




Ruter AV program

June 2022 – Endre Angelvik, Executive Vice President Radical Innovations



**By 2030 privately owned AV's
will be banned in city centers
around the world**



30.000

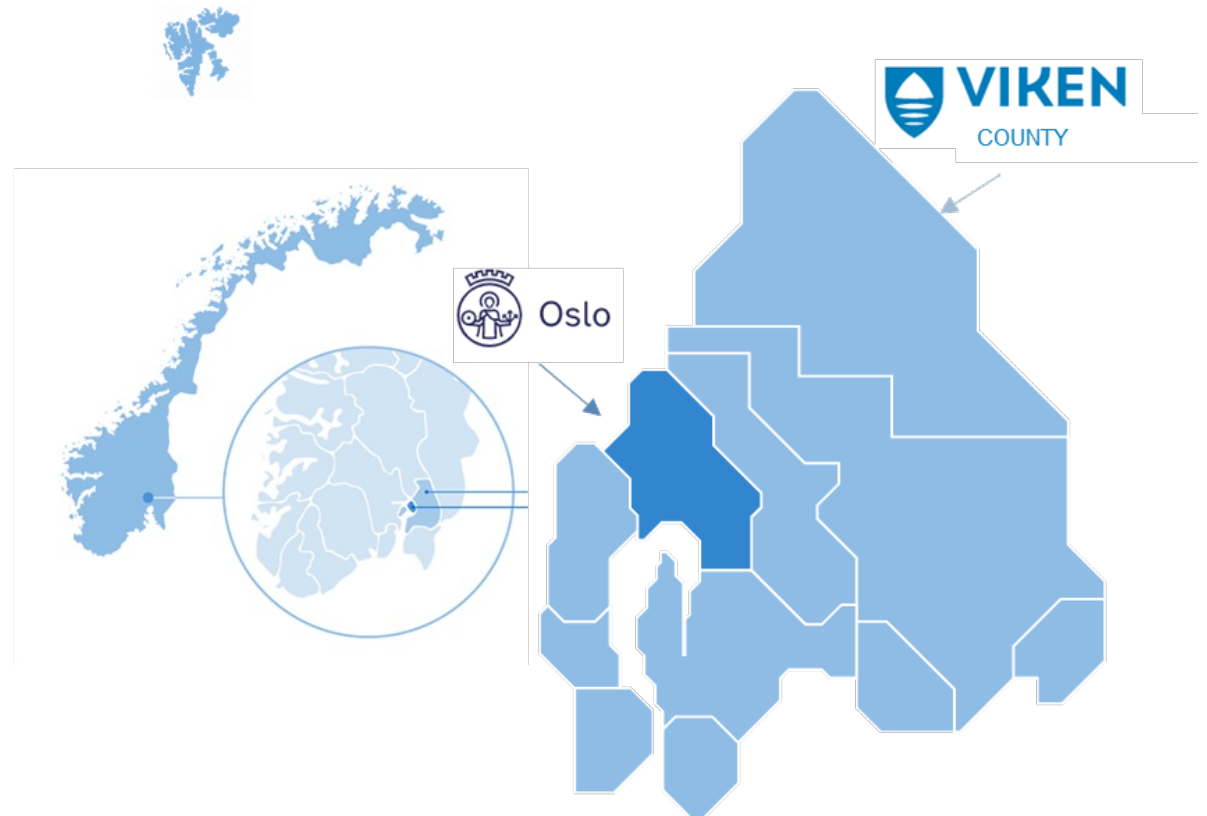
shared autonomous vehicles

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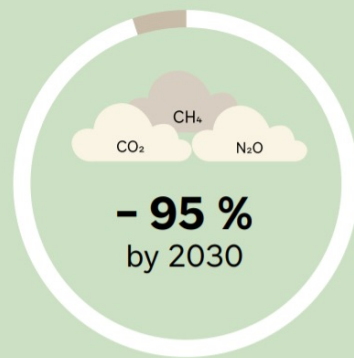
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Who we are?

