

# The opportunity

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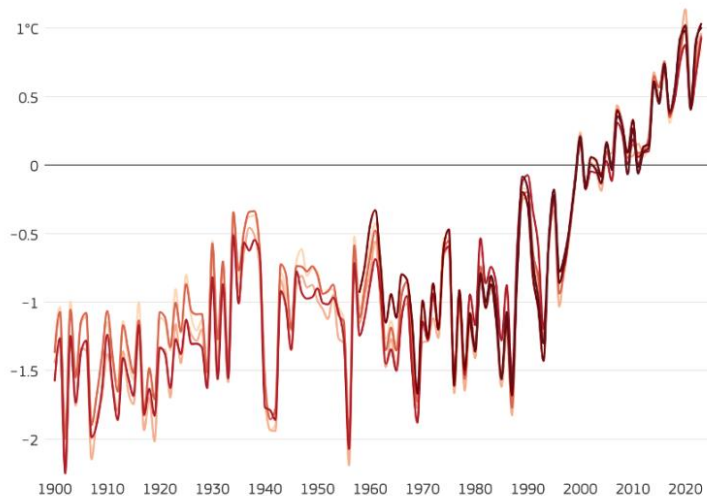
**Ruter#**

# Europe the fastest warming continent in 2023

## Anomalies in annual surface air temperature for European land (WMO RA VI Europe domain)

Compared to 1991–2020 average, various data sources

Berkeley Earth (1900–2023) GISTEMP (1900–2023) HadCRUT5 (1900–2023)  
NOAAGlobalTemp (1900–2023) JRA-55 (1958–2023) ERA5 (1979–2023)

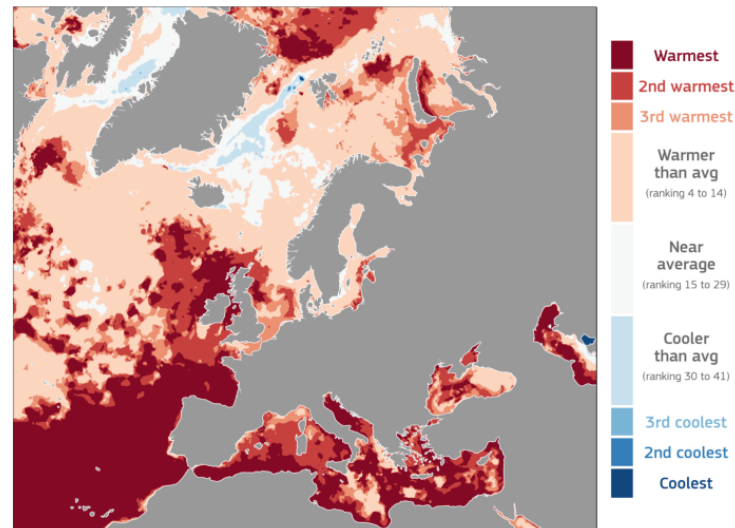


Data: HadCRUT5, NOAAGlobalTemp, GISTEMP, Berkeley Earth, JRA-55, ERA5 • Credit: WMO

## Ranking of sea surface temperatures in 2023

Data: ESA SST CCI Analysis v3.0 • Data period: 1980–2023 (44 years)

Credit: ESACCI/EOCIS/UKMCAS/C3S/ECMWF



Copernicus Climate Change Service  
European State of the Climate | 2023

PROGRAMME OF  
THE EUROPEAN UNION

Copernicus  
European space on Earth

IMPLEMENTED BY  
ECMWF





# Transport is the biggest source of CO2 emissions in Norway

- 61 % of Norway's CO2 emissions stem from transport
- 4 % comes from public transport
- Zero-growth policy for road traffic in major urban areas in Norway
- By 2030, The City of Oslo plans to cut emissions by 95 % and become the first zero-emission city
- Making public transport zero-emission is a major step towards the political goal of the City of Oslo





## Ruter's vision

- ✓ Every person in the Oslo region should experience the **freedom to move** around as they please.
- ✓ The transport system that provides people with this freedom has to be **sustainable**.

→ **Sustainable freedom of movement**





## Transport must be expanded with more «car-like» travel options.

Developing new on-demand services with smaller vehicles can enable more people to live without their own car.



