



# Mobilidata: sharing road user data in Flanders

## Experiences and challenges in data protection and privacy

Peter Lewyllie, Agentschap Wegen en Verkeer  
“Smart Cities” study day, 1st March 2024

**MobiliData**



# Mobilidata

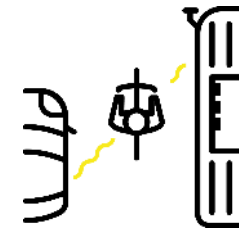


This program is co-financed  
by Connecting Europe  
Facility (CEF)

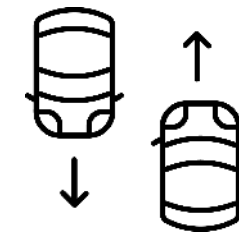
# Mobilidata Mission Statement



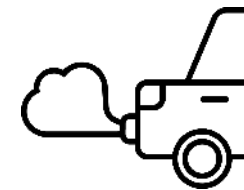
- Mobilidata creates innovative traffic solutions to make traffic **safer, more efficient and sustainable** for all road users.
- By implementing a sustainable digital **data-infrastructure and intelligent traffic light controllers** and by stimulating of the **use of innovative traffic applications**.
- In line with **Flemish mobility policy**.



Road Safety



Traffic flow



Sustainability



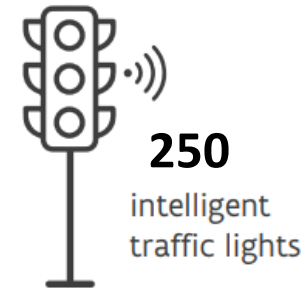
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# Mobilidata Scope & Partners



2019-2024



Partners



AGENTSCHAP  
WEGEN & VERKEER

DEPARTEMENT  
MOBILITEIT &  
OPENBARE WERKEN

DEPARTEMENT  
ECONOMIE,  
WETENSCHAP &  
INNOVATIE

AGENTSCHAP  
INNOVEREN &  
ONDERNEMEN





# Use cases

# MOBILIDATA USE CASES

01

- Static & dynamic speed limits
- Static road signs
- Static road signs – active road user

02

- Priority vehicle warning
- Priority vehicle warning – active road user
- Slow-moving vehicle warning
- Accident/vehicle breakdown warning
- Slow moving service vehicle warning
- Slow emergency/safeguarding vehicle warning
- Slippery roads warning
- Person/animal on the road warning
- Spilled load warning
- Traffic jam ahead warning
- Road works warning
- Road works warning – active road user
- Wrong way driving warning

03

- iTLC Time-to-green information and speed advice
- iTLC Time-to-green information advice – active road user
- iTLC Priority emergency vehicle
- iTLC Prioritising public transport
- iTLC Prioritising vehicle convoy
- iTLC Prioritising convoy – active road user
- iTLC Prioritising truck
- iTLC Prioritising in adverse weather conditions – active road user
- iTLC Traffic signal optimisation
- iTLC Traffic signal optimisation – active road user

04

- Recommend routing
- Truck parking information
- Park & Ride facility information

05

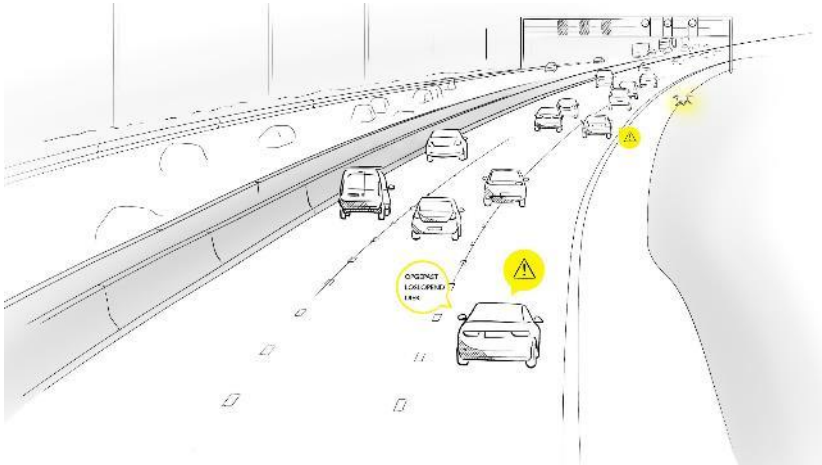
- Road safety monitor
- Smart mobility and environment indicator

