Intelligent Cities Challenge

Supply chains, Logistics and the Economics of Mobility

2nd City Lab

February 17th, 2021

European Commission

Diego Fernando Zapata

Mobility Undersecretary
Medellin

Cornelia Dinca

International Liaison
Amsterdam Smart City

Stephanie Haag

Associate Partner,
McKinsey Center for Future Mobility
Munich

Achim Schade

Associate Partner
McKinsey & Co.
Dusseldorf

Our thematic group

Supply chains, Logistics and the Economics of Mobility

Mentor cities

Amsterdam, Medellin, Antwerp, Hamburg, Singapore, Phoenix

Core Cities

Alcobendas, Chalkida, Corfu, Gdańsk, Haskovo, Kavala, L'Aquila, Logroño, Métropole Rouen Normandie, Metropolitan City of Rome Capital, Padua, Pamplona, Skellefteå, Tripoli (Consortium), Vari-Voula-Vouliagmeni,

Agenda:
Supply chains, Logistics and the Economics of Mobility

17 February 2021

13.10 – 13.30	**Welcome** Introduction to objectives Reflections on cities' progress and recap learning
13.30 – 14.00	**Mentor presentations and Q&As** Urban mobility – Medellin & Amsterdam
14.00 – 14.10	***Break***
14.10 – 14.40	**Core city sharing and group problem solving** Core cities volunteer their asks of the expert and mentors on needs, solutions to scale and challenges faced by each city
14.40 – 15.05	**Full group reflections**
15.05 – 15.10	**Closing remarks**

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Success factors for supply chains, logistics, and economics of mobility:

A brief recap

Small and medium cities in Europe face significant mobility challenges

Setting the stage: mobility systems in EU cities have become increasingly stressed by growing populations

70% The percent of EU population that lives in cities, including small and medium-sized cities

85% The percent that cities account for total EU GDP

The present mobility situation in many European cities has created unsustainable conditions for living, including:

- Severe congestion
- Poor transit access
- Noise emissions
- Poor air quality and GHG emissions

Small and medium-sized European cities are particularly hard pressed, given:

S-M cities often lack the necessary institutional capacity to manage growing populations

Financial resources are often more limited in S-M cities compared to large city counterparts

S-M cities in Europe tend to skew older, creating acute accessibility challenges

Looking ahead

Small and medium sized EU cities will need to understand the evolving disruptions and available solutions that will support enhancing their urban mobility, improve accessibility, and create high quality, sustainable transport systems

Source: Eurostat: Urban Europe, Statistics on Cities, Towns, and Suburbs (2016); Business Models Innovation for Sustainable Urban Mobility in Small and Medium-Sized European Cities (2019)

Urban mobility is vital to our economy

Cities will have more than 60% of the population and supply 65% of the economic growth[1] by 2030 …

60%
of population

65%
of economic growth

…causing demand for mobility to nearly double in growing cities[2]…

2 x
Passenger km travelled in developing cities

… making urban mobility vital to our economy: reducing a single minute of congestion saves more than $1.4B[3]

