



# From Travel Time and Cost Savings to Value of Mobility

## Mobility and Time Value (MoTiV)

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*#INTSYS2017 – Hyvinkää, 29 November 2017*

# Context: traditional view on Value of Travel Time (VTT)

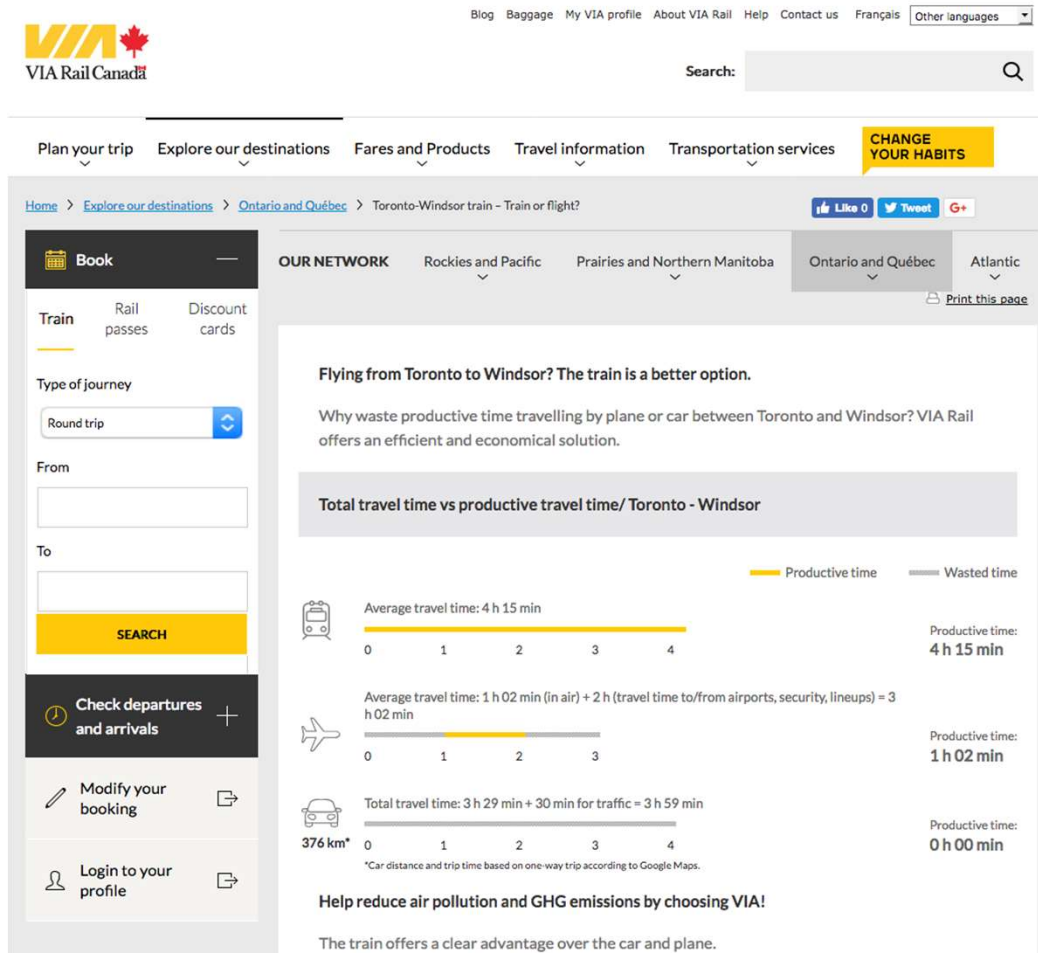
- **Research on Value of Travel Time (VTT) since 60s**
  - VTT as *“cost of time spent in transport”*
  - *“the most important number in transportation economics”*
  - economic models to quantify impact that higher travel/waiting times has on transport systems and organizations/society
- **Assumption: “travel time” is not productive time, hence it should be minimised**
  - “Travel time savings = cost savings”

# Context: towards a broader view on VTT

- **Travel time as productive time**
  - transport/service infrastructure “enablers” (e.g. wifi, proper seating in trains allowing to work while travelling)
- **Beyond time and cost savings: acknowledging the individual dimension of “value”**
  - VTT no longer as a “property of an economic system” but as a “multi-dimensional concept assessed at an individual level”
    - mobility/activity needs, preferences, routines and expectations
  - not straightforward to derive suitable models incorporating “behavioural view” of VTT



# “Travel time as productive time”: business relevance



Canadian rail company promoting **time spent in trains as fully productive despite longer travel time** (compared to car and plane)

# “Travel time as productive time”: activities in MaaS and autonomous vehicles



## *MaaS user-centred service design*



## Activities in autonomous and connected driving context



# Beyond time and cost savings: focus on quality of life



Human mobility  
Transport  
Travel



Life.  
Time.  
Value.

Time use  
Personal core values  
Activities & routines

Achieving good balance  
between the two (broad) areas

# Mobility and Time Value: relevant trends in apps collecting mobility and behavioural data

- Mobility-related & activity-related smartphone apps provide good indication on value of time in mobility contexts
  - **Mobility-related:** journey planners, mobility trackers (also known as activity/mobility diaries)
  - **Activity-related:** fitness / sustainable lifestyle apps, status update in social media
  - **Time-related:** life logs
- Time dimension is typically not explicit, but embedded in both mobility-related and activity-related apps



# Mobility-related apps: journey planners

- Journey planners provide indication on options to go from A to B by one or more means of transport
- Search results based on various parameters:
  - Time to destination
  - Cost
  - Convenience (number of transfers)
  - Safety (e.g. avoid passing by...)
  - Environmental impact (CO<sup>2</sup> emissions)
  - Calories burnt
  - Pick-up of other passengers (e.g. ride sharing)
  - ....customised routing criteria