MobiliData

MobiliData

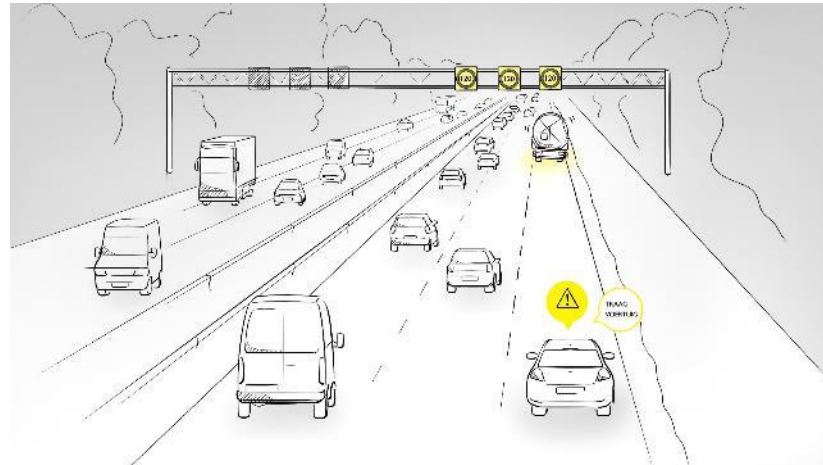
# Warning services

## Hazardous location warning



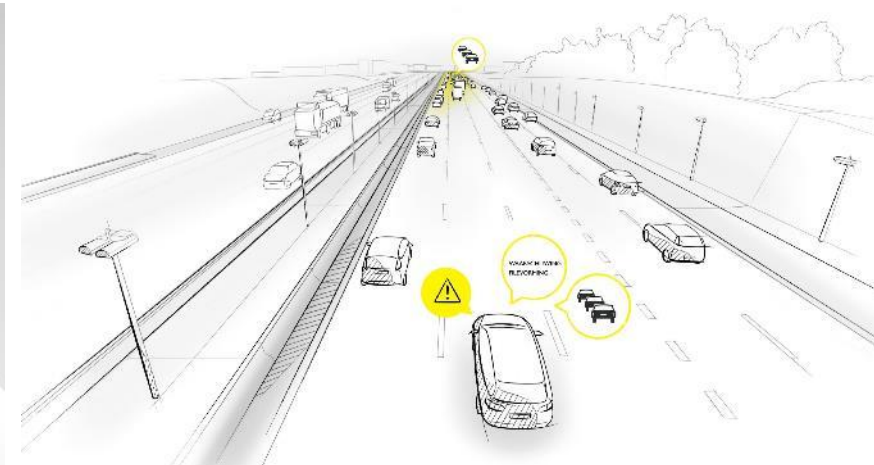
Accidents,  
person, animal, objects  
stationary vehicles  
road works

## Slow moving vehicle warning



Vehicle or service provider  
detects "slower than average"

