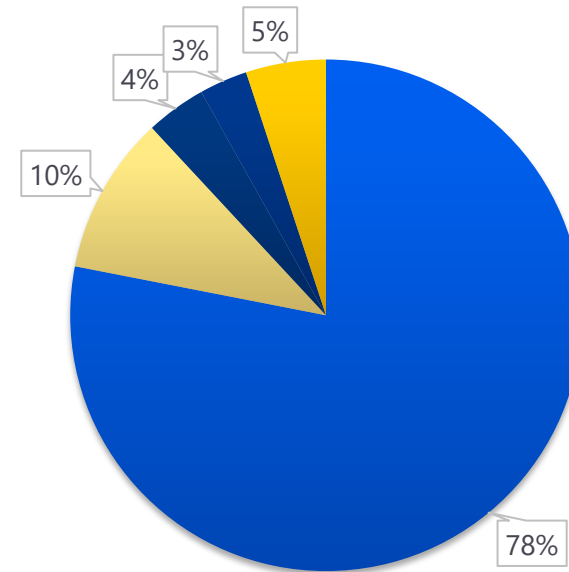


Societal Benefits of OV-fiets



- Accessibility benefits
- Labour productivity
- Healthcare costs
- Burden of disease
- Life expectancy
- GHG emissions
- Air pollution
- Road congestion

Societal Costs of OV-fiets

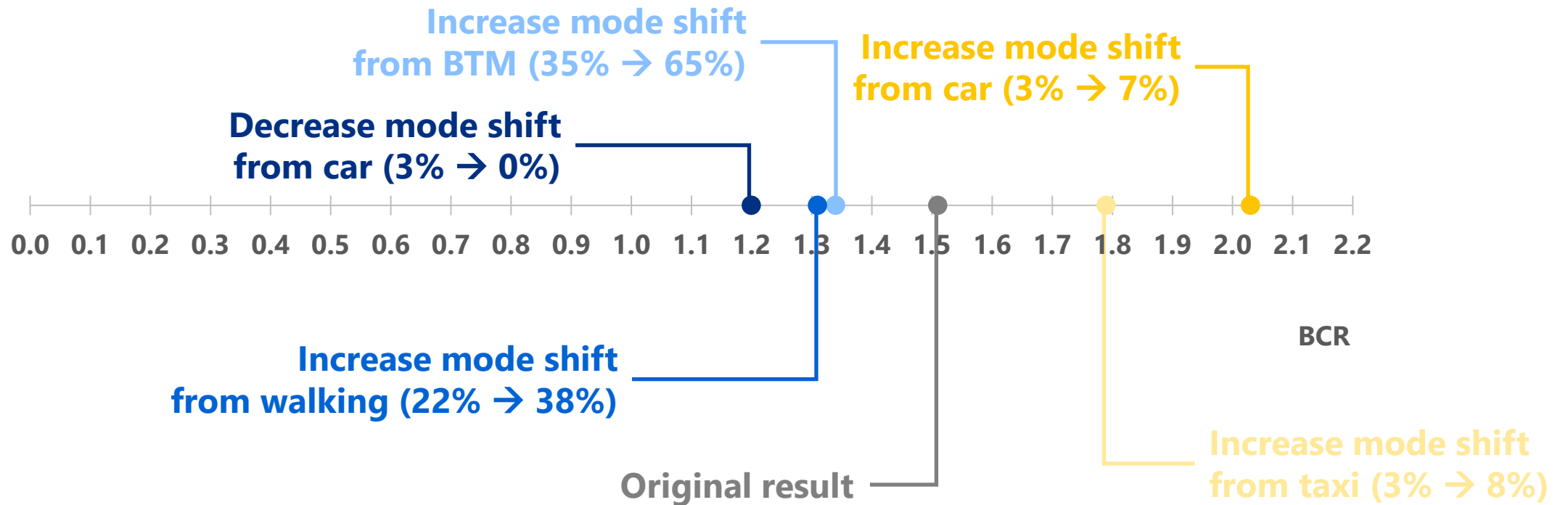


- Investment cost
- Road safety costs
- Reduced tax revenue
- Infrastructure maintenance
- Change in the operating balance

Results: Sensitivity Analysis



Impact of mode shift changes on the BCR in the balanced scenario



Conclusions



- ❖ Overall, OV-fiets has been a benefit to the Dutch society
- ❖ Main benefits: Accessibility, reduced road congestion and health impacts
- ❖ Main costs: investment and road safety costs
- ❖ Moderate loss for operators of OV-fiets
- ❖ Conservative underlying assumptions, robust findings

Reflections: Application to other contexts



- ❖ Local conditions influence travel behaviour and outcomes. Examples: road safety risks, existing level of physical activity
- ❖ Requires high investment and may incur operational losses especially in early years and during disruptions.
- ❖ Main drivers of accessibility benefits: Proximity to train stations, High technology – unlock the bike within seconds
- ❖ Improve train services in tandem to avoid station crowding and maintain high service quality
- ❖ Improve cyclist safety: separated pathways, traffic calming, better lighting and signage along cycling routes
- ❖ Effective over short distance segments -> Leverage other transit modes for longer last-mile connections (buses, trams, LRT, BRT)



With shared bikes, the path is clear,
Access grows as they draw near.
For short trips they bridge the gap,
A seamless journey on the map.

Yet on this path, there's much to bear,
As costs may lead to some despair.
Integration is the key, we see,
To unlock greater synergy.

Wrap-up



- ❖ What would be the impacts of **introducing e-bikes** into the public-transport bike fleet?
- ❖ What **other modes** should be included in the public transport micromobility offer?
- ❖ Do you expect many people would switch from the car to **train+micromobility** if more modes are included?



Thank you!

Questions?