ANTHROPOLIS CHAIR SEMINAR
The place of walking in MaaS:
Appraisal of active modes for sustainable MaaS solutions

THE PLACE OF WALKING IN MOBILITY AS A SERVICE

INTEGRATION OF ACTIVE MODES FOR SUSTAINABLE MAAS SOLUTIONS

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Mariana Reyes • Wednesday, January 26, 2022

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The place of walking in MaaS:
Appraisal of active modes for sustainable MaaS solutions
Ph.D. Student Mariana Reyes

CONTENT

1. Research Questions
2. Why integrating walking in MaaS?
3. Research Phases
4. Research Context
5. Theoretical Frameworks and Methods
6. Case Study
   a. Territorial Context
   b. MaaS Solutions
7. Test Journey
8. Recommendations
9. Conclusions
10. Research Perspectives

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Appraisal of active modes for sustainable MaaS solutions
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1. RESEARCH QUESTIONS

1. What is the current status and the relevance of the integration of active modes in MaaS solutions?

2. What are the factors influencing the existing level of integration of active modes in MaaS?

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The place of walking in MaaS:
Appraisal of active modes for sustainable MaaS solutions
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2. WHY INTEGRATING WALKING IN MAAS ?

- **To favorize intermodal trips** (Lyons, Cain and Jakeman, 2021).

- **To develop pertinent persuasive strategies to incentivize active modes among MaaS users** (Pangbourne, Bennett and Baker, 2020),

- **To visibilize active modes and improving the quality of travel information for active travel provided by MaaS operators** (Anagnostopoulou et al., 2018),

- **To avoid substitution of walking by other individual motorized and less sustainable modes (e.g., electric kick-scooters)** (Lajas and Macario, 2020; Reck, 2021).

- **To achieve level 3-4 MaaS solutions that can become tools to enable better quality of life for cities/citizens** (Sochor et al., 2018)

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Appraisal of active modes for sustainable MaaS solutions
Ph.D. Student Mariana Reyes

3. HOW DO WE INTEND TO DO SO?

PHASE 1 (current phase)

- **Overview of the current level of integration of pedestrian mobility in the MaaS solutions studied and delivering an analytical framework to study this integration.**

PHASE 2

- Analysis of user profiles and stakeholders' interests for the integration of seemingly non-monetizable modes in MaaS.

PHASE 3

- Identification and evaluation of the components of the business and operational models of sustainable MaaS solutions.

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Appraisal of active modes for sustainable MaaS solutions
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4. RESEARCH CONTEXT

PH.D. RESEARCH KEYWORDS

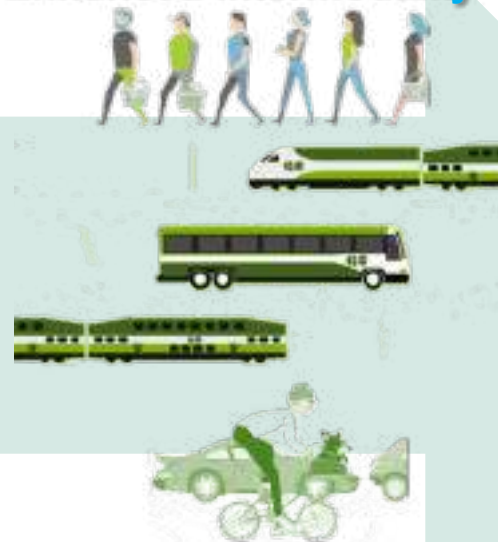Mechanisms for Sustainable Value Creation