- Public Transport Authority (PTA) for the capital region of Norway
- Publicly owned by the municipality of Oslo (60%) and Viken county (40%).
- Ruter had 398 million boardings in 2019.
- 23 % of the Norwegian population
- More than 50% of all public transit in Norway happens in the Ruter region



Climate goals in the capital region



Direct emissions

Oslo's greenhouse gas emissions in 2030 will be reduced by 95 per cent compared with 2009, and by 52 per cent by 2023

- Walking, cycling and public transport will be the preferred modes of travel in Oslo.
- Vehicle traffic will be reduced by 20 per cent by 2023 and by one-third by 2030 compared to 2015.

RUTER'S 8-GOAL SUSTAINABILITY STRATEGY



Effect goals



Main goal



Tools

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ipcc

INTERGOVERNMENTAL PANEL ON climate change

Climate Change 2022 Mitigation of Climate Change

Summary for Policymakers



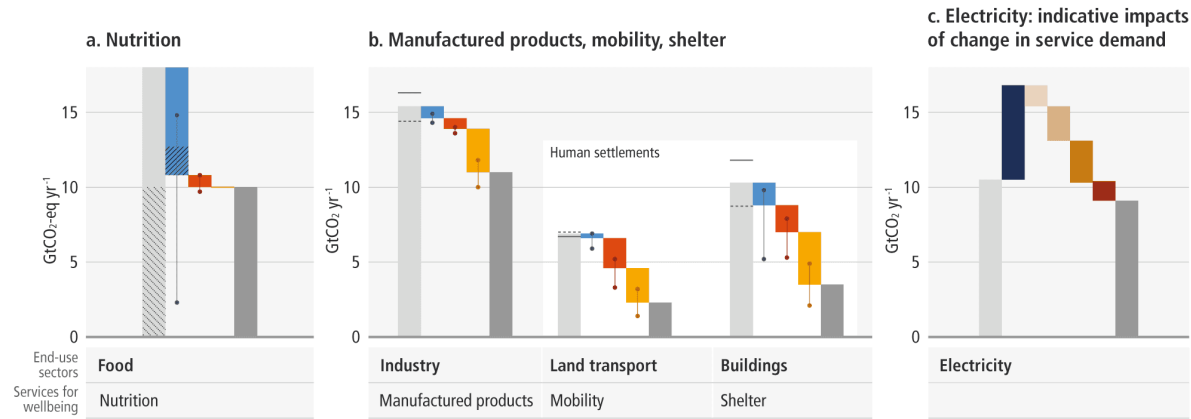
WGIII

Working Group III contribution to the
Sixth Assessment Report of the
Intergovernmental Panel on Climate Change

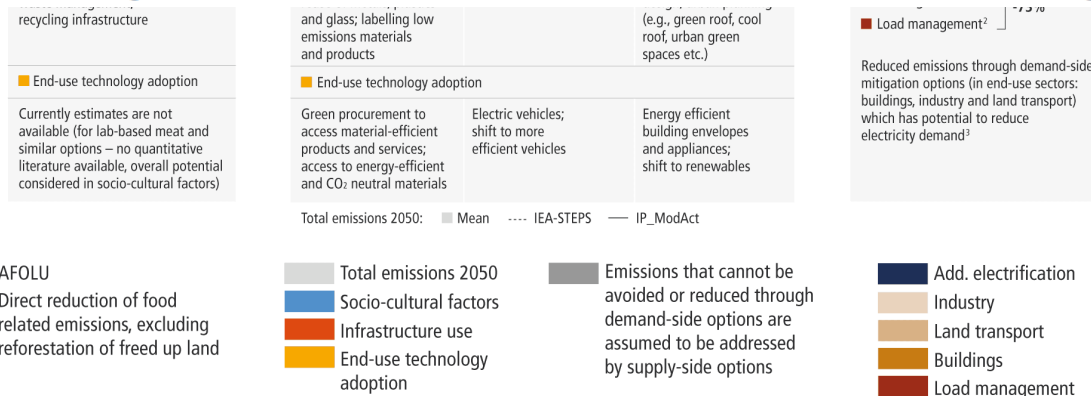


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Demand-side mitigation can be achieved through changes in socio-cultural factors, infrastructure design and use, and end-use technology adoption by 2050.

