

Experts' views on car sharing in future urban mobility

Results from a Delphi-study in four
European countries

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Research in motion

About the Delphi expert survey

- Purpose: To get experts' opinions on different development tracks likely to affect the level of diffusion of cs in the future mobility system.
- Will be used to develop scenarios on impact of cs (energy, emissions)
- Theoretical framework: the Multi-Level Perspective w/conceivable developments within the Landscape, Regime and Niche levels
- Invitations sent e-mail by project partners to a pool of experts and other resource persons in each country among
 - *Public civil servants, transport and urban planners*
 - *Local politicians*
 - *Transport operators*
 - *Car sharing operators*
 - *Research and academia*
 - *NGOs*
 - *Finance and insurance*
 - *Other experts*
- Experts were asked to consider urban mobility-related developments towards 2030 in London, Malmö-region, Oslo or Rotterdam, respectively



Delphi expert survey



- Online self-admin. questionnaire in 2 rounds according to the Delphi-method
- Respondents from the 1st round were invited to modify or keep their response in round 2 based on the average responses of others from round 1
 - *110 responses in 1st round (about 40 for Oslo, and 20 for each of the other cities)*
 - *62 responses in 2nd round*
- Response rate in Norway was about 43% (Round 1), e.g. 44 of 102
- Since there were few significant differences between round 1 and round 2 responses, we chose to use data from the largest sample from the 1st round (N=110)

