



Why invest in all pieces of the puzzle to improve mobility in cities

Bruno Depré

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Embracing technology
Embracing ambition



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Smart City objectives

- enhance quality of live of the inhabitants
- optimize management of resources and assets
- provide a clean and sustainable environment

>while facilitating economic development

>using digital technology



Agoria Smart City – WG smart mobility

Smart City Committee

WG
Energy

WG
Mobility

WG
Building

WG
Digital

** don't forget to pick up or to download your copy of the Smart Mobility white paper!*

- **Goal of the workgroup**

1) help cities evolve into smart cities by presenting the technology industry's vision and capabilities (presentations, white papers*, conferences, ...)

2) advise government and public authorities on policies and regulations in the domains concerned (meetings, position papers, ...)

- **Working group members**

product manufacturers, ICT companies, system integrators, installation companies, consultants, banks, ...

Mobility tendencies & challenges in Belgium

- **Urbanisation**
 - **Belgium** is one of the *most urbanised areas* in the world. By 2030 the number of people living in city centres will *increase by a further 10 to 30%*.
 - This challenges the cities in many ways (socio-economic, ecological, ...). Increasing urban density also puts *pressure on mobility*.
- **Growing people mobility**
 - The demand for *passenger transport* is estimated to *rise by 11% by 2030*. The car is still the primary mode of people transport (82% of all passenger kilometres). With the exception of the bus, the total number of passenger kilometres for other modes of transport will also increase.
- **Growing goods transport**
 - The number of *tonne kilometres* will take a *44% leap by 2030*. Despite the partial shift to inland waterways and rail, delivery vans and trucks continue to dominate the goods transport scene with 70% of all tonne kilometres.
- **Challenges: improving air quality, road safety and smoother traffic**

L'avenir 21/02/2017
Bruxelles, dans le top 10 des villes européennes les plus embouteillées

LE VIF 21/06/12

Embouteillages : le triste record belge

Nergens ter wereld sta je meer in de file dan in België

24-08-15

DeMorgen

Juni was zwaarste filemaand ooit voor Vlamingen



2017 stevent af op filerecord

(en het wordt er niet meteen beter op)

België is filekampioen met Brussel als

filehoofdstad

05/01/2016

BRUZZ

We stonden nooit meer in de file dan in 2018

Bruxelles, Liège et Charleroi

Helpt langer in de file dan vijf jaar geleden



21 november 2017

tijd

Brussel en Antwerpen wereldkampioen filerijden

LE SOIR 24/08/2015

La Belgique reste la championne des embouteillages en Europe

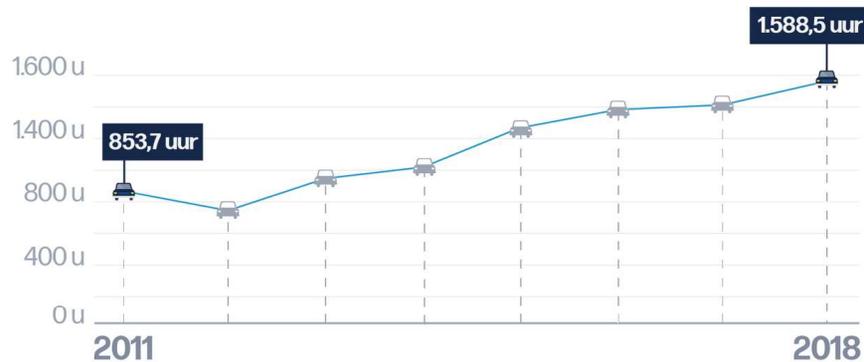
DH 21 novembre 2017

Journée noire sur les routes belges: 445 km d'embouteillages, un record en 2017

1588 hours total length of traffic jam

Aantal uur een totale filelengte van 100km

Doorheen de volledige dag



Stijging in 2018

- 🚗 Vooral zichtbaar tijdens de daluren (10u-15u)
- 🚗 Meer vrijetijdsverkeer met de auto vanwege warme lente en zomer
Vooral na 10u 's morgens
- 🚗 Verandering in trends op langere termijn
Manier en tijdstip waarop we ons met de auto verplaatsen
Meer bestelwagens en lichte vrachtwagens op de baan