## The Oslo study

How autonomous cars may  
change transport in cities



## The opportunity – less kilometers driven



BEST CASE:

Traffic reduction of **14 %** to **31 %**

WORST CASE:

Traffic volumes doubles, resulting in a complete traffic breakdown

## The opportunity – fewer vehicles needed

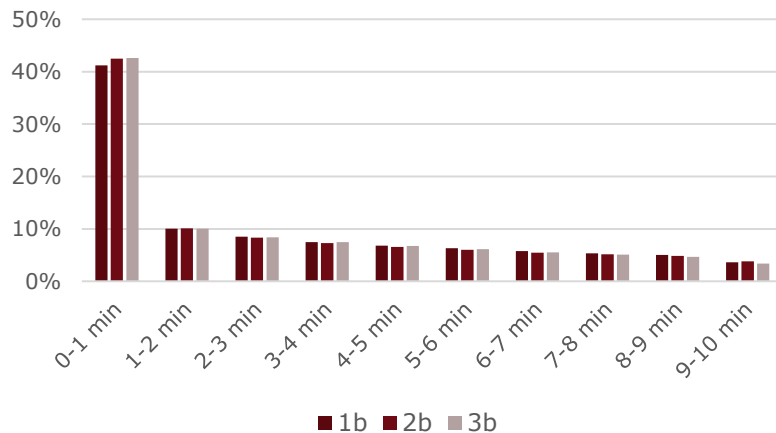