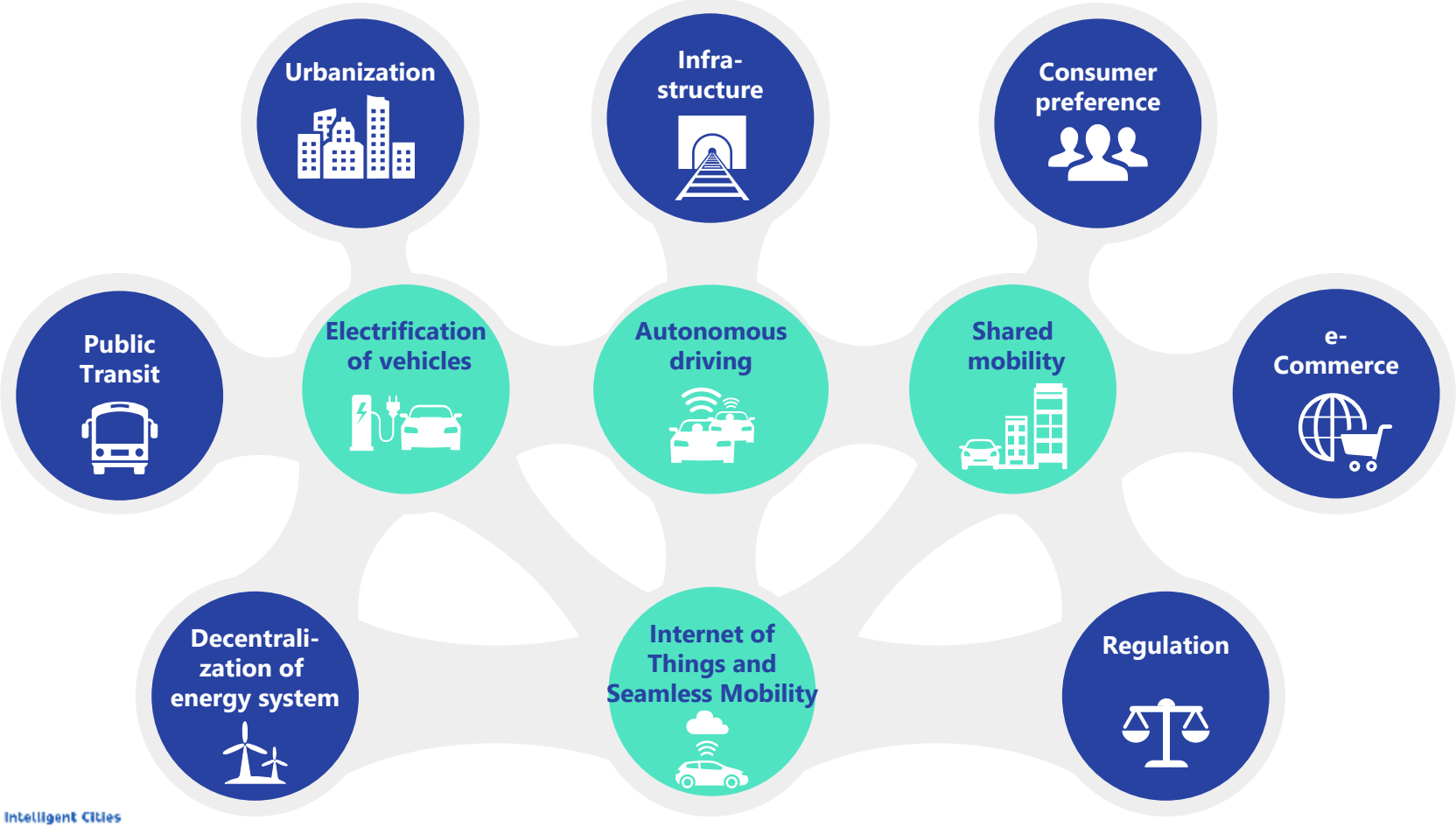
1 min = **> $1.4B**

1. McKinsey Global Institute
2. McKinsey: Integrated Perspective on the Future of Mobility
3. For a city of 10 million residents with a per capita GDP of 35,000 USD and 2 commutes on each of the 230 working days

Source: ONS, City of New York, McKinsey

Disruptive supply chain and logistics trends sit amidst other significant societal and industry trends

The mobility revolution is being shaped by changing societal norms…



- Automotive disruptions
- Other societal and industry trends

… impacting transportation outcomes

- Increasing push for clean, livable cities
- Lower reliance on traditional ownership models
- Rapidly growing logistics demands
- Tightening regulatory restrictions

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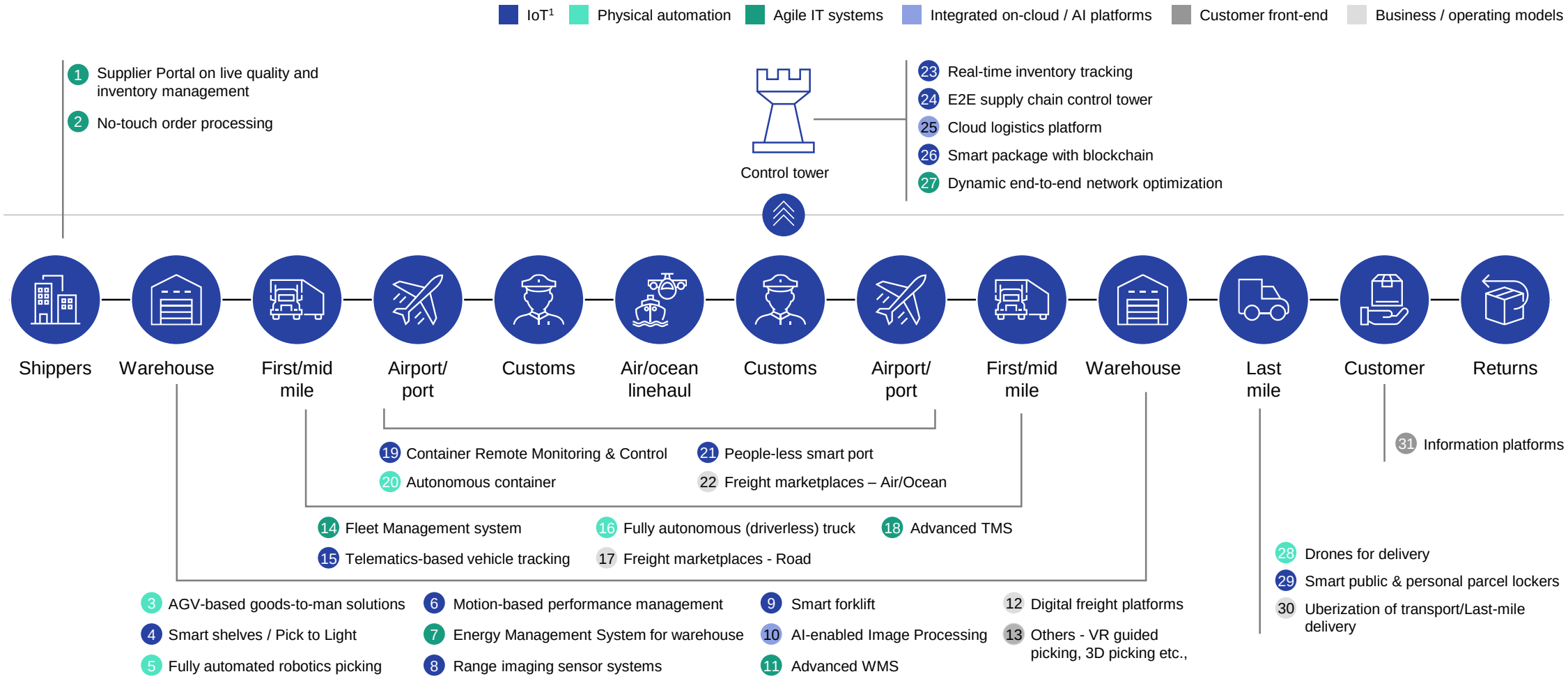
30+ technology and tech-enabled operating model interventions are changing the future of logistics…