Aantal uur een totale filelengte van 400km

Doorheen de volledige dag

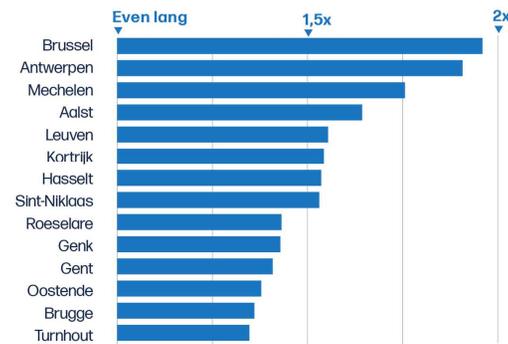


Daling in 2018

- 🚗 Daling, ten opzichte van 2017, vanwege het droge jaar
Regen en sneeuw staan garant voor zware spitsen



Hoeveel langer bent u met de wagen onderweg dan het traject zonder files?



Bron: De Tijd



Trend analysis

- **more traffic jams of >100 km off-peak**
- **concentration around major cities (Antwerp, Brussels, Ghent, ...) but expanding**
- **commuters adapt behaviour:**
 - leave after rush hours (flexible working hours)
 - work from home (teleworking)
 - decreased use of car for home-work traffic (70% in 2010, 56% in 2016; bicycle use from 7% to 16%!)
 - #cars registered increases but km driven decreases (15.867 km in 2003, 14.770 km in 2017)
- **part-time work**
- **goods and parcel delivery**
 - often off-peak
 - e-commerce: important increase of km driven by vans/small trucks
 - e-tolling: more traffic generated by shift to smaller trucks and vans to avoid toll
 - +45% increase (2003-2016)

(source:  **NWS**)

Trend analysis cont'd

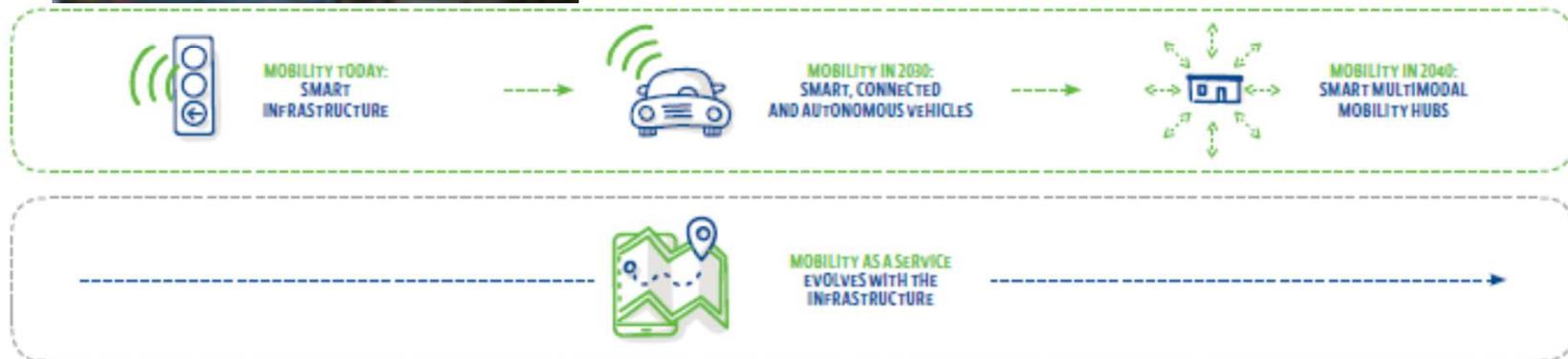
- tram and bus are stuck in traffic jams
- slighty increased use of train for home-work traffic
- on average travel time is 70% higher using public transport during rush hours in comparision to car. (Brussels and Antwerp \approx equal time, Gent \approx X 3)

Smart Mobility, a solution ?



