TRACE
WALKING AND CYCLING TRACKING SERVICES

NEWSLETTER #03

January 2017

Editorial

The TRACE project has now been running for one and a half year, and is getting into full swing: the TRACE tools are now ready, the TRACE Pilot Implementation Strategy has just been released and the pilots will gradually begin from March 2017 on in all cities involved in the project.

On November 22, the TRACE Tracking Tools seminar took place, to validate the TRACE apps by getting feedback from external stakeholders.

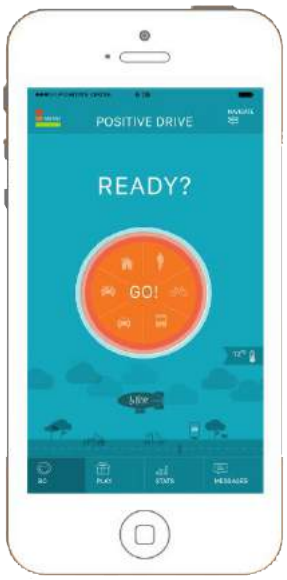
In this issue, we feature an interview from the TRACE coordinator João Barreto (INESC-ID) about the innovative prototype tool that INESC-ID has developed together with some other TRACE partners - an open source framework for behaviour-change campaigns designed to allow both TRACE and future tracking-based applications to be quickly and easily built and deployed.

The newsletter also spotlights the new features of the Traffic Snake Game app, together with stories from some local partners.

For more information about the project and activities in the cities, make sure you regularly check our website at www.h2020-trace.eu and follow us on Twitter and LinkedIn. If you enjoy reading this newsletter, subscribe on the website to receive it biannually.

We wish you a pleasant read!

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635266



TRACE Tools are ready!

The consortium worked hard in the past months to put ready for exploitation three of the four tools that will be developed within the project – the Positive Drive application, the Biklio application and the Traffic Snake Game tracking tool.

Biklio

Bike with benefits

The TRACE project is proud and happy to announce that the three behaviour-change tools have been finalised and successfully tested, and are ready to be presented to their users in the pilot sites next March 2017.

The local approach to testing the tools was first initiated through the Focus group meetings held in March 2016 before the actual development of the tools. The Focus group meetings presented the project in general and gave a brief explanation of the respective tools that will be piloted in each of the TRACE sites. The meetings allowed for screening the opinions of the local stakeholders and collecting useful feedback from them. They also allowed for establishing initial contact with the stakeholders, so that later on they can be engaged in the testing of the tools as users. Each site defined which stakeholders to engage with.

Having collected this valuable feedback, the TRACE tools' developers focused on designing the tools, so as to integrate this feedback. Once ready, the tools were tested in detail in a number of ways. First, the partners in the consortium were very active in testing the tools providing comments and provocative questions to those in charge of the tools. During a consortium meeting held in October 2016 in Lisbon, the two applications – Positive Drive and Biklio were downloaded by the consortium and tested in live conditions, experiencing thus the tracking and reporting any inconvenience. In addition, during a role playing game different partners took the role of a user challenging thus the tools' producers with possible difficult scenarios and motivating them to look into the future when the tools will be running and in use. Finally, a mid-term validation seminar with external stakeholders was organised in Brussels on 22 November to hear the opinion of people not involved in the project. The seminar gathered participants from a wide range of areas, such as other app developers, cities, cycling and public transport experts, among others. Their feedback was asked in three topics - data privacy, value for the user and business models, each related to the specific TRACE tool. More information about the seminar is available further in this newsletter in the article "Building the market place for Smart Mobility Services: TRACE mid-term validation seminar".

The TRACE tracking based tools to promote behaviour change and support mobility planning will be tested in eight pilot sites, and evaluated in terms of impact, success factors and benefits, while preparing for their full commercial exploitation. The tests in the pilot sites will start in March 2017. The process of piloting the tools is described in detail in the document Pilot Implementation Strategy, available for download on the TRACE website here: http://h2020-trace.eu/outputs/publications/.

Building the market place for Smart Mobility Services: TRACE mid-term validation seminar

THE SUSTAINABLE URBAN MOBILITY ACTION CLUSTER OF THE EUROPEAN INNOVATION PARTNERSHIP ON SMART CITIES AND COMMUNITIES (EIP-SCC) ORGANISED A MEETING ON SMART MOBILITY SERVICES, WHICH TOOK PLACE ON NOVEMBER 22 IN BRUSSELS. THIS EVENT ALSO PRESENTED WITH THE OPPORTUNITY TO HOLD THE TRACE MID-TERM VALIDATION SEMINAR, MEANT TO INVITE VIEWS OF RELEVANT PUBLIC AND PRIVATE STAKEHOLDERS ON THE TRACE TOOLS.

