WP.T1 - D.T1.2.22

Review for matching needs and services for a comprehensive planning (Budapest, HU)

Final Version

04 2020

Dissemination level	***Public***
Activity	***A.T1.2 – Understanding the users' need***
Deliverable	***D.T1.2.22 – Review for matching needs and services for a comprehensive planning (Budapest, BKK)***
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Due date of deliverable	***30.04.2020***
Actual date of deliverable	***30.04.2020***
Status (F: final, D: draft)	***Final***
File name	***041_SMACKER_D-T-1-2-22_2020-04-30_Final***

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1. Introduction

Remote regions in central Europe share the same risks and issues related to being at the periphery of main transport networks. Inadequate and under-used services, excessive costs, lack of last-mile services and proper intermodality, poor communication and information to users and car commuting are the challenges that many central European regions face.

The SMACKER project addresses those disparities to promote public transport and mobility services that are demand-responsive and that connect local and regional systems to main corridors and transport nodes.

Within SMACKER mobility issues related to peripheral and rural areas, and main barriers are assessed and addressed by providing solutions that draw on the best international know-how. SMACKER promotes demand-responsive transport services to connect local and regional systems to main transport corridors and nodes: soft measures (e.g. behaviour change campaigns) and hard measures (e.g. mobility service pilots) are used to identify and promote eco-friendly solutions for public transport in rural and peripheral areas to achieve more liveable and sustainable environments, better integration of the population to main corridors and better feeding services. SMACKER helps local communities to re-design their transport services according to user needs, through a coordinated co-design process between local/regional partners and stakeholders; SMACKERS also encourages the use of new transport services through motivating and incentivizing campaigns. The direct beneficiaries of the actions are residents, commuters and tourists.

Participation reflects the overall integration of citizens and groups in planning processes and policy decision-making and consequently the share of power. In particular, transport planning and transport relevant measures are often the subject of controversial discussions within the urban community. The concept of Sustainable Urban Mobility Planning has established the principle that the public should be included from the very beginning of the transport planning process and not only when the plans are largely completed and only minor amendments can be carried out. For that reason, public authorities need to open-up debate on this highly specialised and complex subject area and make participation a part of the planning process. In order to ensure participation throughout the process, development of an engagement strategy would be necessary.

The deliverable deals with the review for matching needs and services for a comprehensive planning (Budapest, HU). The necessary matching between needs and possible offer is the key for a transport solution useful and sustainable. The report assesses the results of mobility needs and expectations reviews to deliver analysis useful for training and planning.

Chapter 2 summarizes the mobility needs in the Budapest pilot area.

Chapter 3 assesses the coherence between mobility needs and the foreseen pilot activities, dedicating a particular attention to reviewing the nudging activities.

Finally, chapter 4 elaborates the lessons learned and defines the main outcomes of the deliverable in terms of both useful insights for the pilot planning (input to D.T2.2.7 “Pilot action planning (Budapest, HU)”) and relevant outlook for the future that could be used for training activities and workshops too. As not all the user needs are addressed through the pilot action, activities emerging as necessary / useful in the lessons learned can be considered as a proposal for further future development.

2. Review of mobilty needs in SMACKER pilot area

2.1. Basic information

Budapest is the largest city in and the capital of Hungary with 1.7 million inhabitants. The surroundings of Budapest including the city have about 3 million inhabitants the majority of which is working or learning in this area. Budapest is one of the most important industrial cities, the economic and cultural centre of the country and the Carpathian Basin. The capital is popular among the tourists worldwide owing to the famous buildings, the geographic situation on the two riversides of the Danube with the Buda Hills and the well-known spas and baths from the middle ages.

The areas interested by the Budapest pilot are located in Budapest's peripheral districts that are low-density built and extended recently the DRT bus line system to have connection to the nearest suburban railway line or that are provided by a fixed bus line of low utilization. The existing call-based service request system should be replaced with an IT system, because the existing system requires a lot of human resources (operators), not effective, and not comfortable for the users.