4 pieces of the puzzle:

- smart infrastructure: (C-)ITS
- smart car: ACE
- mobility hubs
- MaaS



SMART INFRASTRUCTURE



The basis: smart infrastructure (ITS)



Intelligent transportation system (ITS) is the application of sensing, analysis, control and communications technologies to transportation in order to improve safety, mobility and efficiency.

These systems are constantly evolving and becoming more intelligent.

Allows for an optimised use of existing infrastructure

- Smart traffic lights
- Smart parking systems
- Sharing system infrastructure
- Dynamic speed signs
- Dynamic route selection
- Smart toll collection system
- ANPR camera's
- Smart charging infrastructure
- Smart lighting systems
- ...

ITS example: smart traffic lights



- Green light times are adjusted entirely automatically based on oncoming traffic, current traffic density, etc.
- Traffic is managed from a central location using artificial intelligence that factors in oncoming traffic (all modes of transport), current traffic density, current speeds, real-time data and historical data
- The system also takes account of priority traffic: emergency services, public transport, cyclists and pedestrians

Example: Traffic lights Brussels inner ringroad

Traffic lights are controlled by one central traffic computer.

Scenarios can be adjusted in real time and specific scenarios are also included e.g. for European summits.

All data is available via opendatastore.brussels.

Gains: 30% time savings inbound and 15% outbound

ITS example: smart parking systems



Smart parking systems detect whether or not a particular parking space is available. This can be done via a sensor in the ground but also with cameras mounted on poles, buildings or vehicles. The collected data is applied in real time. A dedicated app or displays along the road guides motorists towards free parking spaces. They can head straight for them, thereby easing congestion in the city centre.



30%

of city traffic is generated by looking for a parking space



10 min

is the average time needed to find a parking space in a city



4.5 km

is the average distance motorists cover before finding a parking space in a city

New C-ITS initiatives in Belgium

- **Flanders: Mobilidata**

- Project team: AWV-MOW-EWI-imec
- Roll-out of intelligent traffic light control systems (iVRI) and other C-ITS applications (f.i. in vehicle signage, parking monitoring and guidance)
- 30 M€ funding (23 M€ via public procurement)
- Info can be found at www.mobilidata.be

- **Wallonia: ITS Namur**

- measuring traffic flows, air quality and parking availability
- informing passengers about actual traffic and public transport alternatives
- more about this project in following presentation

Recommendations on ITS

- **quick win opportunities**
- **accelerate efforts in deploying (C-)ITS solutions in Belgium!**
- **include smart bicycle solutions**
- **think forward and make the ITS infrastructure ready for connected and autonomous cars**

- **when: TODAY!**

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ACE VEHICLES



ACE: Autonomous Connected Electric

The ultimate smart car is:

- Electric: green without emissions, silent
- Connected: as a part of a mobility system (V2I, V2V, V2P, ...)
- Autonomous: with AI gradually taking over driver functions
- increasing the capacity of the existing infrastructure

BUT

- risk to draw away users of public transport
- risk of increasing movements (do other things while moving)



The autonomous car = a shared car?

- Smart cars alone will not solve the congestion problem!
- Unless... these autonomous cars and shuttles are shared and integrated in a multimodal mobility solution.
 - >need to move away from private car ownership!
- Bonus: *shared* cars will allow for a substantial reduction of the need of parking spaces, freeing space in the city centers.



ACE in Belgium

- Low market penetration of full electric vehicles
- Some premium brand cars are already connected, breakthrough expected with 5G.
- 1 autonomous shuttle in use (Han-sur Lesse: 500m)
Planned pilots in 2020 with autonomous shuttles at Brussels airport.
- Opportunities in city centers!
Some cities already expressed their interest (Antwerp, Mechelen, Leuven, Genk, Namur, ...)