# Mobility-related apps: journey planners

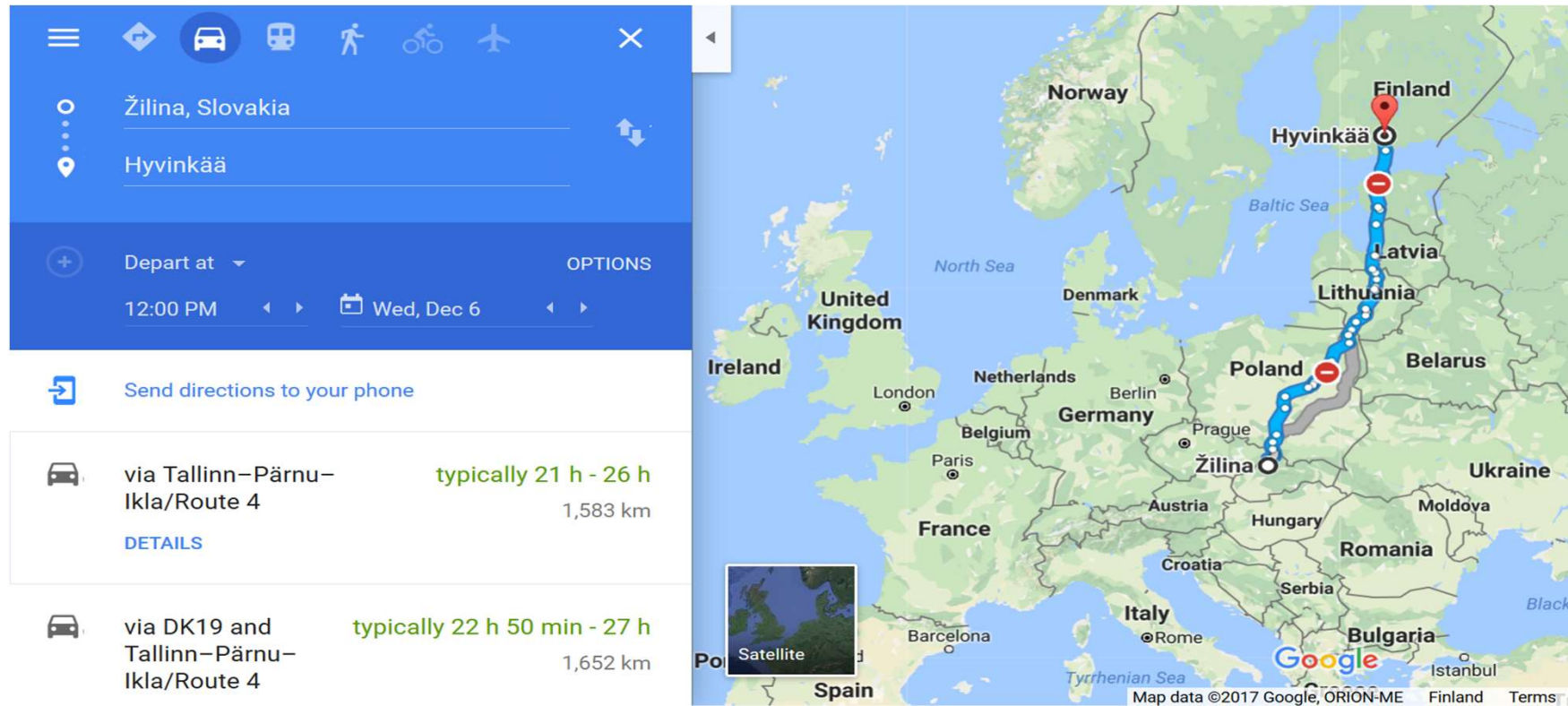
Search from Žilina (Region of Žilina) to Hyvinkää (Southern Finland) on Dec 6, 2017 at 08:00

DEP	ARR	VIA	MEANS	TIME	CO <sub>2</sub>	PRICE	RANK		
	15:11	23:51	Krakow (KRK), Helsinki (HEL)		7h39	296kg	€355	1	Map  Details
	06:45	16:16	Vienna (VIE), Helsinki (HEL)		8h31	363kg	€284	2	Map  Details
	14:45	00:16 Thu	Vienna (VIE), Helsinki (HEL)		8h31	363kg	€284	2	Map  Details
	05:52	16:31	Budapest (BUD), Helsinki (HEL)		9h38	396kg	€377	4	Map  Details
	06:26	17:21	Krakow (KRK), Warsaw (WAW), Helsinki (HEL)	2	9h54	306kg	€404	5	Map  Details
	14:20	01:51 Thu	Vienna (VIE), Riga (RIX), Helsinki (HEL)	2	10h31	377kg	€162	6	Map  Details

