MERIDIAN Deliverable D 8 – D1.08 – Onsite visit BE – Report

Document Information

Authors

Name	Organisation
Jean Walravens	AWV

Distribution

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02-07-2024	00-00-01	AWV for review
09-07-2024	00-00-02	Reviewed version
10-07-2024	00-01-00	PAT for review
25-07-2024	01-00-00	Public

Abstract

On the 20th-21st of June 2024, The Flemish Government – Agency for Roads and Traffic organised a MERIDIAN onsite visit in Ghent, Belgium.

The Belgian onsite visit was organized as a self-contained event (not connected to a steering committee or other MERIDIAN meeting). To allow the highest attendance possible the onsite visit was followed by a knowledge building C-ITS workshop. The event was organised as a noon-to-noon event on Thursday 20th and Friday 21st of June 2024.

The Belgian onsite visit is related to task T3.01 Mobilidata which is part of work package WP3 C-ITS of MERIDIAN.

Content

Agenda

The Belgium onsite visit focussed on the Mobilidata C-ITS deployment program and included live demonstrations and a workshops session.

Day 1: the Mobilidata program was on the agenda to explain its goals, background, architecture, future, etc. Immediately afterwards, the plan is to hit the roads with a van equipped with tablets to put the theory into practice. During the demonstrations highway use-cases and emergency services use-cases were shown. During the demo tour, and also afterwards the participants had all their questions answered and had the chance to discuss their findings.

Day 2: the goal of day 2 was to discuss the roll-out of C-ITS in several MERIDIAN countries. In a workshop the plan was to discuss learnings, best and worst practices and challenges/obstacles, etc. Furthermore, the evaluation of the Mobilidata program and the takeaways of the MERIDIAN Knowledge Building task on C-ITS were on the agenda.

Below are depicted the agendas for the first and second half day:

20th of June 2024 — Room: De Twistappel — 1st Floor

Time	Agenda Item	Lead/Speaker	Supporting Documents
12:00	*Welcoming and walk-in, sandwich lunch*		
13:00	Introduction BE On-site Visit / Agenda	Kristof Rombaut	
13:10	The Flemish Mobilidata program	Erika Decorte	
13:40	Walk towards the bus	Wim Vandenberghe	
13:55	Demo tour with touring car: Time to green, Blue light priority, dynamic speed limits, ...	Wim Vandenberghe	
16:25	Discussion and Q&A	All	
17:00	*End of day 1*		
18:30	Restaurant Pakhuis Schuurkenstraat 4, 9000 Gent		

21st of June 2024 Room: De Twistappel 1st Floor

Time	Agenda Item	Lead/Speaker	Supporting Documents
09:00	Introduction / Agenda	K. Rombaut	
09:10	Deployment Workshop: Learnings from each other: - **what are the killer UCs, and why** - **identified challenges(obstacles) for deployment and how did you overcome them** - **worst practices**	All	
10:10	Feedback from the workgroups	Rapporteur	
10:40	*Coffee Break*		
10:50	Mobilidata Evaluation	Lars Akkermans & Louis Nelen	
11:20	Findings from the Meridian Report of the C-ITS Workshops	Lars Akkermans	
11:50	Wrap-up BE On-site Visit	Kristof Rombaut	
12:00	*End of day 2 & Sandwich lunch*		

Report Day 1

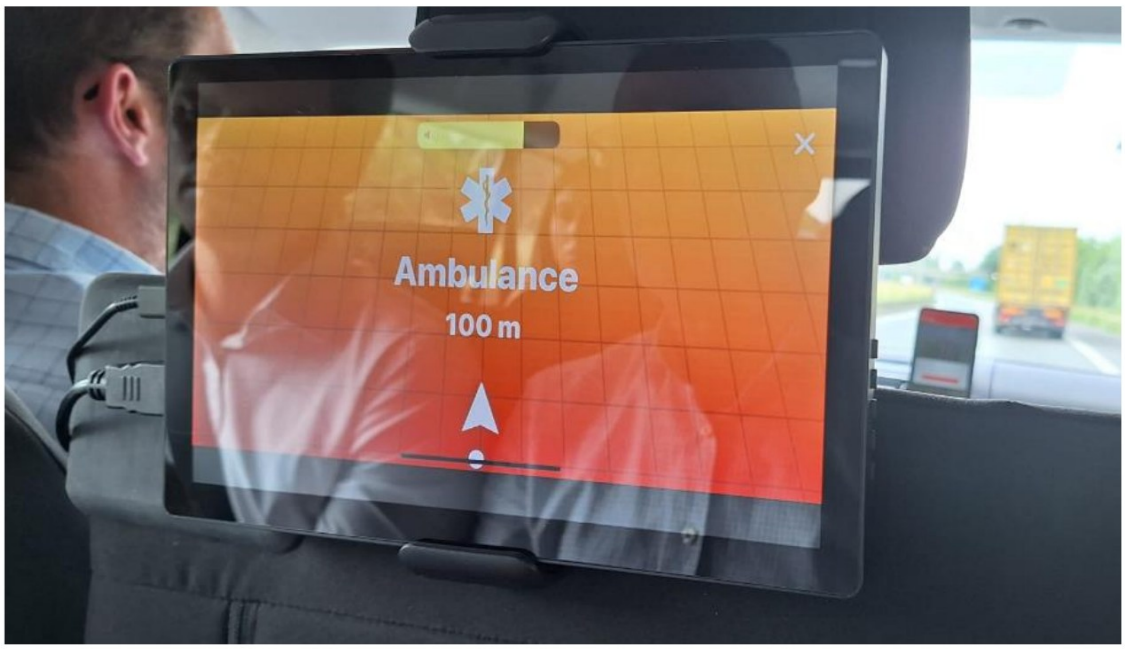
The delegates were welcomed by Kristof on behalf of Agentschap Wegen en Verkeer (AWV) and given a short introduction to the Flemish Agency for Roads and Traffic (Agentschap Wegen en Verkeer) explaining its role in MERIDIAN and its mission towards knowledge building. To end the introduction, the agenda of the 2 half day sessions was shown.

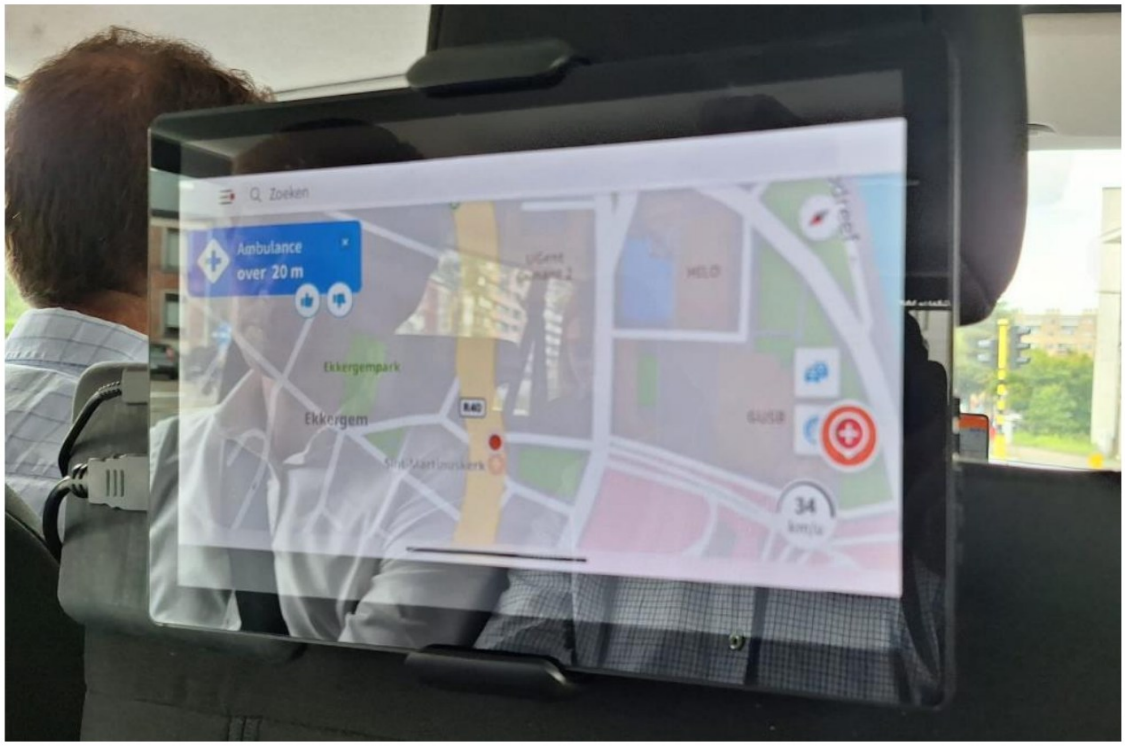
Then the Flemish Mobilidata program was presented by Erika explaining its goals, the background, the architecture, the future plans, etc. Wim gave a technical explanation of the Mobilidata architecture. The participants were able to interact with the presenters and raise many clarification questions.