1. Predominately IoT lever

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Source: McKinsey SC survey, Team analysis

These interventions are advancing through five key categories…

Category	Offering/services		Examples (Large companies & startups)
IoT	Telematics RFID Fuel sensors	Wearables/ Smart glasses Motion detection sensors	SCANDIT, verizon connect, Omnitracs, cisco, AVERY DENNISON RFID, Roper Technologies, Google
Automation	Drones for delivery AGV solutions Autonomous truck and truck convoying systems Warehouse robotics		Alphabet, Bastian SOLUTIONS, DAIFUKU, amp, COMMONSENSE ROBOTICS, TESLA, GreyOrange, VOLVO
Agile IT systems	Enterprise Resource planning (ERP) Transport Management Systems (TMS) Warehouse Management Systems (TMS) Fleet Management System (FMS)		ORACLE, SAP, BlueYonder, optoro
Integrated on-cloud/AI	Advanced analytics and artificial intelligence End-to-end platform Modularized product development		Microsoft, ORACLE, Google, XENETA, SHIPCHAIN®
Customer front-end interfaces	Digitized information platforms		CMA CGM, IBM, aws

1. Emerged by integrating various elements of IoT, automation, and AI with strong execution focus

Significant outcomes

30-40%
reduction in inventory with end-to-end visibility in operations

15-30%
reduction is transportation and warehousing costs

Improved customer experience and service delivery

...leading to new business models in the industry

Offering / services	Description	VC funding into startups (2014 - 19) In USD Bn	Examples
Last-mile delivery	Offer innovative last-mile delivery services to retailers and individuals by using crowdsourced delivery, drones, AVs, etc.	9.9	dada, LALAMOVE, HIVE BOX, GOGOX
Road freight marketplaces and solutions	Increase efficiency by connecting shippers and trucking companies via marketplaces or provide fleet management services	6.0	BLACKBUCK, CONVOY, 福佑卡车
Air and ocean transportation	Offer booking and management of international shipments, incl. value-added services (e.g., track and trace, customs)	1.6	FREIGHTOS, flexport., forto

Source: Crunchbase

What happened since our last workshop

What we heard from you in the last workshop:

1. Different starting points

There is a clear split between cities looking at urban centres vs industrial nodes

