1st March 2024

THE ROLE OF DATA IN SMART MOBILITY

FROM A GOVERNANCE POINT OF VIEW

Audrey Lebas, Smart City Institute (HECLiège, ULiège)

THE SMART CITY INSTITUTE

SMART CITY & SMART MOBILITY DEFINITIONS

ROLE OF DATA IN MOBILITY GOVERNANCE

CASE STUDY: AUSTIN

THE SMART CITY INSTITUTE

RESEARCH

TEACHING

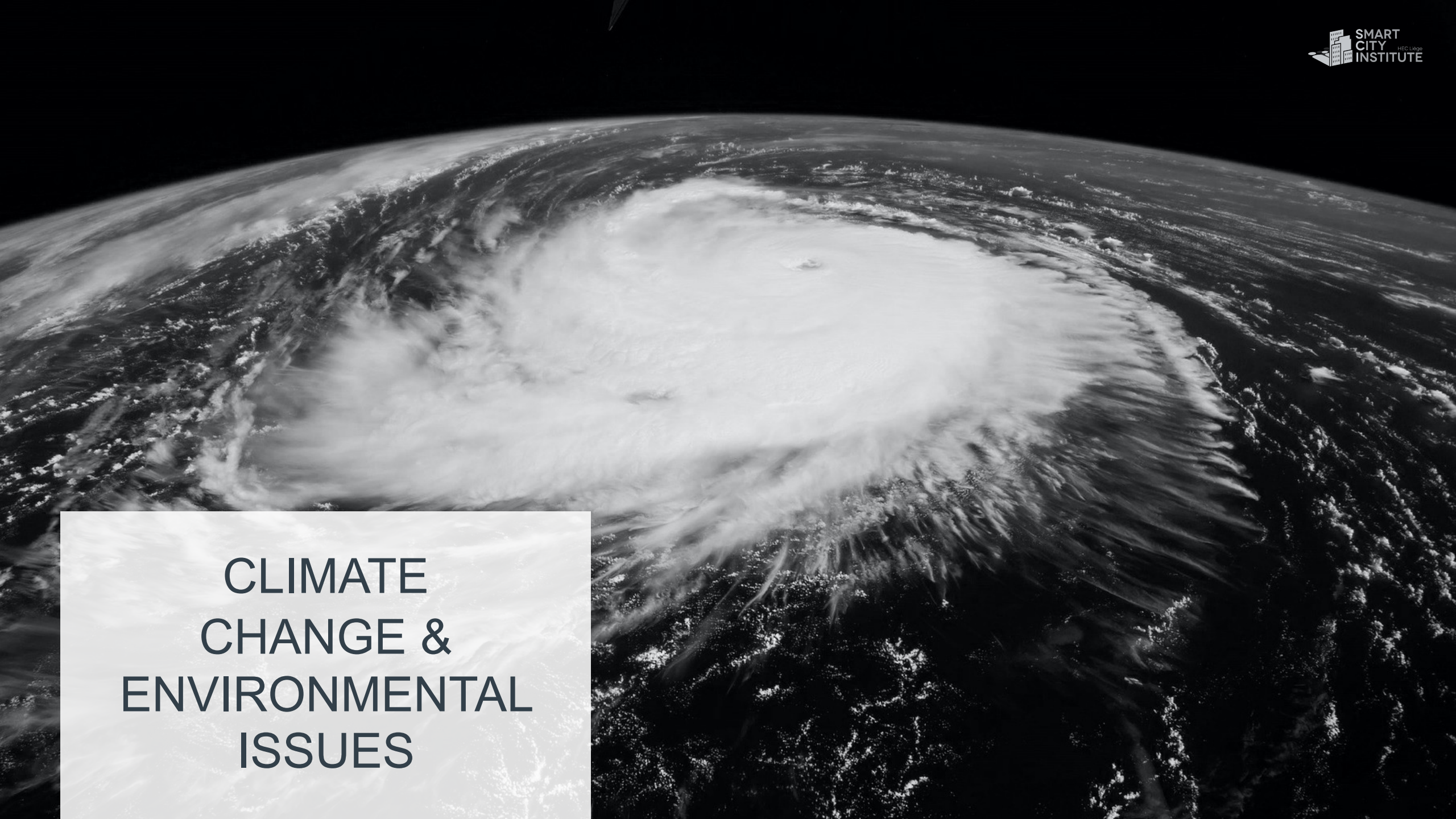
INNOVATION

AWARENESS

- Founded in 2015
- Sustainable and Smart Cities/Territories → Management (strategy, governance, etc.)
- University of Liège, HEC Liège (Belgium)
- Academic referent Smart Region

DEMOGRAPHIC CHANGES

URBANISATION



CLIMATE CHANGE & ENVIRONMENTAL ISSUES

DIGITAL & TECHNOLOGICAL REVOLUTION

INTERNET

SMARTPHONES

DATA & CLOUD

SOCIAL MEDIA

CONTEXT

EXPONENTIALLY CHANGING ENVIRONMENT

SMART CITY

OUR DEFINITION

A “Smart City” is a **multi-stakeholders’ ecosystem** (composed with local governments, citizens’ associations, multinational and local businesses, universities, international institutions…)

Engaged in a **sustainability strategy/transition**

Using technologies (such as digital technologies) as **enabler**

In order to become **more sustainable** (economic prosperity, social well-being & conservation of our natural resources)

SMART CITY

OUR DEFINITION

A “Smart City” is a **multi-** … **m** (composed with local governments, c… …ional and local businesses, … …ons…)