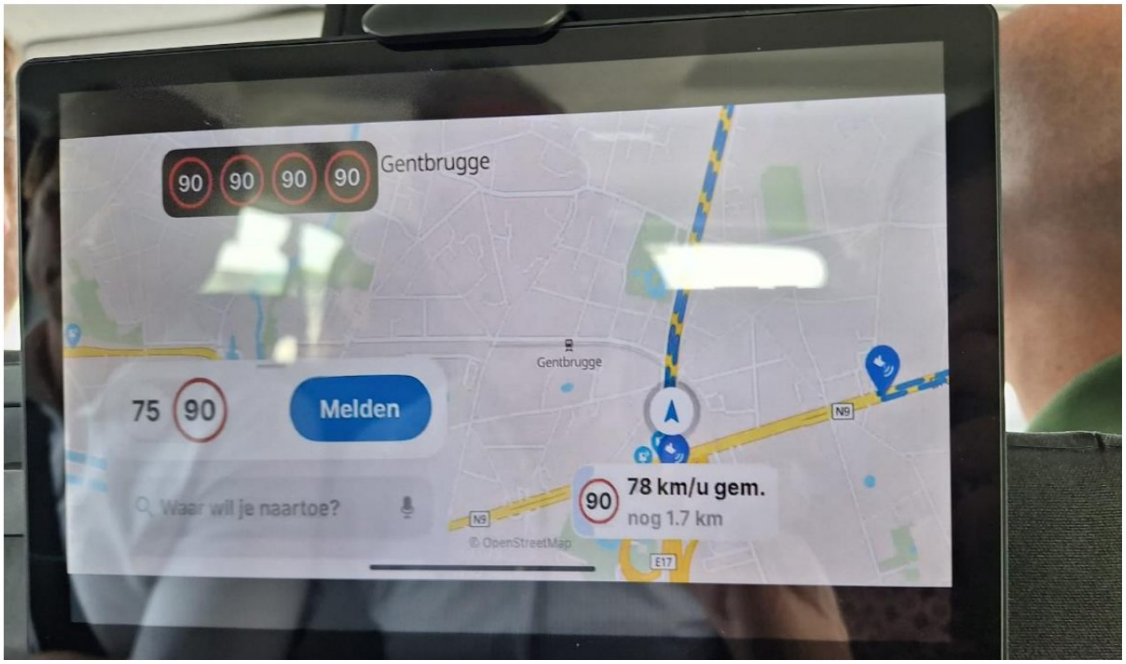
Immediately afterwards, the delegates were taken for a demo tour with a van to put this C-ITS theory into practice. The app in use by the driver was streamed to the tablets on each row in the van so that the participants could follow optimally. During the demo tour Wim explained the scenario and the use cases that were going to be demonstrated.

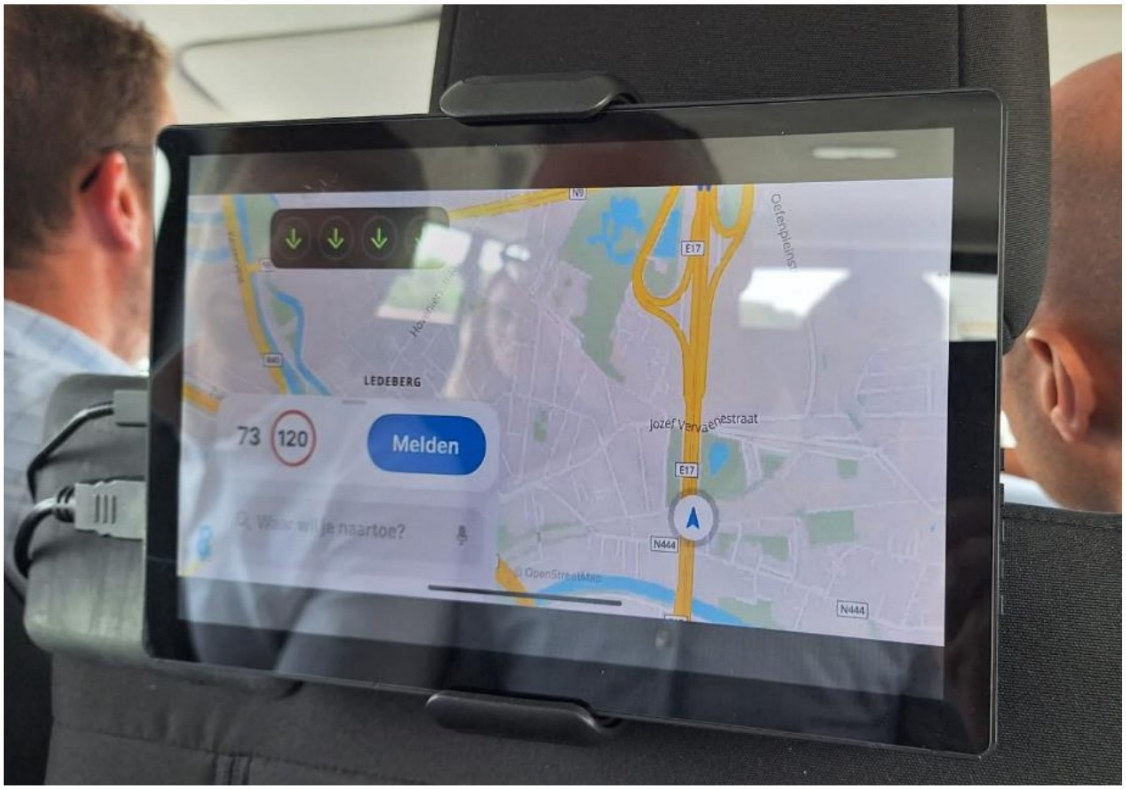
Highway use-cases such as dynamic speed limit and emergency vehicle approaching warning were shown, as well as urban use cases such as time-to-green (TTG) and priority emergency services. In addition an active road user (ARU) use case with the Sway app was explained, where the latter acts as a virtual ARU 'push button' at the

traffic light once it understands the ARU's (predictable) behaviour. All of these use cases are deployed and in use by the public.









Afterwards we reconvened and the participants had the chance to give their feedback on the demo, and have all their remaining questions answered.

Report Day 2

The goal of day 2 was set-up as a T1.04 Knowledge Building workshop on C-ITS to discuss the roll-out of C-ITS in Belgium and in several MERIDIAN partner countries. In this workshop we discussed:

- what are your killer use cases, and why?
- what were identified challenges (obstacles) for deployment and how did you overcome them?
- what are good practices, what could be improved/worst practices.

After the coffee break, the evaluation of the Mobilidata program was explained by Lars, as well as the takeaways of the MERIDIAN Knowledge Building task on C-ITS.

Overall, this onsite visit can be called a success, and the demo tour was well received by the participants.

Annexes

Attendance lists of days 1 and 2

Presentation used

BE On-site Visit meeting in Ghent, 20th of June 2024 (day 1)

No.	Name	Surname	Signature
1	Adamo	Ferro	
2	Ben	Helsen	
3	Chiara	Vishnudatt	
4	Clara	Rybin	
5	Erika	Decorte	
6	Fred	Verweij	
7	Ivano	Toni	
8	Jean	Walravens	
9	Kristof	Rombaut	
10	Lars	Akkermans	
11	Liesma	Grīnberga	
12	Louis	Hendriks	
13	Louis	Nelen	
14	Mirko	Vindimian	
15	Nick	Mijers	
16	Nora	Boujddayn	
17	Ross	Foley	
18	Stefano	Terribile	
19	Ulrich	Haspel	
20	Wim	Vandenberghe	
21			
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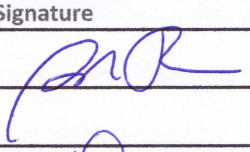
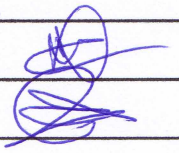
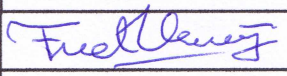
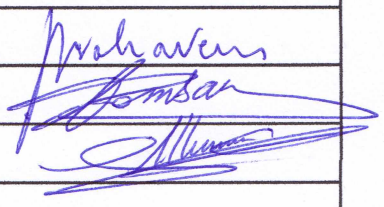
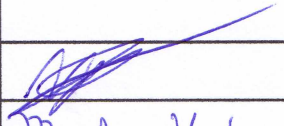
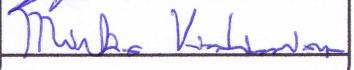
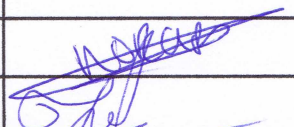
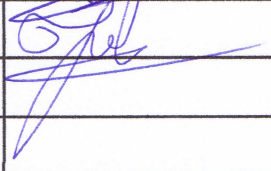
BE On-site Visit meeting in Ghent, 21st of June 2024 (day 2)

No.	Name	Surname	Signature
1	Adamo	Ferro	
2	Ben	Helsen	
3	Chiara	Vishnudatt	
4	Clara	Rybin	
5	Erika	Decorte	
6	Fred	Verweij	
7	Ivano	Toni	
8	Jean	Walravens	
9	Kristof	Rombaut	
10	Lars	Akkermans	
11	Liesma	Grīnberga	
12	Louis	Hendriks	
13	Louis	Nelen	
14	Mirko	Vindimian	
15	Nick	Mijers	
16	Nora	Boujddayn	
17	Ross	Foley	
18	Stefano	Terribile	
19	Ulrich	Haspel	
20	Wim	Vandenberghe	
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MERIDIAN

BE On-site Visit

June 20th - 21st, 2024

Ghent

MERIDIAN BE On-site Visit Welcome

Kristof Rombaut

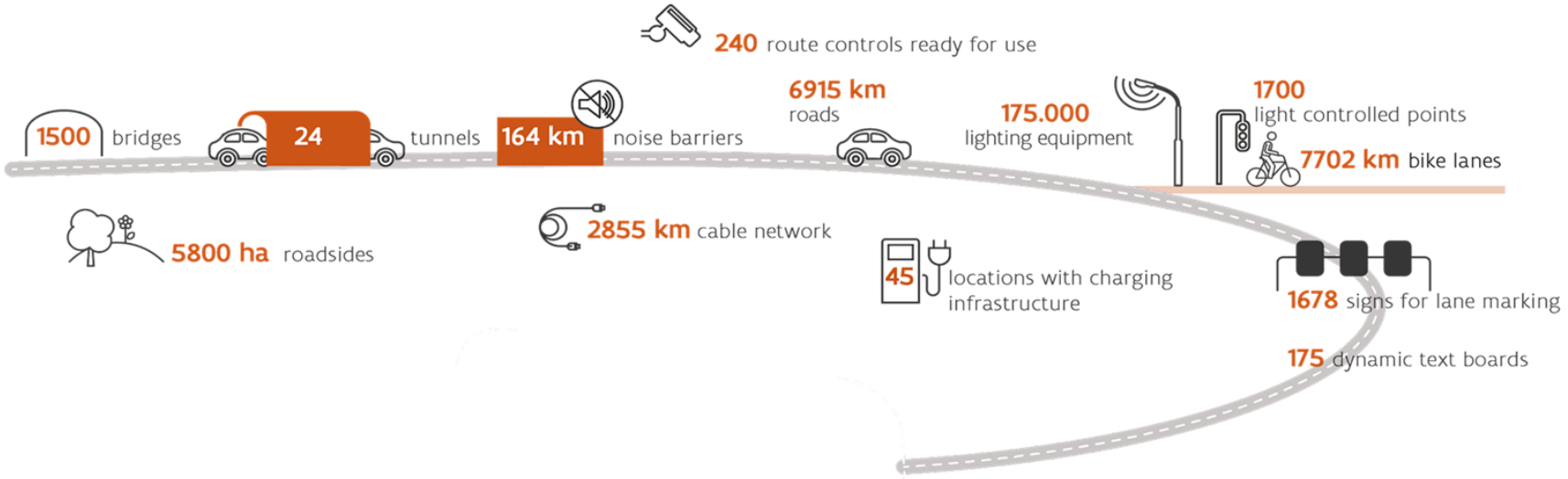
Co-financed by the Connecting Europe Facility of the European Union