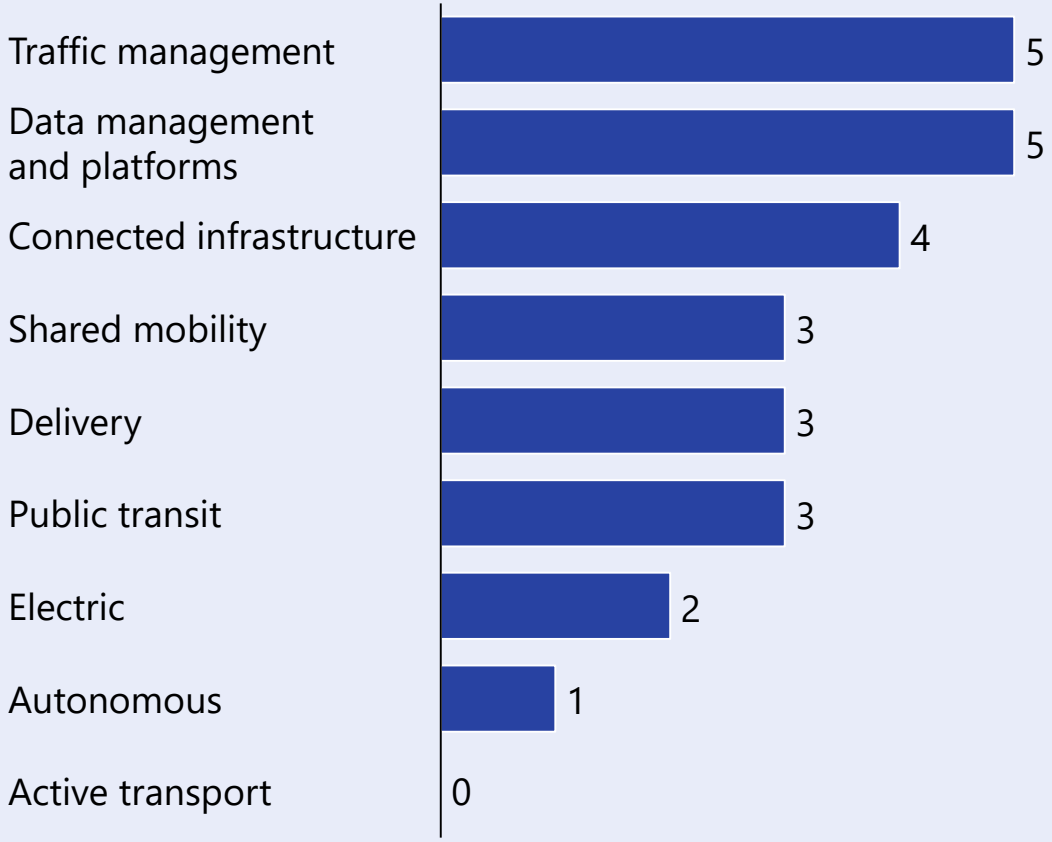
2. Solution oriented

Traffic management and data management platforms ranked top solutions, with general interest in broader connected logistics infrastructure

3. Unlocking resource constraints

There is high demand for solutions that are effective for smaller cities that need capital-light approaches to better mobility

What types of transport solutions are you most interested in?



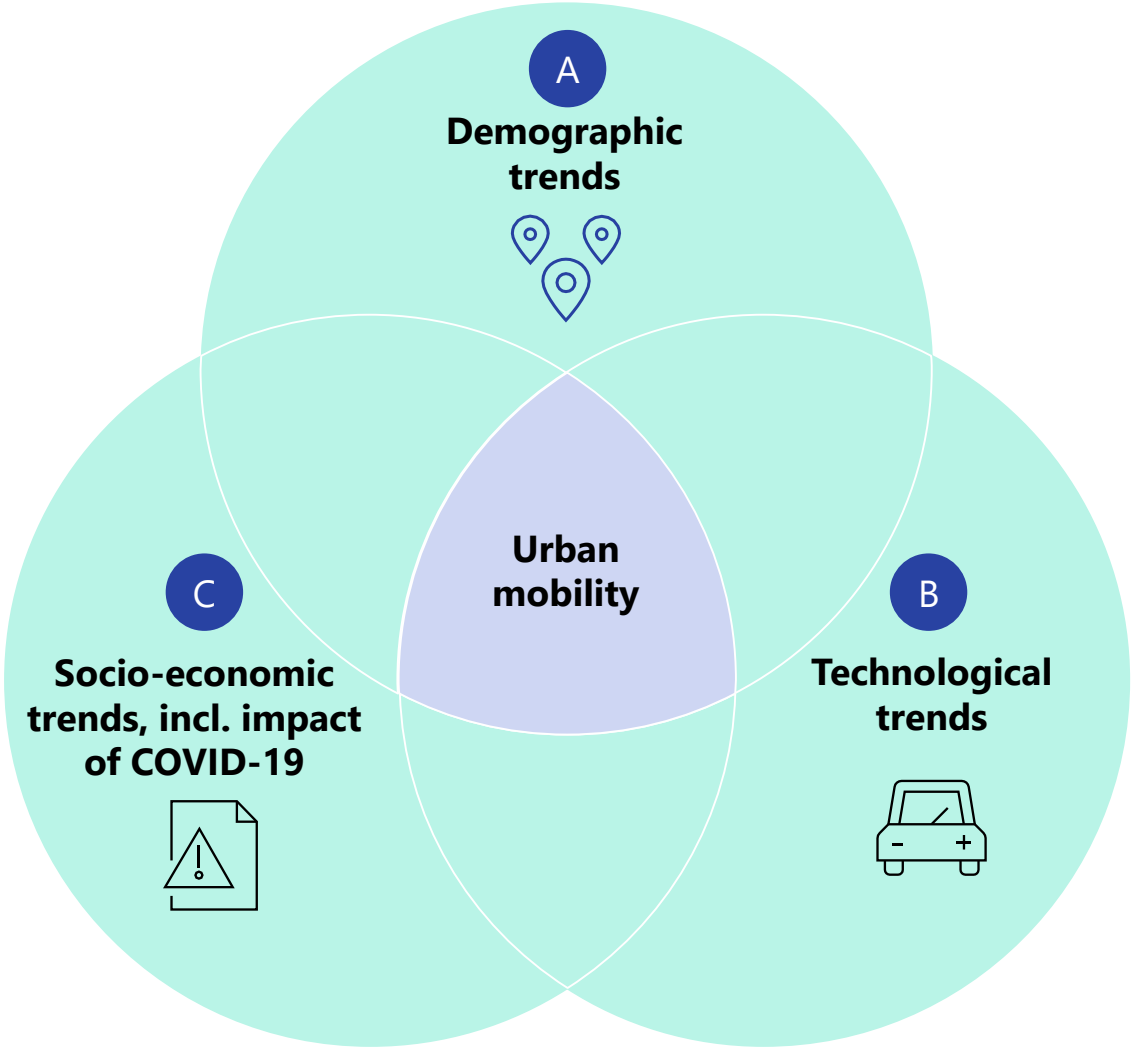
Lack of sufficient skills and operational challenges are key challenges across both themes