Landscape



Regime



Big car comp. & distributors

Road construction & car tech/comfort

Parking policies

Urban planning

Toll roads, car free zones

Environmental concern

Massive development of PT & NMT

MaaS development

Niches

Driverless vehicles



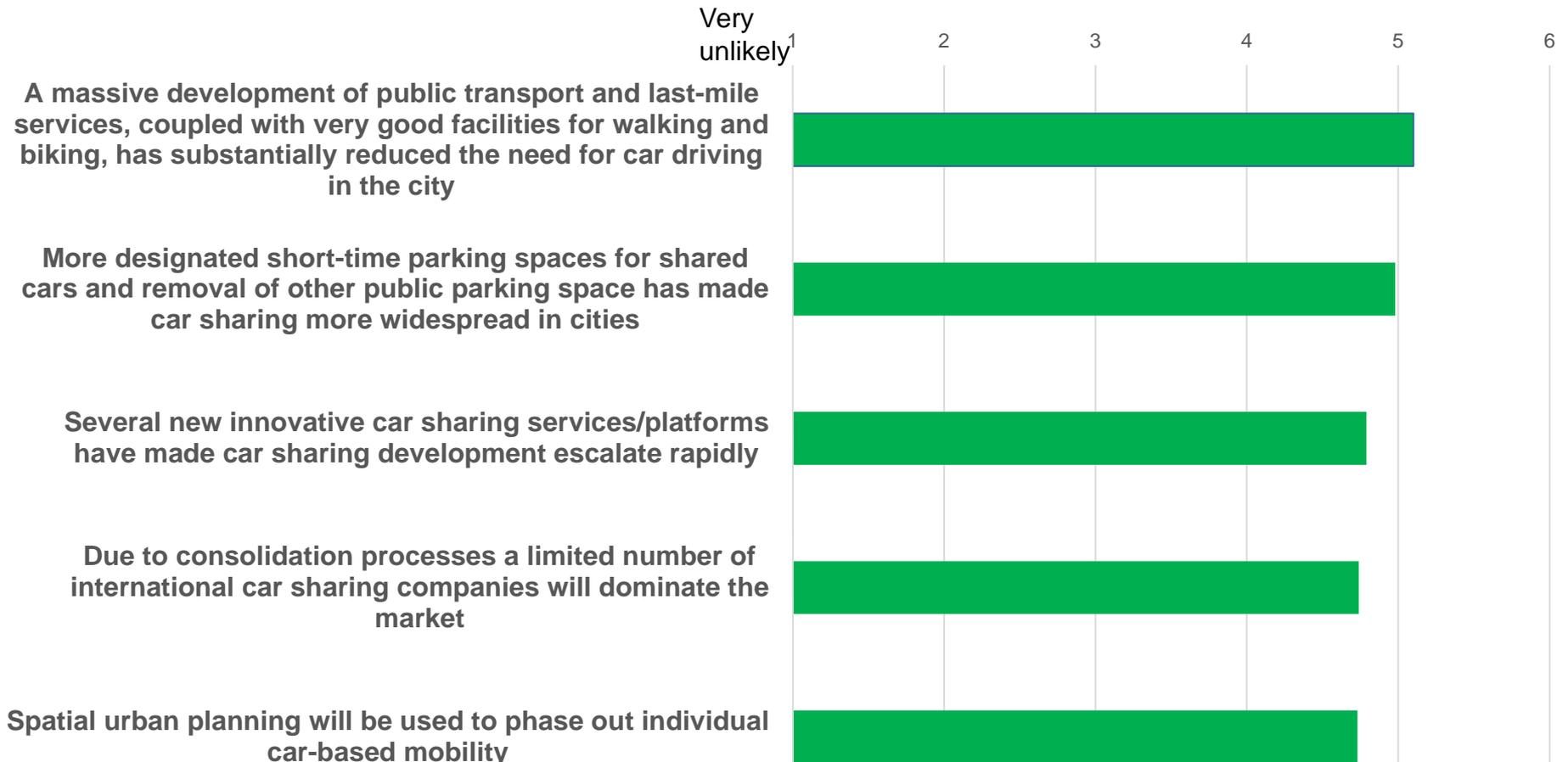
Battery electric vehicles

Future car sharing



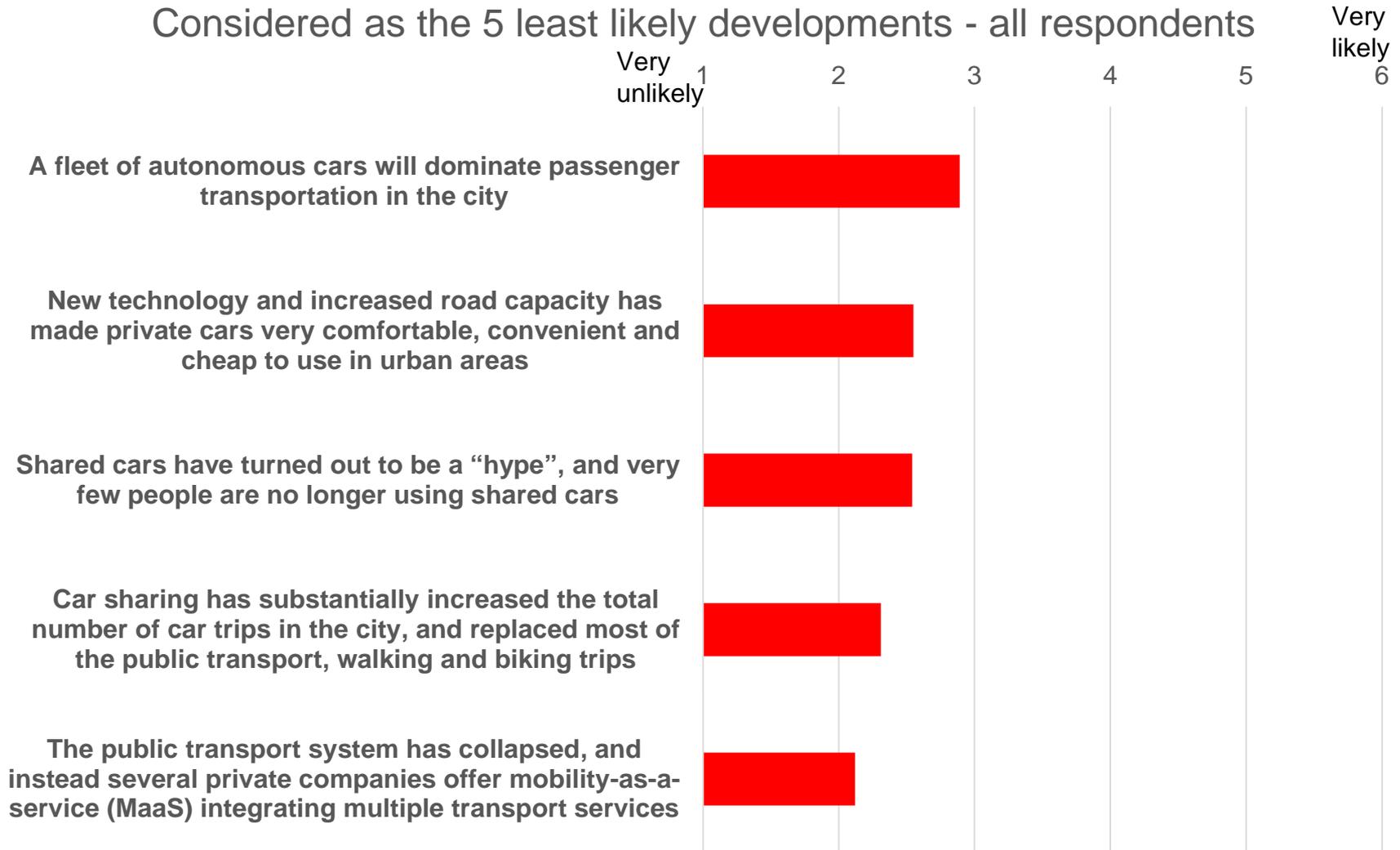
Top 5 likely future developments

Considered as the 5 most likely developments - all respondents



Least likely developments