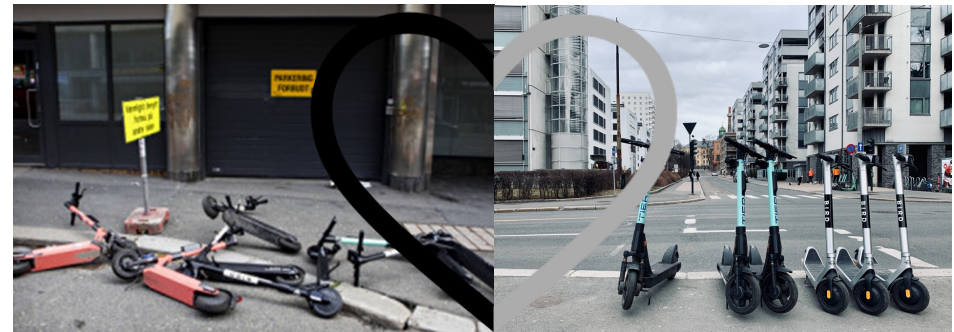
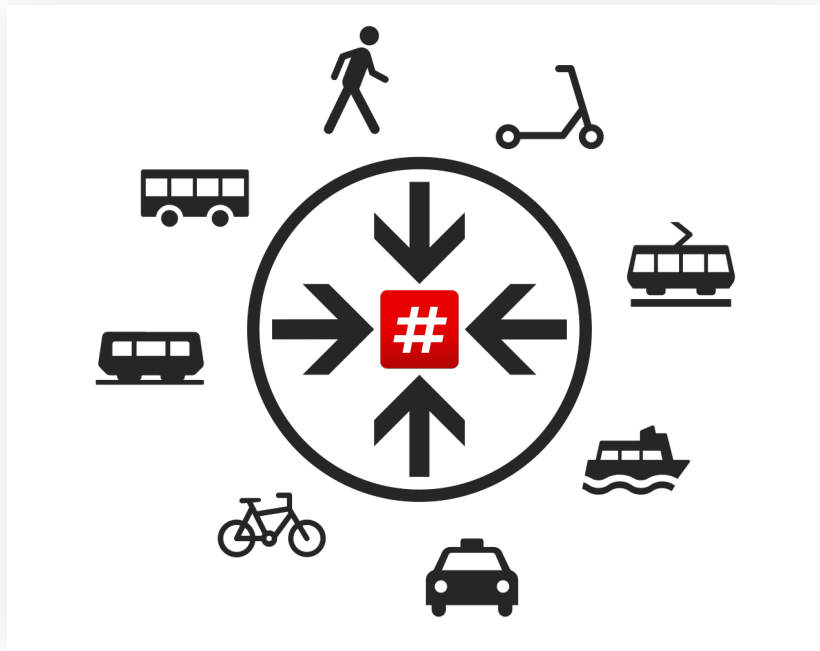


C.8 Demand-side options and low-GHG emissions technologies can reduce transport sector emissions in developed countries and limit emissions growth in developing countries (*high confidence*). Demand-focused interventions can reduce demand for all transport services and support the shift to more energy efficient transport modes (*medium confidence*). Electric vehicles powered by low-emissions



¹ The presentation of choices to consumers, and the impact of that presentation on consumer decision-making.
² Load management refers to demand-side flexibility that cuts across all sectors and can be achieved through incentive design like time of use pricing/monitoring by artificial intelligence, diversification of storage facilities, etc.
³ The impact of demand-side mitigation on electricity sector emissions depends on the baseline carbon intensity of electricity supply, which is scenario dependent.

