Nantes | Hamburg | Helsinki

Deliverable due date: M36 – November 2019

D4.10 Lighthouse features into public transport navigator in use

WP4, Task 4.5 (Subtask 4.5.1)

Transition of EU cities towards a new concept of Smart Life and Economy

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731297.

Project Acronym	mySMARTLife
Project Title	**Transition of EU cities towards a new concept of Smart Life and Economy**
Project Duration	1st December 2016 – 30th November 2021 (60 Months)
Deliverable	D4.10 Lighthouse Features Into Public Transport Navigator In Use
Diss. Level	PU
Status	☐ Working ☐ Verified by other WPs ■ Final version
Due date	30.11.2019
Work Package	WP4
Lead beneficiary	FVH
Contributing beneficiary(ies)	
Task description	**Task 4.5: ICT and Urban Platform developments – ICT & URBAN PLATFORM [FVH] (HEL, VTT, CAR)** Energy and district-level components will be developed and up-taken into Helsinki Urban Platform. Currently the Urban Platform consists of over 600 various systems. With Lighthouse, the zone-specific and energy-specific components both to the static open data as well as real-time data (IoT) systems will be implemented. Also, two specific Apps will be developed to demonstrate the value of the new open data and open APIs, and a hackathon will be organised to engage external developers for further data exploitation. **Subtask 4.5.1: Urban platform data upgrades and two demonstrator App deployments**. FVH will lead the development of updates in the urban platform and development of "Carbon-neutral Me" App to be used by the residents and job-goers at all Zones. "Lighthouse features" will be designed and deployed into public transport navigator in use and several Lighthouse-specific IoT service, backend and sensoring systems in use to support on e-mobility and analysis. Definition of the lighthouse features and inclusion into the transport navigator.

Date	Version	Author	Comment
16/10/2018	0.1	Timo Ruohomäki (FVH)	First draft
31/10/2018	0.2	Timo Ruohomäki (FVH)	Minor edits, ready for review.
29/10/2019	1.1	Timo Ruohomäki (FVH)	Updates for the M36 final deliverable

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Abbreviations and Acronyms

Acronym	Description
mySMARTLife	Transition of EU cities towards a new concept of Smart Life and Economy
HSL	Helsinki Region Transport Authority
AQ	Air quality

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1. Executive Summary

This deliverable provides status information of the task where lighthouse features were to be implemented as part of the transport navigator. The task is heavily related to other tasks where those lighthouse features were to be implemented. As an example, such features can be noise and air quality monitoring sensors. The chapter Lighthouse Features defines the types of observations that can be related to route planning instructions. It should be noted that prior to mySMARTLife, there were only a limited number of sensors providing such data in real time. The route planning guidance will naturally depend on such data and it is expected, that these development paths will join on the later stages of the project so that there will be both live data and services that can utilize it.

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2. Introduction

2.1 Purpose and target group

This document is the final deliverable providing information on deliverable 4.10, lighthouse features into public transport navigator in use.

2.2 Contributions of partners

The following table depicts the main contributions from participant partners in the development of this deliverable.

Table 1: Contribution of partners

Participant short name	Contributions
HEL	Review and comments
HMU	Route schedules to HSL, operation of robobus.

2.3 Relation to other activities in the project

The following table depicts the main relationship of this deliverable to other activities (or deliverables) developed within the mySMARTLife project and that should be considered along with this document for further understanding of its contents.

Table 2: Relation to other activities in the project

Deliverable Number	Contributions
D4.15	Autonomous last mile pilot schedules made available on public transport navigator

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3. Introduction

This deliverable provides status information of the task where lighthouse features were to be implemented as part of the transport navigator. The task is heavily related to other tasks where those lighthouse features were to be implemented. As an example, such features can be noise and air quality monitoring sensors.

In general, mySMARTLife platform development has focused on backend development on the platform side, making the data available through APIs. The actual transport navigator is a service originally released in 2001 and operated by Helsinki Region Transport (HSL), a joint local authority whose member municipalities are the cities of the Helsinki region. While HSL is not a member of mySMARTLife consortium, they have heavily invested on open source development, thus welcoming new service ideas for the platforms they maintain.

The route planning service[1] is based on OpenStreetMap and OpenTripPlanner technologies. The platform is called Digitransit and it has been developed as a joint project between HSL and the Finnish Transport Agency. The source code of the platform is available at GitHub[2].

Since the mySMARTLife-project has only limited resources on front-end development and user experience design, the route planning improvements are to be created as a joint effort on two projects and as an inhouse development of Helsinki regional transport authority HSL that is not funded from either project. The other relevant project is Synchronicity[3] (7322440) that will focus on the development of the OpenTripPlanner routing algorithms to demonstrate with real users the possibilities of advanced route planning methods, while the role of mySMARTLife is to open new data sources on urban platform and to set up the sensor network. It is to be seen whether these new features end up on the actual service maintained by the HSL, but as a proof on concept the pilot system developed at Synchronicity will provide the necessary combination and real user experiences to define whether the new features are relevant. At the moment, after first beta -level demos, the comments have been positive.