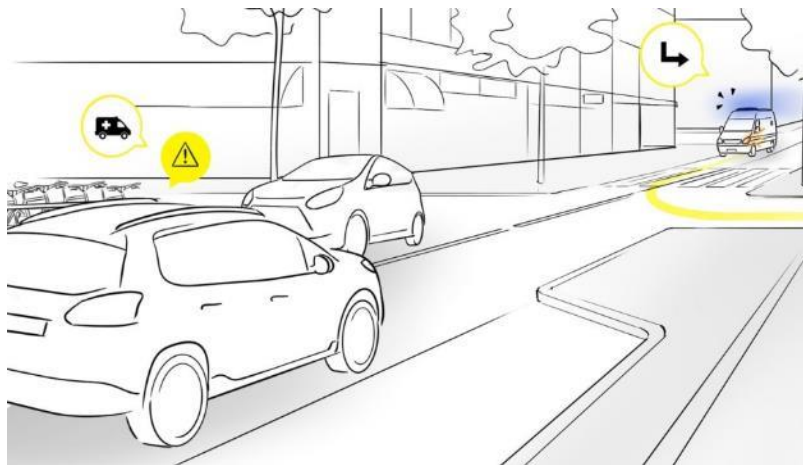
## Traffic Jam Ahead warning



Based on traffic management  
systems & service provider  
warnings

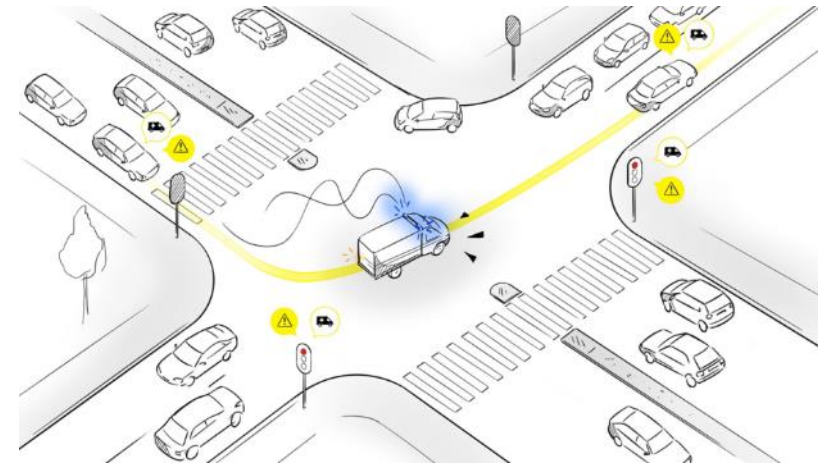
# Emergency services

Emergency vehicle warning



Mobile or stationary emergency vehicle

Traffic light priority for emergency vehicles

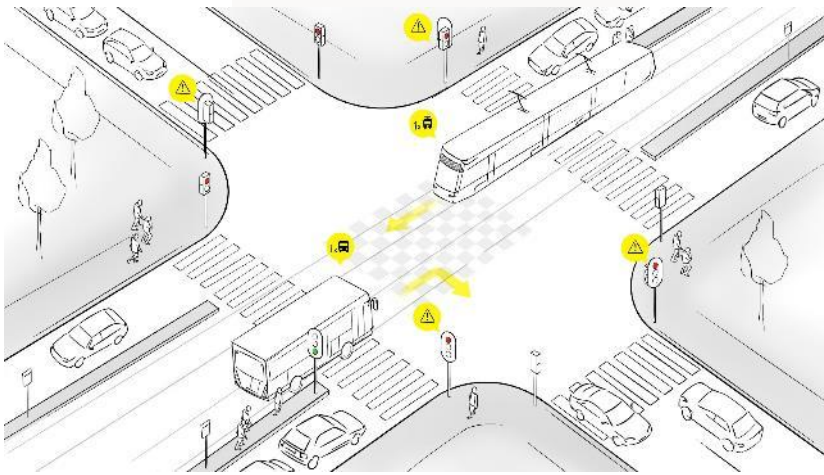


Safer and faster crossing



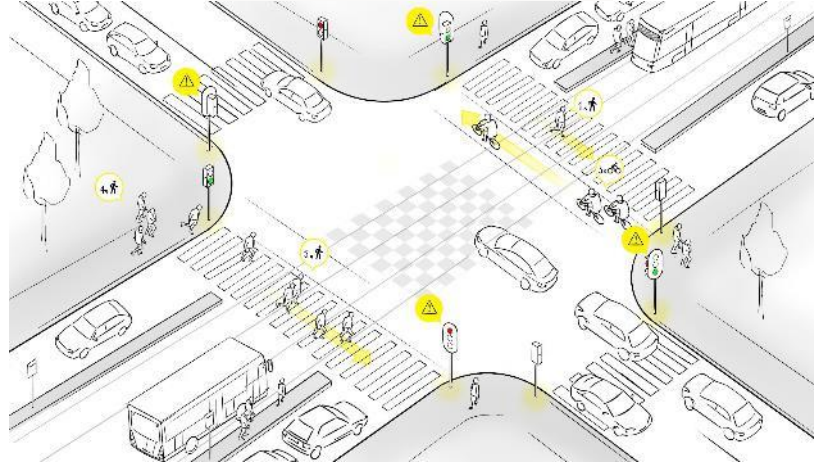