Transport infrastructure lies at the core of mobility as stated in the 2011 Transport White Paper: "*Infrastructure shapes mobility*" thus a short overview of existing transport infrastructure and mobility services in the pilot region of Budapest pilot region is presented in the table below. The table provides a simplified insight into transport infrastructure and mobility services that are important for understanding of specific conditions in which SMACKER pilot activities are to be implemented.

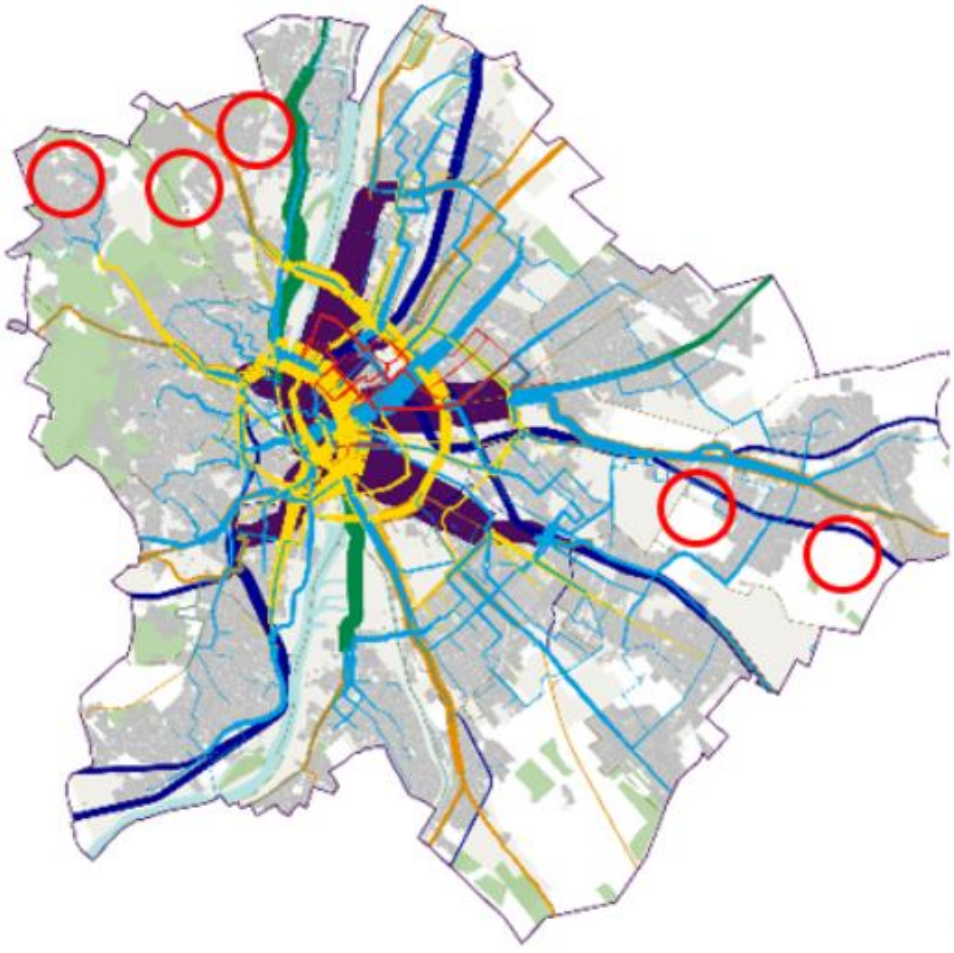

Figure 1: DRT lines in Budapest in May 2020

Table 11: Overview of existing Transport infrastructure and mobility services in Budapest pilot region