Engaged … **on**

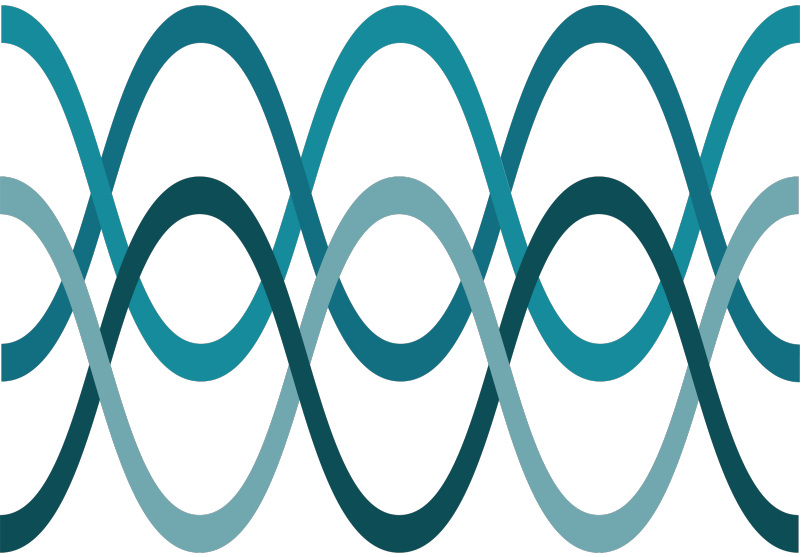
Using technolo… **enabler**

In order to become **m**… …rosperity, social well-being & con… …resources)