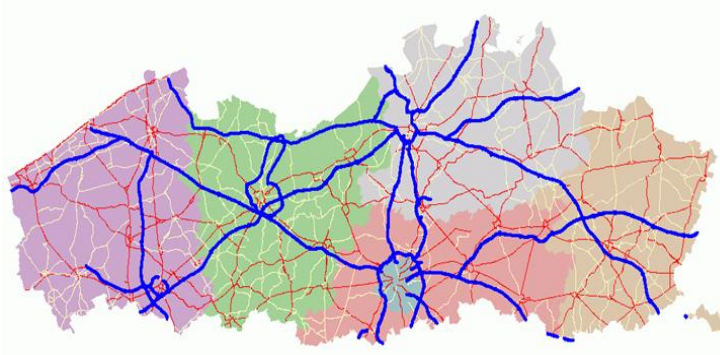
Flemish Agency for Roads and Traffic

MER Vlaanderen is wegen en verkeer

Leading in providing *safe, reliable, sustainable* and *futureproof* infrastructure and traffic management

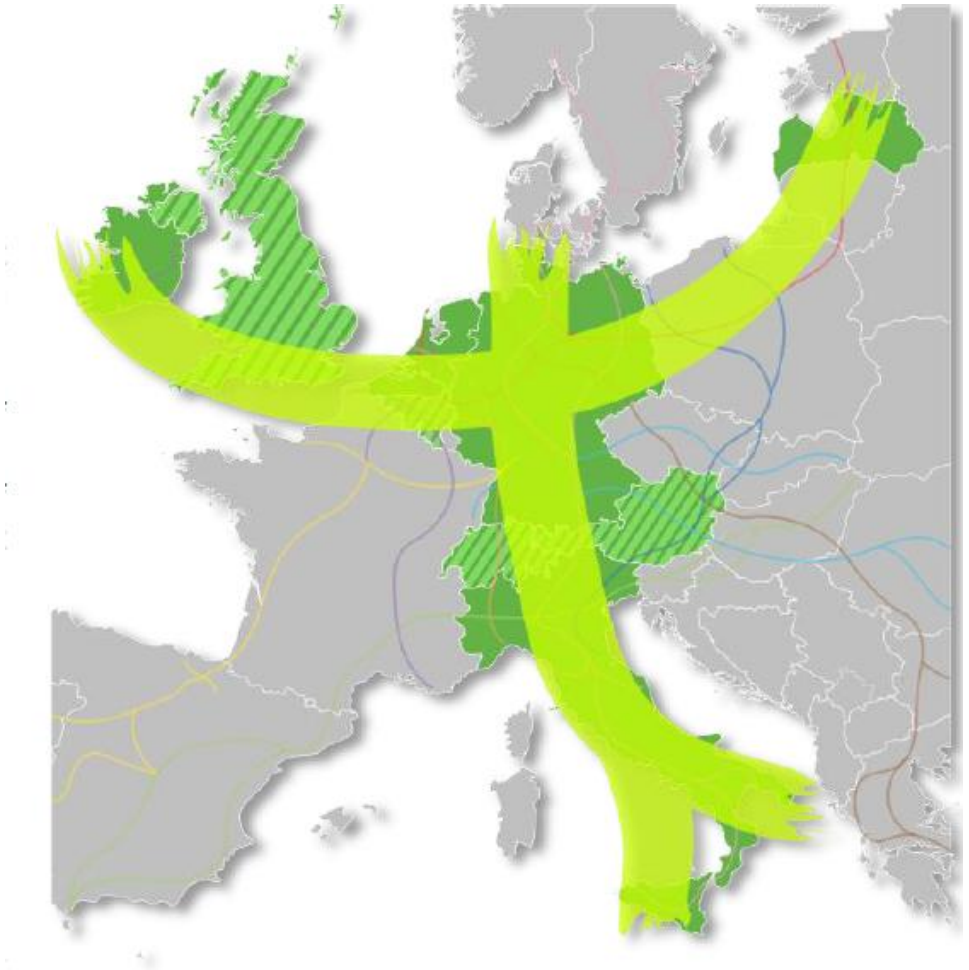
Traffic safety is our main priority





Co-financed by the Connecting Europe Facility of the European Union

- The MERIDIAN project will foster digitalisation of the mobility system focusing mainly on the Scandinavian-Mediterranean and North Sea-Baltic Core Network Corridors
- Implementing digital systems and services along the busiest European freight corridors. The project targets expansion of digital infrastructure, roll-out of C-ITS, implementation of ITS for bottlenecks on open road and tunnels, digital corridor management and multimodal services
- Its implementations will support common objectives to increase traffic safety and reduce congestion.



Work packages & Flemish Tasks

WP1 Project Management & Knowledge Building (5 tasks) – DE

- T1.01 Project Management – DE
- T1.02 Communication – NL
- T1.03 Cross Corridor Cooperation-DE horizontal tasks
- **T1.04 Knowledge Building - BE-VL**
- T1.05 Evaluation - IT

WP2 Digital Infrastructure and Digital Twin (8 tasks)

- **T2.01 Building Information Management (BIM)**

WP3 C-ITS (4 tasks)

- **T3.01 Mobilidata**

WP4 Bottleneck and Digital Corridor Management (17 tasks)

- **T4.01 Dynamic Traffic Management and Peak Hour Lanes**
- **T4.02 Tunnel Safety Systems**

WP5 Multimodal Services (7 tasks)

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Agenda Day 2

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Flanders' Mobilidata

Erika Decorte & Wim Vandenberghe

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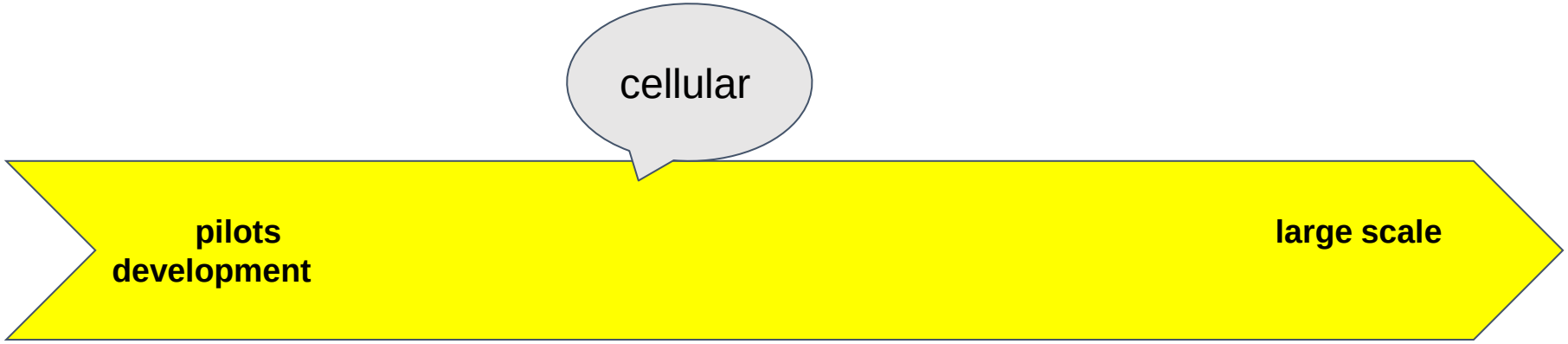
C-ITS roadmap Flanders



citrus

MobiliData

MobiliData 2?

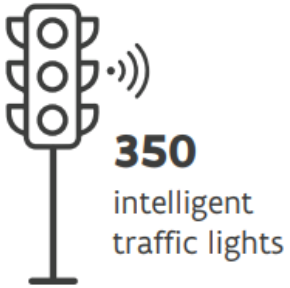
2019-2024

InterCor

C-ROADS

MERIDIAN

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



GOALS

safer traffic

smoother traffic

lower emissions

Partners:

imec embracing a better life

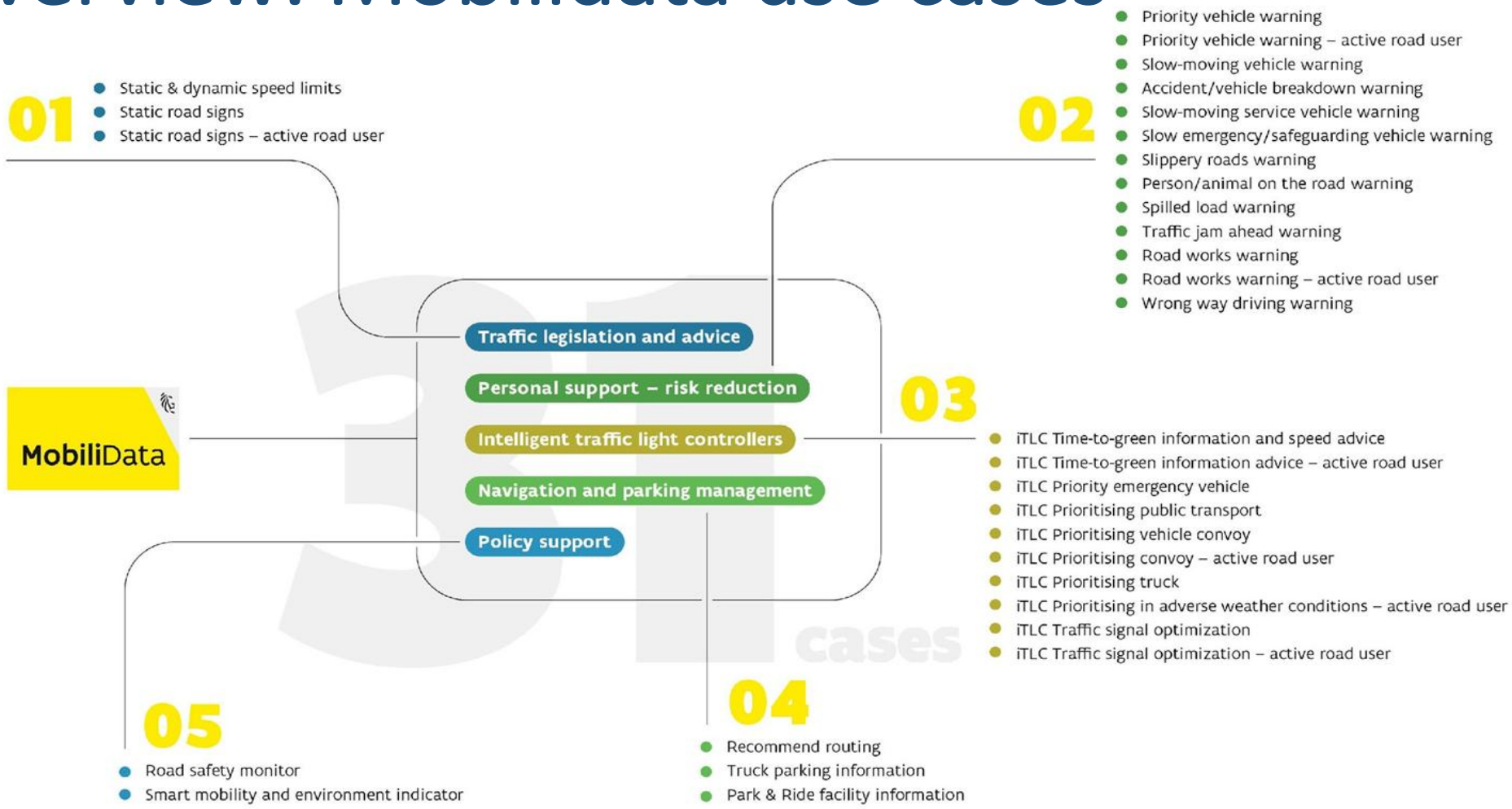
AGENTSCHAP WEGEN & VERKEER

DEPARTEMENT MOBILITEIT & OPENBARE WERKEN

DEPARTEMENT ECONOMIE, WETENSCHAP & INNOVATIE

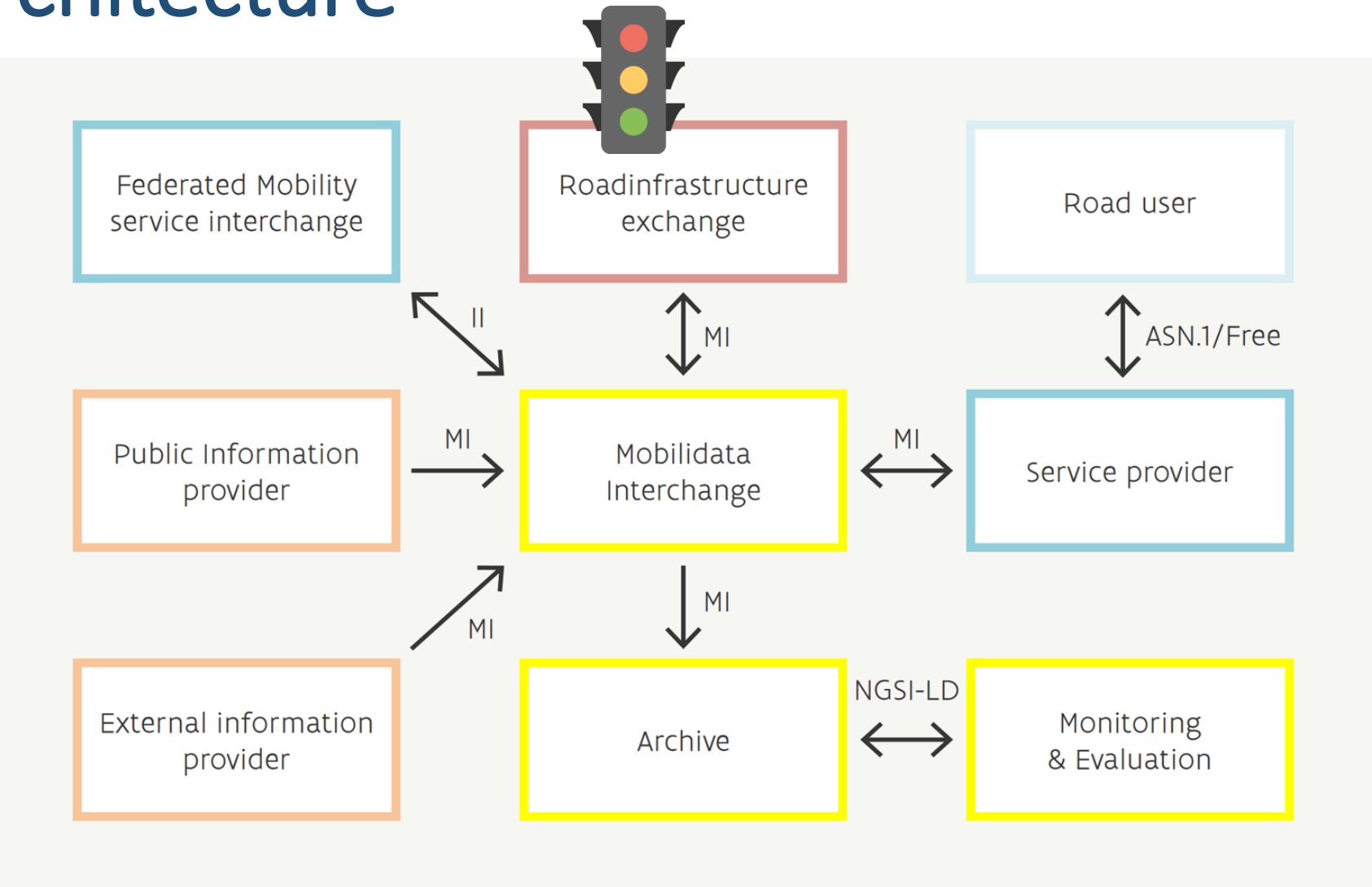
AGENTSCHAP INNOVEREN & ONDERNEMEN

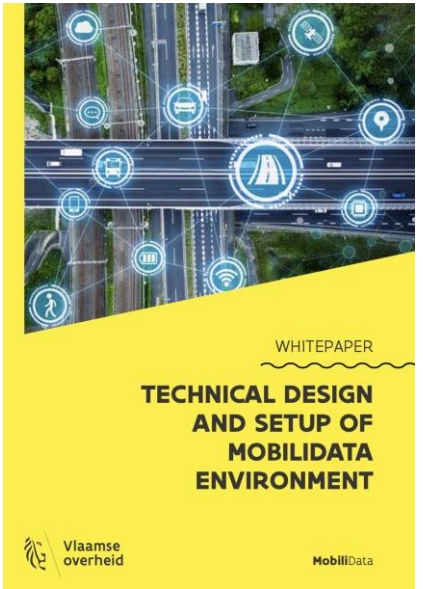
Overview: Mobilidata use cases




Flanders
State of the Art
imec

Architecture



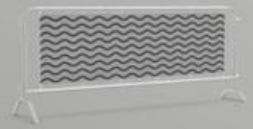


[Link to whitepaper]

iTLC

- ITS application
- RIS
- TLC

PUBLIC DATA



- Road signs
- Parking
- Incidents
- Weather forecasts
- Road Works

MOBILIDATA INTERCHANGE

- Traffic Light Exchange

CONNECTING PARTIES

- Back-end
- Front-end
- Private data

ROAD USERS

- Pedestrians
- Cyclists
- Passenger cars
- Public transport
- Emergency services

Download the apps

Get information and advice along the way!

Choose an app tailored to your needs and get started. All apps use information provided by Mobilidata. Currently, the connected apps are focused on motorized traffic.

Flitsmeister

Displays most up-to-date and detailed speed camera and traffic information.

Available on the Google Play | Download on the App Store

NDrive - KartaGPS

Free, offline and informative maps that allow you to explore new places and get detailed directions.

Available on the Google Play | Download on the App Store

Sway

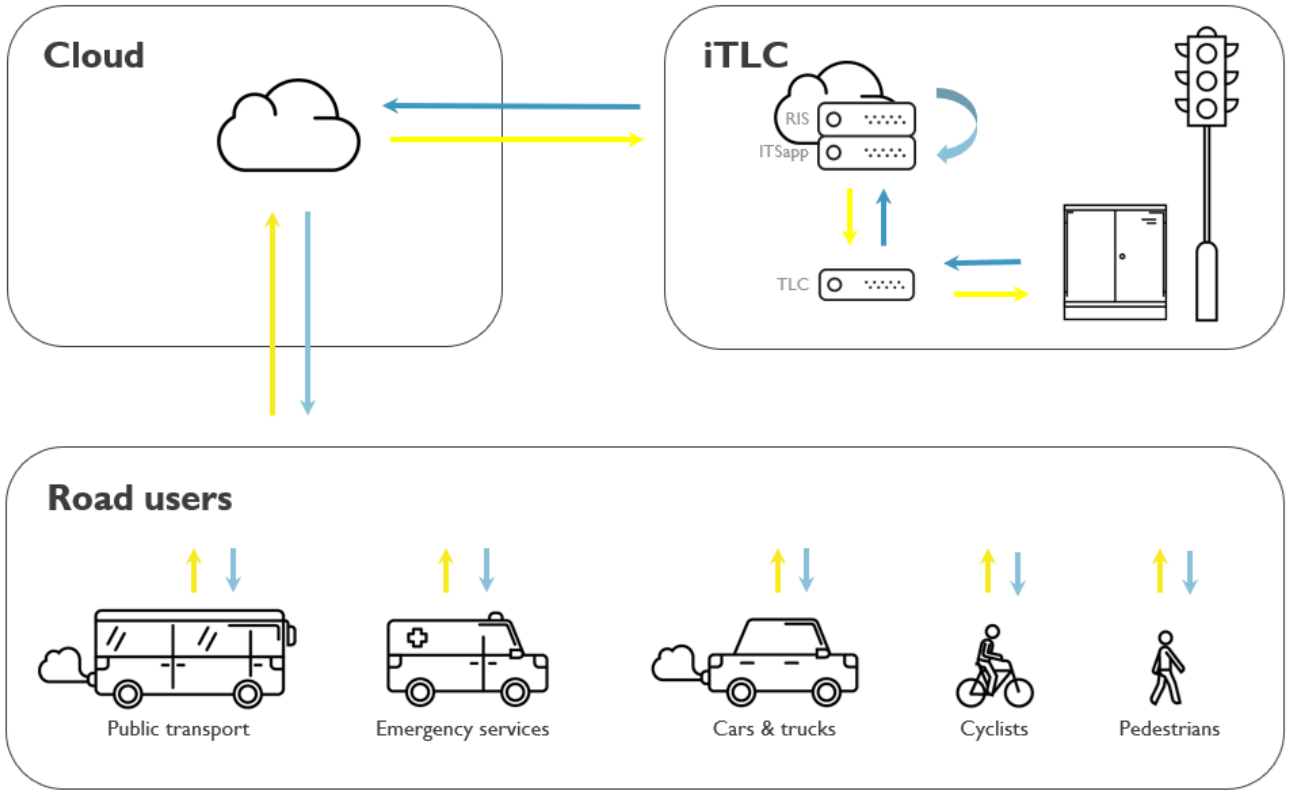
Sway is the innovative app for cyclists and pedestrians. Get the time-to-green at the intelligent traffic lights and get a running start!