routeRANK multi-modal journey planner



# Mobility-related apps: journey planners

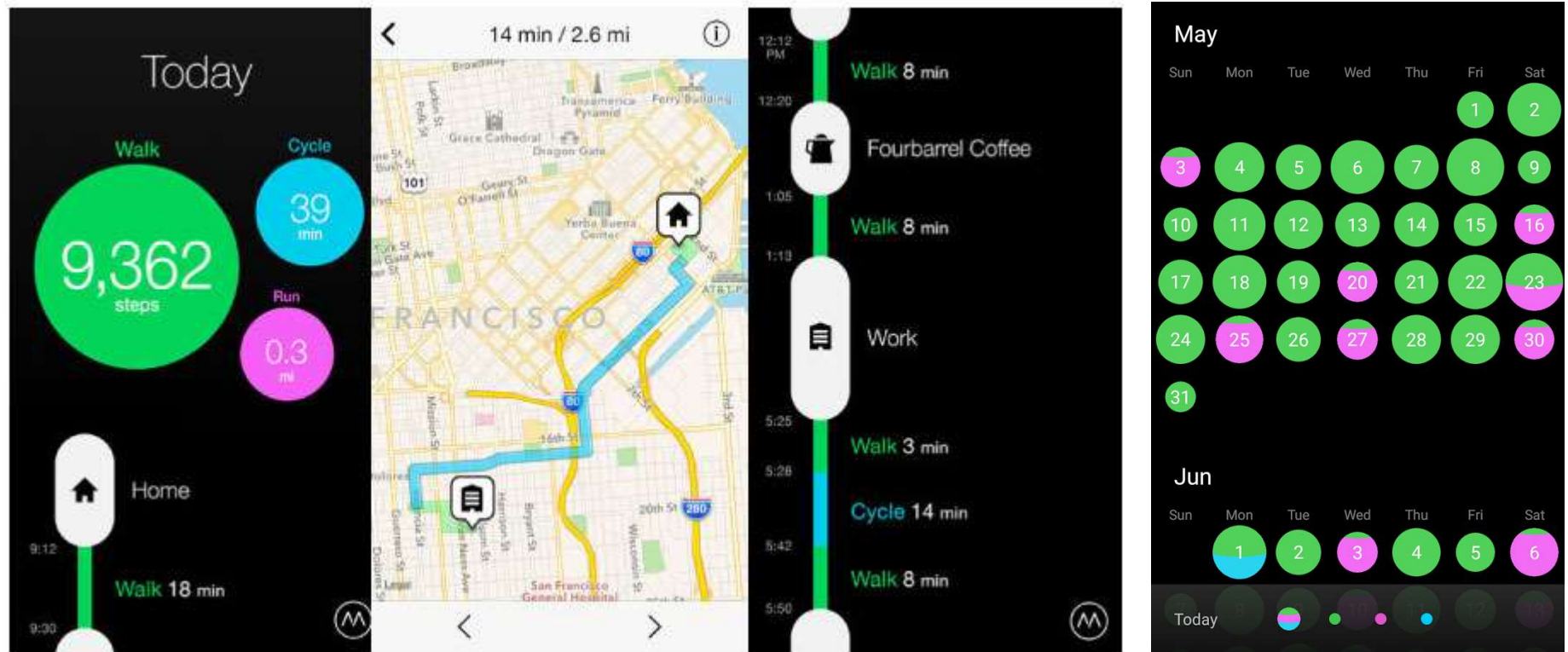


Google Maps integrates a journey planner

# Mobility-related apps: mobility trackers

- Mobility trackers are an evolution of “step counters” and allow visualising one’s mobility behaviour and transport routines to increase personal awareness on mobility choices
  - awareness may lead to behavioural change, although this is not the primary aim of the app
- Once installed, these apps collect data on user mobility and visualise statistics back to the user
  - personal modal split
  - step count / km count / calories burnt
  - time spent at relevant locations (e.g. home / office)
  - ...
  - customised statistics

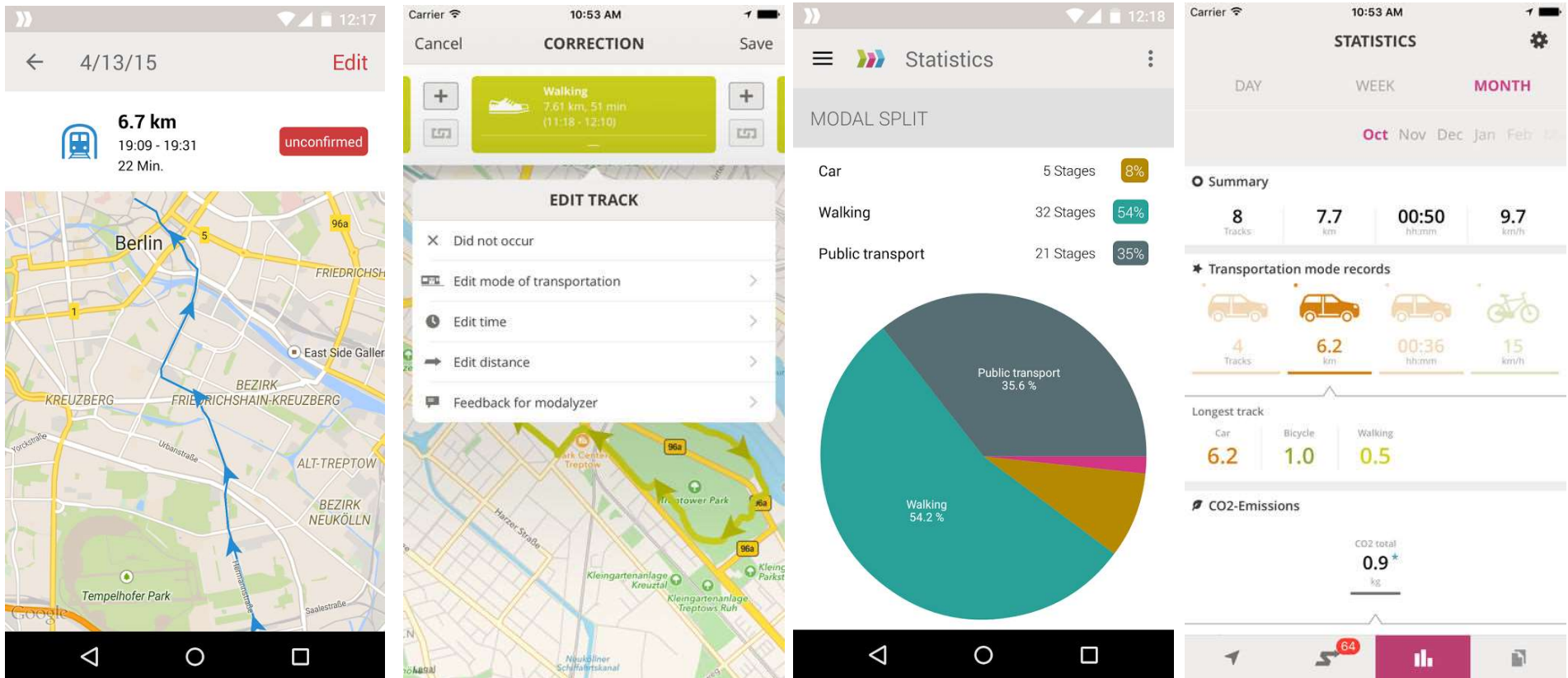
# Mobility-related apps: mobility trackers