Considered as the 5 least likely developments - all respondents



Delphi Study results by case city - 5 considered most likely developments

— London, UK

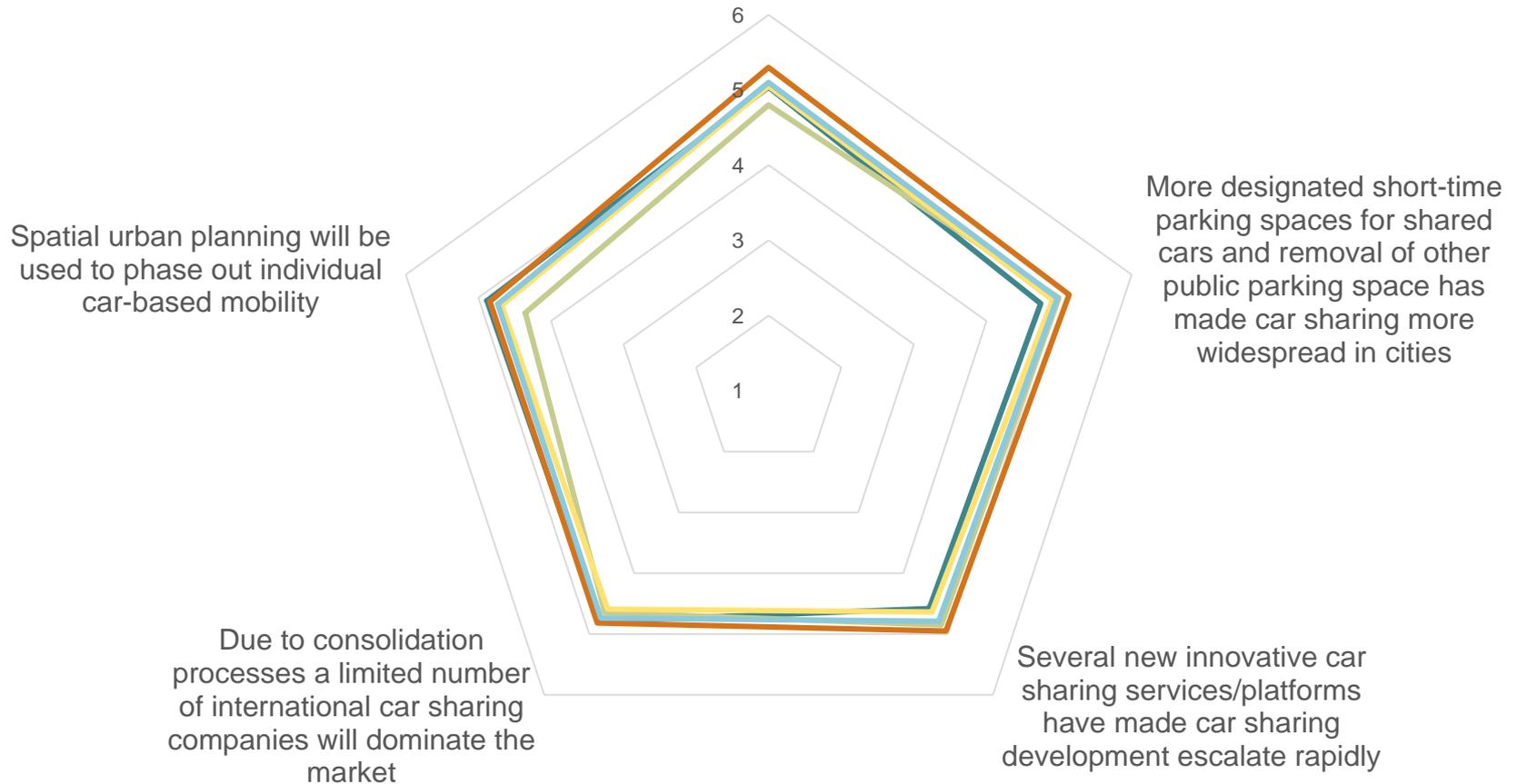
— Rotterdam, the Netherlands

— Malmö-region, Sweden

— Average for all respondents