# Traffic light control

## Public transport optimization



Better information than loops  
Flexible on PT changes  
Less installation cost & maintenance

## Policy based optimization



Road user type  
Waiting times  
Stops  
Queue lengths

## Better pedestrian & bicycle detection



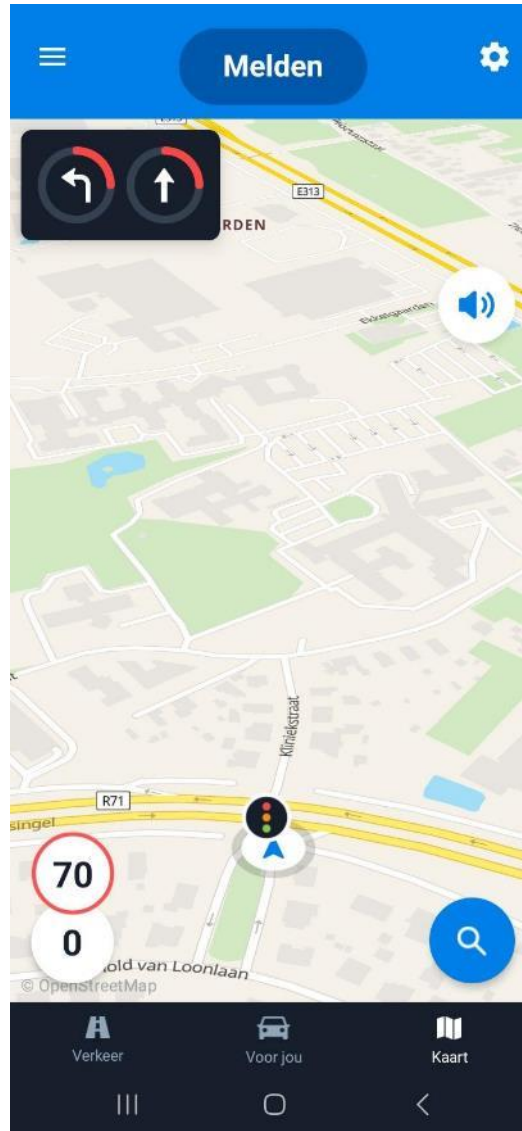
Active road users can be optimized for at distance  
(vs. push buttons)

# App examples

Bike/Pedestrian app  
(Sway)



Time-to-green  
(Flitsmeister)



Road user feedback  
(KartaGPS)