Moves app – part of Facebook



# Mobility-related apps: mobility trackers



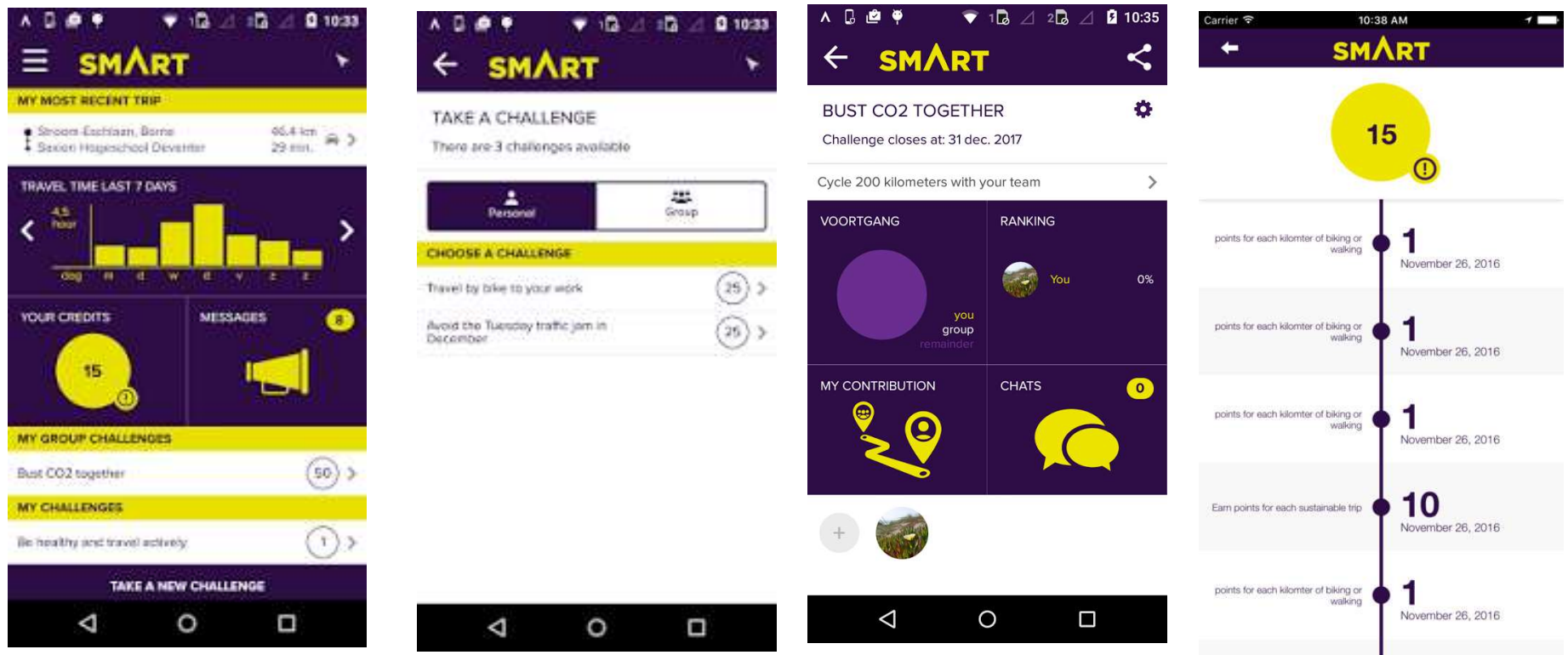
Modalyzer app – commercially evolved into MotionTag

# Activity-related apps: fitness / sustainable lifestyles

- Activity-related apps are often focused on activities promoting a healthier and balanced personal lifestyle
  - Specialised: centered on individual activity (e.g. running apps)
  - Holistic: encompassing several dimensions of behaviour
- Unlike mobility-related apps, this kind of apps often aim at promoting behavioural change through
  - gamification approach (setting goals and achieving points/rewards)
  - community dimension to compare and share own performance with peers