Recommendations on ACE

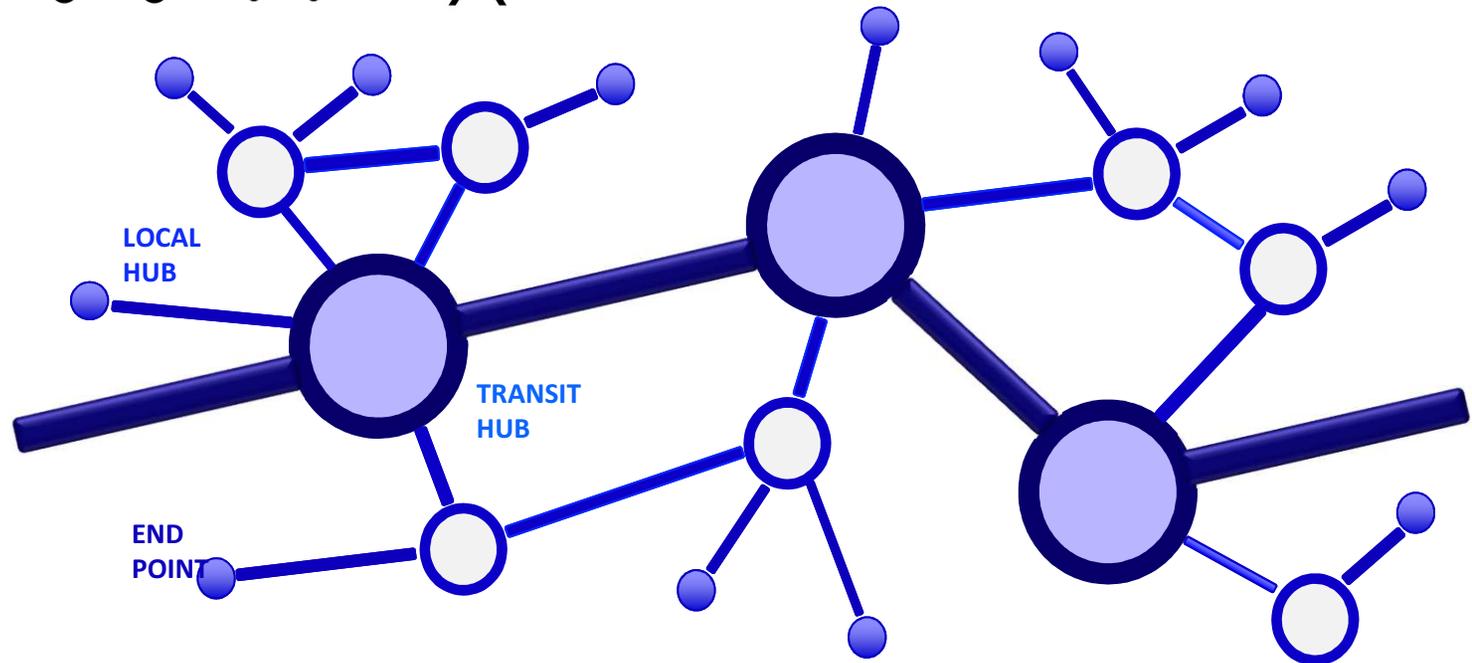
- **opportunity for local authorities: autonomous shuttles on dedicated lanes**
 - **facilitate deploying C-ITS and communication networks (5G)**
 - **prepare legislation and regulations**
 - **stimulate shared mobility**
-
- **when: TODAY – 2030 (full autonomous)**

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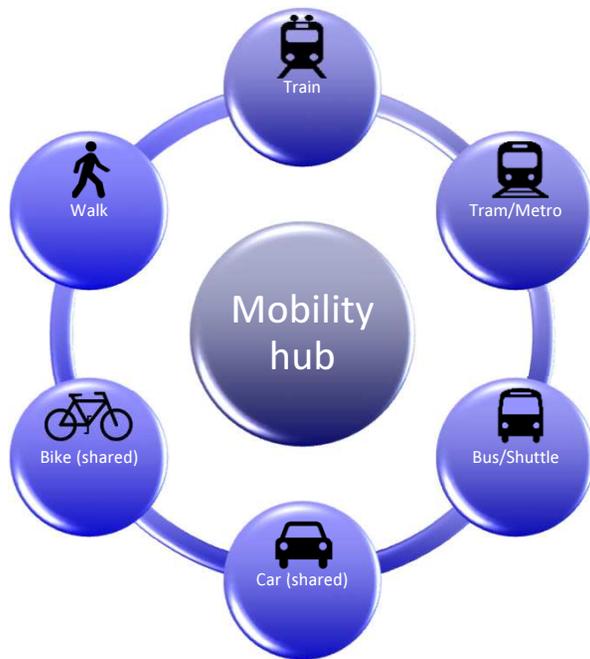
MOBILITY HUBS