AVAILABILITY OF TRANSPORT INFRASTRUCTURE					
		Comprehensive	Appropriate	Incomplete/limited	Not applicable
Existing network (scope, coverage)	Roads	☒	☐	☐	☐
	Rail	☒	☐	☐	☐
	Light rail/tram	☒	☐	☐	☐
	Cycling paths	☐	☒	☐	☐
	Pavements	☐	☒	☐	☐
QUALITY OF TRANSPORT INFRASTRUCTURE[2]					
		Good	Adequate	Poor	Not applicable
Condition of infrastructure	Roads	☐	☒	☐	☐
	Rail	☐	☒	☐	☐
	Light rail/tram	☐	☒	☐	☐
	Cycling paths	☐	☒	☐	☐
	Pavements	☐	☒	☐	☐
DENSITY OF PUBLIC TRANSPORT INFRASTRUCTURE					
		Good	Adequate	Poor	Not applicable
Density of transport stops / stations	Bus	☒	☐	☐	☐
	Rail	☐	☒	☐	☐
	Light rail/tram	☒	☐	☐	☐
AVAILABILITY OF MOBILITY SERVICES:					
		Available	Planned	Under consideration	Not applicable
Existing or planned mobility services	Bus	☒	☐	☐	☐
	Rail	☒	☒	☐	☐
	Light rail/tram	☒	☐	☐	☐
	Car sharing	☒	☐	☐	☐
	Bike sharing	☒	☐	☐	☐
	Park and ride	☒	☐	☐	☐
	e-scooter sharing	☒	☐	☐	☐

The city of Budapest as the capital of Hungary is connected with comprehensive and dense road network and railway line connecting the region linking it to other regions of Hungary and to neighbouring countries. All typical urban transport modes are available in the city.

2.2. Mobility needs

In February 2020 BKK staff together with the bus drivers of DRT lines asked 172 passengers about their satisfaction with the service, and the service request system. Their opinion about the planned pilot action is also asked in the survey. The main outcomes are the following:

- If users are asked about their satisfaction related to the DRT lines and services, the lowest rate is given to the service request methods. This points out that the largest potential is in developing a new notification system.

[1] The table should be understood from point of view of rural and semi-rural regions and related mobility needs in such areas.

[2] Good – infrastructure in optimal condition, no intervention needed; Adequate - infrastructure in average condition, interventions/maintenance needed; Poor – infrastructure in bad conditions, interventions needed.

- Drivers talked about the experience that there are potential passengers who do not indicate their travel demand in the timetable period of DRT because they find the way too complicated and they think it is easier to wait for the bus that will run by another demand. They are checking the departure of the bus on the online schedule surface or just physically: they look out of the window if the bus “came up” to the bus stops.
- The willingness to use a new web-based application for notifying the travel demand is higher among the young people (under 30) and lower among the elders.
- The need for facilitating the service request methods are obvious and users are open to try or use continuously the new interface.

3. Assesment of coherence between mobility needs and SMACKER activities in pilot regions

3.1. SMACKER pilot action in relation to mobility needs

In Budapest, the aim of the pilot is to develop, test and implement a new web based online application, where passengers have direct access in order to book a ride and can follow whether the bus goes on the demanded route. Passengers will also have the possibility to cancel or rebook their requests if they cannot ride the pre-booked service. This (web based) application will also be available on smart phones in order to allow for a better access and give bigger flexibility to the users. The (web)application will have a backend for the dispatcher, who can follow the bookings and the cancellations. The aim of the application is to automatically advise the respective drivers on their to do list satisfying the trip requests, without direct involvement of the dispatchers. For this purpose, either the existing online traffic control and passenger information system (FUTÁR) will be used, which gives indication for the driver through the on-board unit, or another smart device.

Main technical parameters of SMACKER pilot in Budapest are presented in Table 2 below.

Table 2: Main DRT technical parameters of the Budapest pilot action. [Source: Interreg Europe (2018), A Policy Brief from the Policy Learning Platform on Low-carbon economy.]