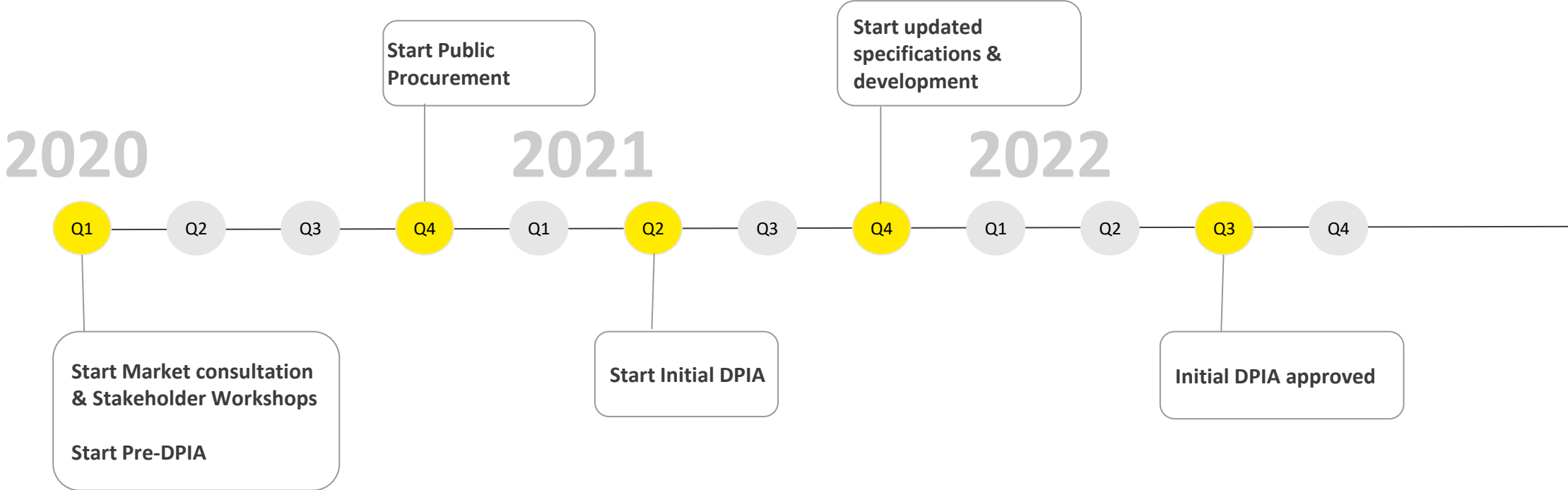






# Timeline

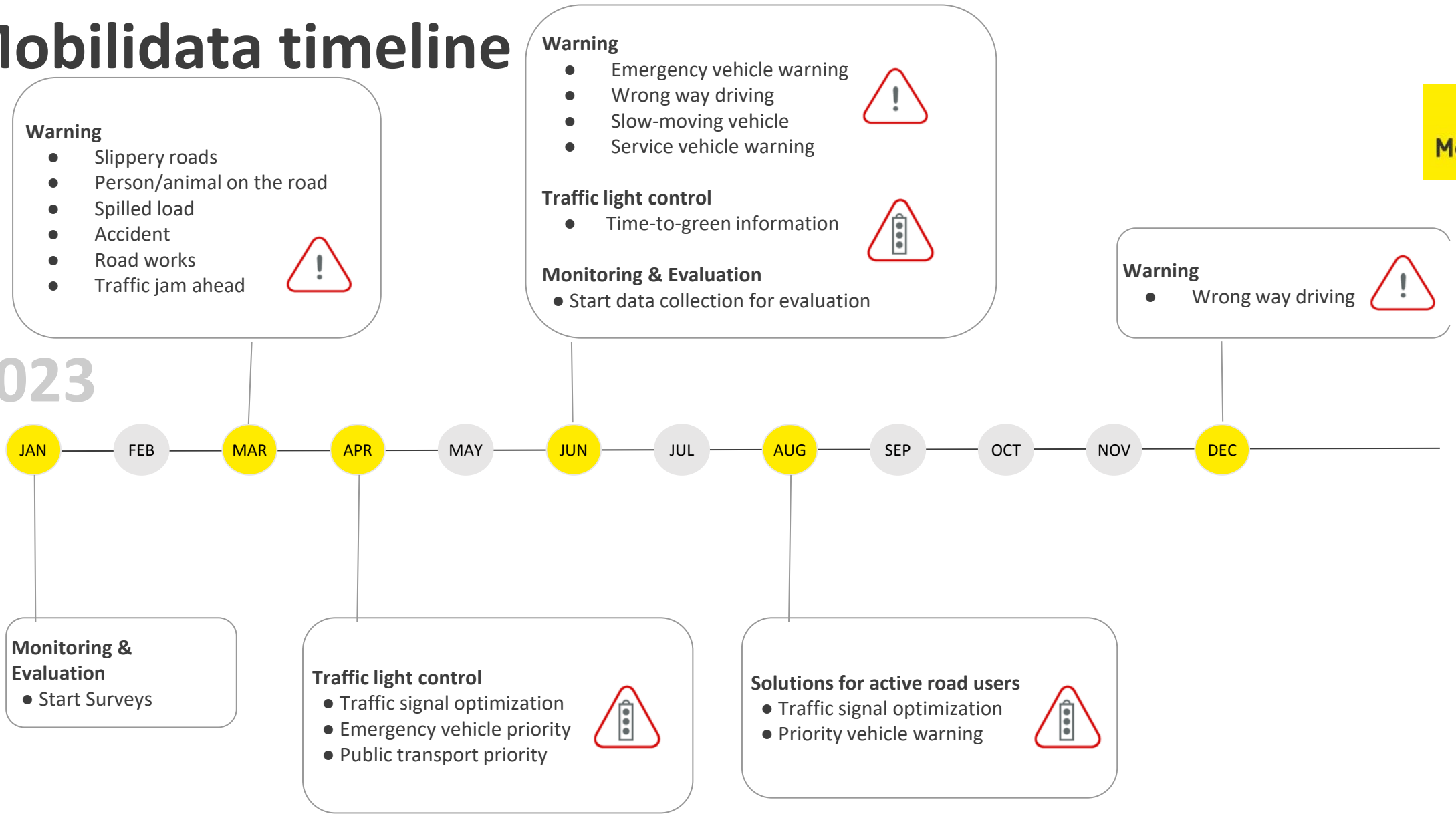
# Mobilidata timeline



# Mobilidata timeline



2023



## Warning

- Slippery roads
- Person/animal on the road
- Spilled load
- Accident
- Road works
- Traffic jam ahead



## Warning

- Emergency vehicle warning
- Wrong way driving
- Slow-moving vehicle
- Service vehicle warning



## Traffic light control

- Time-to-green information



## Monitoring & Evaluation

- Start data collection for evaluation

## Warning

- Wrong way driving



## Monitoring & Evaluation

- Start Surveys

## Traffic light control

- Traffic signal optimization
- Emergency vehicle priority
- Public transport priority