Multimodal mobility: mobility hubs



The mobility hub principle



- layered infrastructure:
 - transit hub: long distance connections
 - local hub: short connections
 - each hub offers new modal options
- also energy hub (electric vehicles)
- and communication hub (information)
- and experience hub



En route to the first mobility hubs in Belgium

- In Flanders transport company De Lijn is reflecting on the future of depots and mobility hubs. A pilot project will be launched in Mechelen.
- This depot there will become a hub including:
 - Charging infrastructure for electric **buses**
 - A transshipment centre for last mile logistics
 - **Car** and **bicycle** sharing systems



A map of Walloon mobility hubs

In Wallonia a work group is currently planning the geographical distribution of mobility hubs there. This is what the mobility hub network could look like in Wallonia.

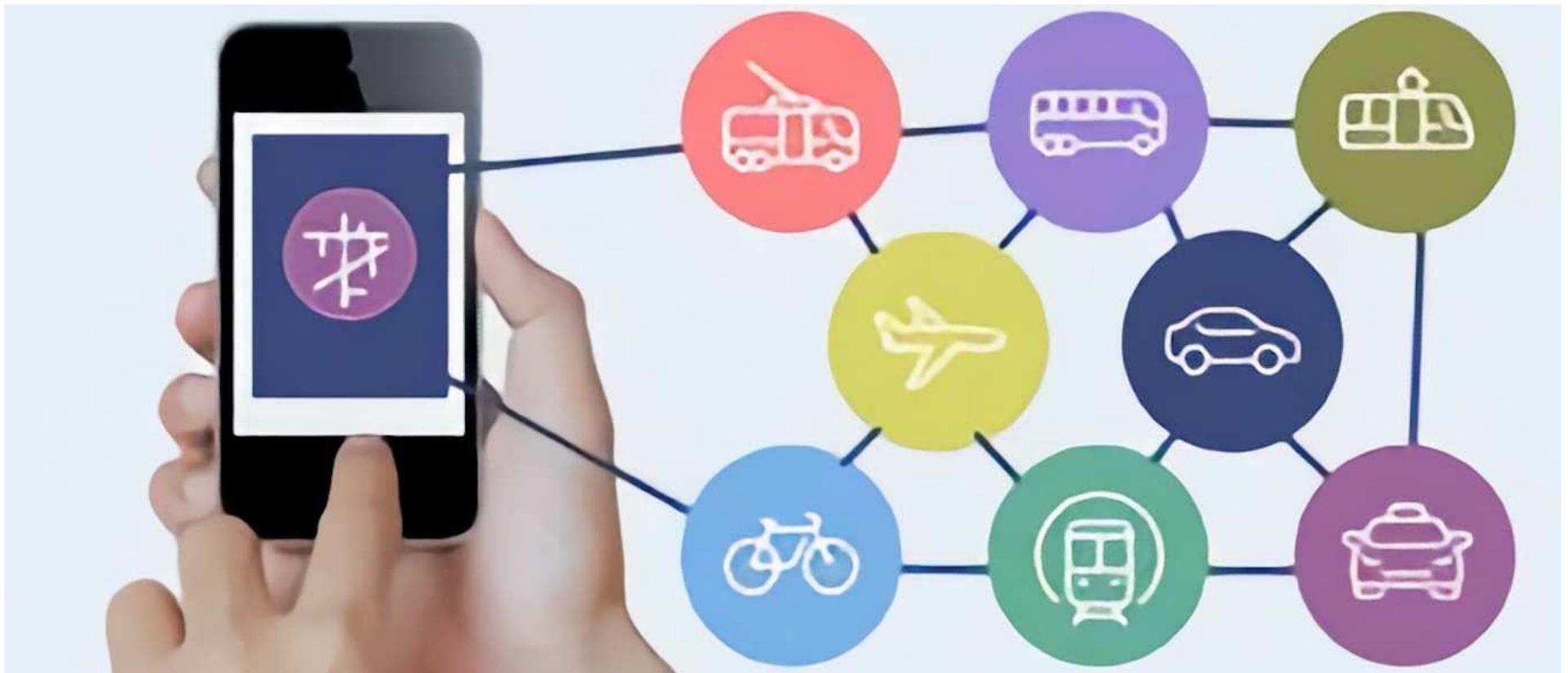


Source: Office of Walloon minister DiAntonio

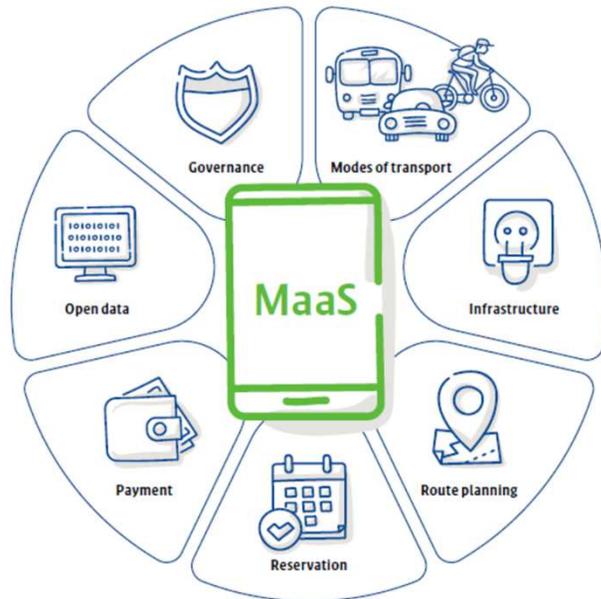
Recommendations on Mobility Hubs

- **action needed to improve quality of public transport as a credible alternative to the privately owned car**
- **coordination between mobility operators (public and private) is a must**
- **opportunity for local authorities**
 - urban planning: development of hubs
 - stimulate and manage shared mobility solutions
 - invest in bicycle infrastructure
- **when: TODAY – 2040 (mobility hub network)**

MOBILITY AS A SERVICE



Mobility as a Service



Mobility-as-a-Service (MaaS) is the shift away from personally-owned modes of transportation and towards mobility solutions that are consumed as a service.

The MaaS platform links service providers (rail, tram, bus, taxi, car or bike sharing, parking, e-charging, payment), infrastructure, open data and the traveller.

MaaS is integrating seamless end-to-end trip planning, booking, electronic ticketing, and payment services across all modes of transportation, public or private.