# Activity-related apps: fitness / sustainable lifestyles

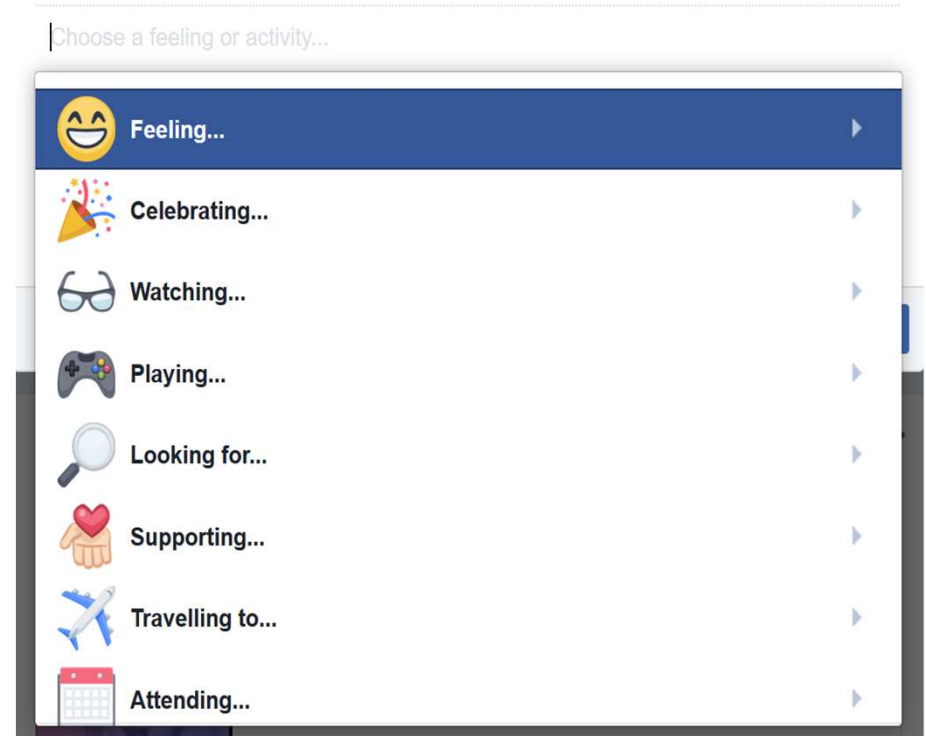
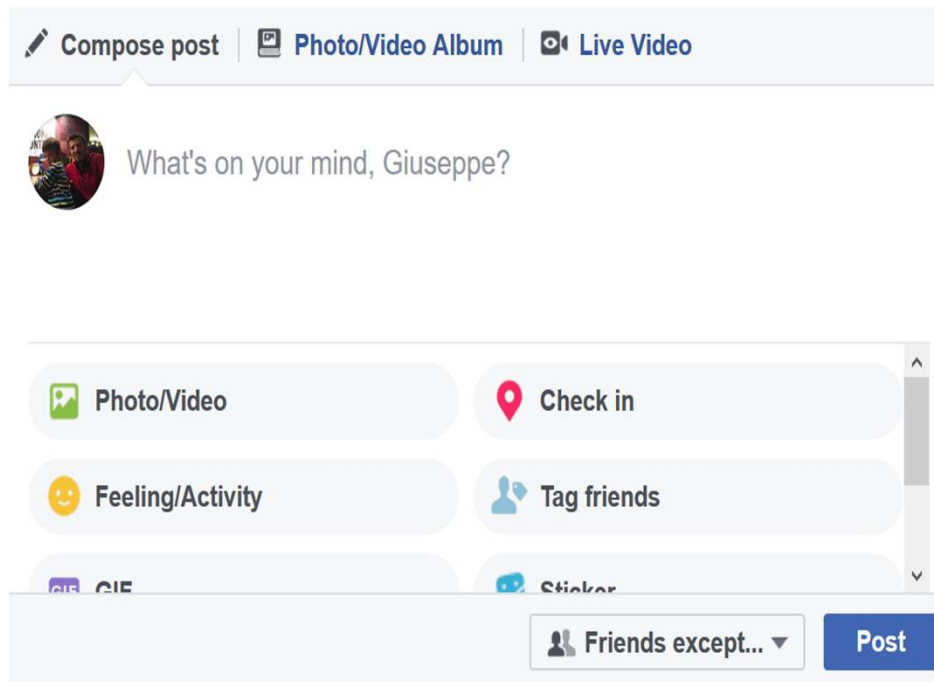


SMART (Self-Motivated And Rewarded Travelling)  
Urban Mobility app

# Activity-related apps: status update in social media

- Personal status update is a central feature of social media. This may simply include a short textual message, but also more complex and structured information including:
  - Multimedia content (photo/video, even in live streaming)
  - Tagging keywords or people
  - Hyperlinks
  - Location reference (check-in)
  - ...
- Although not focused on mobility or activity behaviours, status updates provide a useful insight into personal values, preferences, activities and behaviours.