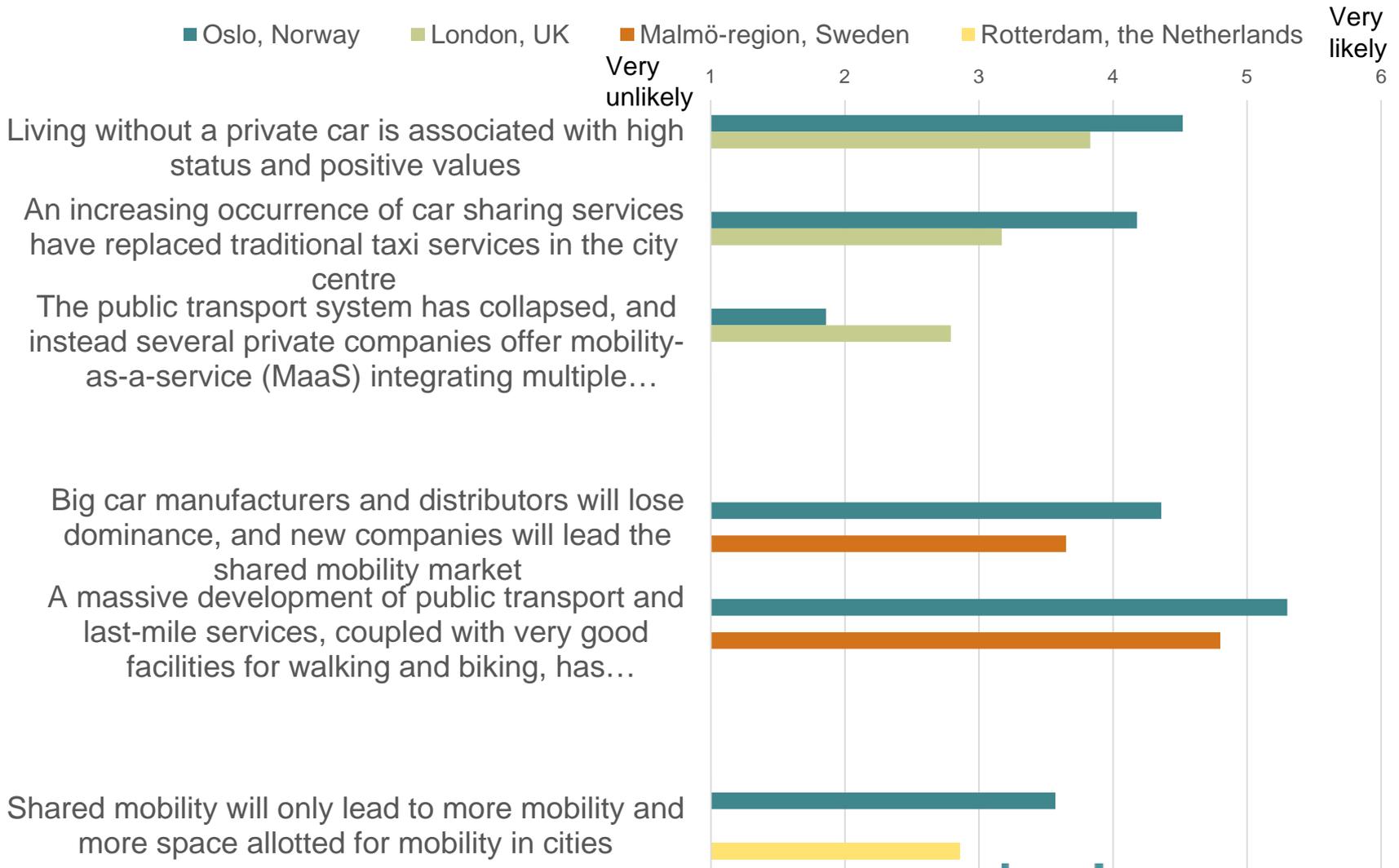
— Oslo, Norway

A massive development of public transport and last-mile services, coupled with very good facilities for walking and biking, has substantially reduced the need for car driving in the city