Key succes factors MaaS

- **Access to reliable (real time) information**
 - need for an open mobility platform with real time data of all possible modi: train, tram, metro, bus, shuttle, car, bike, ... but also planned and unplanned events affecting mobility
- **Seamless connectivity:**
 - need for multimodal planners with respect to traveller requirements (fast, cheap, most interesting, least changes, excluding ...) with auto-rerouting function (incidents, circumstances, ...) and with integrated policy levels (federal, regional, urban)
- **Seamless payment:**
 - payment for the trip (unified payment system)
 - diversification in fares depending on options choosen

Levels of MaaS



Examples in Belgium

- **“Slim naar Antwerpen” website and app**
 - Link to mobility providers, routeplanners, MaaS providers, parkings, flexible offices, booking and payment apps etc...
- **MaaS platforms: Olympus, Whim, ...**



Recommendations on MaaS

- **data makes MaaS happen: make real time (travel) data available**
- **quality standards to ensure positive user experience**
- **develop a multimodal mobility platform policy and start implementing**
- **encourage a behavioural shift away from private car ownership to mobility access by offering better alternatives**

- **when: TODAY – evolving in time as new technologies and business models emerge**

Conclusion

- **For a better, safer and greener mobility:**
 - Invest in smart infrastructure and C-ITS
 - Enable green and autonomous vehicles and stimulate shared solutions
 - Enable and stimulate the creation of mobility hubs and multimodal transportation use
 - Create a multimodal mobility platform that enables advanced MaaS applications

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Thank you

For your attention



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