Smart Territory
Smart Region(s)
Smart Villages

SMART CITY

STAKEHOLDERS/GOVERNANCE



GOVERNMENT/PUBLIC

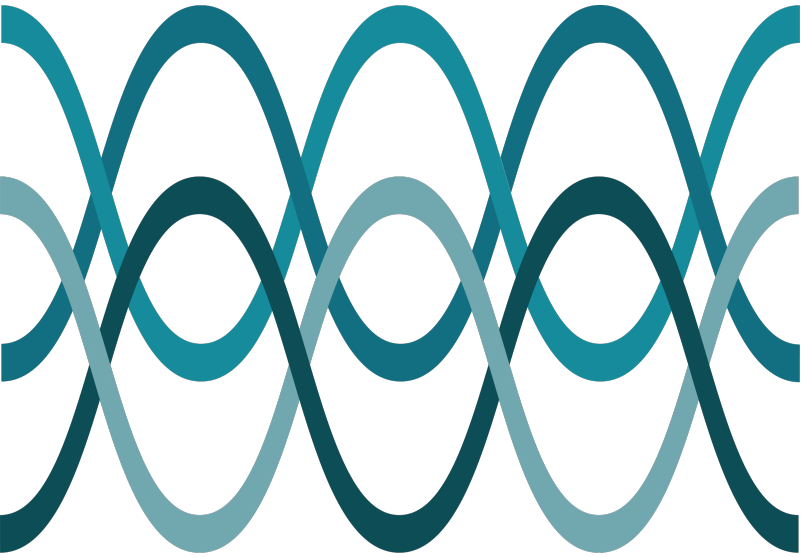
ACADEMIC

INDUSTRY

CITIZENS

SMART CITY

STAKEHOLDERS/GOVERNANCE



GOVERNMENT/PUBLIC

ACADEMIC

INDUSTRY

CITIZENS

Top-down

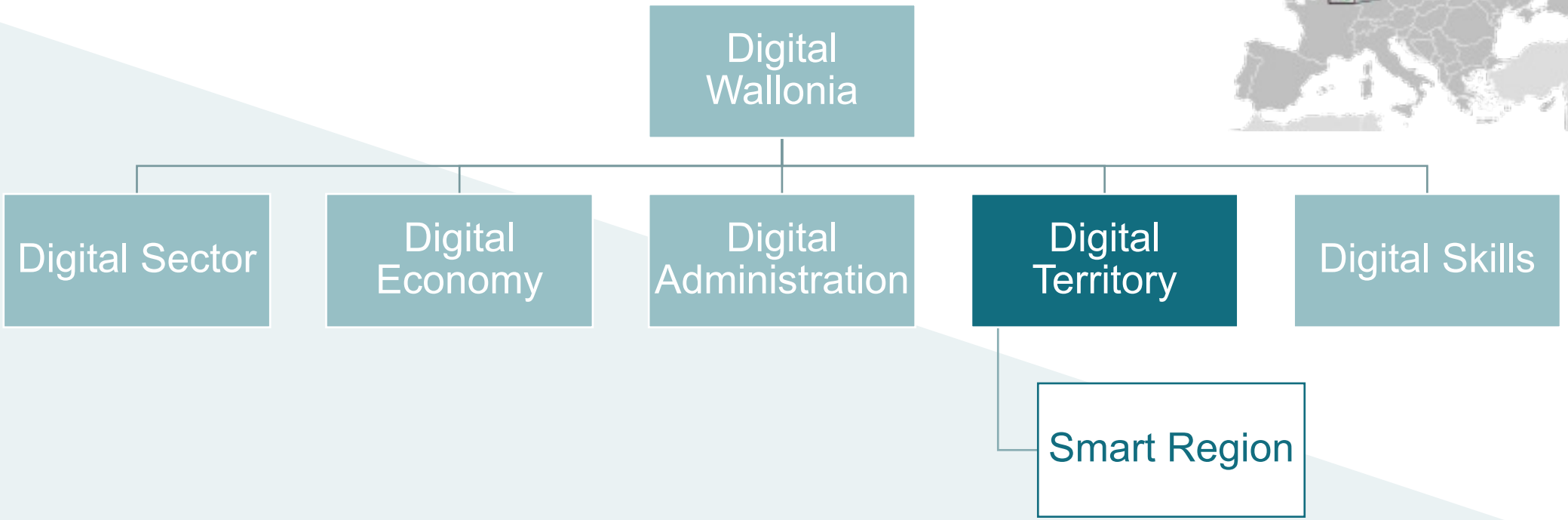
Public authorities > other actors

Bottom-up

Other actors > public authorities

SMART REGION

CONTEXT



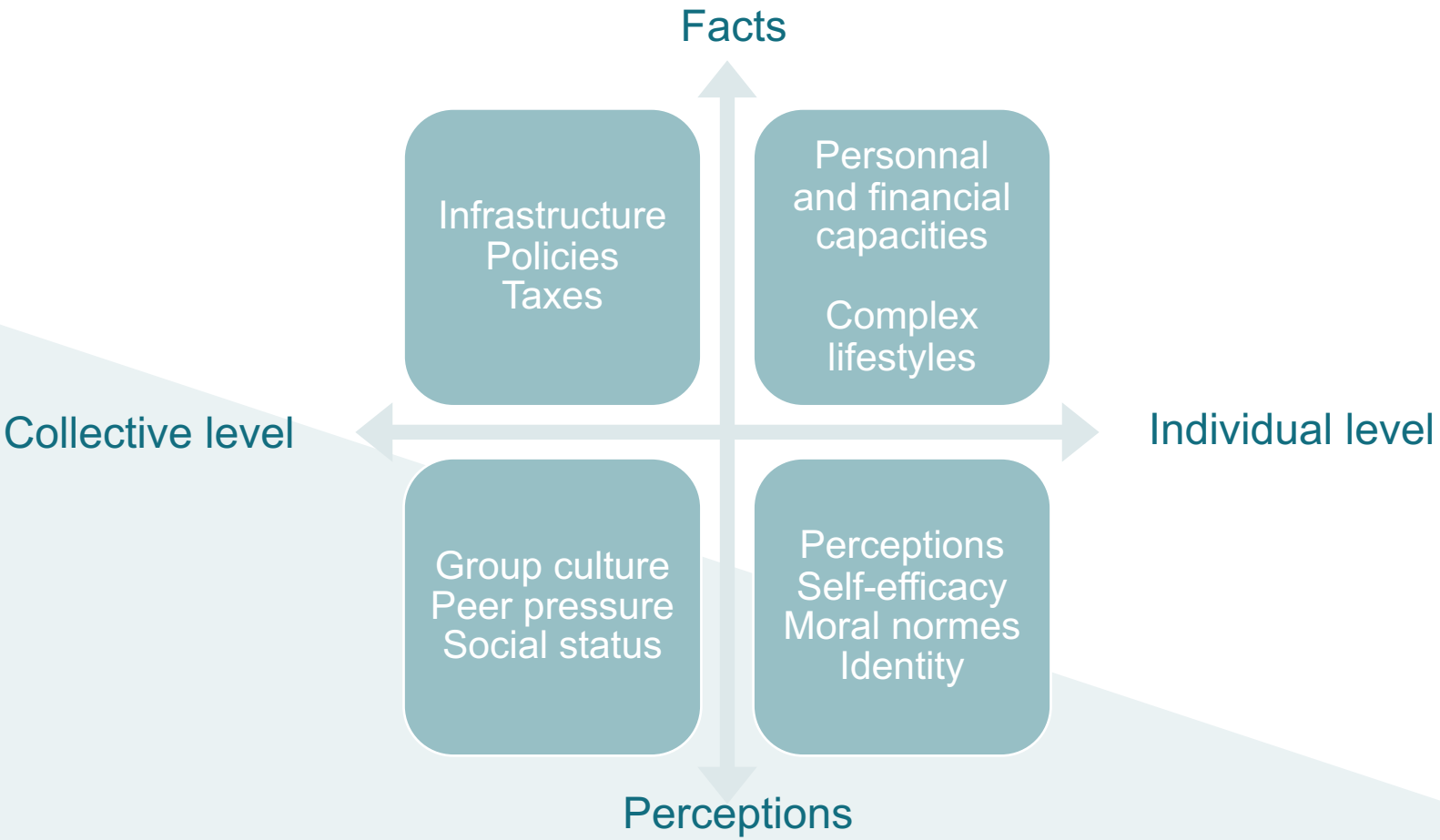
SMART CITY

SIX DIMENSIONS

Giffinger (2007)

MOBILITY

BARRIERS TO THE CHANGES IN BEHAVIOUR



Adapted from Grant-Muller, Hodgson & Harrison (2020)

SMART MOBILITY: DEFINITION

#1

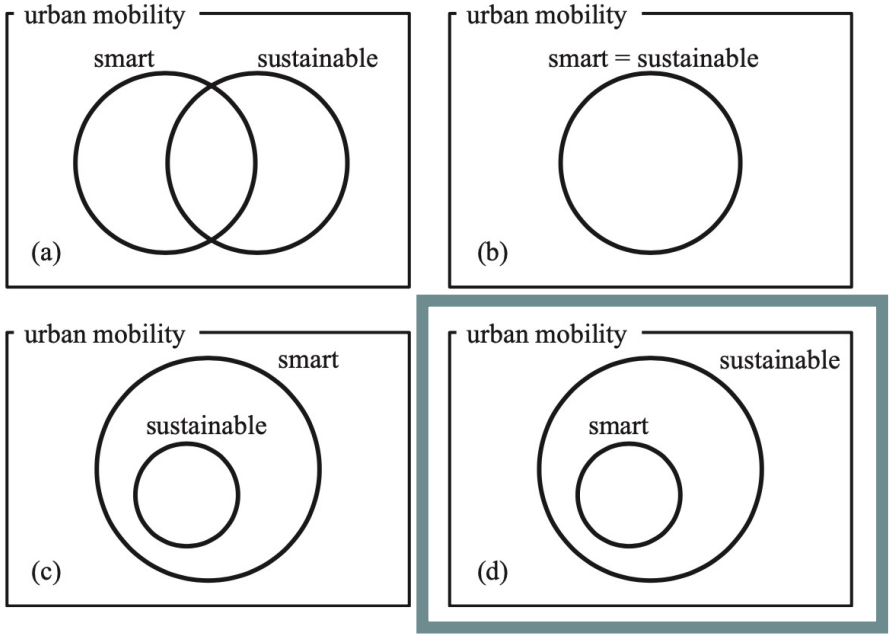
#2

#3

SMART MOBILITY: DEFINITION

Smart Mobility brings together all the solutions aimed at **optimising the use of infrastructure, vehicles and equipment** to facilitate the mobility of people and goods (European Commission, 2011)

Smart Mobility is a broad concept which facilitates to achieve a sustainable development **by optimising transport services**, taking into account technological, societal, economic and environmental challenges (Zawieska & Pieriegud, 2018)



Alternative Venn diagrams of urban mobility
Lyons (2018).