Key parameters addressed	Set of parameters	Budapest PILOT
How does the user book their journey?	- Telephone call - Internet (website/app)	- Telephone call - Internet (website/app)
When is booking required?	- On the day/when required - In advance - Repeating booking	- Maximum one week, at least 30 minutes before departure, for the demand responsive journey
How frequently should the service run?	- Only when requested - Set number of journeys per day	- Only when requested on DRT lines, in demand responsive time slots (some DRT lines are operating on timetable basis in peak/working days)
How flexible is the route?	- Fully set, but only runs when there is demand - Deviations possible within a set corridor - Fully flexible	- Fully set on most of the lines, but only runs when there is demand - Deviations possible within a set corridor on some lines
Where are users picked-up or dropped-off?	- Many-to-many - One-to-many / many-to-one - One-to-one	- Many-to-many
What area is the service covering?	- Rural - Suburbs - Mixed	- Suburbs

Key parameters addressed	Set of parameters	Budapest PILOT
Who are the main users?	- All public - Disadvantaged groups - Private groups	- All public
What size of vehicle should be used?	- Car - Minibus - Bus	- Minibus - Bus
What is the price for the user?	- Free - Paid	- Paid (normal public transport tariff)
How is the DRT system financed?	- Subsidised - Partly-subsidised - Commercial	- Partly-subsidised - Commercial
What competition is there with other Transport solutions?	- High - Low	- Low

Based on Enoch, M.P et al (2004), "INTERMODE: innovations in Demand Responsive Transport" developed by the Department for Transport and Greater Manchester Passenger Transport, it is possible to identify four key technical areas related to the development and improvement of DRT services: changes in communication channels/tools, changes in type of service, changes in level of service and changes in fares level and structure.

Table 3: Budapest pilot interventions' maturity levels

Categories	Changes in	Level achieved (yes / no)
Communication	Change in communication channels/tools	Yes
Type of service	Change in type of service - change in type/size of vehicles	No
	Change in type of service - degree of route flexibility	No
	Change in type of service - degree of timetable flexibility	No
	Change in type of service - changes in mode of booking	Yes
Level of service	Change in level of service - changes in frequency	No
	Change in level of service - in operating hours	No
Level of fares integration	Change in fares level and structure - fares integration	No
	Change in fares level and structure - MaaS Approach	No

The SMACKER pilot to be implemented in Budapest answers almost all the mobility needs identified. Only within the group of elderly passengers, there is a higher share of those, preferring the old system (i.e. just check the bus at the street or call for a ride with telephone). However, it is foreseen, the old channels of booking will remain. The correlation between identified needs and pilot action is depicted in table below.

Table 4: Correlation between identified mobility needs and Budapest pilot action

Mobility needs (as identified in pilot region)	**SMACKER pilot action's interventions in relation to specific mobility need.**	**Correlation of pilot with identified needs** (low / medium / high)
a) **Service request method for a DRT ride is poor**	Is foreseen in the new online system	High
b) **Possibility to check the departure of the bus**	After the IT development, it will be available in FUTÁR application.	High
c) **The willingness to use a new web-based application for notifying the travel demand is higher among the young people (under 30) and lower among the elders**	There will remain a telephone-based booking system for the elderly	Medium
d) **Need for facilitating the service request methods are obvious**	Is foreseen in the new online system	High

The pilot action corresponds well to identified mobility needs.

3.2. SMACKER nudging activities in relation to mobility needs

As in Budapest the DRT service is already running, the most important target groups for nudging initiatives are the existing users and the potential users from the covered area, who are using private transport. The existing users are easily reachable through leaflets and posters on the buses and in the bus stops, while potential users could be reached by leaflets, and through the internet. Following the list presented in D.T1.1.4, BKK as Budapest pilot coordinator identified a number of nudging initiatives that could be reasonably feasible and useful:

- (5.1) Mobility stand on local and regional event
- (5.3) Presentations at periodic local meetings, establishment of a local mobility forum
- (5.8) "Car-free day" / EU Mobility week
- (5.14) Use of social media to make (flexible) public transport visible
- (5.17) Customized PT information packages on paper about selected topics
- (5.23) Time table and other information as APP for mobile devices
- (5.24) Making public transport visible on public places and places were people meet and likely need mobility supply.