Key challenges faced

- Need to clearly define a data strategy and legislation, including cooperation with trade associations
- Lack of awareness and low utilization rates of digital solutions and broader mobility systems
- Coordination and management of large number of stakeholders
- Developing sustainable long-term business models, and short-term financing options

Mentor city presentation: Urban mobility

We observe three groups of trends shaping urban mobility in the new normal



Demographic trends

Increasing population of city agglomerations, especially in boroughs of the city

Technological trends

Autonomization, Internet of Things, electrification, shared mobility / MaaS

User acceptance for technological innovations

Socio-economic changes, including those induced by Covid-19

Changing the consumption model, in particular on the axis "owner" vs. "user"

Rapid digitization, increasing cleanliness and hygiene requirements

A seamless urban mobility ecosystem would improve major paint points for city residents

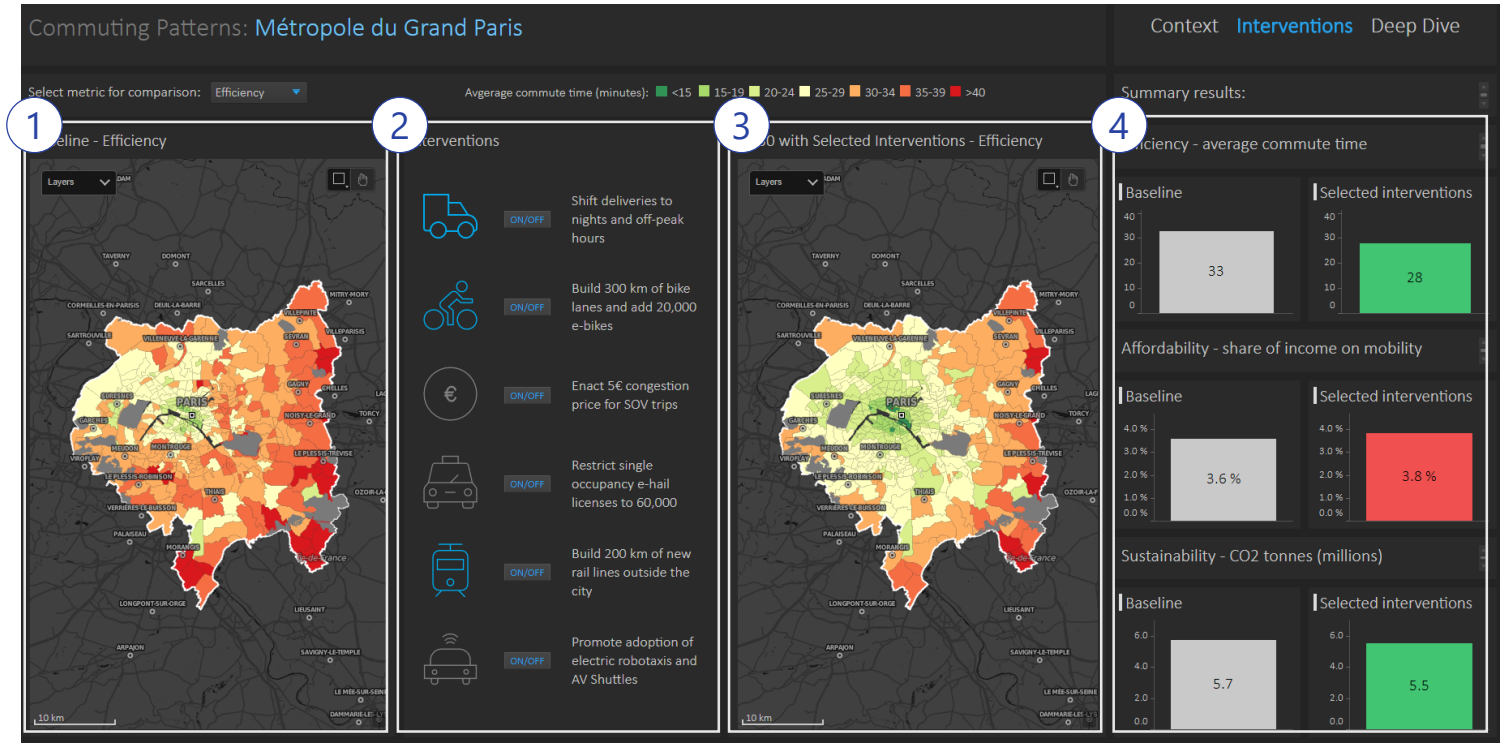
System indicators	Change from baseline	Explanation
Availability Passenger km per year	**30%** more travel	30% more passenger km travelled Mobility system able to support economic growth, urbanization, and induced demand
Affordability Average USD per trip	**25-35%** Less expensive	Users move from expensive commuter and heavy rail to less-expensive point-point shared AVs
Efficiency Average time per trip	**10%** less time	Increased rush hour capacity for both road and rail (e.g., off-peak delivery, AV dedicated lanes, predictive maintenance) Demand shifted away from peaks and onto shared modes with dynamic pricing
Convenience share point-point trips	**50%** more point-point	15% of trips previously served by bus to rail switch newly available and more convenient point-to-point mobility options
Sustainability, Mn tons of CO2 per year[1]	**80-95%** less CO_2	The shift away from private internal combustion engine vehicles to autonomous modes – assumed to be electric given high usage - reduces CO2 emissions