SMART MOBILITY: DEFINITION

#1

#2

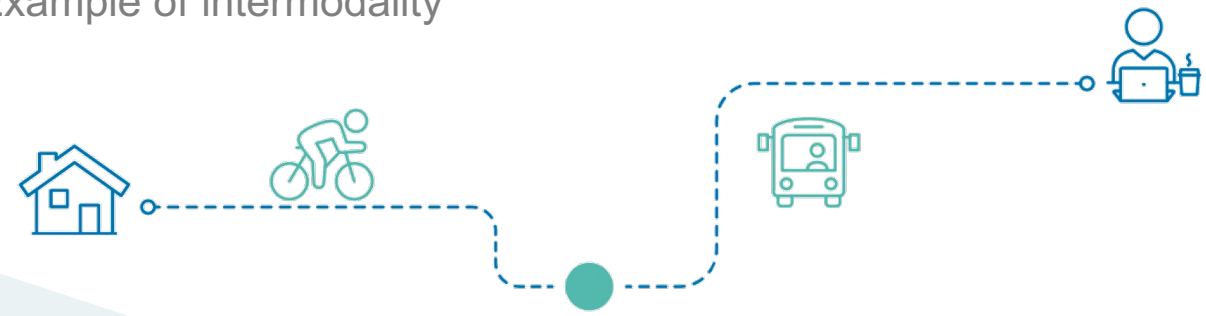
#3

SMART MOBILITY: DEFINITION

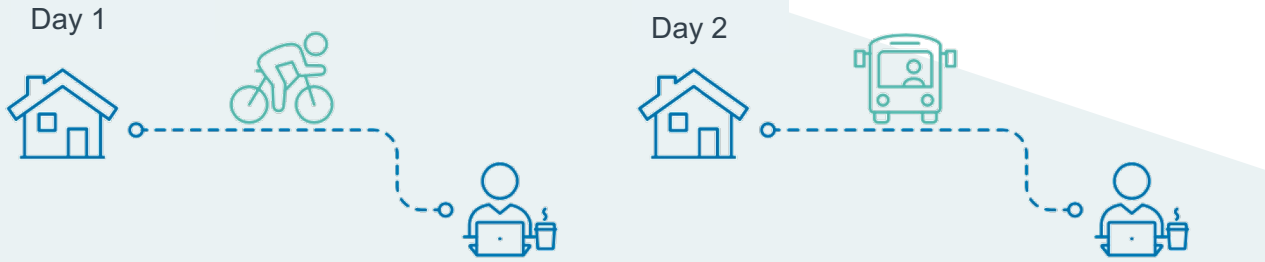
MULTIMODAL MOBILITY

MULTIMODALITY & INTERMODALITY

Example of intermodality



Example of multimodality



Adapted from Lebas, A. (2020)

4 INNOVATION TRENDS IN SMART MOBILITY

#1
Electrification

#2
Sharing

#3
Connectivity

#4
Automation

4 INNOVATION TRENDS IN SMART MOBILITY

#1
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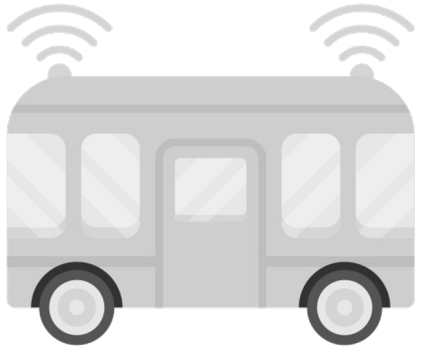


#4
Automation

#3 CONNECTED MOBILITY

DATA USAGE PROCESS IN MOBILITY

Adapted from Lebas, A. (2020)

COLLECTION

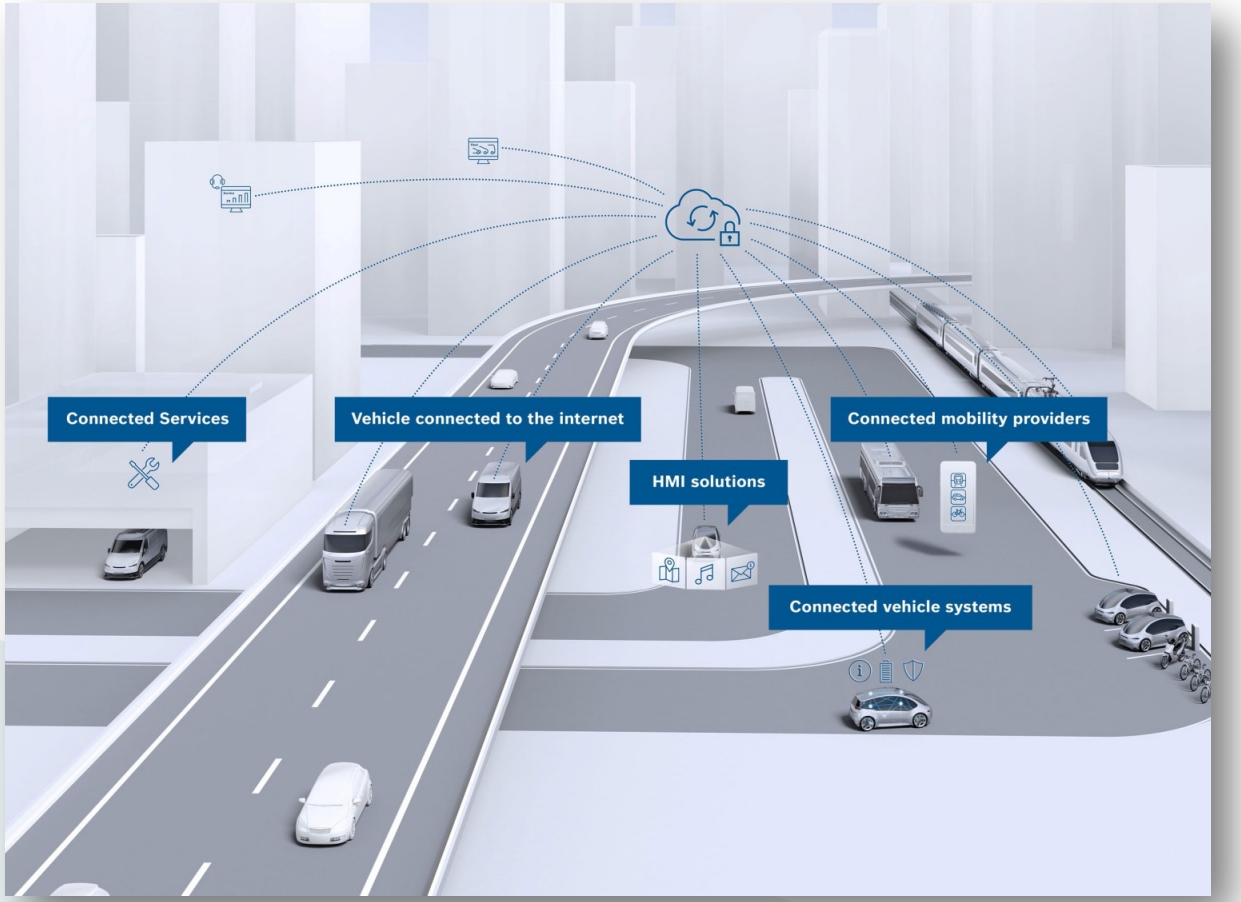
Data are generated through various channels (Big Data, sensors, Internet, etc.). These data are generated in real time.