## Solutions for active road users

- Traffic signal optimization
- Priority vehicle warning






# Mobilidata timeline




2024





**Dynamic speed limits on highways** 

**Information services**


- Recommended routing
- Truck parking information
- Park & Ride facility information

**Warning Services Evaluation Report** 




**Monitoring & Evaluation Final Report** 

**Static road sign information**

**Dynamic Zone 30 information** 


**Traffic light control**

- Active road users:
- Multiple connection optimization
- Vehicle convoy support



**Traffic light control**

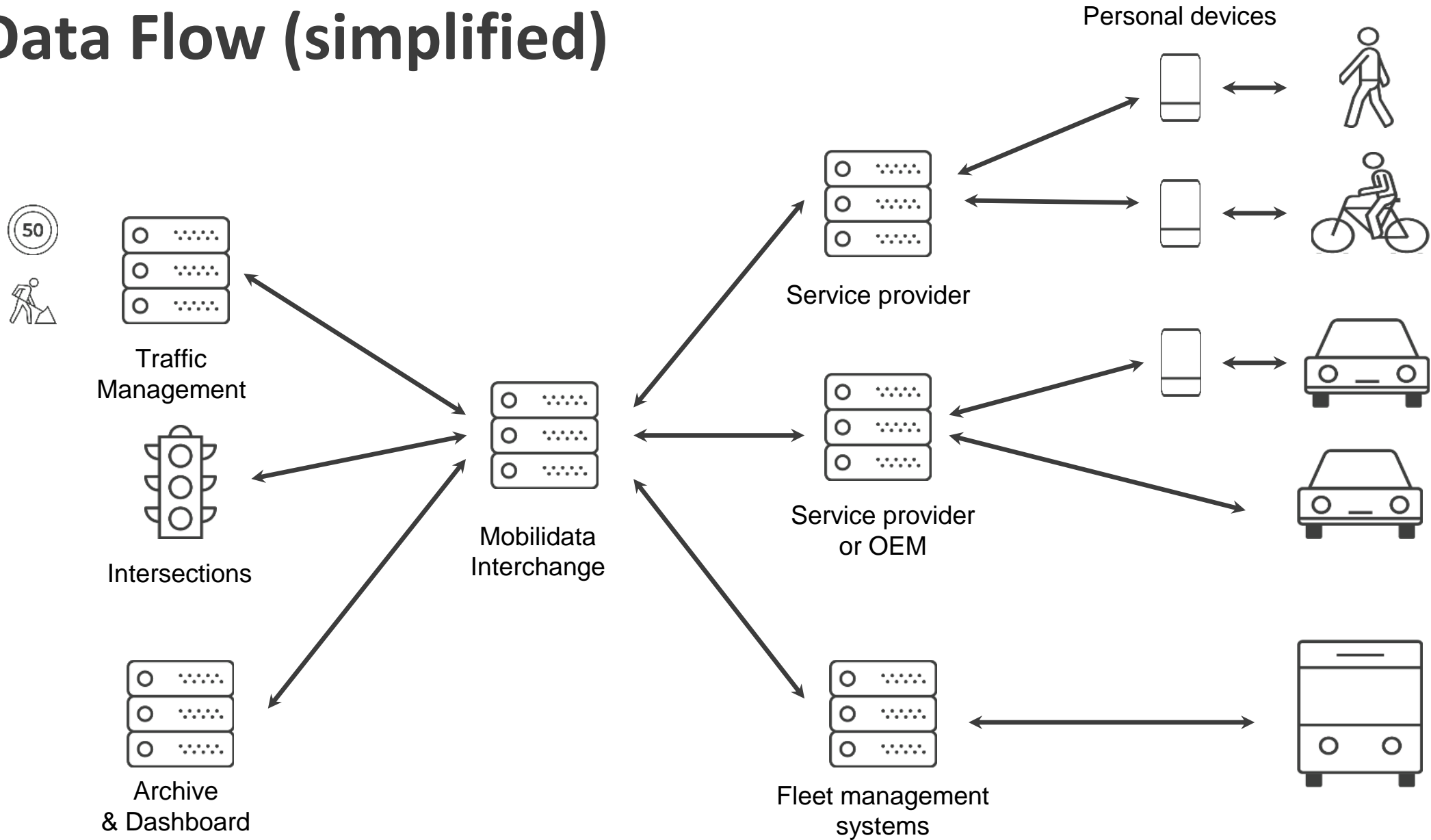
- Priority active road users in adverse weather
- Support for convoys of active road users