Catalyst for sustainable shared mobility

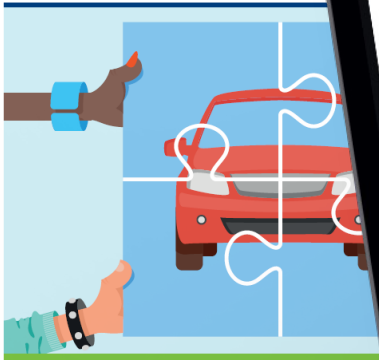


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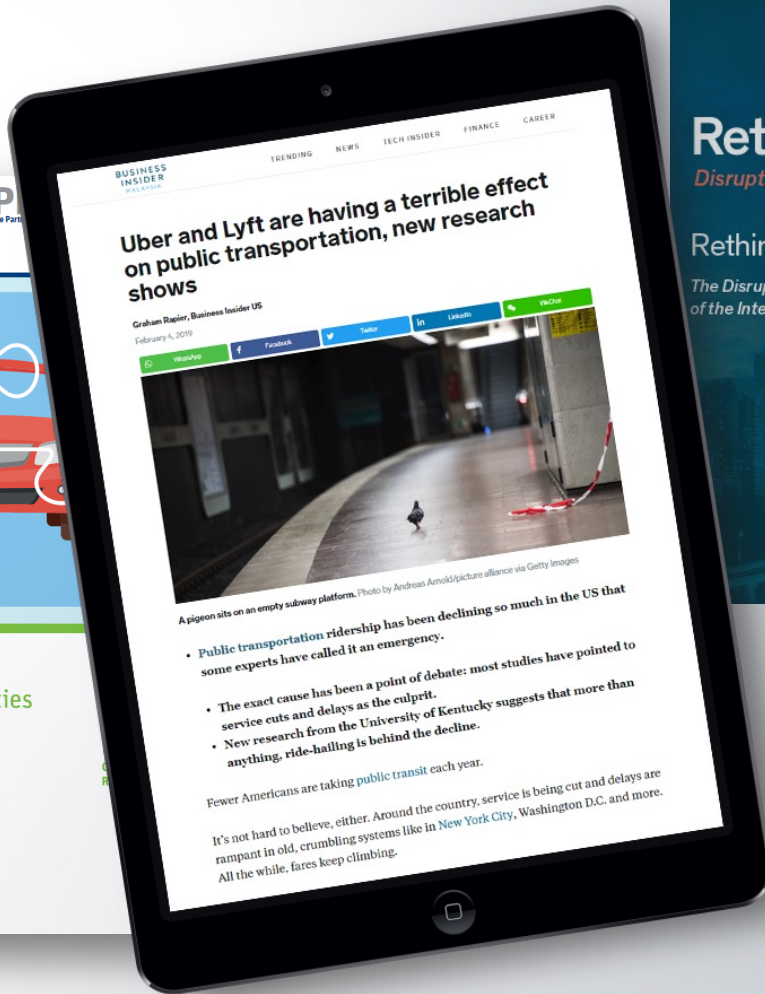


Sustainable freedom of movement

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Shared Mobility Innovation for Liveable Cities