Available on the Google Play | Download on the App Store

More apps coming soon

Future apps always appear on this page

Connected traffic lights



Benificial to

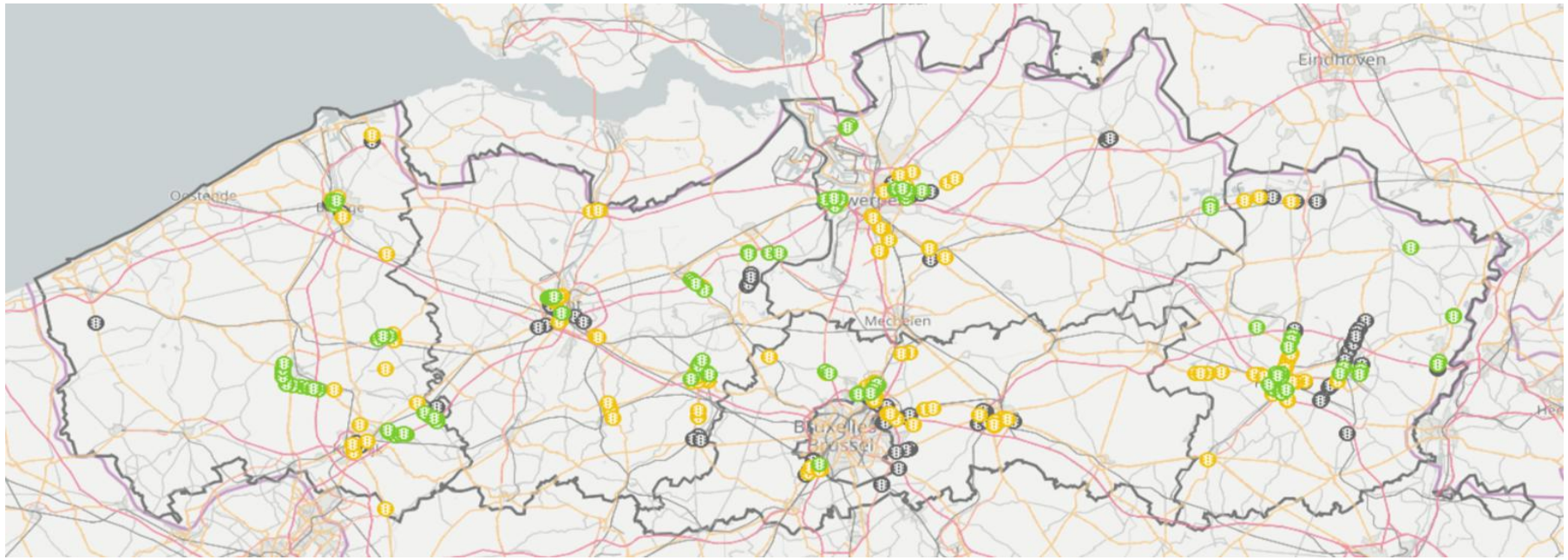
- road users
  - emergency services
  - public transport
  - active road users
  - car
- road authority
  - policy tool

Contracts open to other road authorities

Roll-out connected traffic lights in Flanders

Goal: 250 intersections by end 2024 > 200 intersections

- 100 operational, 47 in progress/operational in coming months
- TLEX operational ☑
- Mobilidata Interchange operational ☑
- Launch use cases > 2023 + 2024



Launching use cases: timeline

- Blue colored boxes: important milestones
- ITLC: intelligent traffic light controller
- Active road users: cyclists and pedestrians

Wrong way driving warning

Way forward…

- Move from innovation to commodity
  - From innovation program to running business
  - Requires healthy B2G market offering architectural components
  - Requires bigger market size demand for same components from other EU regions
  - Standardization & collaboration among regions needed
- Expand impact
  - Extend user base
  - Increase iVRI penetration rate
  - Continue investing in data quality and data collection to fuel the information creation
  - Set up additional partnerships & enlarge ecosystem
- Mobilidata 2?

Let’s cooperate!

Private parties	Road authorities	Emergency services Public transport	Public parties
Bart Lowyck bart.lowyck@imec.be	Casper Moerbeek Casper.moerbeek.ext@imec.be	Erika Decorte Erika.decorte@mow.vlaanderen.be	Lars Akkermans lars.akkermans.ext@imec.be
			

FLANDERS INNOVATION & ENTREPRENEURSHIP

This program has the financial support of FIE

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

MobiliData

AGENTSCHAP WEGEN & VERKEER

DEPARTEMENT MOBILITEIT & OPENBARE WERKEN

AGENTSCHAP INNOVEREN & ONDERNEMEN

DEPARTEMENT ECONOMIE, WETENSCHAP & INNOVATIE

imec

www.mobilidata.be

Royal HaskoningDHV – Enhancing Society Together

Goudappel

EQUANS

swarco

Trafiroad – we sign for safety

YUNEX TRAFFIC – A Siemens Business

KO HARTOG – VERKEERSTECHNIEK B.V.

BEMOBILE – a revolution in traffic

monotch – SMART MOBILITY PLATFORMS

FM

NDrive

MOVIAS smart mobility

BOSCH – Technologie voor het leven

TRANSPORT & MOBILITY LEUVEN

TRACTEBEL ENGIE

Photoshoot

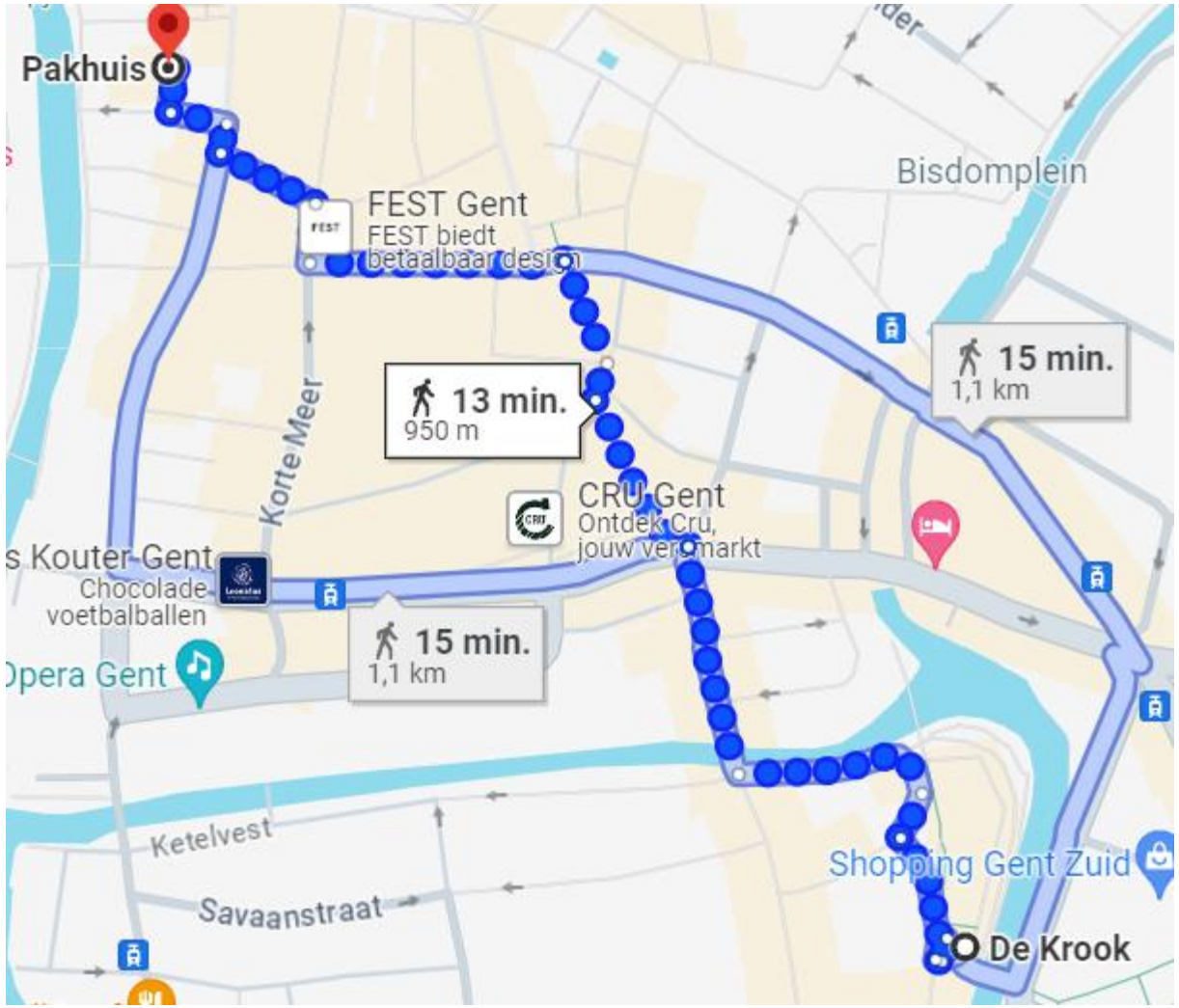
Demo Tour

Wim Vandenberghe

Dinner

- 18h30
- Pakhuis
  Schuurkenstraat 4
  9000 Gent

- Tomorrow: start at 9h00



Agenda Day 2

21st of June 2024 Room: De Twistappel 1st Floor

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Deployment Workshop Learnings from each other