CONNECTION

Datas are shared on the network, either from vehicle to vehicle (v2v), from vehicle to infrastructure (v2i)

USE

Infrastructures and vehicles instantly learn from the collected data and adapt towards greater efficiency, optimisation, fluidification, prédication and personnalisation



Bosch.com

#3 CONNECTED MOBILITY

SOURCES OF DATA

Generated by people

- Floating mobile data
- Location history data
- Crowdsourced data

Generated by vehicles

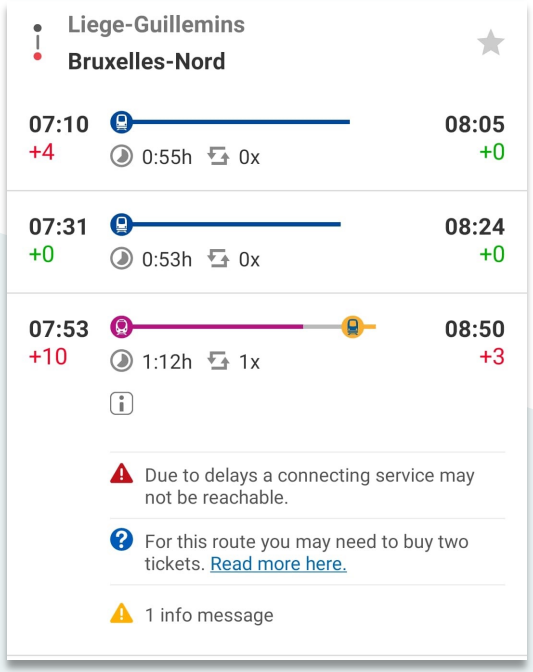
- Floating data
- Connected vehicle data
- New mobility providers

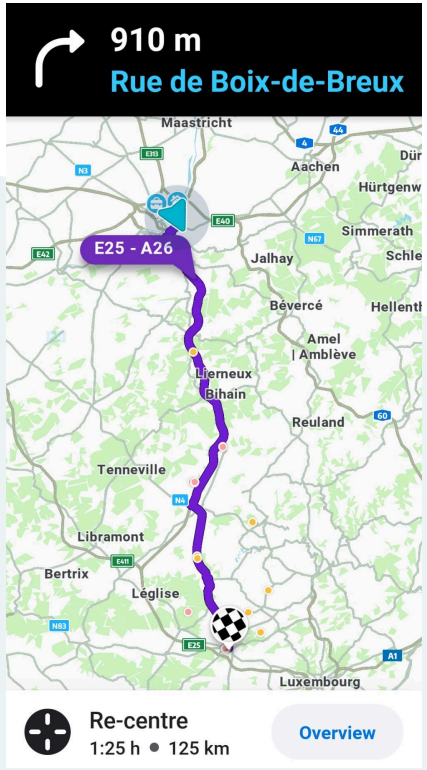
Generated by the city

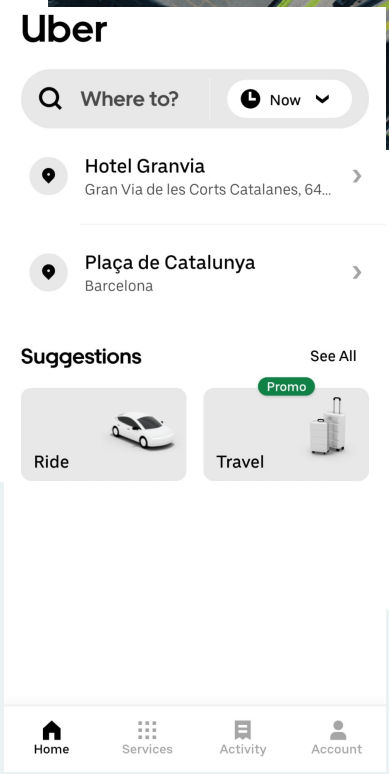
- Sensors
- Camera
- Fare

EIT Urban Mobility, 2023

#3 CONNECTED MOBILITY







HOW DOES DATA SUPPORT MULTIMODAL MOBILITY?

INTEGRATION OF SERVICES

Digital integration

Physical integration

MULTIMODAL MOBILITY

DIGITAL INTEGRATION OF SERVICES

Digital integration

Platforms for centralising information, booking and/or payment (e.g. Mobility as A service)

Lebas (2020). Adapted from Kamargianna & Mathyas (2017)