The general purpose of this meeting was to focus on building the market place for smart mobility services and roll-out action. The event featured a mix of discussions with a specific emphasis on:

- → Citizen-centered approach to data
- → In-depth discussions on tools validation
- → Take-up and up-scaling of business models

The meeting served as a seminar to validate the TRACE tools (Positive Drive, Biklio and the Traffic Snake Game) by getting feedback from external stakeholders. The validation seminar for the TRACE apps was organised in a "World cafe tables" format: the tables were arranged in such a way that feedback was asked in three topics - data privacy, value for the user and business models - and each time for a specific app. This approach allowed to have three interactive discussions per session, and each app's responsible person had the chance to collect personalised suggestions for each of the three topics.

All presentations and a report of the seminar are available here: http://h2020-trace.eu/approach/mid-term-validation-seminar/

NEXT TRACE Take-Up Group meeting - 2nd of February 2017 in Brussels

The TRACE Take-Up Group (TUG) is a permanent structure composed of public and private actors interested in the roll-out of TRACE tracking tools beyond the project. The members validate the development of the tools throughout the project and actively contribute to drive the processes through their ideas and initiatives.

Contact information

For more information about the TRACE TUG, or for joining the next meeting, please contact Giacomo Lozzi (**glozzi@polisnetwork.eu**) at POLIS, and visit **http://h2020-trace.eu/approach/take-up-group/**

In the spotlight

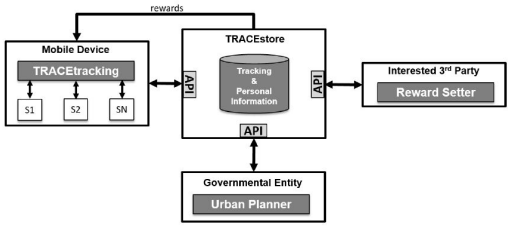
Interview with João Barreto, INESC-ID

The Instituto de Engenharia de Sistemas e Computadores, Investigação e Desenvolvimento em Lisboa (INESC-ID) is a R&D institute dedicated to advanced research and development in the fields of Information Technologies, Electronics, Communications, and Energy.

The work of INESC-ID is organised in five main research lines:

- *Computing Systems and Communication Networks*
- *Embedded Electronic Systems*
- *Information and Decision Support Systems*
- *Interactive Intelligent Systems*
- *Energy Systems*

João Barreto from INESC-ID, project leader of the TRACE project, presents to the readers of this newsletter the prototype tool developed within TRACE. João Barreto is an Assistant Professor at the Computer and Information Systems Department at the Technical University of Lisbon and a researcher at INESC-ID.



TRACE global architecture

WHAT ARE THE MAIN FEATURES OF THE PROTOTYPE TOOL THAT YOU HAVE DEVELOPED IN THE TRACE PROJECT?

Essentially, the prototype provides a full set of features that usually underlie a typical behaviour-change mobile application that is based on tracking. It provides a baseline system, intended to be representative of typical tracking-based systems, where the most relevant outcomes of the ICT research executed in TRACE have been incorporated.

The prototype includes the tracker component itself, which is the heart of the mobile application running with each citizen at his/her smartphone (or some other handheld/wearable device). This component is able to track where and how the user is moving around. The collected traces are then transmitted to a back-end server, which is able to store and analyse big volumes of data from a wide set of citizens participating in one or more campaigns.

This research and development effort was mostly led by INESC-ID, with relevant contributions from the partners that are directly involved in ICT development tasks within TRACE, namely Ijsberg, TIS and Mobiel 21.

WHAT IS THE PARTICULAR INNOVATION IN THE PROTOTYPE?

There are a number of ways in which the prototype is innovative.

Perhaps the most outstanding one is that it is an open source framework designed to allow future tracking-based applications to be quickly and easily built and deployed. We noticed that most existing behaviour-change campaigns that were based on tracking-based applications had to develop new applications entirely from scratch. This is a significant burden, which increases development time and costs, producing error-prone systems. By making available an open framework that already provides the key functionality for tracking, we enable future campaigns to take advantage of our framework to build new tracking-based applications with significantly less technical effort.

Additionally, we put a strong emphasis on interoperability, in order to allow the tracking-based applications to run even on heterogeneous systems. Finally, each module (from the tracker running at the mobile device to the back-end) uses a number of state-of-the-art techniques yielding energy-efficient performance and accuracy.

DOES THIS TOOL HELP REDUCING THE COMPLEXITY OF BIG DATA THAT IS COLLECTED DURING THE TRACKING?