Workshop questions
Learning from each other

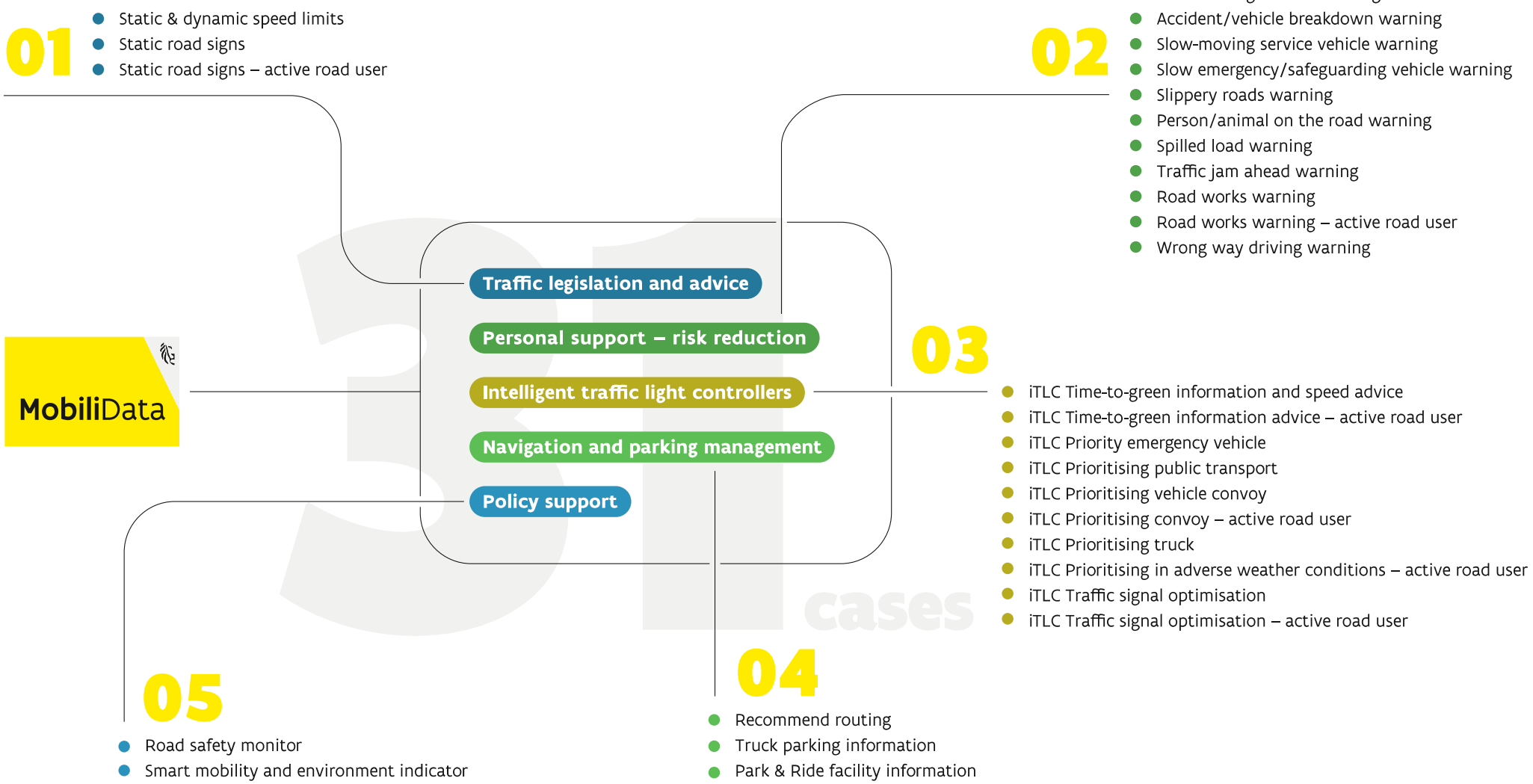
1. What are your killer use cases, and why?
2. What were identified challenges(obstacles) for deployment and how did you overcome them?
3. What are good practices, what could be improved/worst practices

Mobilidata Evaluation

Lars Akkermans

Co-financed by the Connecting Europe Facility of the European Union

Overview: MobiliData use cases



Monitoring & Evaluation methodology

Primary objective: To identify and validate, in an objective way and using a sound and repeatable method, the functioning of the MobiliData programme, the different results thereof and future (required) developments to maintain C-ITS services and the associated structure.

Secondary objective: To improve end-user pick-up and use of services based on both subjective as well as objective parameters

SIX Monitoring & Evaluation "links in the chain":

1. Technical monitoring: to continuously monitor and evaluate the (technical) functioning. Is all hardware/software working as it should be working?

   Why? The technical backbone is required to provide a continuous service. Continuity of services is important for end-user participation/use.

2. Monitoring of data quality: to monitor and improve the face validity of data towards an end user (timeliness, accuracy, etc.)

   Why? High face validity = high resemblance with "the real world" = high trust by end-users that what he sees is real.

3. Acceptability, acceptance and use (of C-ITS services): to gage and monitor end-user investment into C-ITS services

   Why? The sustained roll-out of C-ITS services in MobiliData depends on the overall use of the services by end-users. If they are not willing to accept and use C-ITS services, there is no point in offering the services in Business-to-Consumer or Government-to-Consumer channels.

4. Behavioural monitoring: to gain insight into behavioural changes caused by (the use of) C-ITS service

   Why? C-ITS services should improve road safety, reduce individual costs, and improve personal mobility. This requires objective measurement of behavioural changes to validate impacts.

5. Societal consequences: to monitor and validate broader societal impacts as a result of the introduction of C-ITS services and Mobilidata

   Why? C-ITS services are introduced to reduce the societal costs associated to mobility. This is mostly based on the extrapolation of individual behavioural change and changes to public stakeholder decisions.

6. Business models: to assess (and generate) feasible sustainable business models that support the longevity of Mobilidata & C-ITS services

   Why? C-ITS services need to be sustained in order to remain effective over a longer period of time. This requires sustainable business models.

Monitoring & Evaluation methodology

SIX Monitoring & Evaluation "links in the chain": everybody has a role to play

1. Stakeholders that build the Mobilidata platform and provide the C-ITS services

   Responsible for the execution of all 6 links in the M&E chain

2. Public authorities, such as AWV that initiated the MobiliData program

   Responsible for validating the M&E outcome

   Responsible for using the M&E results to attract more public and private stakeholders to make use of MobiliData

   Responsible for communicating results within the public stakeholders' organisations

Monitoring & Evaluation methodology

Primary principle:

To monitor & evaluate the entire “chain” from its start to the end

- Start = hardware & data source
- End = acceptance, use, societal impact, sustainable business models

Secondary principle:

Real-life execution is different from lab-test, sandbox, theoretical execution of monitoring & evaluation activities

- Methodological choices depend on:
  - Constraints due to the user context and service context: traffic, meteorological limitations, etc.
  - Constraints due to the impact targets: we cannot temporarily shut-off C-ITS functionalities within a broader context and (1) risk human life or (2) economically hamstring our business partners (i.e. loss of users of applications)
  - Constraints due to timing and introduction of services
  - Constraints due to tight interpretation of GDPR
- Practical choices depend on:
  - End-user HMI
  - End-user system use (Android vs iOS)
  - Project timing (milestones & reporting)

Monitoring & Evaluation methodology

Different methods for each of the six sections of M&E AND group of use cases

1. Technical monitoring

   Main methodology: continuous monitoring of up-time, data traffic, response rates, etc. (in line with C-Roads reporting)

2. Monitoring of data quality

   Main methodology: survey questions related to experiences with specific use-cases (if/when an end-user has encountered them)

   Note: Data quality is also monitored via the (imec) MobiliData Quality Dashboard (MDQD) which focusses on identifying and measuring statistical parameters for different data sources related to Data Quality (i.e. false positive/negative, true positive/negative, F1 scores, etc.). This is a separate action to the M&E activities within MobiliData.

3. Acceptability, acceptance and use (of C-ITS services)

   Main methodology: survey questions related to experiences with specific use-cases (if/when an end-user has encountered them)

   Secondary methodology: end-user in-depth interviews or workshops

4. Behavioural monitoring

   Main methodology for “warning use-cases”: statistical analysis of A/B (or 0/1) conditions in real-life behaviour.

   Main methodology for “iVRI use-cases”: GPS trace analysis

5. Societal consequences

   Main methodology: extrapolation of singular behaviour (see above) to a societal level

6. Business models

   Main methodology: workshops with public and private stakeholders focusing on the meaning of the outcome of MobiliData for these stakeholders, feasible and sustainable (business) models, eco-systems and interactions.

Main findings: technical monitoring

Functioning of system components = data from the hardware components

- **Public Information Provider (PIP)**
  - Parameters checked: Uptime / Throughput / Message Age / Latency / Packet Delivery Ratio / Queue length & size / Dead Letter queue
  - Latest report: Jan 2024
  - Status: reported functioning as per requirements
- **Mobilidata Interchange (MI)**
  - Parameters checked: Traffic light connection status / Size of data exchange / Continuity and availability of the data exchange / Quality of data exchanged / Latency
  - Latest report: Jan 2024
  - Status: reported functioning as per requirements
- **Traffic Light Exchange (TLEX)**
  - Parameters checked: Traffic light connection status / Data exchange volume / Continuity and availability of the exchange / Quality of data exchanged / Latency
  - Latest report: Jan 2024
  - Status: reported functioning as per requirements (after limited bug reports)
- **ContextAdapter and ContextBroker**
  - Parameters checked: Uptime / Message age / Number of disconnects / Latency / Packet delivery ratio / Throughput / Queue length / Dead letter Queue
  - Latest report: Jan 2024
  - Status: reported functioning as per requirements

Main findings: data quality & use

Data source = End-user surveys which were executed after each trip where the end-user encountered the relevant use-case.