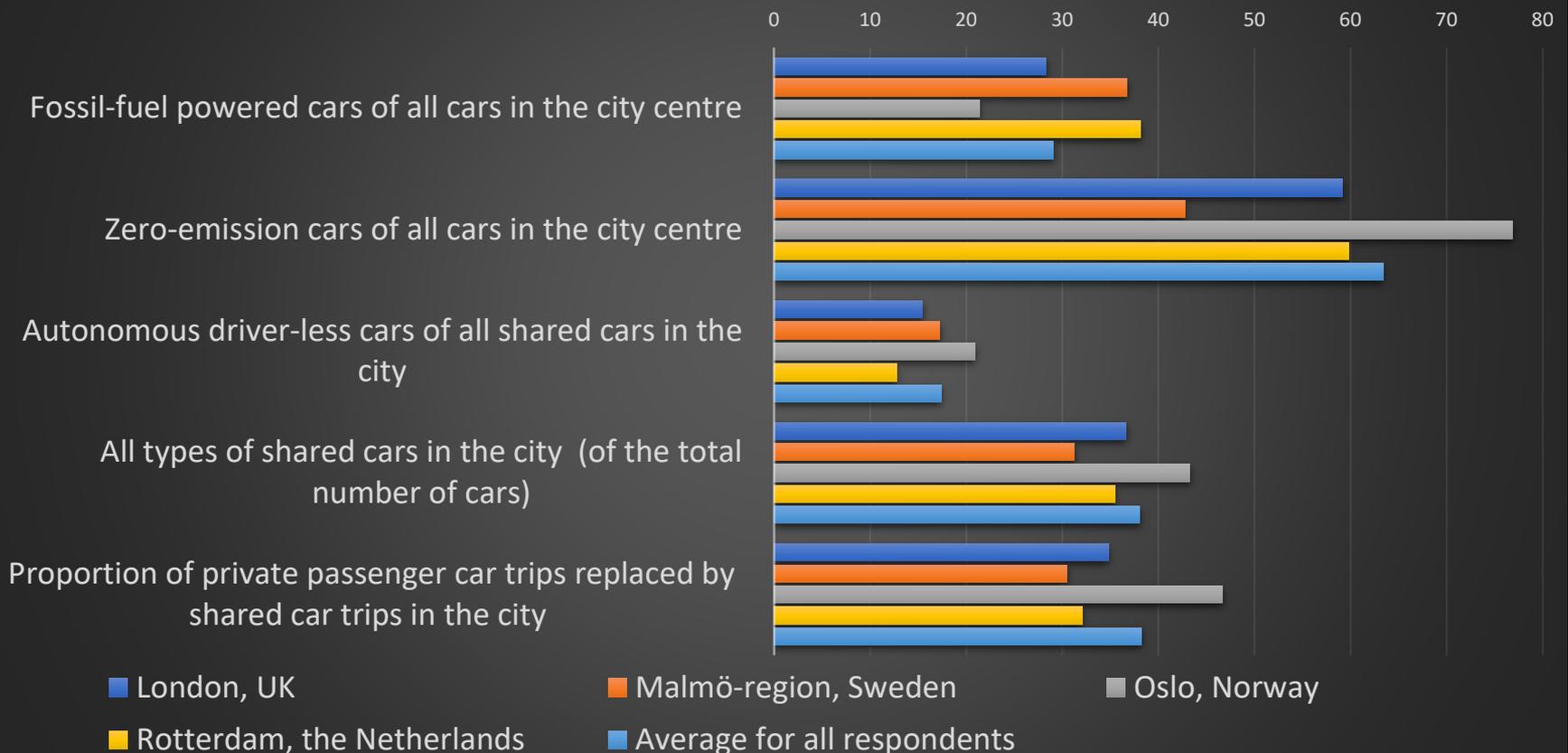
Only a few sign. differences btw. cities

Significant differences between case city repondents - Reference city: Oslo



Estimates of technological & cs future development – also much agreement across cities

Technological and car sharing diffusion estimates (percent) by 2030
- by case city



Some conclusions so far...

- Not much modification of answers from Round #1 to #2
 - *Indicates that experts are quite certain of their initial judgement*
- Experts generally believe car sharing will increase in magnitude and importance towards 2030
- Developments that are «cs favorable» are judged likely to occur
- Developments working against cs growth are judged less likely to take place



Some conclusions so far...

- Experts think fossil-fueled cars will be partly phased out and zero-emission cars take over by 2030,
 - *and only a low proportion of autonomous cars in city centers*
- The majority (45%) of cs cars within B2B business models
- Cs diffusion believed to become 40% of all cars in cities
- Cs trips can replace 40% of private car trips in case cities, on average
- With this level of prevalence of cs cars in 2030, that will make a substantial impact on energy use and emissions.



and finally - some more...



- Very few significant differences in judgments across respondents from:
 - *The four case cities*
 - *Workplace sector*
 - *Or cs involvement or not (working for org./co. involved with cs.)*
- There are differences, but only on a few of the 27 development aspects and 8 tech and cs diffusion dimensions – no systematic differences across categories
- Overall agreement across experts' judgements can indicate that experts are fairly certain wrt. the expected development – e.g. what will - and will not - happen towards 2030
- 2-3 scenarios will be developed based on the findings
- **We think the Delphi-results are important as input for policy makers when setting premises and designing the future mobility system**

Thank you for your attention!