Behavior Change   Enhanced Intermodality

Sustainable value gains for all the MaaS ecosystem stakeholders

MaaS

Walking + Cycling

Governance Perspective Analysis

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Appraisal of active modes for sustainable MaaS solutions
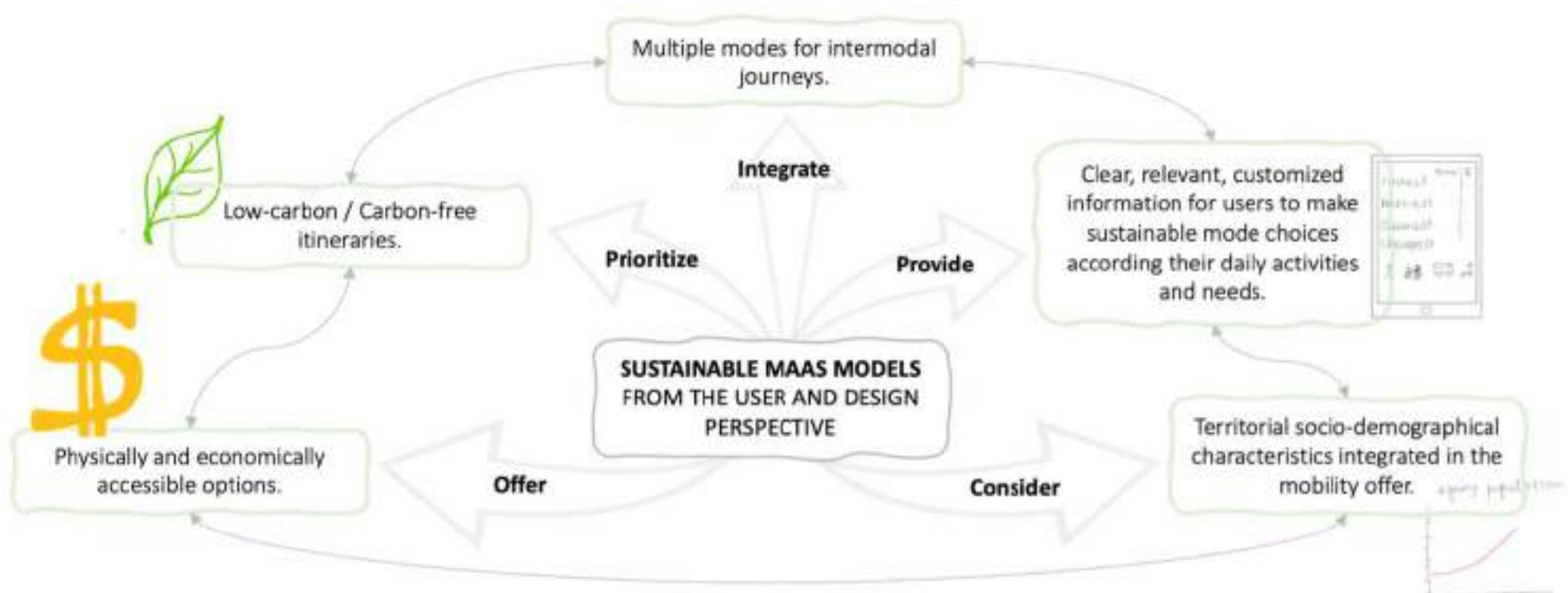Ph.D. Student Mariana Reyes

4. RESEARCH CONTEXT

GLOBAL GAINS OUT OF ACTIVE MOBILITY AND CAR USE REDUCTION

Benefits linked to improved walking and cycling conditions (e.g. infrastructure, image, awareness)	
	Reduced travel time and more comfort for cyclists and pedestrians
	Increased accessibility to amenities
	Improved traffic safety for vulnerable user groups through increased visibility & safer infrastructure
	Increased mobility level through better affordability of transport for lower social classes
	Reduced energy consumption
	Reduced land consumption via sealed surface from deconstructed traffic area

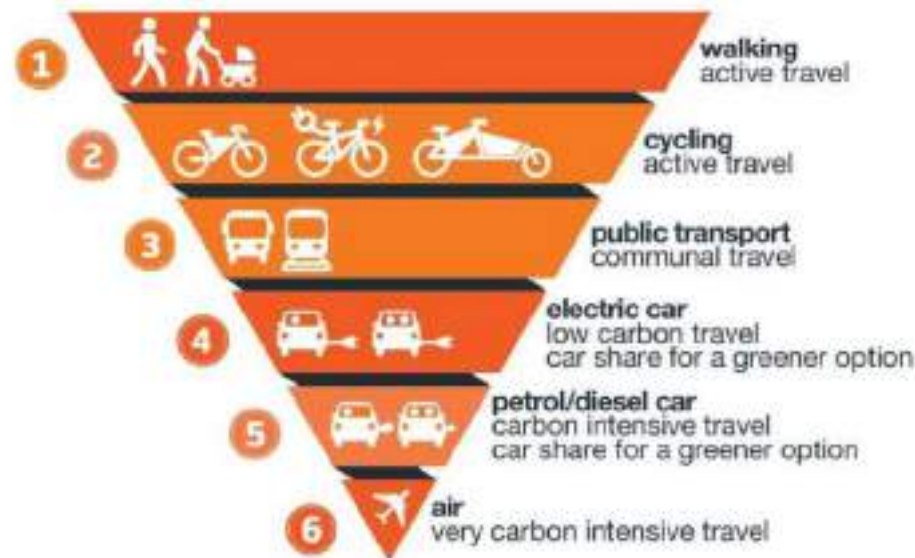| Benefits linked to reduced motorised vehicle usage	
	Reduced GHG & other harmful emissions
	Reduced noise pollution (only gains relevance at min. 50 % of reduction of motorised traffic, therefore effect in FLOW is not depicted)
	Increased traffic safety through the reduction of motorised traffic
	Reduced mobility (thus vehicle operating) costs
	Reduced vehicle travel time through diminishing congestion level
	Improved quality of life by more social interaction and reduction of separation effect
	Improvement in private businesses via increased attractiveness of public spaces

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Ph.D. Student Mariana Reyes

4. RESEARCH CONTEXT

SUSTAINABLE MOBILITY GOALS

Multiple modes for intermodal journeys.

Integrate

Prioritize

Provide

Low-carbon / Carbon-free itineraries.

Clear, relevant, customized information for users to make sustainable mode choices according their daily activities and needs.

SUSTAINABLE MAAS MODELS
FROM THE USER AND DESIGN PERSPECTIVE

Physically and economically accessible options.

Offer

Consider

Territorial socio-demographical characteristics integrated in the mobility offer.