1. Assuming no electrification of vehicle parc in B-A-U scenario, zero marginal emission of rail modes, and that all AVs are electric

Source: McKinsey (FoM 3 Urban Mobility Model)

Our solution: McKinsey supports cities in decision-making with urban mobility simulation

Dashboard allows to evaluate effects of selected interventions on mobility performance metrics in future scenario



1. Status quo: View of the selected KPI in 2030 without any interventions

2. Selected interventions: Turn on/ off individual interventions

3. Future scenario: Evaluate the impact of the interventions, by origin, for the selected KPI

4. Performance metrics: Evaluate how the selected interventions impact key mobility performance metrics

Key benefits

- Framework and **catalogue of interventions** to assess interventions against predefined performance metrics
- **Fact-based evaluation** of interventions based on decision-oriented urban mobility simulation
- **Prioritization** of most effective solutions for both Cities and mobility players
- Design of **integrated urban mobility strategy** based on scenario analysis

How it works: Digital twin uses numerous data sources to simulate behavior of mobility users and assess performance of the system

Inputs (for typical city)

10+
Data sources[2]

10+ GB
Of raw data

100.000+
Weekly trips

600.000+
GPS locations

1 mn.+
Individual agents

Urban mobility simulation…

The model evaluates how residents choose their transport mode and predicts future travel flows based on adjusted agent choice

…results in two key outcomes

Urban mobility performance metrics

Value estimation of use cases[1]

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1 e.g., for smart parking, new transport models congestion mitigation, AV offloading 2. e.g., public transit data, traffic data, individual movements, demographics

Alcaldía de Medellín

Diego Fernando Zapata

Undersecretary for Mobility
City of Medellín

Q&A

Cornelia Dinca

International Liaison
Amsterdam Smart City

Amsterdam Economic Board

Amsterdam Smart City

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International Liaison
18 Feb 2021

Accelerating The Mobility Transition: An Ecosystem Approach

Amsterdam Economic Board

Amsterdam Smart City

Independent innovation platform that brings together innovative companies, knowledge institutions, public authorities and proactive citizens to shape the city of the future.

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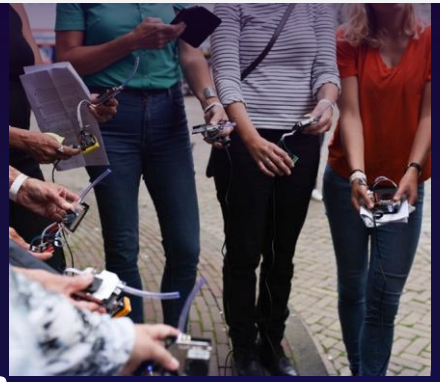
Smart City approach to boost transitions

Energy

from fossils to clean, creating sustainable energy options for all



Digital City

from closed to open, using tech for social value

Circular Economy

from linear to regenerative use of resources

Mobility

from crowded and polluting to smart and sustainable mobility

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Values

Human Centered

Open & transparent

Public Value

Learning by doing

E-Mobility: Getting Smart with Data

Amsterdam University of Applied Sciences, Interreg, NWO, TKI Urban Energy, Regieorgaan SIA

Applied research on the roll-out of public-charging infrastructure, compiling lessons learned from several large projects including: FLEXPOWER, SEEV4-City, U-SMILE and addressing:

- Various use groups: visitors, residents, commuters, shared fleets, taxis
- Charging infrastructure definitions
- Managing charging infrastructure data
- Key Performance Indicators (KPI) of charging infrastructure
- Roll-out strategies: Demand-driven versus Strategic
- Smart charging strategies
- Fiscal incentives and their effect on EV sales in the Netherlands

More info:

- https://www.hva.nl/kc-techniek/subsites/en/kc-techniek/publications/publications-general/e-mobility.html
- https://www.mra-e.nl