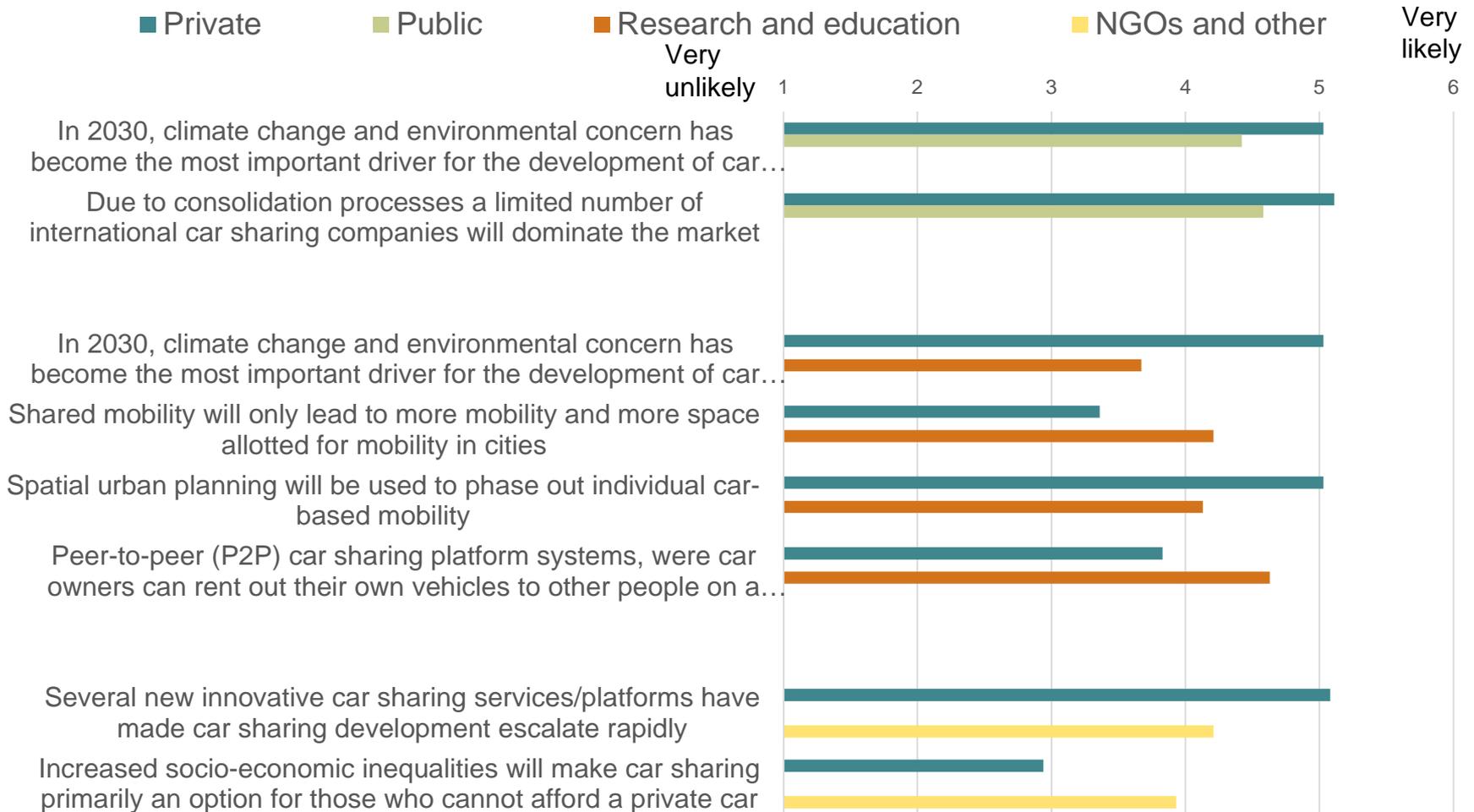
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Few sign. differences based on workplace sector