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Appraisal of active modes for sustainable MaaS solutions
Ph.D. Student Mariana Reyes

4. RESEARCH CONTEXT

SUSTAINABLE MOBILITY MODE HIERARCHY

Source: UK Energy Savings Trust in: Policy brief: Active Modes of Transport, Interreg, 2019

9

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Appraisal of active modes for sustainable MaaS solutions
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4. RESEARCH CONTEXT

MOBILITY AS A SERVICE DEFINITION

We define MaaS as:

*"An innovation on **mobility management**, where the revolution resides in the **integration of transport services, digital and physical infrastructure, new actors, and other technologies in one digital platform with a single account** to simplify usage. This **user-centric platform** permits the personalization of trips with the available / selected mobility services and takes into account the **users' territorial resources and context**. One of the most **valuable characteristics of MaaS** as we see it, is the provision of **higher quality real-time-information** that **catalyzes sustainable mobility practices and social equity**. The shift in mobility practices should be reflected on **individual, economical and societal value gains"**.*

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The place of walking in MaaS:
Appraisal of active modes for sustainable MaaS solutions
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5. THEORETICAL FRAMEWORK AND METHODS

THEORETICAL FRAMEWORK

- Business model generation, value chains
- **Sustainable business models**
- **Usability**, UX/UI principles
- **Governance**
- Mobility management
- **Behavioral economics, nudges, persuasive strategies, modal choice factors**

METHODS
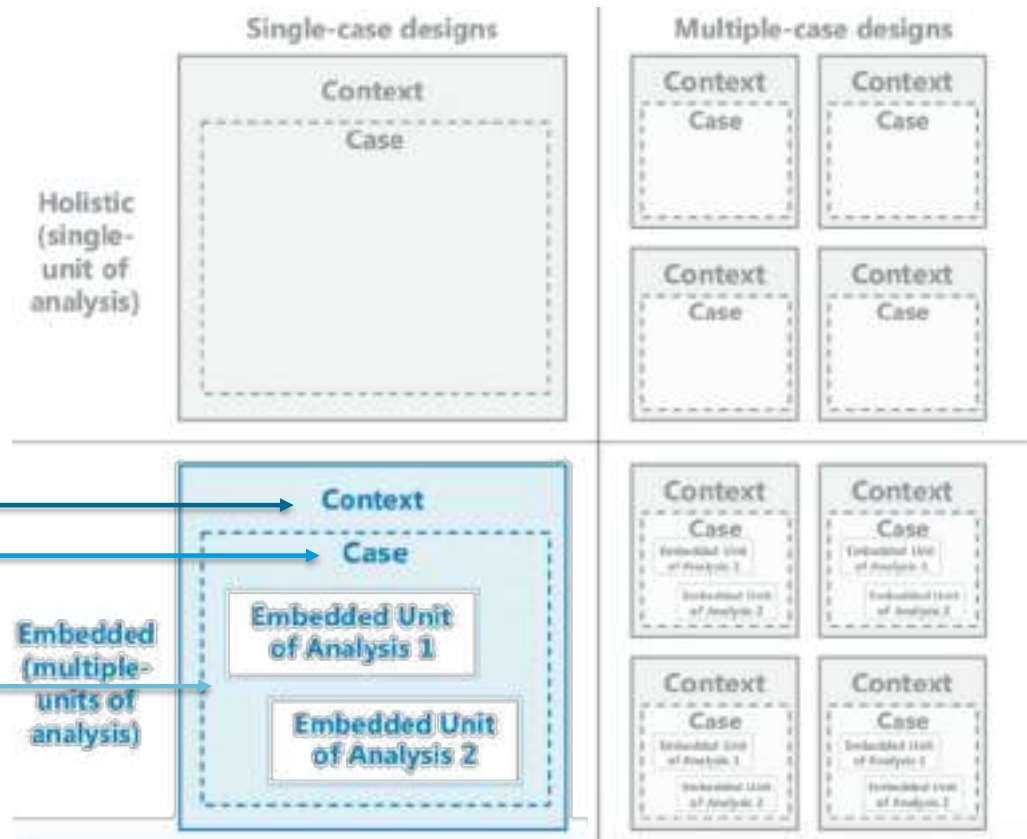### Comparative case study analysis

- Embedded case study with two units of analysis (Yin, 2018).
- Test journey in-app (as an a-b test)
- Interviews
- Literature review: Scientific and gray literature on MaaS, sustainable business models, mobility management, UI design, and behavioral sciences.

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Ph.D. Student Mariana Reyes

5. THEORETICAL FRAMEWORK AND METHODS

Integration of walking

in MaaS solutions*

deployed in the *Île de France Region*

Single-case designs

Multiple-case designs

Holistic (single-unit of analysis)

Context

Case

Context
Case

Context
Case

Context
Case

Context
Case

Embedded (multiple-units of analysis)

Context

Case

Embedded Unit of Analysis 1

Embedded Unit of Analysis 2

Context
Case

Context
Case

Source: Yin, 2018

* Level 2 MaaS in the scale of Sochor et al. (2018), this means they integrate travel information, navigation and the possibility to buy some PT tickets and some of the services within the application.