# Activity-related apps: status update in social media

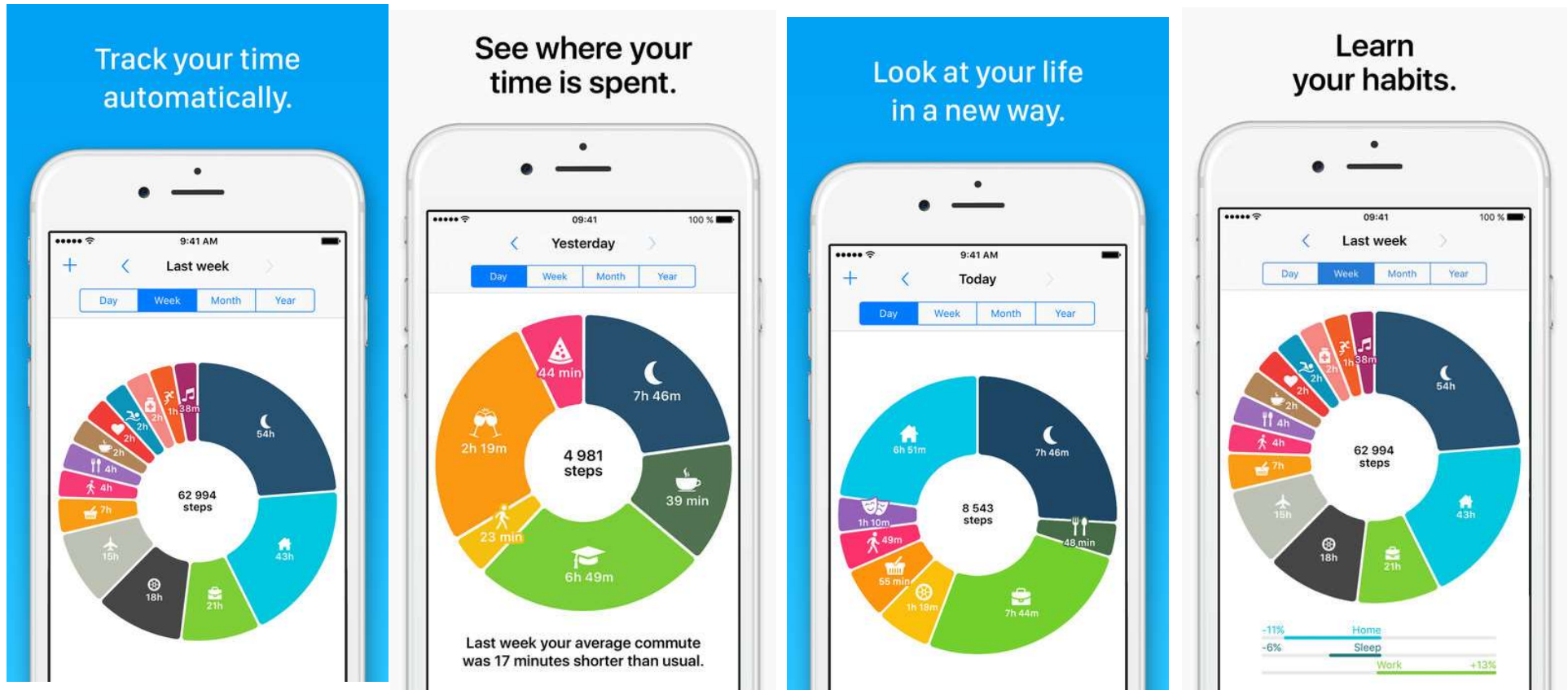


Facebook status update (with focus on mood/activity update)

# Time-related apps: time trackers

- Time trackers are similar to mobility trackers, with the exception that they do not focus only on mobility-related time allocation, but more broadly to time allocation to relevant activities of one's life
  - visualising one's time allocation to increase personal awareness on choices
  - awareness may lead to behavioural change (seeking life balance), although this is not the primary aim of the app
- Once installed, these apps collect data on user time allocation (with some user input) and visualise statistics back to the user
  - Time spent at home, at work, sleeping
  - Comparison of time spent in leisure vs work-related activities
  - ...
  - customised statistics

# Time-related apps: time trackers



Lifecycle app

# Apps collecting mobility and activity behavior: some remarks

- Ongoing trend towards **personal big data analytics** based on collection, processing and visualisation of data related to user's mobility and activity behaviour
  - Knowledge generated by processing such data and visualising it back to the user (or to a relevant stakeholder) is valuable
- The **data** to collect depend on the **purpose** of the app and its expected **value** to the user
  - App purpose and value for the user must be clearly defined
  - Privacy concerns and data protection framework to be addressed



# Exploring “Mobility and Time Value”: H2020 project “MoTiV”

- **Mobility and Time Value (MoTiV) is a H2020 research and innovation action to explore the “changing value of travel time”**
  - project started on 1/11/2017 and will last until 30/4/2020
- Exploratory research on VTT dynamics and their expected impacts through the analysis of a European-wide **dataset on mobility behaviors** collected with the **MoTiV app**
- Focus on individual preferences, behaviors, lifestyles



# The MoTiV Consortium

Partner	Country	Web-site
University of Zilina (Coordinator)	Slovakia	<a href="http://www.uniza.sk">www.uniza.sk</a>
CoReorient Oy	Finland	<a href="http://coreorient.com">http://coreorient.com</a>
European Cyclists' Federation ASBL	Belgium	<a href="https://ecf.com">https://ecf.com</a>
Fundacio Eurecat	Spain	<a href="https://eurecat.org/en">https://eurecat.org/en</a>
INESC ID	Portugal	<a href="https://www.inesc-id.pt">https://www.inesc-id.pt</a>
RouteRANK Ltd	Switzerland	<a href="https://www.routerank.com/en">https://www.routerank.com/en</a>
TIS.pt	Portugal	<a href="http://www.tis.pt">http://www.tis.pt</a>

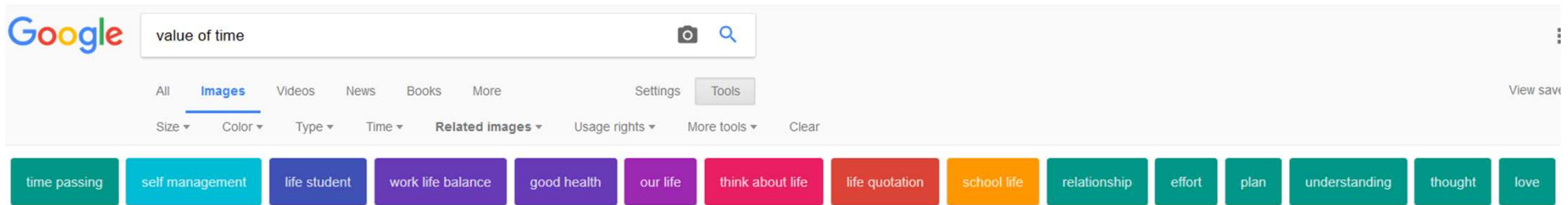


# The MoTiV Objectives

1. **Broaden the definition and assessment of VTT beyond the “time savings” consideration**, based on a multidimensional time “value proposition” for the user
2. **Gain an understanding of traveller’s reasons for his/her travel choices** in line with the perceived value proposition of mobility
3. **Assess to what extent ICT connectivity and transport services/infrastructure affect VTT** across leisure and work activities and within cultures and generations
4. **Elaborate specific actions and recommendations for mobility policy makers and solution developers** that shape the value propositions of travel time