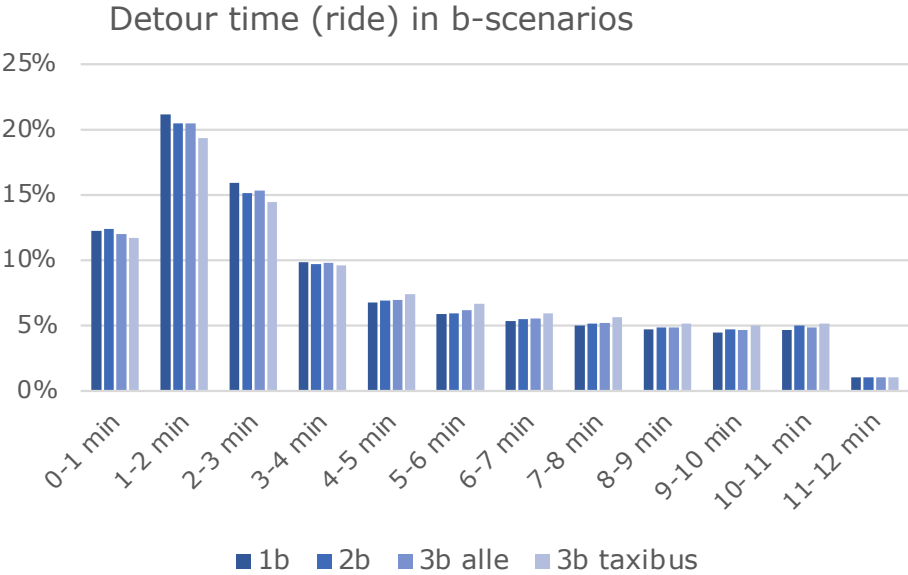
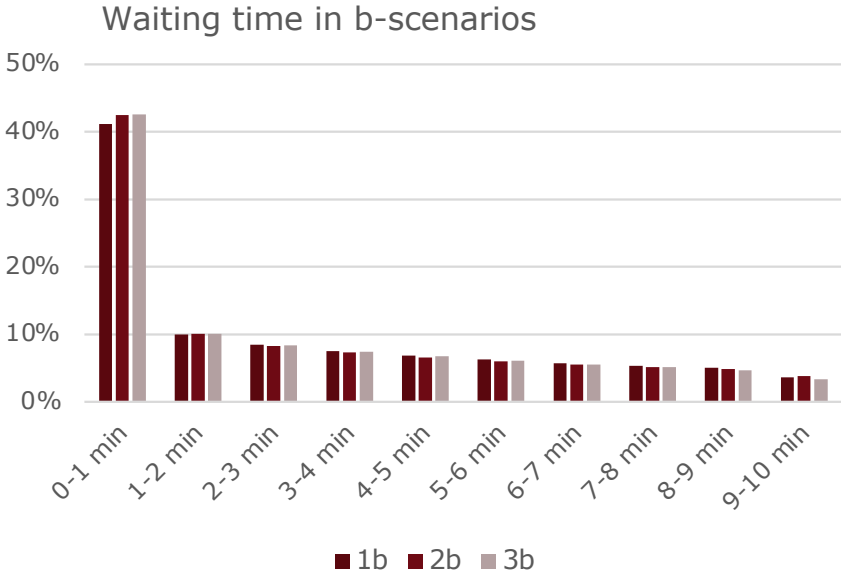
The Oslo Study

– HOW AUTONOMOUS CARS MAY CHANGE TRANSPORT IN CITIES



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Customer experience of the system



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Average waiting time with ride sharing (seconds)