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The place of walking in MaaS:
Appraisal of active modes for sustainable MaaS solutions
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6. CASE STUDY
a. TERRITORIAL CONTEXT

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Appraisal of active modes for sustainable MaaS solutions
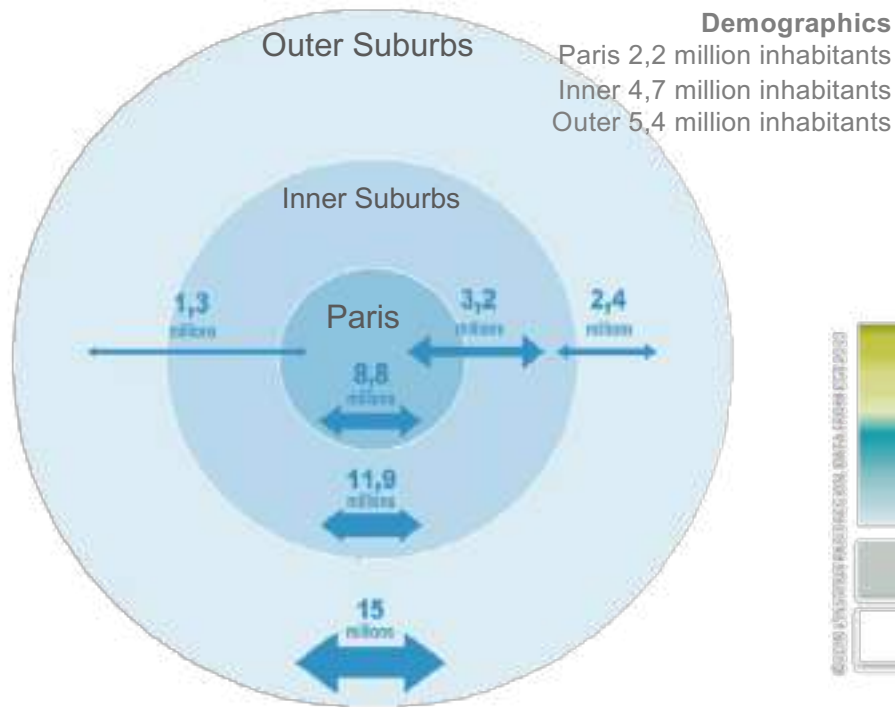Ph.D. Student Mariana Reyes

SOCIO-DEMOGRAPHIC ELEMENTS

- 12.3 million inhabitants in a territory of 12,000 km^2, with an average population density of 1,017 inhabitants per km^2.

- New mobility guidelines and legislation: LOM, 24/12/2019; integration of micromobilities to the transport code.

- Fluctuation of fuel prices triggering the yellow jackets' movement.

- Covid-19's mobility restrictions and health concerns -> less users in PT and an explosion of bike users.
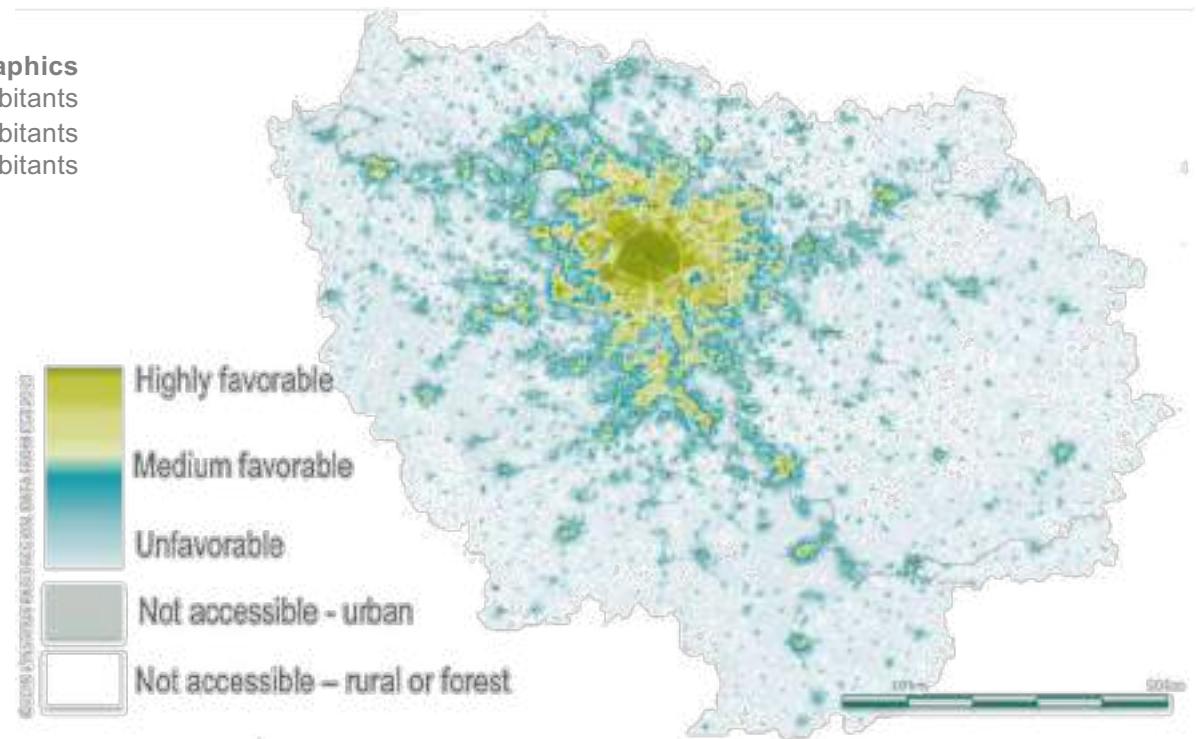
Île de France (Paris region)

Icons by Monkik; Alexander Skowalsky for Noun Project. Source: thenounproject.com
Data from INSEE, 2018; LOM; 24/10/2019.