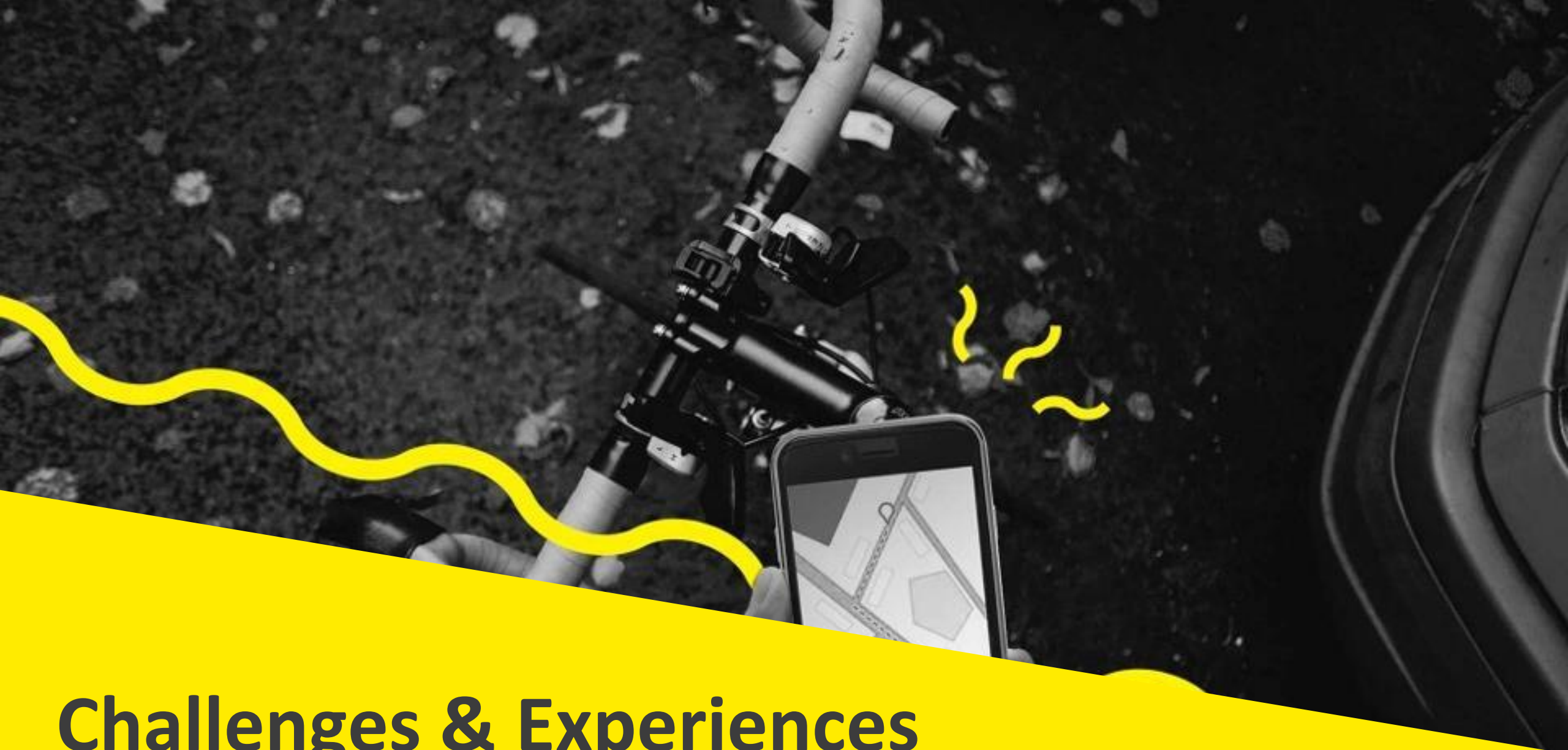




# Data Flow

# Data Flow (simplified)





# Challenges & Experiences

# Challenges

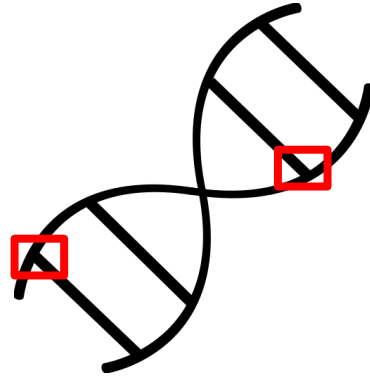
- Awareness
- Consent
- Traces
- Governance



# Awareness



identification  
presence  
access-key



identification  
physical attributes  
predisposition  
ancestry  
relatives  
presence



home  
work  
contacts  
health, religion,  
political, sexual,  
habits, lifestyle  
presence  
offences  
identification

# Awareness

Mobility data experts:

- “Anonymous location data”
- “But we don’t know who the trace belongs to”
- “But you don’t know who the trace belongs to”(\*)
- “Nothing is allowed”, “data protection is blocking innovation”
- Communication to press

(\*) SRB vs EDPS



Sensitization &  
Processes &  
Transparency



# Consent

## necessity, proportionality & legal basis

- Safety Warnings:  
task in public interest  
balance between privacy and safety for data subjects and other road users
- Emergency services / Operator Services / Public Transport:  
task in public interest or legal obligation
- Evaluation:  
task in public interest
- Traces & Surveys:  
Consent

# Consent

- Consent in apps mostly for advertisement purposes
  - Separate consent for road operator sharing and purposes
  - New in commercial mobility apps: resistance
  - Opt-in: requires convincing
- Transparency - Information
  - Purposes
  - Advantages
  - Eco-system partners

# Traces: processing

- Realtime Processing
  - Slow-vehicle & emergency / service vehicle warning
  - Traffic light control optimisation
  - Traffic light emergency vehicle priority
  - Traffic light public transport priority
- Delayed Processing
  - Traffic light control evaluation & dashboarding
    - Intensity, time loss, # stops, approach curve, priority handling, direction
  - Warning use cases evaluation
    - Driver behaviour near incidents (speed changes)
  - Aggregation for dashboarding & policy support (future work)