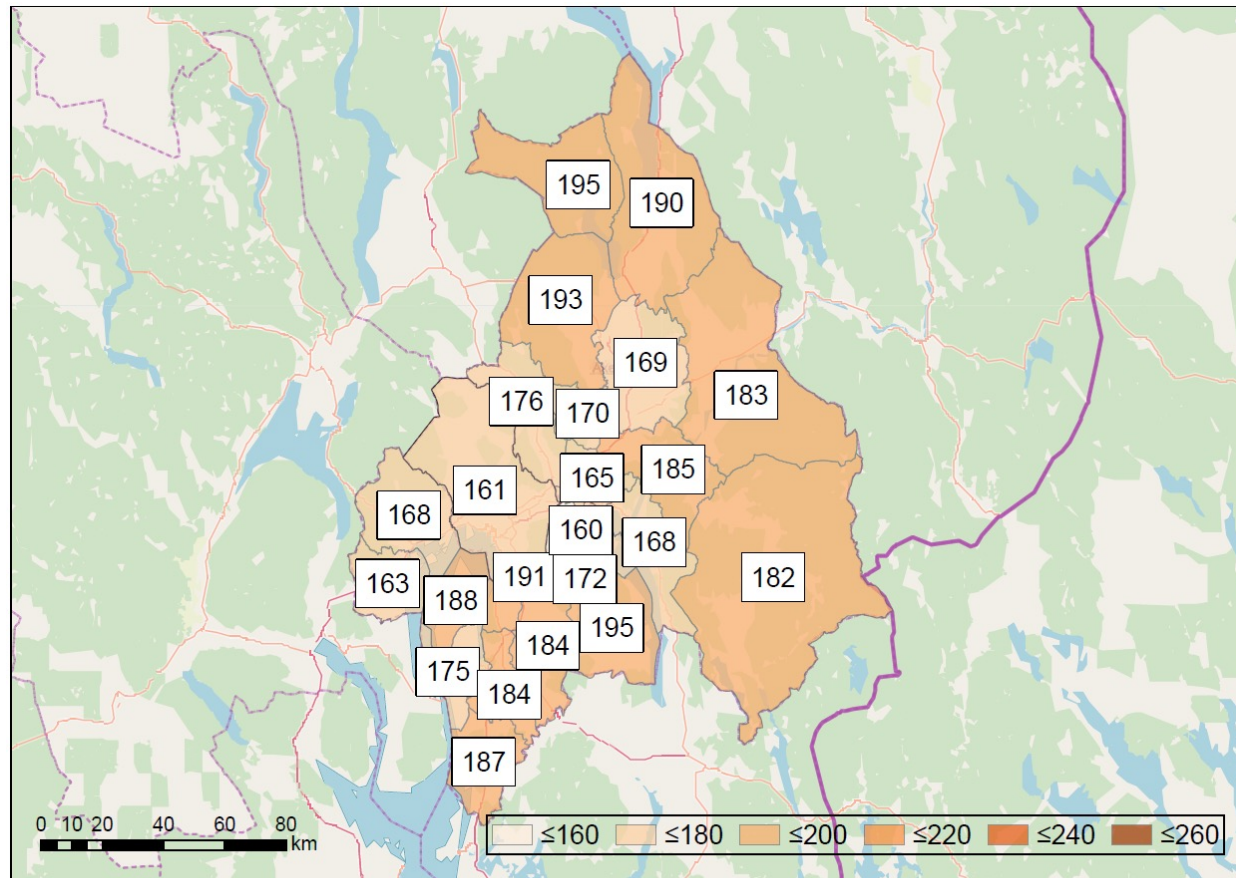


FIGURE 6-21 Scenario 1b PUDO average wait time by municipality

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Vehicle reduction



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

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Vehicle kilometres travelled – potential reduction



BEST CASE:

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

WORST CASE:

Traffic volumes doubles, resulting in a complete traffic breakdown

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Ruter has purchased AV services since 2018