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Appraisal of active modes for sustainable MaaS solutions
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MOBILITY DYNAMICS

Average daily journeys in the region

Demographics
Paris 2,2 million inhabitants
Inner 4,7 million inhabitants
Outer 5,4 million inhabitants

Walkability Index

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The place of walking in MaaS:
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MODAL SHARE

**Active modes (cycling and walking)
18 million trips**

0.9 %
Motorcycles and Scooters

1.9 %
Bike

0.7 %
VTC, taxis, free-floating and school transport

21.9 %
Public Transport

40%
Walking

34.5 %
Private Car
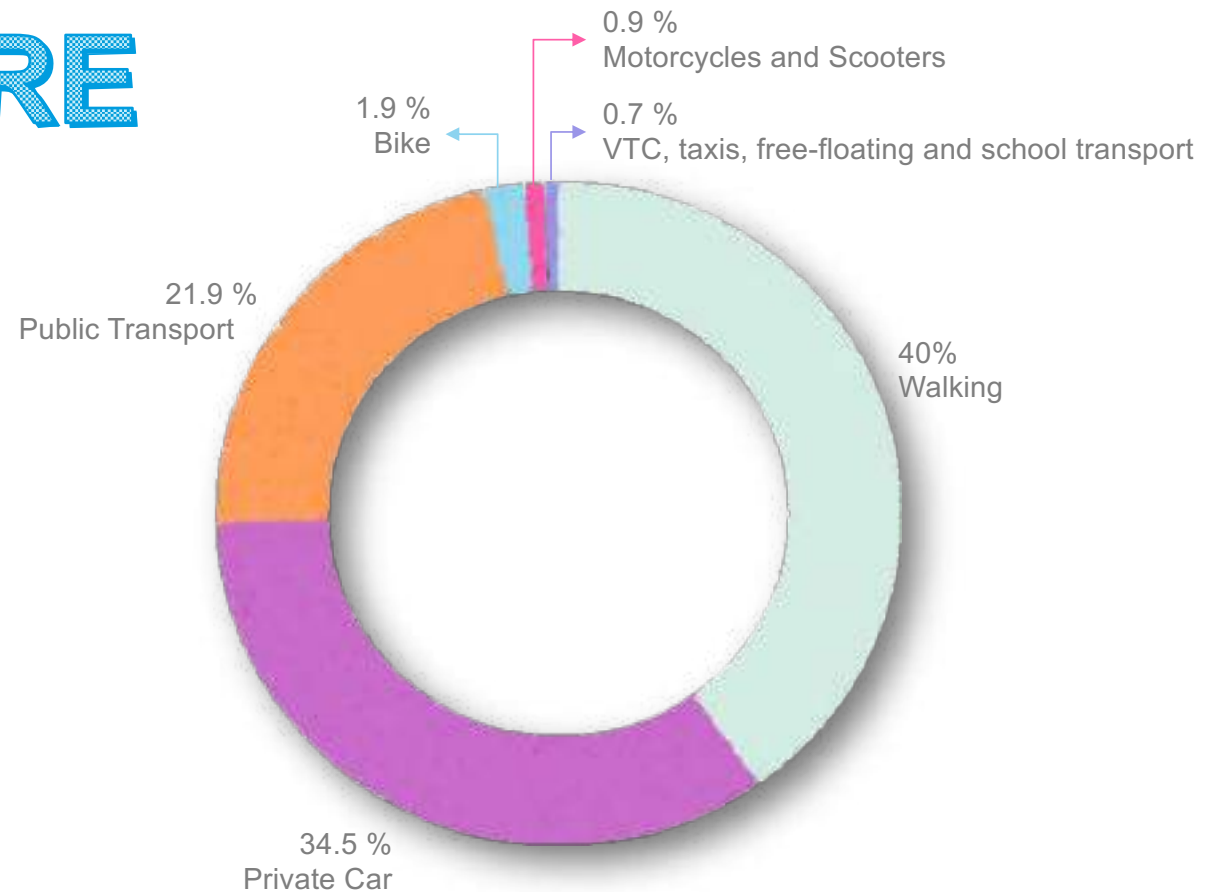
Modal share in the Île de France Region

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The place of walking in MaaS:
Appraisal of active modes for sustainable MaaS solutions
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6. CASE STUDY

b. THE MAAS SOLUTIONS

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MAAS OPERATORS

We studied two MaaS solutions deployed in Île de France by two public MaaS operators:

MaaS Operator: Régie Autonome des Transports Parisiens, (RATP)

Role: Public Transport Operator (PTO) created **Bonjour RATP**.

MaaS Operator: Île de France Mobilités (DFM)

Role: Public Transport Authority (PTA) bought white brand app **IDFM App.**

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Appraisal of active modes for sustainable MaaS solutions
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MAAS OPERATORS

And compared them with two MaaS-like* solutions with international presence: Google Maps and Citymapper

Google Maps

Citymapper

MaaS Operator: Google Maps

Role: Private navigation solution owned and managed by **Google**

MaaS Operator: Citymapper

Role: Private navigation solution owned and managed by **Citymapper**

*MaaS-like since they offer MaaS the navigation tools, integration of itineraries for different mobility modes, subscritptions (Citymapper) and in-app payment features are only available in some cities.