# Objective 1 (O1): “Beyond time savings”



## Emerging perspective (employed in MoTiV)

- VTT as the “*individual happiness / satisfaction for the time spent in transport*”
- Travel time not necessarily unproductive, especially since ICT allow “activities within mobility” and “mobility within activities” (i.e. activity time no longer separated from travel time)
- VTT estimation should incorporate impact on “individual well-being” and travel satisfaction, therefore embedding personal preferences, needs, motivations and behaviors

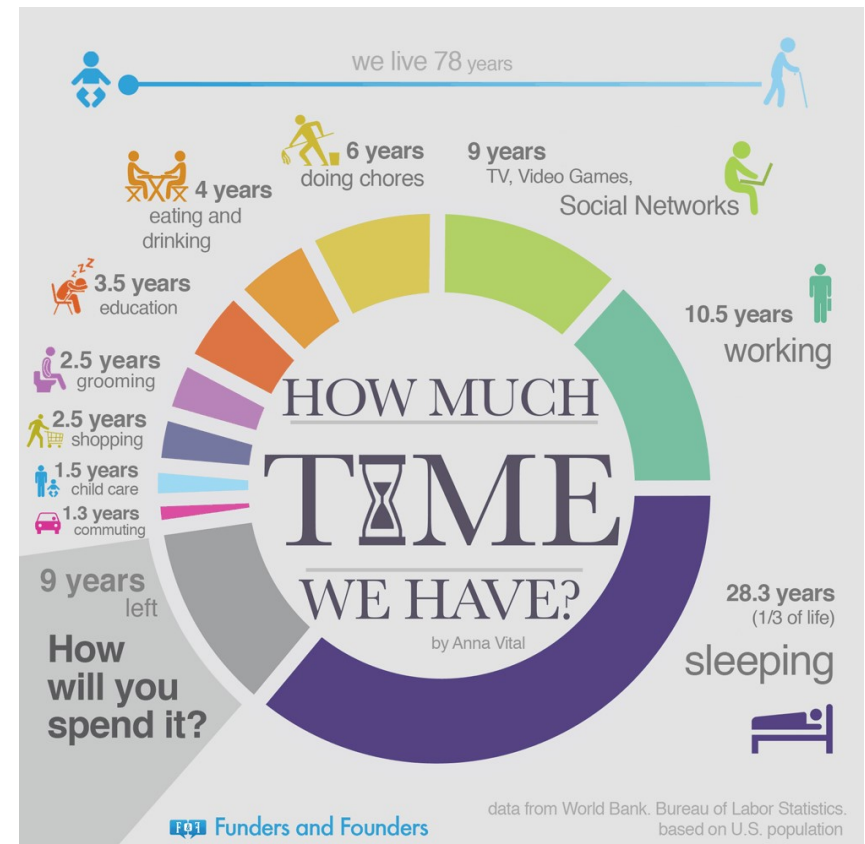
# Objective 1 (O1): “Beyond time savings”

*“It is not just about time savings, but about the perceived quality of time”*

## O1. Conceptual Outputs

SO1.1: Conceptual Framework for Estimation of VTT

SO1.2: Methodology for VTT Estimation



# Objective 2 (O2):

## “Understanding traveller’s reasons”

- A motive is *“something that causes a person to act in a certain way”*
- MoTiV’s aim is to define and validate a conceptual framework for VTT estimation based on the value proposition of mobility

### O2. Technological and Organisational Outputs

SO2.1: Requirements for data collection of mobility and behavioural data to estimate VTT

SO2.2: Smartphone app development

SO2.3: European-wide data collection





# Objective 2 (O2):

## “Understanding traveller’s reasons”

- **Gathering mobility, behavioral and contextual data to assess one’s perceived Value Proposition of Mobility:** *“The value embedded in individual mobility choices”*
- **Smartphone-based data collection via app combining features of**
  - Travel/activity diary (*activity dimension*)
  - Journey planner (*mobility dimension*)
  - Personal time tracker (*time dimension*)



# Objective 3 (O3): How ICT connectivity and transport services/infrastructure affect VTT

## Evaluation of the collected dataset

- Identify behavioural patterns and matching them to the “value proposition of mobility” to understand
  - travel and mobility choices
  - role of “influence factors” (ICT, transport services/infrastructure) in VTT
- Cross-cultural, generational and gender analysis

### O3. Socio-economic Outputs

SO3.1: ICT-related influence factors

SO3.2: analysis of transportation system and supporting infrastructure

SO3.3: investigation of crowdsourced micro-tasks as an area determining a shift away from the “speed” paradigm

# Objective 4 (O4): Actions and Recommendations for Policy-makers and Solution Developers

- Based on the results of the evaluation, recommendations for short-medium term and long-term covering e.g. role of VTT in MaaS, connected and autonomous driving, shared mobility

## **O4. Policy and Business Recommendations**

**SO4.1: role of ICT shaping VTT**

**SO4.2: role of transportation system and supporting infrastructure in shaping VTT**

**SO4.3: cost-benefit analysis for the European context on role of influence factors in VTT**

**SO4.4: forecast analysis with outlook on VTT in Europe 2030**



# MoTiV Expected Impact

1. Comprehensive overview about **preferences, behaviours and lifestyles that influence the travel option choice**, the time spent for travel preparation and travelling as well as the value proposition of the travel time.
2. **Identify influence factors for mode choice and travel time value perception** in the context of life style and personal values will be a basis for transport policies and strategies.
3. The project will generate **knowledge about the value of time in mobility contexts**, considering different geographical, cultural, economic and gender factors.