Yes, and this is done in a number of ways. Firstly, at the mobile app, the collected traces are compressed such that their upload to the back-end server is optimised for lower battery consumption and network usage. But the crucial step is performed at the back-end server. Since the data collected from numerous participants, possibly from different campaigns, can be huge, analysing it for getting the relevant indicators for the campaign itself and for urban planning purposes can easily be a cumbersome process. We tackle this by employing several advanced techniques to process such high volumes of data efficiently: from relying on specialised representations of trajectory data, which are optimised for high-performance analytics, to

resorting to parallelised executions that exploit the parallel power of clusters of multi-core machines.

HOW DOES IT ALLOW FOR THE SEAMLESS PARTICIPATION OF CITIZENS IN THE TRACKING PROCESS?

Ideally, citizens should be able to participate without feeling that the application is interfering with their common use of their smartphones. Battery consumption is usually the most relevant way in which tracking-based apps disturb the users. The main reason is that these apps usually require accurate GPS traces, which have a significant energy cost to capture.

In TRACE, we focused a significant part of our research efforts in devising adaptive approaches which try to adjust GPS usage and frequency in order to minimize energy usage while ensuring the accuracy levels that the application desires. Our experimental results show very promising savings in realistic scenarios.

HOW DOES THIS PROTOTYPE HELP PROVIDE SECURE AND RELIABLE TRACKING? HOW DOES IT HELP IN DEALING WITH POSSIBLE FRAUDULENT BEHAVIOUR BY USERS?

From the assessment stages of the project we learned that, while preventing fraudulent behaviour was a desired feature for most stakeholders, they were reluctant to resort to approaches that complicated usability or required additional hardware.

So we focused on reducing fraud by relying on techniques that try to automatically detect the current mode of transport of a user based on information collected from the sensors (e.g. accelerometer) at the user's smartphone. Since most behaviour-change campaigns for sustainable mobility depend on accurately inferring each user's modality, having accurate and resilient techniques to guess that information is a major feature.

Project in the spotlight

FLOW - FURTHERING LESS CONGESTION BY CREATING OPPORTUNITIES FOR MORE WALKING AND CYCLING

FLOW is a project that aims to put walking and cycling on an equal footing with motorised modes as a solution to improve traffic performance. In order to do that, the impact of walking and cycling on traffic performance, and as result on urban congestion, must be carefully evaluated. FLOW is developing a user-friendly methodology for evaluating these impacts as well as assessment tools for cities to use in evaluating the effects of walking and cycling measures on traffic performance. The tools consist of a congestion impact assessment (including socio-economic impact, an assessment of soft measures, congestion evaluation based on KPIs and a cost benefit analysis) and traffic modelling.

As part of FLOW, existing transport demand models are being calibrated and customised in the FLOW partner cities to help analyse the relationship of cyclist and pedestrian movements to traffic and congestion. The modelling and impact assessment will identify the impact on traffic performance and the possible congestion reducing effect of walking and cycling measures. FLOW partner cities will develop implementation scenarios and action plans for adding or up-scaling measures that are shown to reduce congestion.

FLOW will target three distinct audiences, with appropriate materials and messaging for each. Cities will learn about the value and use of new transport modelling tools, businesses will be made aware of the potential market in congestion busting products and services and decision-makers will be provided with facts to argue for walking and cycling to be put on equal footing with other modes of transport. FLOW will meet the challenge of "significantly reducing urban road congestion and improving the financial and environmental sustainability of urban transport" by improving the understanding of walking and cycling measures that have potential to improve the traffic flow.

FLOW has recently selected its Market Forerunners and Market Followers - companies that provide innovative planning and modelling services directly to local authorities for walking and cycling measures. The list of the companies, selected through an open call, can be consulted on the FLOW website. FLOW and TRACE have been cooperating closely and the two projects are discussing the possibility that some of the TRACE tools are tested and applied in some of the FLOW cities. To learn more about the project, visit FLOW website and subscribe to the newsletter at: **http://h2020-flow.eu/**

News bites from TRACE pilot sites

PLOVDIV WANTS TO GO SHOPPING BY BIKE

The national organiser of "Do the Right Mix!" campaign – Interimage, organised an urban talk on the potential to use bicycle for shopping activities. The event went under the name "Cargo Bike Talk" and gathered bike producers, local representatives, users and TRACE enthusiasts.

Energy Agency of Plovdiv presented the Biklio concept campaign and used the case to also announce the Traffic Snake game campaign. The discussion paid attention to the technical implementation of the campaign, the recruitment and participation of the businesses, the motivation of the cyclists and pedestrians to participate in the campaign.

The local authorities broadly discussed the demand for reliable data on mobility shift from conventional transportation as private car or public transport to alternative one – cycling and walking.

There was also great interest in having more cargo bikes for shopping purposes. During the session, a cargo bike producer made a demonstration of his e-cargo bike.