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The place of walking in MaaS:
Appraisal of active modes for sustainable MaaS solutions
Ph.D. Student Mariana Reyes

PLATFORM COMPARISON

Bonjour RATP
- Released in June 2021
- + 5 M downloads (Google play store, consulted 01/2022)
- Size 90,9 Mo (Apple Store)
- Developed by RATP Smart Systems

IDFM App
- Released in October 2020
- + 1 M downloads (Google play store, consulted 01/2022)
- Size 157,1 (AS)
- Developed by Instant Systems

Google Maps
- Released in 2005
- + 10 000 M downloads (Google play store, consulted 01/2022)
- Size 209,8 Mo (AS)
- Developed by Google

Citymapper
- Released in 2011 in London, 2015 in Paris
- + 10 M downloads (Google play store, consulted 01/2022)
- Size 169, 6 Mo (AS)
- Developed by Citymapper

USER INTERFACE

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7. TEST JOURNEY

WALKING ITINERARY
- User Interface
- Incentives

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TEST JOURNEY

Figure 24. Start and End of Test Journey in Paris. Source: Cartography from OpenStreetMap, 11/2021

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Appraisal of active modes for sustainable MaaS solutions
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TEST JOURNEY UI ANALYSIS

MODES HIERARCHIZATION

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Ph.D. Student Mariana Reyes

TEST JOURNEY UI ANALYSIS

WALKING HIERARCHIZATION AND ITINERARY
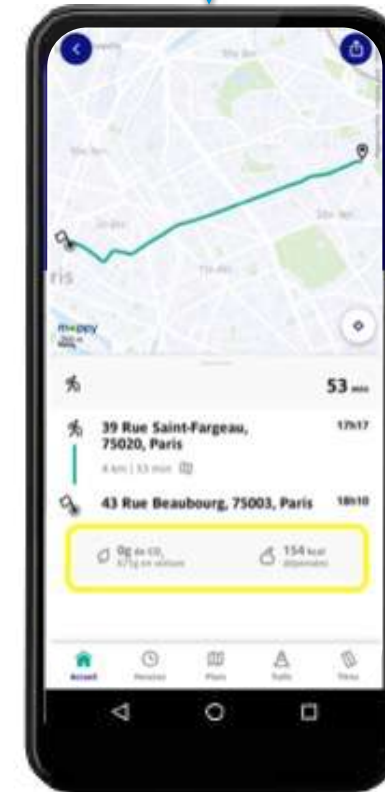
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Appraisal of active modes for sustainable MaaS solutions
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TEST JOURNEY UI ANALYSIS

WALKING VISIBILITY IN **INTERMODAL** ITINERARIES

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Appraisal of active modes for sustainable MaaS solutions
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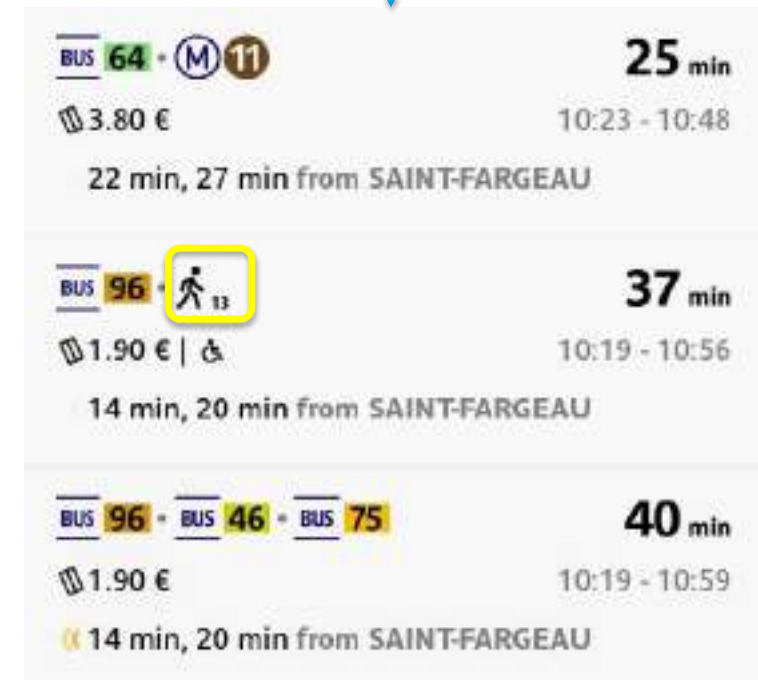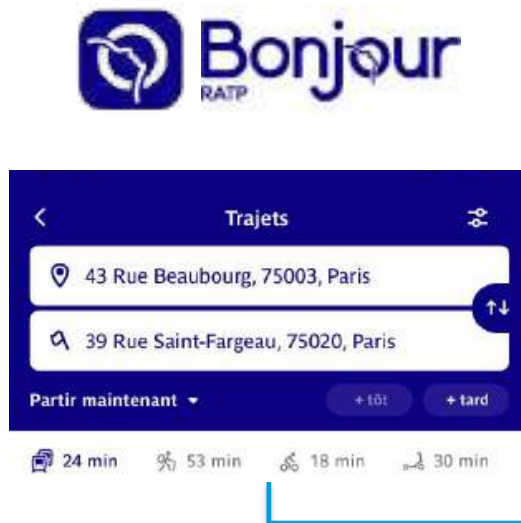
TEST JOURNEY UI ANALYSIS