Akershusstranda



22 000+
Passengers in
5 months

9 000
Km driven

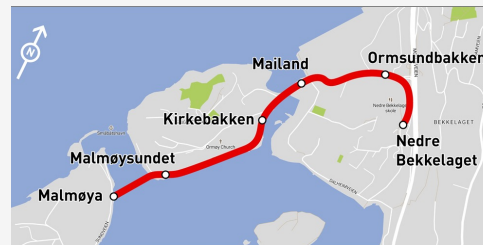


Ormøya & Malmøya



6 717
Passengers in
10 months

23 000
Km driven



Kongens gate

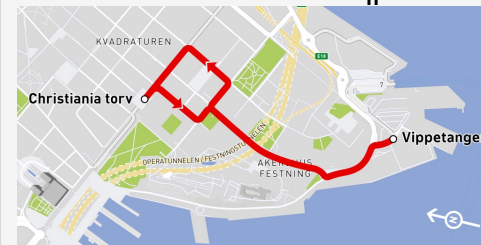


1 560
Passengers in
4 months

2 600
Km driven

3X
Traffic light
crossings

V2X
Communicatio
n



Ski



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



Successful winter operation



Our first autonomous vehicle is now in the Norwegian Technical Museum



TEK
NISK
MUS
EUM

A road to a complete autonomous vehicle fleet

Transform
Complete system –
all vehicles autonomous

We are here

Start operations
First regular operations

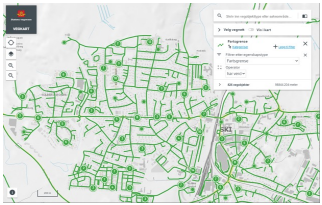
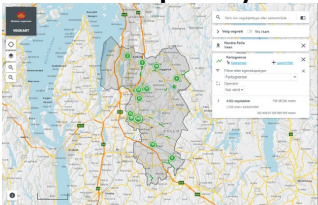
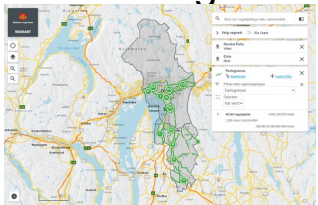
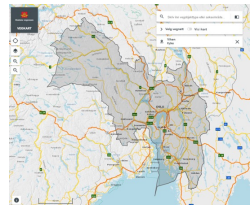
Scaling up
Regular contracts and
change orders

Piloting
Trials and marked
introduction

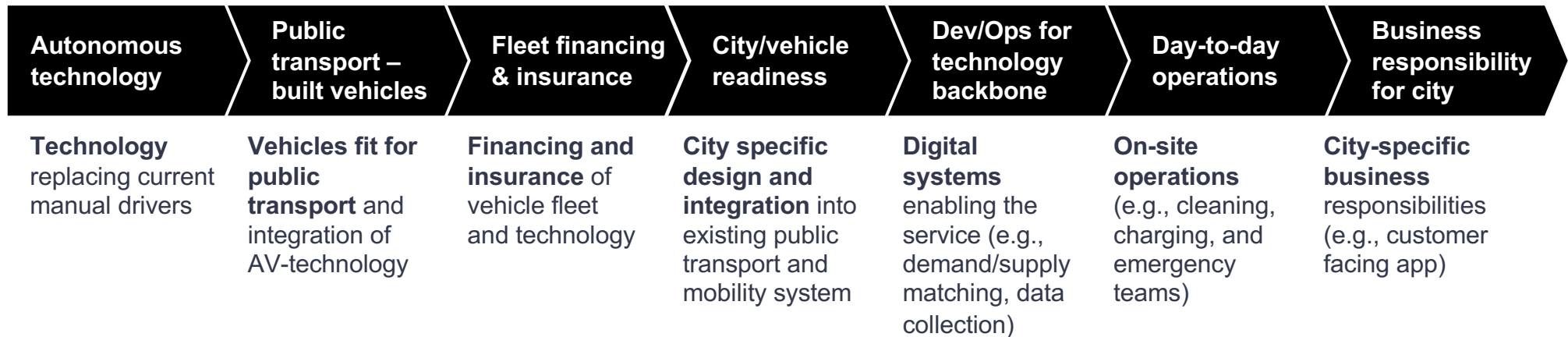


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Transforming the transportation system:

Initiative	Technology demonstration	Business viability demonstration	Scaling demonstration	2030 ->
Geo area	Local area 	Municipality 	Oslo Region 	Oslo – Viken 
AV's total	4 – 20	20 – 250	~ 20 000	30 000 +
Timing	2021-2023	2022-2025	2024-2030	2030-

But, we need collaborators and suppliers:



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What are we looking for

- Large fleets of vehicles
- Speeds up to 80 km/h (and more)
 - Needed to provide attractive and competitive service
- Operate in our entire geography
 - Customer needs are both local and regional
- Without safetydriver
 - Needed to scale

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Multiple, custom-made business models



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Public transport in Norway – unique conditions

Stable and cooperative political environment, strong economy,
and digital inhabitants with trust in public sector



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Foto: Ruter As / Nucleus AS, Daniel Jacobsen

Sustainable freedom of movement



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Thanks!

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