Budapest organizes several events during the European Mobility Week (that takes place in September every year) for a long time (5.1, 5.3, 5.8), where BKK always has a tent, and provides information about ongoing R&D projects, and the services. Nowadays social media is one of the most important communication channels between the Public Transport Authority and the passengers, so news about services and developments are published on the official Facebook page of BKK, which has more than 160.000 followers. About SMACKER project already some news items have been published but once the pilot started, BKK plans to launch several further information about that (5.14).

Social media might be the most important communication channel for potential users, while for existing users BKK will provide information through posters and leaflets on the vehicles, the stops, on BKK mobile application and BKK customer centres during the lifetime of the pilot. (5.17, 5.23, 5.24).

The majority of the above nudging activities are supporting the implementation of the web based online application. In principle, all nudging activities serve to transfer the information to the different target groups to satisfy their information needs in relation to the online service request opportunity. The correlation between identified needs and nudging activities is depicted in table below.

Table 5: Correlation between identified mobility needs and nudging activities planned in Budapest

Mobility needs	SMACKER nudging activities in relation to users' needs	Correlation of nudging activities with identified needs (low / medium / high)
a) **Service request method for a DRT ride is poor**	- (5.23) Time table and real time information in FUTÁR application for mobile devices and on the web	High
b) **Possibility to check the departure of the bus**	- (5.3) Presentations at periodic local meetings, establishment of a local mobility forum - (5.17) Customized PT information packages on paper about selected topics	High
c) **The willingness to use a new web-based application for notifying the travel demand is higher among the young people (under 30) and lower among the elders**	Elderly passengers - (5.1) Mobility stand on local and regional event - (5.17) Customized PT information packages on paper about selected topics - (5.24) Making public transport visible on public places and places were people meet and likely need mobility supply. Younger passengers - (5.8) "Car-free day" / EU Mobility week - (5.14) Use of social media to make (flexible) public transport visible	High
d) **Need for facilitating the notification methods are obvious**	- (5.23) Time table and real time information in FUTÁR application for mobile devices and on the web	High

3.3. Matching mobility needs to SMACKER pilot action and nudging activities

Table 6 provides an overview, which aspects are addressed by the actions undertaken in the Budapest pilot region on a general level.

Table 6: Overview of identified mobility needs in relation to pilot action and nudging activities

MOBILITY NEEDS MATCHING WITH PILOT ACTION AND NUDGING ACTIVITIES					
		Issue/need recognized	Addressed by the pilot	Addressed by nudging activity	n. a.
Geographical scope	Inter-urban	☐	☐	☐	☒
	Urban-rural	☒	☒	☒	☐
	Rural	☐	☐	☐	☒
	Intra-regional	☒	☒	☒	☐
	Inter-regional	☐	☐	☐	☒
	First/last mile	☒	☒	☒	☐
User groups	Residents	☒	☒	☒	☐
	Commuters	☒	☒	☒	☐
	Tourists	☐	☐	☐	☒

MOBILITY NEEDS MATCHING WITH PILOT ACTION AND NUDGING ACTIVITIES					
	Elderly	☒	☒	☒	☐
	Vulnerable groups (mobility impaired)	☒	☒	☒	☐
Time related availability of PT	Availability on weekdays - daytime	☒	☒	☒	☐
	Availability on weekdays – evening/night	☒	☒	☒	☐
	Availability on weekends - daytime	☒	☒	☒	☐
	Availability during weekends – evening/night	☒	☒	☒	☐
Flexibility of public transport	Fixed itineraries and flexible time tables	☒	☒	☐	☐
	Fixed itineraries with deviation on demand	☒	☒	☐	☐
	Flexible itineraries with predefined bus stops	☒	☒	☐	☐
	Flexible itineraries and flexible stops	☐	☐	☐	☒
Access to information on mobility options	Residents	☒	☒	☒	☐
	Commuters	☒	☒	☒	☐
	Tourists	☐	☐	☐	☒
	Elderly	☒	☒	☒	☐
	Vulnerable groups	☒	☒	☒	☐

As shown above, the foreseen pilot action and nudging activities are well aligned with identified mobility needs.