MODES HIERARCHIZATION IN THE INTERFACE

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Appraisal of active modes for sustainable MaaS solutions
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WALKING HIERARCHIZATION

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Appraisal of active modes for sustainable MaaS solutions
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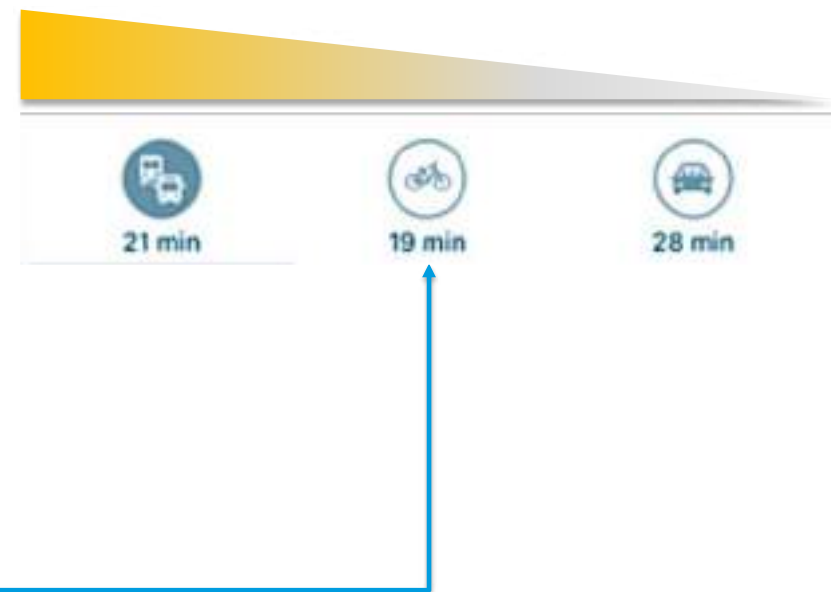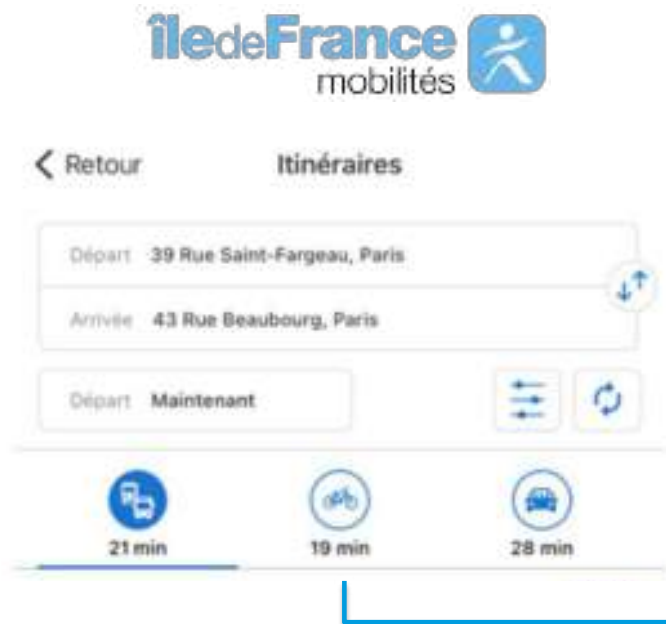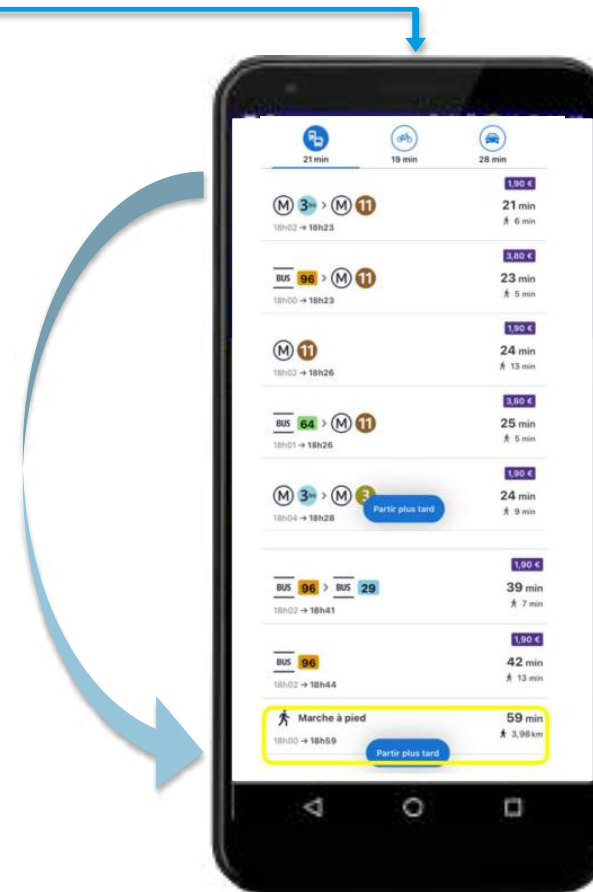
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WALKING ITINERARY
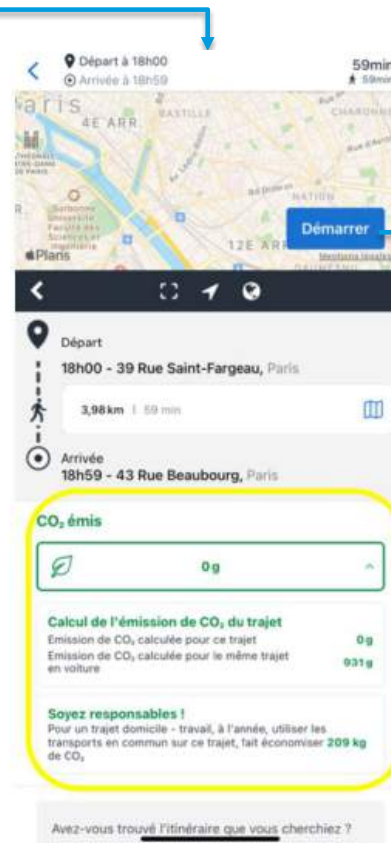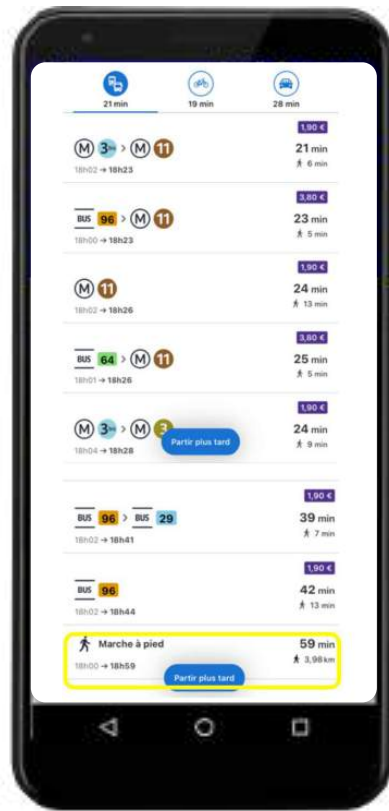
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The place of walking in MaaS:
Appraisal of active modes for sustainable MaaS solutions
Ph.D. Student Mariana Reyes