UC5 (Accident & vehicle breakdown)

- 71% reported (subjective) receiving a warning (i.e. they think they saw it)
- 77% reported (subjective) sighting of event after receiving a warning (i.e. they think they saw the event for which they were warned)
- 79% reported (subjective) that they found the warning was presented in a timely fashion

UC11 (Congestion)

- 44% reported (subjective) receiving a warning (i.e. they think they saw it)
- 71% reported (subjective) sighting of event after receiving a warning (i.e. they think they saw the event for which they were warned)
- 80% reported (subjective) that they found the warning was presented in a timely fashion

UC12 (Road works)

- 72% reported (subjective) receiving a warning (i.e. they think they saw it)
- 82% reported (subjective) sighting of event after receiving a warning (i.e. they think they saw the event for which they were warned)
- 78% reported (subjective) that they found the warning was presented in a timely fashion

UC14 (Time to Green)

- 26% reported (subjective) receiving TTG information (i.e. they think they saw it)
- 23% reported (subjective) a correlation between the phase of traffic light and the TTG information, IF they saw it (i.e. they think they saw the event for which they were warned)
- 56% reported (subjective) that they found the warning was presented in a timely fashion
- Note: these values indicate that end-users most likely need more time adjusting to the presentation of TTG information (i.e. they need to get used to it)

Main findings: Behavioural change (qual.)

Data source = End-user surveys which were executed after each trip where the end-user encountered the relevant use-case.

UC5 (Accident & vehicle breakdown)

- 74% reported (subjective) improved awareness
- 74% reported (subjective) slowing down / adjusted speed
- 16% reported (subjective) changing lanes

UC11 (Congestion)

- 63% reported (subjective) improved awareness
- 60% reported (subjective) slowing down / adjusted speed
- 8% reported (subjective) changing lanes

UC12 (Road works)

- 63% reported (subjective) improved awareness
- 58% reported (subjective) slowing down / adjusted speed
- 12% reported (subjective) changing lanes

UC14 (Time to Green)

- 50% reported (subjective) improved awareness
- 41% reported (subjective) slowing down / adjusted speed
- 16% reported (subjective) changing lanes

What does this mean?

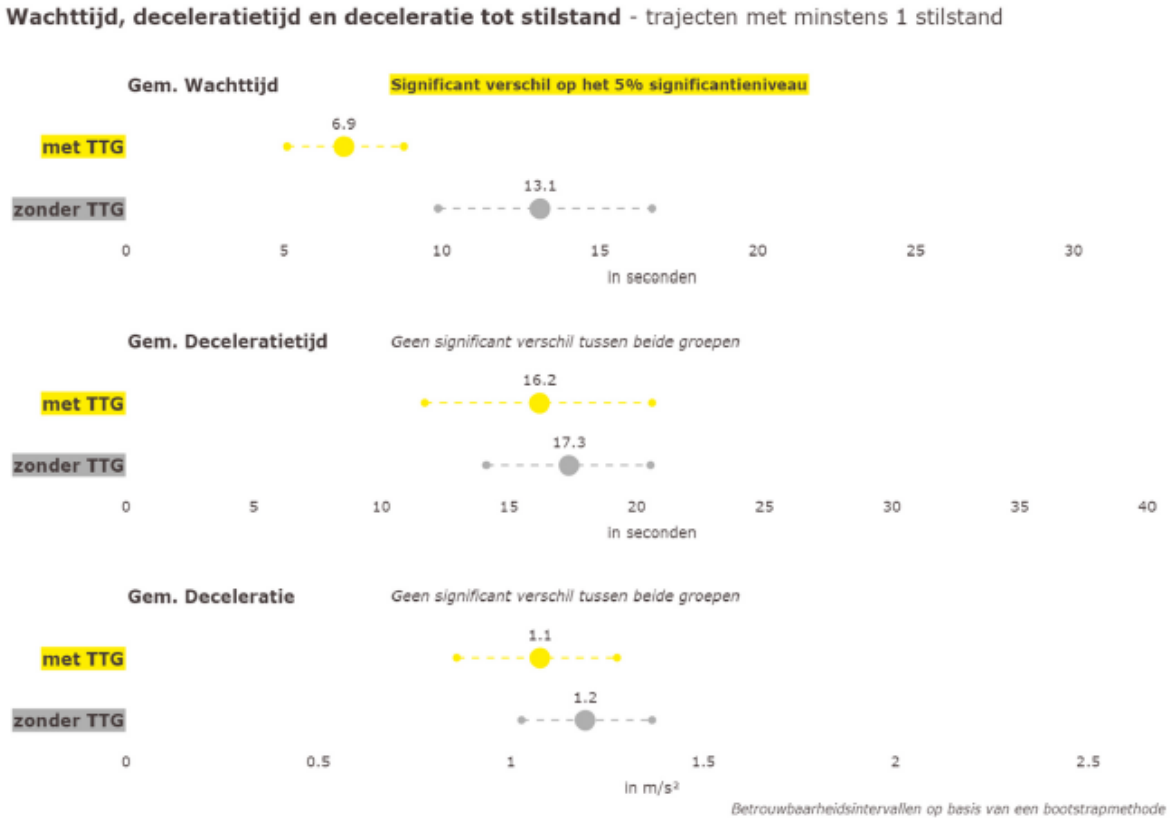
- UC5, UC11 and UC12 are "**warning C-ITS services**"
  - The end-users report that they are effectively impacted by the warning that is presented. They respond to it by (more often than not) being "more aware", "changing speeds" and (sometimes) "changing lanes".
- UC14 is an "**informative iTLC service**"
  - Half of the end-users report that they are aware of the information that is presented and (sometimes) adjust their speed according to the information that they received.
- There is a difference between the "warning services" and the "informative services". **Warning services are effectively presented with a strong auditive and visual signal** on the end-user interface (application on a smart phone). A warning tone is used and the information is presented (shortly) full-screen. Informative services have a softer, less salient presentation. They only show up on the top of the screen, without warning signals. This may explain the difference between the reported behaviours.

Main findings: Behavioural change (quant.)

Data source = GPS locations & traces from end-user applications which are linked to MobiliData platform.

UC14 Time-to-green

- Reduction of the average waiting time for users with the TTG functionality activated



Note: the reduction of (average) waiting times was earlier reported by Mobilidata as one of the most important reasons for potential end-users to support C-ITS services and consider the sharing of information, such as GPS locations (based on survey research).

Main findings: Behavioural change (quant.)

UC4 (slow vehicle)

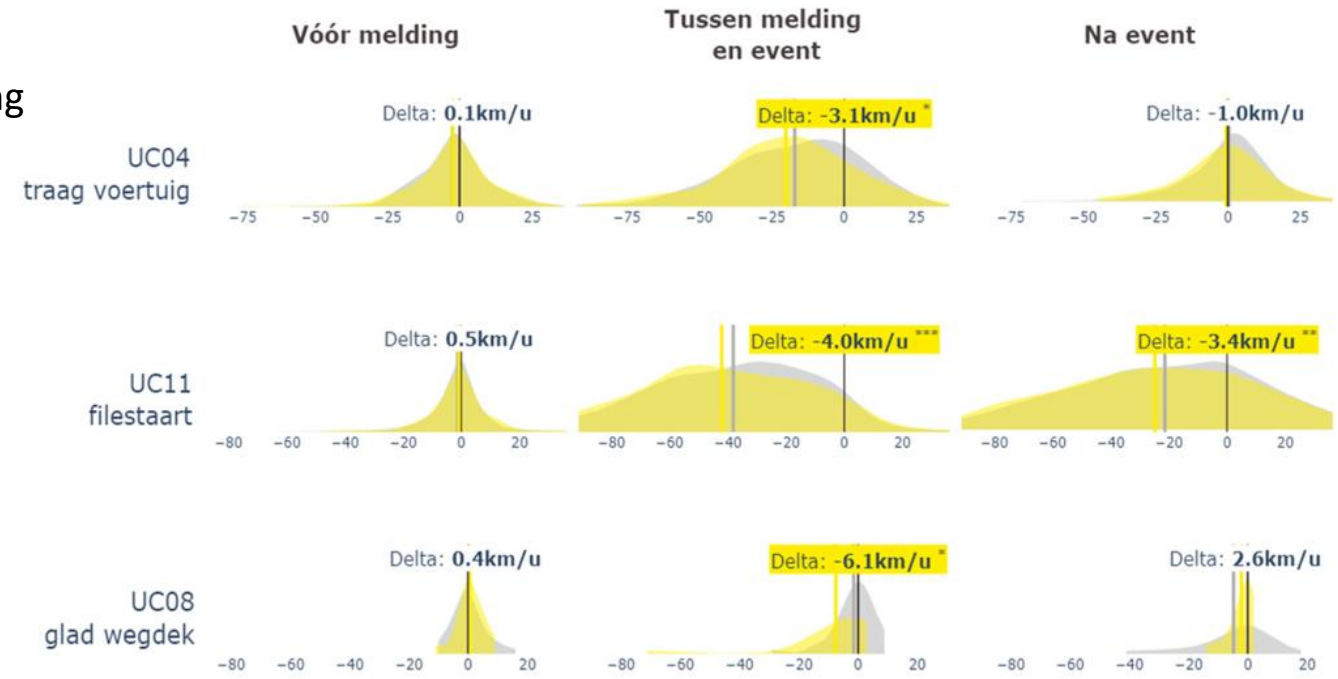
- Significant speed adjustment (between time of receiving the warning and the event location) as a result of receiving warning information.

UC11 (congestion warning)

- Significant speed adjustment (between time of receiving the warning and the event location; as well as after the event location) as a result of receiving warning information.