MULTIMODAL MOBILITY

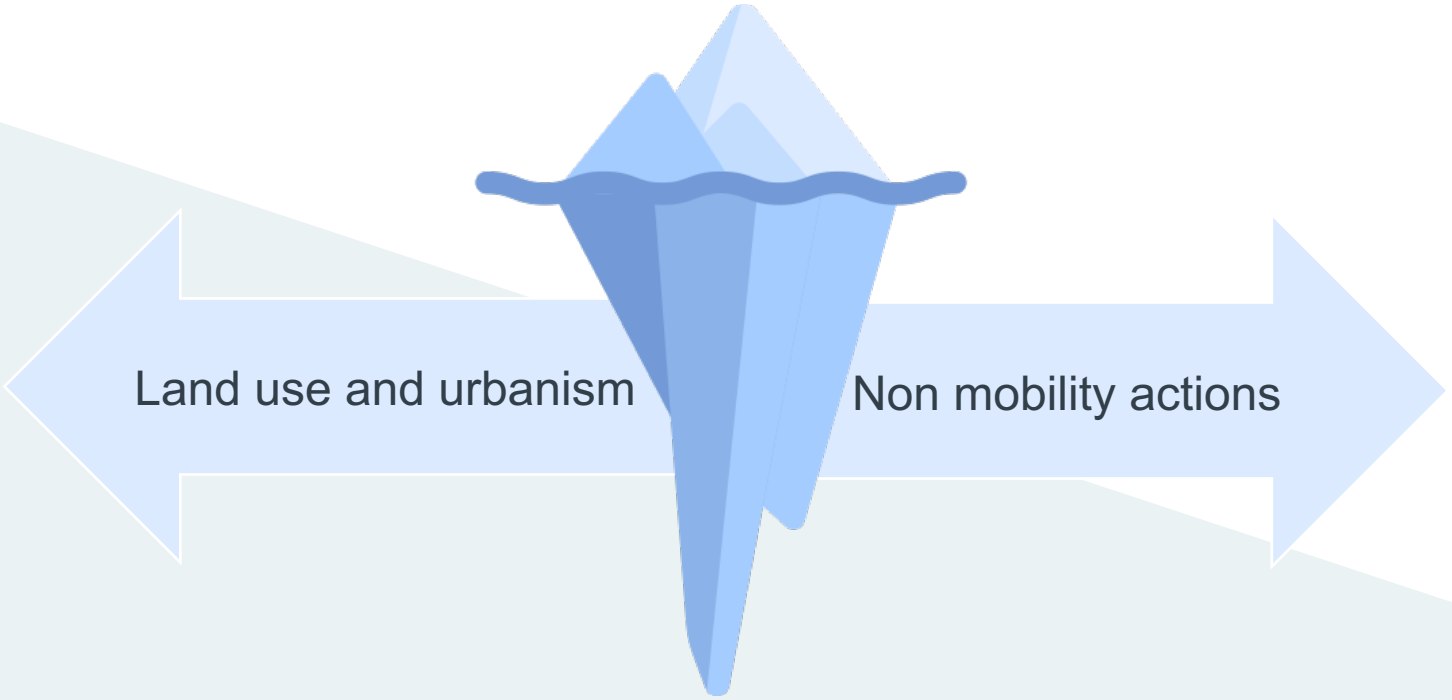
INTEGRATION OF SERVICES

Digital integration

Physical integration

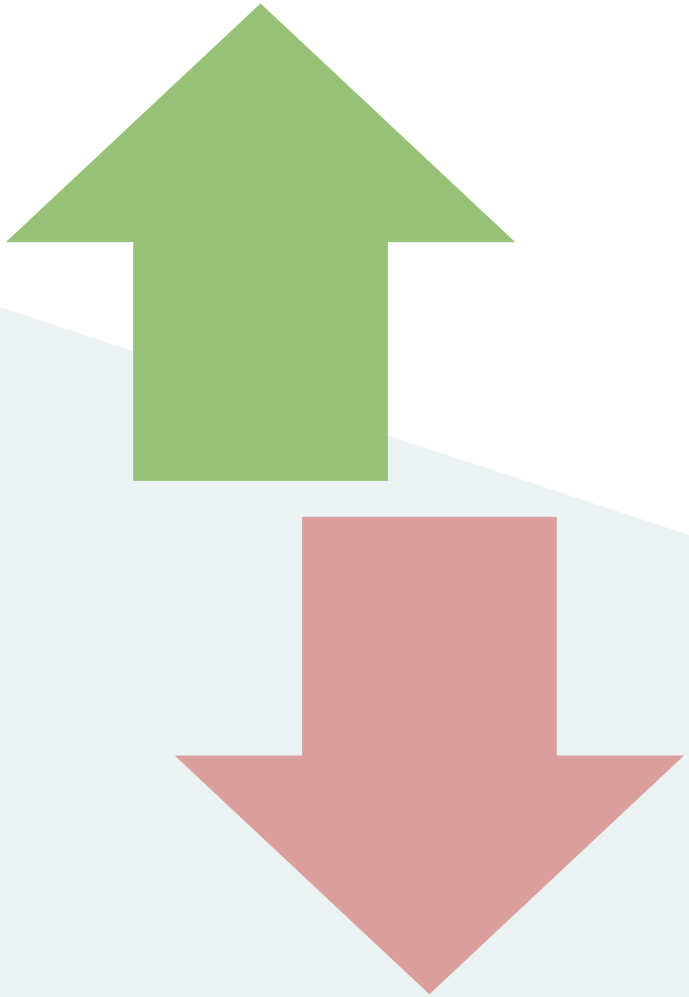
MULTIMODAL MOBILITY

INTEGRATION OF SERVICES



Physical integration

#3 CONNECTED MOBILITY

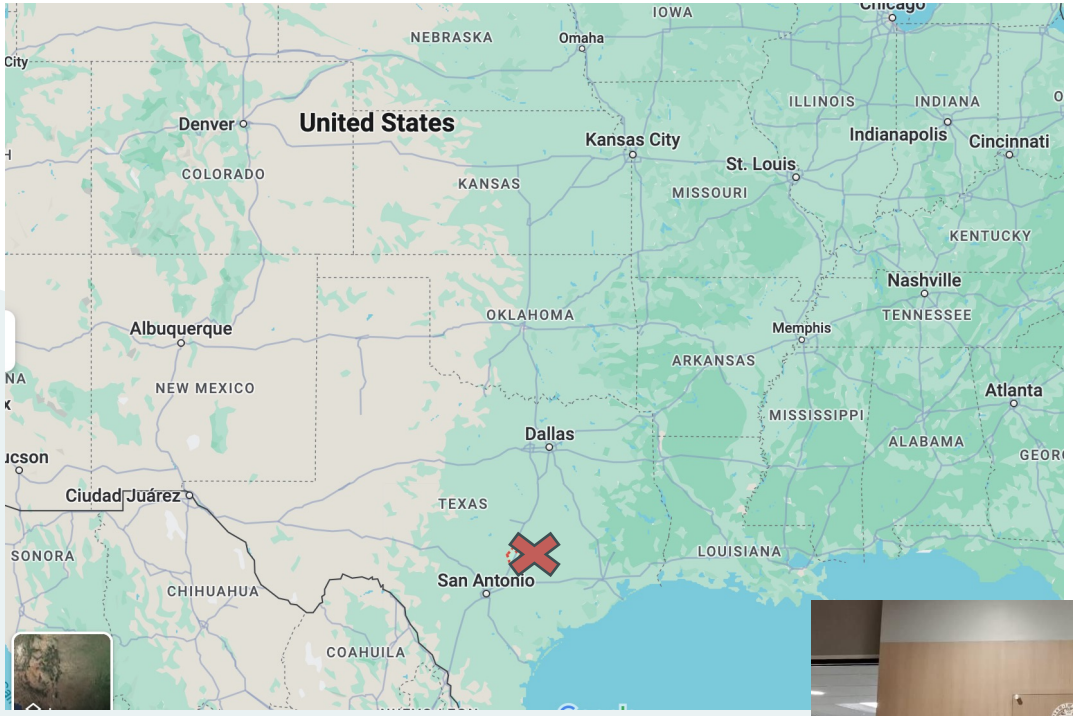


- Real time information (traffic management)
- Personnalisation
- Planning (urban, public transport, demand management)
- Safety and automation

More inclined to travel with shared transport?

- Data as the new gold?
  - Generation (volume)
  - Management (Who does what? Where?)
  - Safety & ethical issues
- Health impact?
- Energy dependency?
- Digital divide? What about rural areas?

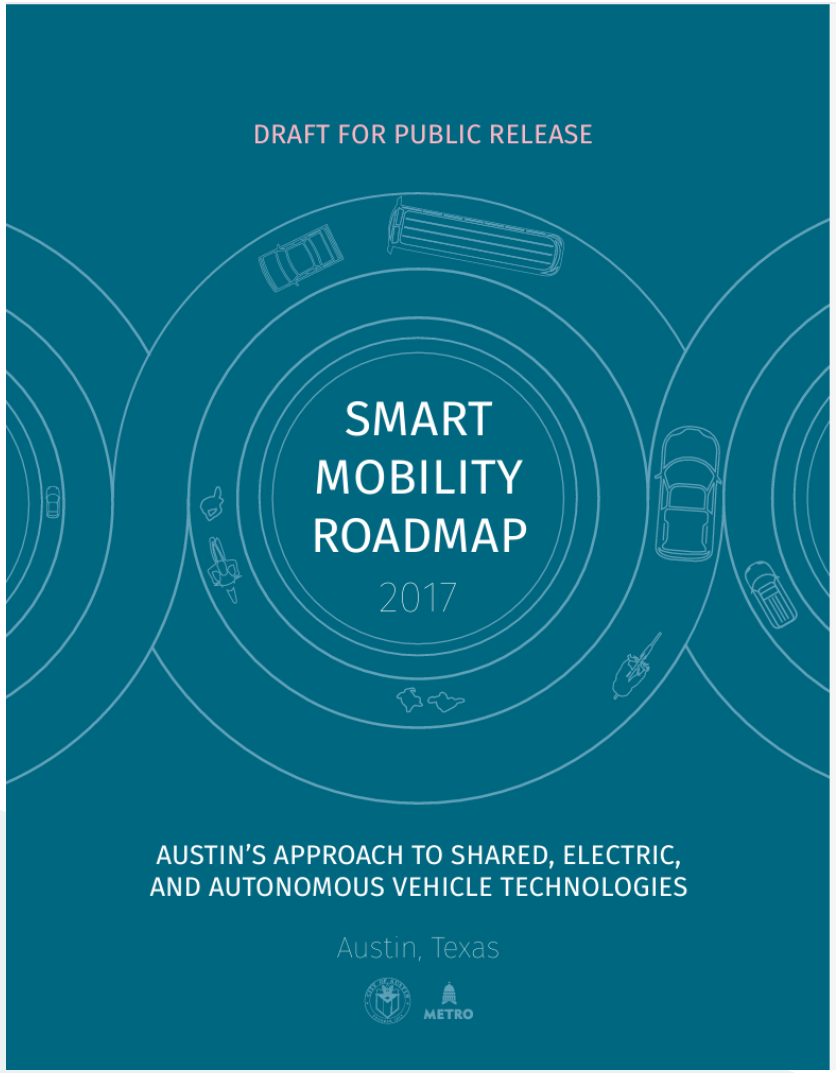
CASE: AUSTIN, TEXAS



CASE: AUSTIN, TEXAS

SMART MOBILITY

- Smart Mobility plan since 2018 relying on 3 pillars:
  - significative innovations
    - Shared mobility
    - Electric mobility and infrastructure
    - **Use of data and technology**
    - Use of space and infrastructure
  - collaborations
  - education



CASE: AUSTIN, TEXAS

VISION ZERO

- 'Vision Zero’ since 2015.
- The city's aim is to put an end to traffic-related deaths and serious injuries by 2039 while increasing safe, healthy and equitable mobility for all through a holistic approach.
- This involves a combination of measures such as safer street design, targeted enforcement, evidence-based public policy, thoughtful public engagement and local community participation.