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WALKING VISIBILITY IN **INTERMODAL** ITINERARIES

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The place of walking in MaaS:
Appraisal of active modes for sustainable MaaS solutions
Ph.D. Student Mariana Reyes

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PERSUASIVE INFORMATION PROVIDED

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The place of walking in MaaS:
Appraisal of active modes for sustainable MaaS solutions
Ph.D. Student Mariana Reyes

8. RECOMMENDATIONS

Utilizing *Usability* **principles** to **improve** the way **information** is **displayed** and offered to users **prioritizing low-emission** modes/trips.

Providing **qualitative information** [crowdsourced?] **about the itinerary**: quality of the infrastructure, weather forecasts, public lighting, crowd levels, topography, type of streets (cf. Citymapper's main street feature) as an added-value in MaaS solutions.

Providing Detailed / visual information on the **connection of walking with other modes** for **intermodal trips**: *"you'll wait X minutes at the bus stop if you leave now walking, you can leave in X minutes and reduce your waiting time".*

Implementing of sustainable mobility policies and institutional policies **through MaaS** to achieve level 4 MaaS: *"enabling better quality of life for cities/citizens"* (Sochor et al., 2018)

Addressing the integration of **higher quality pedestrian information to enable** the **creation of sustainable value**.

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The place of walking in MaaS:
Appraisal of active modes for sustainable MaaS solutions
Ph.D. Student Mariana Reyes

9. CONCLUSIONS

1. What is the current status and the relevance of the integration of active modes in MaaS solutions?

- Active modes, specifically walking is currently shyly integrated to the studied MaaS solutions in the French capital region.

2. What are the factors influencing the existing level of integration of active modes in MaaS?

- Institutional policies have "set the tone" for the modal integration of MaaS solutions, but more attention is required to updating these policies to prioritize non-motorized modes, like walking and cycling.

- Institutions' partnership strategy is aligned to their BM and their policy of promoting sustainable mobility through PT in the Paris region.

- More studies are needed to target integration strategies of active modes in MaaS and identify the place of integrating walking in the value creation, capture and reallocation processes.

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Appraisal of active modes for sustainable MaaS solutions
Ph.D. Student Mariana Reyes

10. RESEARCH PERSPECTIVES

- Stronger focus analyzing pedestrian itinerary's treatment/integration in **intermodal trips**

- Focus on business model characteristics for **sustainable value creation**

- Definition of **personas** to identify the users benefitting of this integration

- Backing up the UI choices with interviews to identify **stakeholder's interest** towards the integration of active modes in MaaS solutions to create sustainable value for MaaS and institutional policies

- Necessary to take into account the territorial scope of MaaS operators and the **sustainable mobility policies** in the territorial context

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The place of walking in MaaS:
Appraisal of active modes for sustainable MaaS solutions
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THANK YOU FOR YOUR ATTENTION

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