GET RELAX AND REDUCE YOUR CO2 FOOTPRINT: THE "COMMUTASTIC" APP IN LUXEMBOURG

The Luxembourg TRACE pilot has already gained local experience with serious mobility games. Its local Commutastic game is a mobile application that rewards users for avoiding peak traffic. Communastic demonstrated that we can improve the overall traffic conditions in Luxembourg, including cross-border commuting, by offering users an after-work alternative.

Participants were incited to firstly engage at least once a week in wellness and relaxation activities. The after-work activities included swimming in the Olympic swimming pool, visiting the National Modern Art Museum, going to the gym, or watching a movie.

Participants could team up with 2 to 5 colleagues or sign up individually. During two consecutive weeks in 2015, they were encouraged to use the Commutastic application. Besides avoiding traffic jam, they could follow app suggestions to walk or cycle to the after-work activities. Sustainable behaviour allowed users to collected points and badges which enabled them to access to the before-mentioned activities for a reduced fee or even for free.

CYCLE SOUTHEND ARE HERE TO HELP SOUTHEND RESIDENTS IN ALL THINGS BIKE!

Cycle Southend was born in 2008. Its vision is for the bike to become part of everyone's daily routine, with more and more people choosing to cycle both recreationally and as a preferable mode of travel, with more parents allowing their children to cycle to and from school and transforming Southend into a place where pedestrians, vehicles and bikes can happily co-exist in a 'shared-space'. The first 3 years of Cycle Southend saw cycling increase by 17%.

Cycle Southend now has a selection of cafes and shops that are an accredited Bike Friendly place. They have agreed to provide cycle parking, offer to fill up cyclists' water bottle, offer the loan of a bike lock, have a bike repair kit handy for use, allow cyclists to recharge batteries on electric bikes, and stock maps/leaflets for cycling events.

The Traffic Snake Game (TSG) goes trackable with TRACE!

THE TRAFFIC SNAKE GAME (TSG) IS A FUN CAMPAIGN TO PROMOTE WALKING AND CYCLING TO SCHOOL FOR CHILDREN AGED 4 TO 12, THEIR PARENTS, AND THEIR TEACHERS.

During the campaign week (or two weeks), children put dots on a snake banner every day they walk, cycle, use public transport, or carpool to school. Children receive a reward when the end of the traffic snake banner is reached. Examples of rewards are 15-minutes additional playtime, no homework for a day, ice cream, a new bicycle shed, or a walking or cycling tour. In the 'deluxe' version of the TSG campaign, schools include additional activities, such as a car free day or a cycle training at school.

In 2015, TSG 2.0 was launched allowing a school to play the Traffic Snake Game online via a Smartboard (a digital schoolboard) or standard computer. In the digital version of TSG, there are no stickers or a banner, but on the smartboard a drawing of cityscape is shown: it starts out ugly and grey, but becomes brighter and more beautiful when sustainable trips are logged.

To date, 18 European countries have played the game and took advantage of the successful strategy which encourages parents to try alternatives to the car for home to school trips. In School Year 2014-2015, the international campaign increased the use of sustainable transport modes by 15% during the campaign and by 14% three weeks after the campaign compared to before the campaign.

So far, the impact of the campaign has been measured using a hands up survey or via the TSG website.

Within TRACE, mobility tracking will be added to the TSG campaign. Children will carry a GPS tracking device when coming to school. The device will register their travel mode, travel speed, and travel route. The tracking data will be used within the classroom for measuring the number of sustainable home-school travels in the TSG campaign. Additionally, the tracking results will allow schools and municipalities to visualize home-school travels and help them to increase traffic safety for children travelling to the school.

Upcoming events

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European Cycle Logistics Conference 2017

This event will showcase best practice in cycle logistics, highlight support needed and define the strategy required to implement successful cycle logistics solutions and initiatives.

The conference programme will include plenary sessions led by leading experts & speakers and targeted streamed sessions aimed at municipalities, businesses and associations and cyclists.

20-21 March 2017
Vienna (Austria)

http://www.eclf.bike/vienna17/

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4th European Conference on Sustainable Urban Mobility Plans

The European Conference on Sustainable Urban Mobility Plans is the principal annual event enabling the international community of practitioners, policy makers, city staff and academics from across Europe to come together to debate key issues, highlight developments in mobility planning and exchange ideas and experience.

29-30 March 2017
Dubrovnik (Croatia)

http://www.eltis.org/participate/events/4th-european-conference-sustainable-urban-mobility-plans

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Velo-city 2017 conference

European Cyclists' Federation's Velo-city series of conferences is widely considered as the global cycling summit. The conferences are designed to encourage cycling as part of daily transport and recreation. Early bird registration opened on 12 December 2016.

13 - 16 June 2017
Arnhem-Nijmegen City Region (the Netherlands)

http://www.velo-city2017.com/

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