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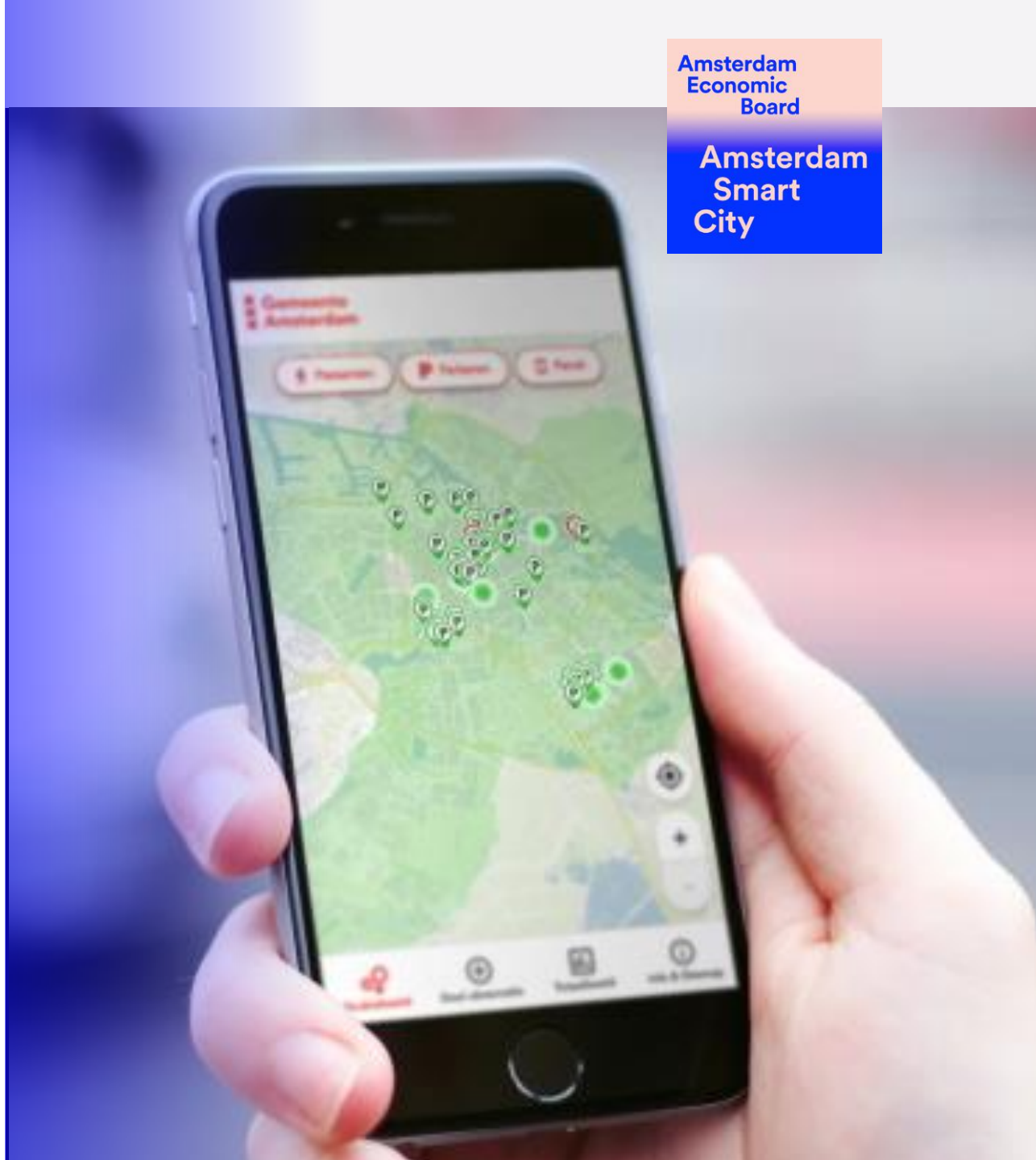
Crowdedness Dashboard

City of Amsterdam, AMS Institute, National Road Traffic Data Portal, amsterdam&parterns

Web application providing current information about busy and quiet places and in the city, supporting people in deciding which areas to visit.

Combines data sources from different organizations / departments including the Crowd Monitoring System Amsterdam (CMSA) & parking garage data.

More info:
www.druktebeeld.amsterdam.nl



Scale-up: Visitor Flows

MRA Smart Mobility Platform, Province of North Holland, Province of Flevoland, Vervoerregio, City of Amsterdam, Floriade, AMS Institute, Johan Cruijff Arena

Innovation partnership: a form of contracting in which clients, knowledge partners and entrepreneurs collaborate intensively. The goal is to predict visitor flows of people and influence their behaviour.

The jointly developed and purchased solution will support:

- Real-time management of traffic and visitor flows in public spaces
- Exchanging data in the chain (data aggregation, forecasting and influencing behaviour), aimed at a (market) standard for data exchange for traffic and visitor flows

More info:
https://www.innovatiepartners.nl/project/Scale_Up

Marineterrein Amsterdam Living Lab

Bureau Marineterrein, AMS Institute, NEMO Science Museum, Amsterdam Smart City

Testing ground facilitating the collaboration between companies, knowledge institutions and governmental organizations, leading to experiments that can be transferred and scaled.

Focus on mobility challenges including clean logistics, mobility hubs and last-mile solutions.