CASE: AUSTIN, TEXAS

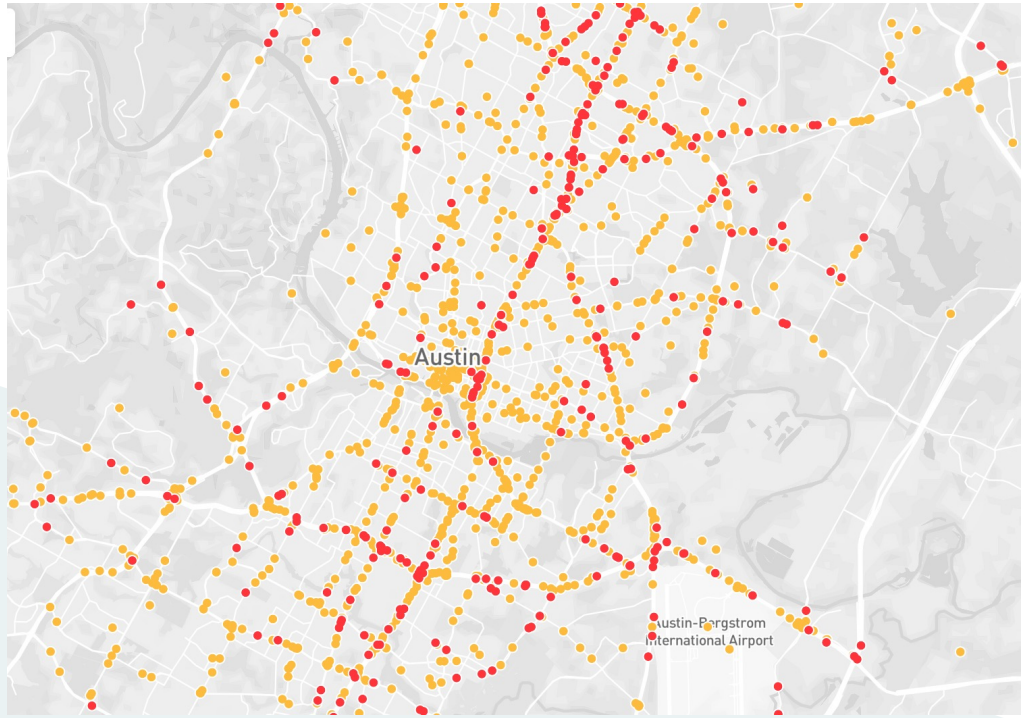
VISION ZERO (BOARD)

4	132	35	987
Fatalities in 2024	Years of Life Lost in 2024	Serious Injuries in 2024	Total Crashes in 2024
Down from 10 this time last year	Down from 203 this time last year	Down from 54 this time last year	Down from 1,388 this time last year

By Travel Mode

All | Fatalities | Serious Injuries

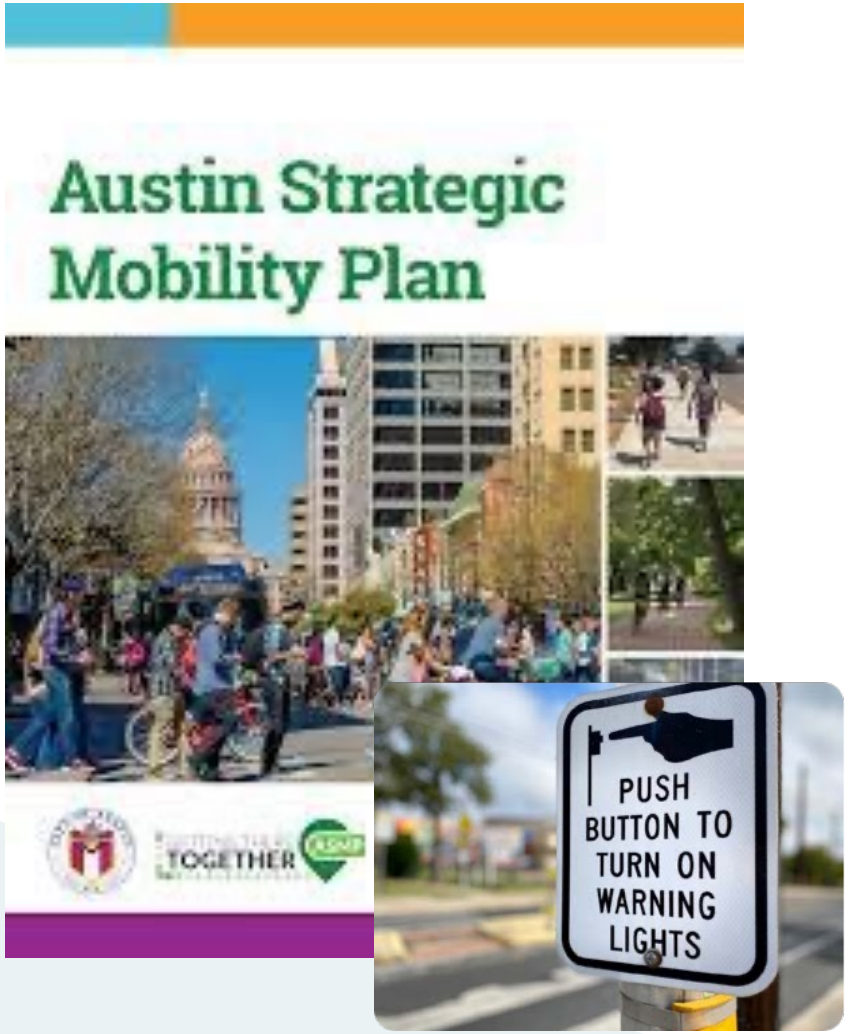
	2020	2021	2022	2023	2024
Motorist	346	402	383	319	25
Pedestrian	81	108	132	103	11
Motorcyclist	56	82	96	84	1
Bicyclist	26	29	29	30	1
E-Scooter Rider	1	11	12	6	1
Other	0	1	3	2	0
Total	510	633	655	544	39



CASE: AUSTIN, TEXAS

STRATEGIC MOBILITY PLAN

- Released in 2019 – first multimodal plan
- Roadmap for the implementation of projects, programmes, initiatives and short and long term investment in transport
- Result of a participatory process (2016-2019)
- 10 priorities, including
    - To develop shared mobility options using data and emerging technologies.
    - To put an end to traffic-related deaths and serious injuries by 2039 while increasing safe, healthy and equitable mobility for all through a holistic approach → safer street design, targeted enforcement, evidence-based public policy, thoughtful public engagement and local community participation.



SMART MOBILITY

TAKEAWAYS

- **No one-size-fits-all approach** to Smart Mobility

- **Innovation (and data)** can be **an enabler** but it **cannot solve all issues**

- Sustainability cannot be reached without **multi-/intermodality**

- Mobility is only the **top of the iceberg**

SMART CITY INSTITUTE
TOWARDS SUSTAINABILITY

THANK YOU !

audrey.lebas@uliege.be

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