4. Lessons learned and outlook for the future

The analysis of existing situation in relation to transport infrastructure, services and mobility needs has validated the premises used for elaboration of pilot action.

Nevertheless, there are some suggestions to be made that should be beneficial for pilot planning (D.T2.2.7) and for trainings and workshops[3]. Finally, some recommendations that go beyond SMACKER activities can be elaborated, as follows.

Pilot planning specific recommendations:

- Offer further information and support at a mobility information point of the transport operators (BKK Customer centres), where (also elderly) people can go with their smartphone online where booking will be demonstrated.
- Consider, if the drivers could be trained to support (and advertise) the usage of the online service request system as well. They should be able to answer the frequent questions of the potential users in the bus (as usually they are the only direct contact for the people with the transport operator). Instructions should be provided for the drivers.
- Such instructions similar as for the drivers can be forwarded to other relevant institutions, such as health care centres, retirement homes, schools, etc.
- Develop a strategy, how to make the online service request and the supply visible for visitors from outside of the region.
- Consider mobility needs of vulnerable groups even though they are not specifically mentioned (how the service request system can be used by handicapped people). E.g. blind people have their own reading apps and it need to be checked, if the DRT app can be combined with it. Or voice control for (partially) paralysed people.
- Consider, if there is a need for the online service request system providing other languages than Hungarian?
- Further readings/useful case studies:
    - All your journeys, get an all-inclusive plan or simply pay as you go. Whim is the carefree way to travel: https://whimapp.com/at-en/
    - A Policy Brief from the Policy Learning Platform on Low-carbon economy: Demand-responsive transport https://www.interregeurope.eu/fileadmin/user_upload/plp_uploads/policy_briefs/2018-06-27_Policy_Brief_Demand_Responsive_Transport.pdf
    - New booking system for rural demand responsive transport: https://www.stirling.gov.uk/drt

[3] Budapest LTG training took place in February 2020 (see D.T1.3.7).

Suggestions for training and workshop activities:

- Discuss, how to integrate (or develop further) the online service request system into/towards a mobility as a service tool where more modes are included (e.g. sharing systems, taxi, etc.) and e-ticketing.
- Discuss, what are other requirements and needs for the typical users of the online service request system, which could be included as additional element in the online service request system, either mobility related or not (e.g. cooperation with health care services, ensured connections to other public transport lines at interchanging points).
- Organise training with other regions (and discuss option, how these regions could apply similar tools with a common standard).
- Discuss, how the DRT-system itself could be developed further in the region, which are the limitations and potentials of this mode in the region (or any other).
- Discuss how to involve non-public transport users from the covered areas.

Beyond SMACKER:

- Develop strategies, how to integrate (or develop further) the online service request system into/towards a mobility as a service tool where more modes are included (e.g. sharing systems, taxi, etc.) and e-ticketing.
- Look for cooperation with other regions in Hungary to find a common standard for the online service request system, so that passenger are already familiar with the booking system if visiting other cities/regions.

5. References

1. European Commission, 2011: Transport White Paper Road Map to a Single European Transport Area – Towards a Competitive and Resource Efficient Transport System, https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52011DC0144
2. Enoch, M.P. et al (2004), INTERMODE: innovations in Demand Responsive Transport. [Report for] Department for Transport and Greater Manchester Passenger Transport Executive. Final report. London: Department for Transport.
3. Interreg Europe (2018), A Policy Brief from the Policy Learning Platform on Low-carbon economy
4. SMACKER Application Form, Version 27 February 2019
5. SMACKER "D.M.2.1 Internal Quality Handbook", September 2019
6. SMACKER "D.T1.1.1 Review of service level and technical level for rural and peripheral areas", November 2019
7. SMACKER "D.T1.1.4 Review of behaviour change and nudging initiatives", September 2019
8. SMACKER "D.T1.2.16 Data collection on users mobility needs and expectations (Budapest, HU)", February 2020
9. SMACKER "D.T1.3.1 Planning and reasons for training", January 2020