[1] https://www.reittiopas.fi/
[2] https://github.com/HSLdevcom/digitransit
[3] https://www.synchronicity-iot.eu/

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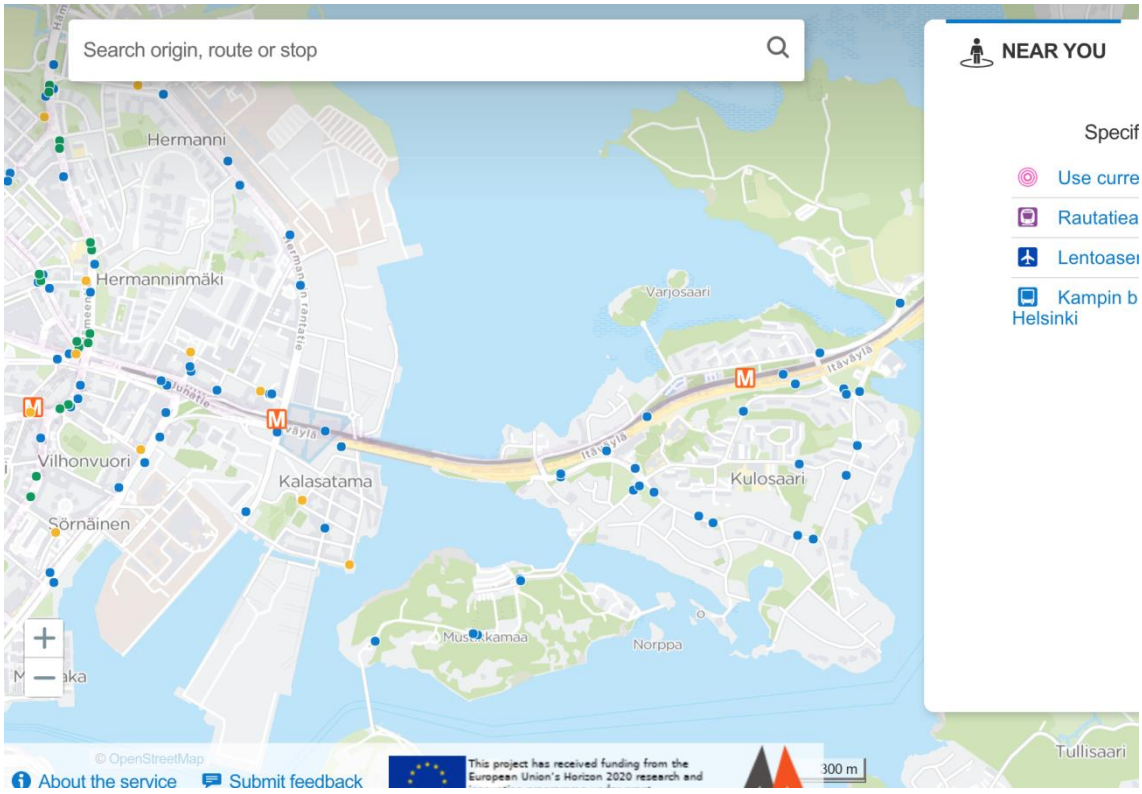

Figure 1: Clean Air Route Planner

4. Lighthouse Features

4.1 Introduction

In mySMARTLife -project, the new sensor infrastructure built in Helsinki will mostly focus on environmental noise and air quality. The air quality monitoring is also made in co-operation with other projects such as HAQT – Helsinki Air Quality Testbed[4]. In mySMARTLife, air quality sensors are being co-created with the city residents under the Citizen Science -framework. It is expected that such sensors can provide additional information to the official air quality sensors when their data is managed appropriately.

4.2 Air quality and environmental noise

The number of high-quality sensors in the city will anyway be relatively small due to the cost of sensor and requirements for the mounting location. In case of air quality monitoring the area of observation is also very small and sensors with a distance of one meter can provide different results. It is expected, that simulations could provide more useful data with larger coverage. The ENFUSER -model developed as part of the HAQT -project can provide that and as part of the mySMARTLife -project, an additional task is

[4] http://fmispace.fmi.fi/index.php?id=haqt

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to see how the simulation data could be managed parallel to sensor data for services like route planning. The main issue is the volume of data in simulations: while there will be 40-50 high-quality air-quality (AQ) sensors in the city, the total number of “virtual sensor datapoints” in ENFUSER -model can be in millions.

As part of the mySMARTLife -project, ten permanent environmental noise sensors are to be deployed around the city. While the number is low, they are placed in locations that represent well a replicable target: a certain type of street, corner of roads or park. Later in other projects there will be more comprehensive noise simulations that can provide input on route planning algorithms in the same way as the ENFUSER -model does for air quality.

4.3 Autonomous Buses

The autonomous last mile pilot reported in Deliverable D4.15 also has a link to the route planning. The autonomous bus pilot operated in 2018 was running a scheduled route and the route information was included in the HSL route guide (Journey Planner). This information was then used on bus stop displays, that were able to guide people to use the autonomous, electric bus instead of normal routes. Naturally the very limited number of options for autonomous lines and possibility to use only one autonomous bus made the pilot very small, but as a proof of concept it was enough to show that this kind of trial operations can be included into region-wide public transport system with relatively low effort.

Figure 2: Autonomous Bus 94R in Bus Stop Display

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5. Conclusions

This deliverable aims to provide services based on activities developed in other deliverables. The actions have been following the developments of the autonomous bus operations piloted as part of mySMARTLife, and the co-operation with other projects like Synchronicity has provided additional resources on service development that were out of the scope on this deliverable. The feedback from the residents will be collected and the service promoted throughout the monitoring period of the project.

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