# Traces: re-identification

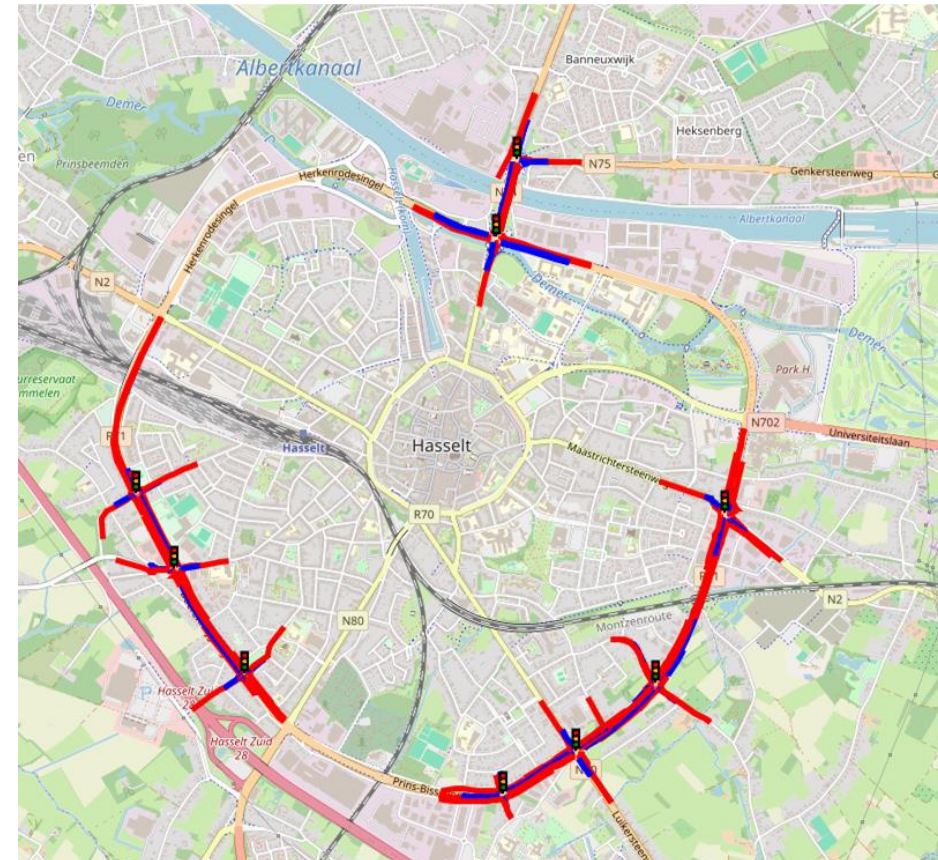
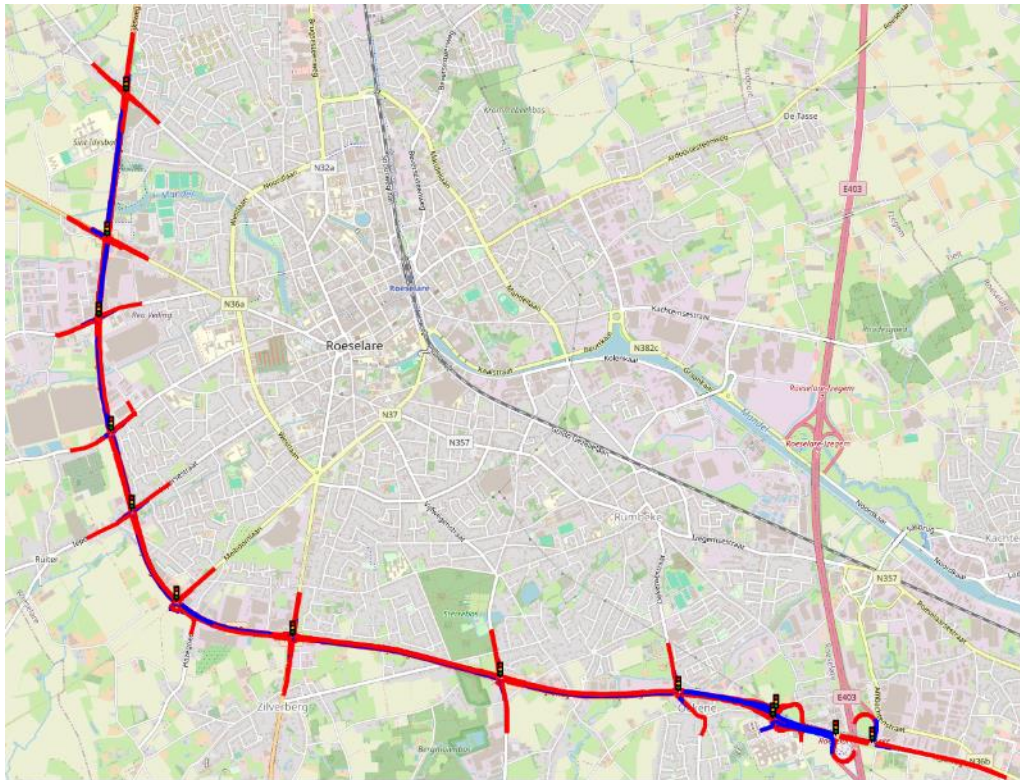
- Re-identification
  - End-points
  - Regular patterns (p.e. used to predict pedestrian/bicycle crossing)
  - Early adopters
- Risk of Re-identification
  - Hard to get expertise on board
  - Constantly evolving field: big data & AI
  - Combination with unknown datasets or identifying information
- Impact assessment = difficult to assess
  - Location: connection possible with all aspects of personal life
  - Not special category data, but very sensitive nevertheless

# Traces: anonymization?

- How to anonymize?
- Current approach:
  - No anonymization => always “personal data”
  - Data retention period as short as necessary
    - Purpose dependent
  - Data minimisation
  - Starting point data omission
  - “Geofence” near intersections and incidents => still large area
- Ongoing:
  - Literature research on location privacy preservation techniques, re-identification risk and impact
  - Research on aggregation and data minimisation for dashboarding, archive & policy support

# Traces: coverage near intersections

- Restricted to roads connected to intersections
- Only a subset of service provider data
- Still a significant coverage
- Examples: Roeselare & Hasselt



# Governance

- # different partners and stakeholders
- Organisation structure - #workgroups & partner meetings & steering committee
- Governance, based on Flanders' Information Classification framework (ICR)
- Risk management & technical/organisational measures
- Oversight & Supervision
- Data sharing: Protocols and/or Processing agreements
  - Controller - Processor: can change over time
- Continuous re-assessment of evolving use cases, technology, architecture and connecting parties, law and regulations

# Ongoing or future assessments

- Data exchange with Public Transport companies
- Data exchange with police (emergency vehicle locations)
- Data exchange with major car or app manufacturers from non-EU or non-adequate-protection countries
  - China, US (Latombe/SchremsIII?), Waze / Google Maps / Apple Maps?
- Mobility / Bike app use by children – parental consent
- Identity management for apps (road user type)



# Conclusions

- Privacy by design is an everyday mission
- Invest a lot in awareness raising
- Continuous re-assessment of evolving field

AGENTSCHAP  
INNOVEREN &  
ONDERNEMEN

Dit programma is mogelijk  
danzij de financiële steun  
van Vlaio



Dit programma is  
co-gefinancierd door  
Connectin Europe  
Facility (CEF).



# Share knowledge!

## [www.mobilidata.be](http://www.mobilidata.be)

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