More info: https://www.living-lab.nl

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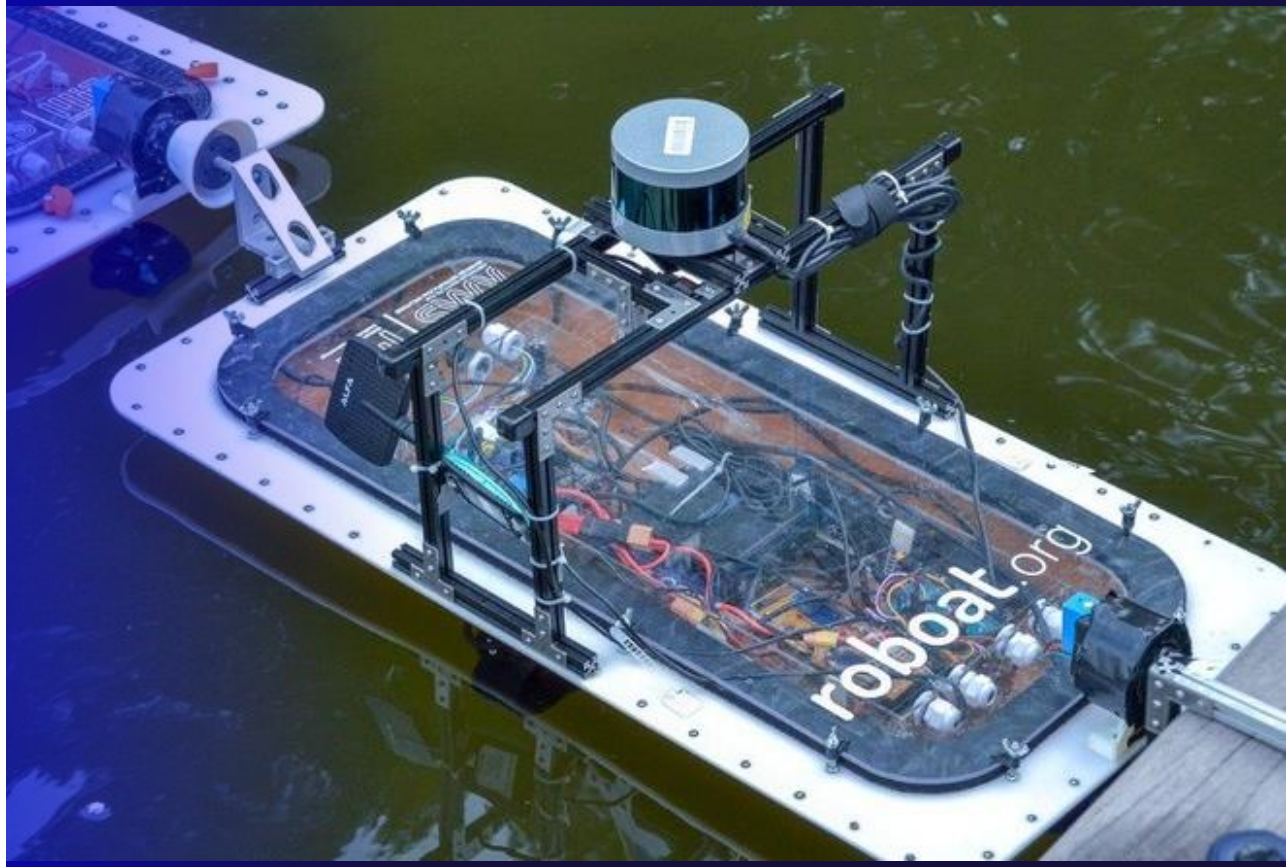

Data Dilemmas: Data Sharing for MaaS Systems

Amsterdam Smart City, City of Amsterdam Data Lab, Province of North Holland

Public dialogue and international knowledge exchange on data sharing for MaaS systems between Province of North Holland, EMT Madrid and City of Helsinki

18 Feb 2020, 16:00-17:30 CET

More info:
https://amsterdamsmartcity.com/updates/event/data-dilemmas-sharing-data-for-maas-systems

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Q&A

Core city sharing and group problem solving

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Please select/rank the issue(s) you would like to cover today

1. Digital upskilling

Support to manage different tools and get staff to use them effectively; digitally upskilling citizens to use services

2. Under-utilisation

Understanding the levers available to support sustainable usage rates of mobility solutions (e.g., public transit), especially post-Covid

3. Implementation support

Designing systems, what data to collect, in what format, how to store & share data and ensure security; setting up innovation labs/sandboxes to improve interactions

4. Synergies with national government mobility policy and systems

Identifying the overlap with the central government plan and resources to digitize services efficiently and create momentum

5. Stakeholder management

Working with different teams within government and third-party vendors to ensure on-time and within-budget delivery

6. Business models

Developing business models and unlocking creative financing opportunities to support sustainable funding long-term

Which subthemes are you most excited to explore during the ICC?

FOR DISCUSSION

We can discuss ideas on 3 areas

1. The need I have in my city is….
2. The solution I'm trying to scale in my city is…
3. The challenge I face is…

Reflections and wrap-up