Number of cars can be reduced  
by **84 %** to **93 %** in all scenarios

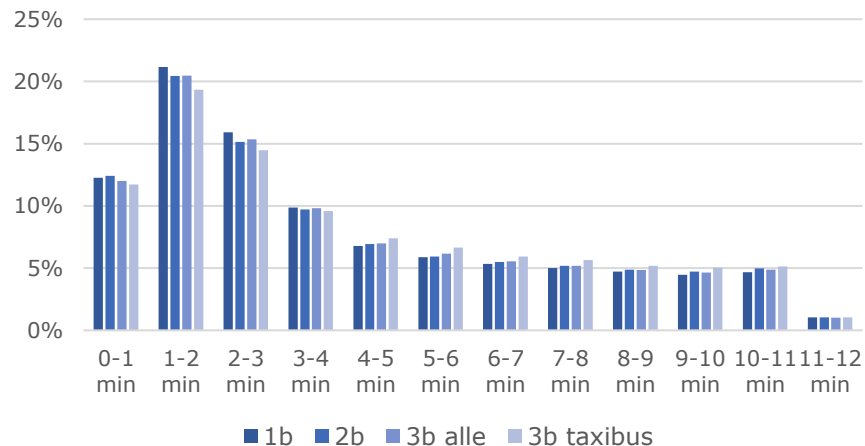


# The opportunity – better for the customers

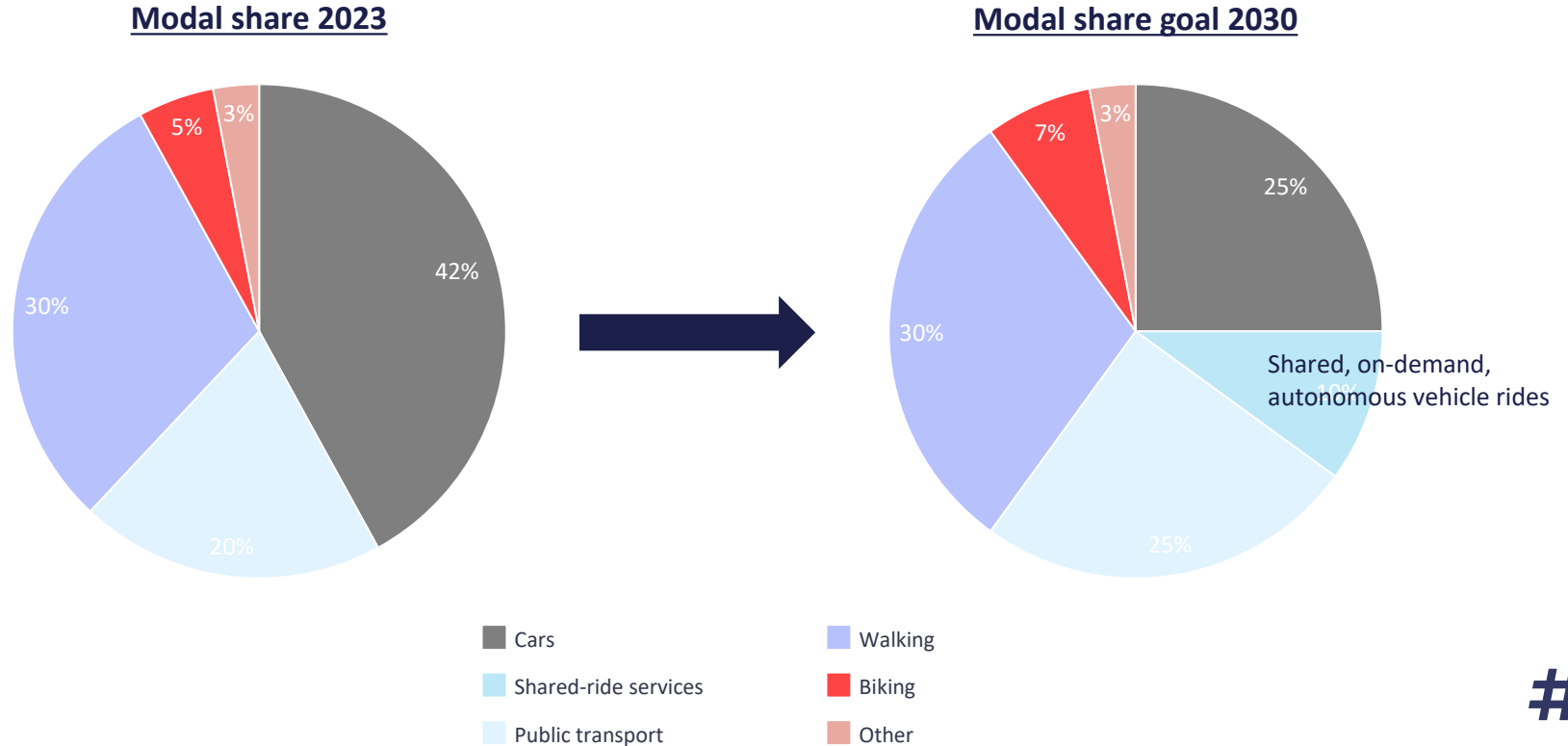
Waiting time in b-scenarios



Detour time (ride) in b-scenarios



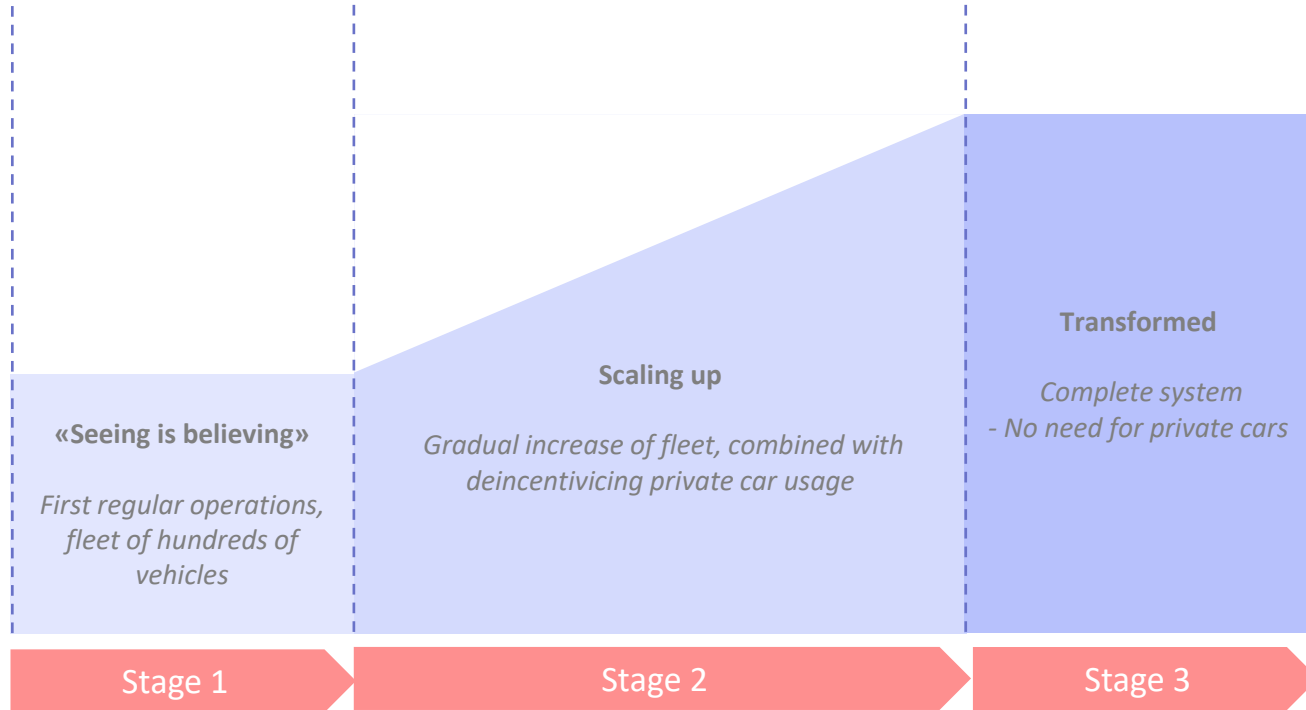
# Shared, on-demand services can replace car journeys