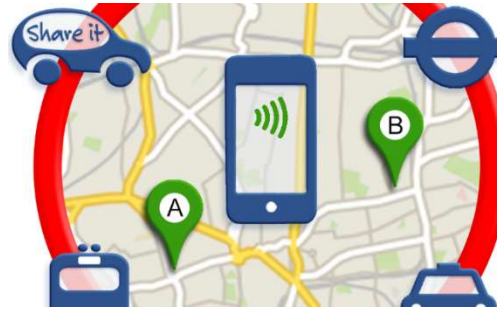


# MoTiV Expected Impact



1. Comprehensive overview about **preferences, behaviours and lifestyles that influence the travel option choice**, the time spent for travel preparation and travelling as well as the value proposition of the travel time.
  - Based on Europeans' real itineraries and routines
  - Quantified assignment of values to travel time beyond cost and time savings (and including “soft factors”)
  - Knowledge on modes and circumstances enhancing or curbing VTT

# MoTiV Expected Impact



## 2. Identify influence factors for mode choice and travel time value perception in the context of life style and personal values will be a basis for transport policies and strategies.

- ICT- and transport- related influence factors (e.g. sharing economy solutions, MaaS, autonomous vehicles) promoting or curbing VTT
- Knowledge on socio-economic and environmental gains for short and medium-term in line with EU policies and strategies
- Evidence for policy-makers at all levels (boundary conditions for sustainable mobility system) and business actors (profiled services)
- Potential for higher citizens' engagement with public transportation

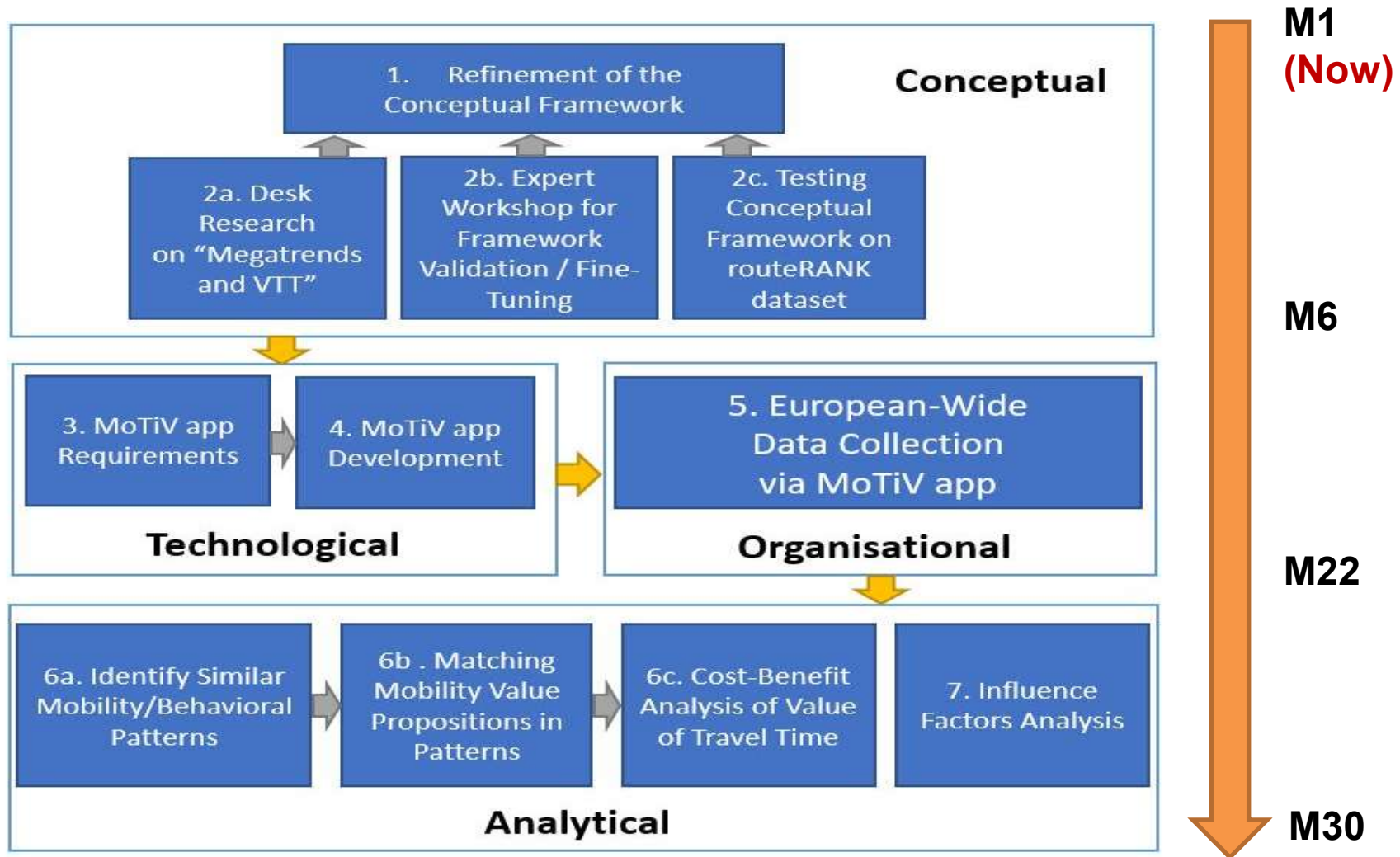


# MoTiV Expected Impact



3. The project will generate **knowledge about the value of time in mobility contexts**, considering different geographical, cultural, economic and gender factors.
- Knowledge on socio-cultural variations of perceived value proposition of mobility
  - New business models for mobility providers based on offering of solutions going beyond the “cost-time saving” paradigm
  - Open dataset will stimulate research on VTT and related areas

# MoTiV Framework



# Thank You for your attention!



Follow the MoTiV project:  
[www.motivproject.eu](http://www.motivproject.eu)

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