UC8 (slippery roads)

- Significant speed adjustment (between time of receiving the warning and the event location). However: caution required due to limited number of events.



Note 1: the speed differences are not only significant, but they are also large enough to effectively reduce braking distances by several meters in real-world incidents and would therefore correspond to a reduction in the number of accidents or the impact severity in case of an accident.
Note 2: UC11 (road works) and UC9 (person on road) showed trends towards speed adjustment.

M&E discussion of results

What have we learned?

- The technical backbone of the MobiliData program functions as it is intended to function. It is quick and reliable.
- We have strong evidence that important behavioural changes were reported as well as observed for different C-ITS use-cases within the Mobilidata program. These changes are very strongly associated to safer and more comfortable road (driving) behaviour.
- The combination of both qualitative (self-reported) and quantitative (observed) behaviour builds a strong case on the existence of practical impacts. It also provides the MobiliData program with possible steps to further improve our impacts.
- The “human element” is currently very important. As long as a human driver/road user is involved, it is important to make use of an appropriate Human-Machine Interface (HMI) to convey warning or other information to the user.
- A strong basis is present for the last two steps of the M&E chain: societal benefits and business models (i.e. financial sustainability).

Agenda Day 2

21st of June 2024 Room: De Twistappel 1st Floor

Time	Agenda Item	Lead/Speaker	Supporting Documents
09:00	Introduction / Agenda	K. Rombaut	
09:10	Deployment Workshop: Learnings from each other: - what are the killer UCs, and why - identified challenges(obstacles) for deployment and how did you overcome them - worst practices - evaluation methodology and results	Moderators / rapporteurs	
10:10	Feedback from the workgroups	Rapporteurs	
10:40	*Coffee Break*		
10:50	Mobilidata Evaluation	Lars Akkermans & Louis Nelen	
11:20	Findings from the Meridian Report of the C-ITS Workshops	Lars Akkermans	
11:50	Conclusions of the BE On-site Visit	Kristof Rombaut	
12:00	*End of day 2 & Sandwich lunch*		

Findings from the Meridian Report of the C-ITS Workshops

Lars Akkermans

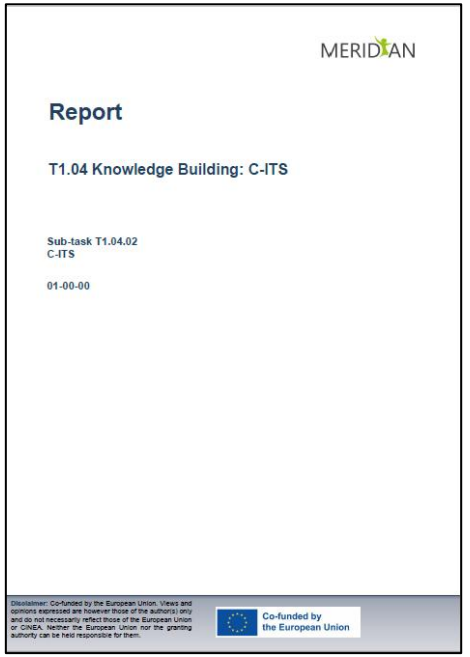
Co-financed by the Connecting Europe Facility of the European Union

Task 1.04 Knowledge Building Work Plan -- C-ITS

Knowledge building topics / work groups	Lead		2022						2023												2024											
			3Q			4Q			1Q			2Q			3Q			4Q				1Q			2Q			3Q			4Q		
			J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Sub-Task 1.04.02 C-ITS	BE-FL	Lars																														
Preparation																																
Kick-off 15 March 2023 (Ghent)																																
Workshop - 5 July 2023																																
PAPI interviews - Jul/Aug/Sep																																
Workshop - Oct 2023																																
Report																																
BE On-site Visit 20-21 Jun 2024																																

Task 1.04 Knowledge Building C-ITS

- Kick-off meeting Ghent
- First feedback-based workshop
- PAPI (Paper assisted Phone Interviews) - execution
- Workshop: elaboration of knowledge base “What if”
- Reporting & presentation
  - Published on MERIDIAN web-site (under Material Hub)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Report

T1.04 Knowledge Building: C-ITS

Sub-task T1.04.02
C-ITS

01-00-00

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Task 1.04 Knowledge Building C-ITS

- Kick-off meeting
  - Identification of key topics for knowledge-building
- Workshop
  - Topic 1 - Eco-system facilitation: connecting stakeholders
  - Topic 2 – Data quality
  - Topic 3 - Technology used / how is the technology used and integrated in the processes
  - Topic 4 - Financial & economic sustainability challenges
  - Topic 5 - Regulation & standardization of C-ITS services
  - Topic 6 - Data security
  - Topic 7 - End user connection – impact of end users – numbers of end users
  - Topic 8 - (End user) reimbursement models to build engagement
- PAPI (paper assisted phone interviews)
  - Preparation / Execution / Analysis / Reporting
    - Landesbaudirektion Bayern (Germany)
    - Administratie Wegen en Verkeer (Belgium)
    - Autorità di Sistema Portuale del Mar Tirreno Settentrionale (Italy)
    - Die Autobahn GmbH (Germany)
    - Autostrada del Brennero SpA (Italy)
    - Transport Infrastructure Ireland (Ireland)
- Elaboration: “what if” workshop
    - Transport Infrastructure Ireland (Ireland)
    - Flemish Agency for Roads and Traffic (Belgium)
    - Die Autobahn (Germany)
    - Autostrada del Brennero (Italy)
- Reporting & presentation

Task 1.04 Knowledge Building C-ITS

- Topic 1: Eco-system and end users: importance, financial and economic sustainability and facilitation
  - In-depth understanding of
    - Function of eco-systems
    - Composition & possible partners
    - Fluidity / flexibility of eco-systems
    - Link with different aspects such as financial and economic sustainability
  - Sensitivity to
    - Project vs. program interaction
    - Contractual interpretation
    - Product vs. project placement

Task 1.04 Knowledge Building C-ITS

- Topic 1: Eco-system and end users: importance, financial and economic sustainability and facilitation
  - Understanding of stakeholder and function
    - Primary stakeholders: Private road users; Public transport; Professional transport drivers and logistic companies; Traffic centers; Emergency services / Emergency service centers; Roadside services; Public authorities /road authorities
    - Secondary stakeholders: OEM; Service providers; Telecommunications providers (network operators)
    - Tertiary stakeholders: Vehicle and goods insurance companies; Research & Development companies, institutes, universities, etc.; OEM suppliers; Service suppliers (incl. banks); Sensor suppliers; Data-related companies (incl. Statistics), data owners/data providers; Data users; Services supporting public authorities
  - Definition of end-users
    - Front-end end users “boots on the ground”: Vehicles (CCAM); Human users (private / professional vehicles; emergency vehicles, Public Transport)
    - Back-end end users associated to the service provider: traffic centers; road authorities; logistics companies; emergency service centers; data owners/users/providers; etc.
    - Limited understanding of end user needs!
  - Financial and economic sustainability
    - Very limited planning or implementation of financial/economic sustainable structures

Task 1.04 Knowledge Building C-ITS

- Topic 2: Technology choice and integration in operational and functional processes
  - Distinction of reasoning towards knowledge on technology choice between
    - R&D projects.
    - Roll-out projects or programs.
  - R&D projects
    - The technology choice in these projects is based on local necessity and experience from previous projects. As the purpose for this type of projects is mostly to identify the suitability of a possibly solution or to develop such a solution, the outcome is important for future roll-out actions. However, at the current time, the outcome of the choice or development process is not yet clear.
  - Roll-out projects or programs
    - The overall consensus on a choice for different (types of) technologies, either an outright choice for one type of technology or a combination of technologies, is that this is very much **situational dependent**.
  - Logically this means that
    - The knowledge base is further developed during R&D projects to eventually crystalize in roll-out projects
    - Singularity of (testing of) solutions and associated know-how evolved into situation dependent know-how and, as such, technology agnostic solutions.

Task 1.04 Knowledge Building C-ITS

- Topic 3: Regulation and standardization
  - Push for knowledge sharing via C-Roads connections

Workshop: “What if”

- The workshop challenged participants to look into the future. The questions focus on 3 of the most important challenges:
  - To have a healthy eco-system
  - To find (your) end-users
  - To obtain financial sustainability
- One main assumption:
  - The C-ITS services that you are currently using or testing have passed that phase. They have been tried and tested, improved according to the findings from your (regional or local) roll-out and are *now ready to be made available to the larger public*.

Workshop: “What if”

- Which parties/stakeholders do you at least need to bring the C-ITS services to the general public?
  - Do you need “them” (primary/secondary/tertiary stakeholders)?
  - Do you (already) know them?
- As a provider of a C-ITS service, how will you find out, or make sure that your service will be used by the intended end users?
  - Is there a match between your intended user and the actual user?
  - Do you have means to validate this match?
- What results must be achieved (at least) to maintain sufficient momentum for a healthy financial/economic sustainable situation?

Workshop: “What if”

- Which parties/stakeholders do you at least need to bring the C-ITS services to the general public?
  - All participants provided a list of roles & names. The level of detail depended on status of C-ITS service used as lead example.
  - Trigger to integrate stakeholder management into C-ITS projects/programmes/roll-out
- As a provider of a C-ITS service, how will you find out, or make sure that your service will be used by the intended end users?
  - Participants indicated to mostly rely on surveys. However, no detailed solution is at hand. This is where good monitoring & evaluation practices for C-ITS come in handy.
    - Know your target – select appropriate KPI – provide regular monitoring
    - Know your stakeholders behaviour – choose/support good HMI practices – support implementation
- What results must be achieved (at least) to maintain sufficient momentum for a healthy financial/economic sustainable situation?
  - Societal benefits & economic return (road safety, congestion & time loss, emissions)
  - Realistic positioning of C-ITS services (on same level as i.e. public transport)

What could be next?

- Insight into end-users and stakeholders = first step
- Integration into project or programme = next step

- Insight into importance of financial sustainability = first step
- Knowledge from eco-system to identify financial incentives and requirements, needs and opportunities = next step

- Target setting based on solid KPI, monitoring & evaluation practices

MERIDIAN
BE On-site Visit

Kristof Rombaut

Co-financed by the Connecting Europe Facility of the European Union