# Key design criteria for SAV system

- **Ridesharing**
  - fundamental to get reduction in kilometers driven, which drives benefits as well as business case
- Operate as **one integrated fleet**
  - competing fleets will not reduce kilometers driven, hence not generate benefits
- **Integrated with public transit**
  - key to complement to maintain reduction in kilometers driven
- **Replacement** of private car journeys
  - if this is just an added service, it will not provide key sustainability benefits
- **Large scale** needed
  - both to provide reliable private car replacement service and to be attractive investment case

# A three stage approach to system transformation



# Worked with autonomous vehicles since 2018

## Akershusstranda



**22 000 +**  
Passengers in  
5 months

**9 000**  
Km driven



## Ormøya & Malmøya



**6 717**  
Passengers in  
10 months

**23 000**  
Km driven



## Kongens gate



**1 560**  
Passengers in  
4 months

**2 600**  
Km driven

**3X**  
Traffic light  
crossings

**V2X**  
Communication



## Ski



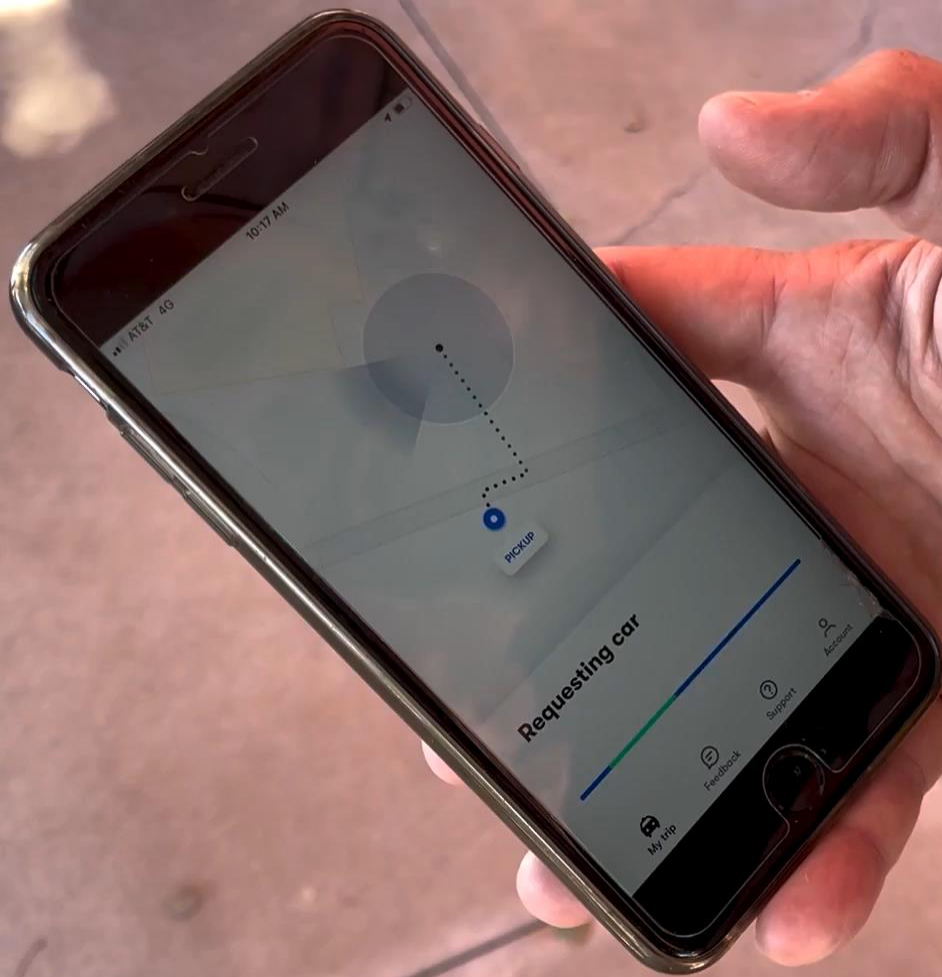
- **Increased speed** **9 000 +**  
Km driven
- **Winter conditions**
- *On-demand functionality*
- *Unmanned operations*











The future is still in the making ...



***... and we need to make it shared!***