Significant differences between respondents by work sector -
Reference sector: Private sector



Delphi Survey statistics

Descriptive Statistics (conceivable developments) N=110	(Very unlikely=1, Very Likely=6)	Mean
A massive development of public transport and last-mile services, coupled with very good facilities for walking and biking, has substantially reduced the need for car driving in city		5.10
More designated short-time parking spaces for shared cars and removal of other public parking space has made car sharing more widespread in cities		4.98
Several new innovative car sharing services/platforms have made car sharing development escalate rapidly		4.79
Due to consolidation processes a limited number of international car sharing companies will dominate the market		4.74
Spatial urban planning will be used to phase out individual car-based mobility		4.73
Most apartment buildings in the urban centre can only offer parking for shared cars, or offer car sharing for residents paid as part of the rent		4.51
Car sharing has become tightly integrated with public transport services were transport is paid for based on actual consumption (in km. travelled, per minute etc.)		4.46
Privately owned passenger cars used for individual mobility have been banned in the city centre		4.46
In 2030, climate change and environmental concern has become the most important driver for the development of car sharing		4.45
Sharing of various goods and assets has become commonplace in many different areas of everyday life/sectors of the economy (e.g., sharing food, houses, tools, equipment etc.)		4.35
Deployment of autonomous vehicles in cities has halted due to regulatory and safety issues		4.34
Only autonomous zero-emission vehicles (i.e. tailpipe emissions, vehicles that emits no exhaust gas from the onboard source of power) are allowed to drive in the city centre		4.27
Living without a private car is associated with high status and positive values		4.25
Peer-to-peer (P2P) car sharing platform systems, were car owners can rent out their own vehicles to other people on a short-term basis, is used mainly as supplement to private or rented cars,taxis		4.14
Urban governance will leave the mobility transition towards shared mobility to be dealt with through the market		4.08
Big car manufacturers and distributors will lose dominance, and new companies will lead the shared mobility market		4.04
Shared cars have also become commonplace outside of cities, in suburbs and rural areas		3.99
Open-ended car sharing, where users can pick up and deliver vehicles at various predefined parking spots within the city centre, will dominate car sharing activities		3.91
An increasing occurrence of car sharing services have replaced traditional taxi services in the city centre		3.75
New micro-mobility entrants with footloose electric or similar vehicles have flooded cities, and replaced most car driving in the city centre		3.73
Shared mobility will only lead to more mobility and more space allotted for mobility in cities		3.50
Increased socio-economic inequalities will make car sharing primarily an option for those who cannot afford a private car		3.16
A fleet of autonomous cars will dominate passenger transportation in the city		2.89
New technology and increased road capacity has made private cars very comfortable, convenient and cheap to use in urban areas		2.55
Shared cars have turned out to be a “hype”, and very few people are no longer using shared cars		2.54
Car sharing has substantially increased the total number of car trips in the city, and replaced most of the public transport, walking and biking trips		2.31
The public transport system has collapsed, and instead several private companies offer mobility-as-a-service (MaaS) integrating multiple transport services		2.12
Tech. & car sharing diffusion		(%)
What is the share of zero-emission cars of all cars in the city centre by 2030?		63.36
What is the share of commercial business-to-consumer (B2C) shared cars of all shared cars by 2030 ?		44.55
What is the proportion of private passenger car trips replaced by shared car trips in the city by 2030?		38.23
What is the proportion of all types of shared cars in the city (of the total number of cars) by 2030?		38.09
What is the share of open-ended or free-floating (non-station based) shared cars of all shared cars by 2030?		36.32
What is the share of fossil-fuel powered cars of all cars in the city centre by 2030?		29.05
What is the share of peer-to peer (P2P) car sharing of all shared cars by 2030?		24.32
What is the proportion of autonomous cars with full-time driverless operations (level 4 and 5) of all shared cars in the city by 2030?		17.41