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The Symbiosis between Traffic Management and Mobility-as-a-Service

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Abstract

Social media offers a wealth of mobility-related information and an ultimate instrument for day-to-day traffic management road operators activities. The social community approach presented in this paper (Social Traffic Management) offers a personalised traffic information service and traffic management platform, which is based on mainstream social media, and aims to best match demand and supply with the intent to improve travellers' comfort in a multi-modal environment, while contributing to road operators and public authorities' goals. This paper describes the Social Traffic Management approach, the traveller experience and discusses the symbiosis between traffic management and mobility-as-a-service (MaaS). It also gives an insight in how this approach is being tested within the H2020 MyCorridor and CEF Socrates 2.0 projects.

Keywords:

SOCIAL TRAFFIC MANAGEMENT, MOBILITY-AS-A-SERVICE, IMPACT AWARE ROUTING

Introduction

The social community approach presented by this paper offers a personalized traffic information service and traffic management platform, which is based on mainstream social media, and aims to best match demand and supply with the intent to improve travellers' comfort and ease road congestion. Social Traffic Management is also intended as a tool supporting road authorities and mobility service providers in their service provisioning interaction with travellers. The platform has a multi-modal approach, including Public Transport, bike or taxi services, to best match demand to capacity and user preferences.

Approach

One of the tools within Social Traffic Managenemt is to actively connect to target groups, often through existing social media communities and platforms, which are generally related to a specific location or event. This approach was successfully applied at the International Hansadays in Kampen, and the ArenaPoort area in Amsterdam which includes a football stadium (Johan Cruyff Arena) and several concert venues. The area accommodates up to and beyond 80.000 visitors at peak times when

several large audience events take place simultaneous. In this case the relevant community consists of concert visitors, which could be easily identified through social media “posts” and “likes” related to the concert, or identified during their on-line ticket purchase through the concert organizer. By acting as a service provider towards these visitors, they were pro-actively informed about travel options, traffic flow, accessibility, time tables, parking options, etc. Reversely, visitors were able to contact the service centre by using their preferred social media channel (e.g. Whatsapp, Facebook Messenger, Twitter, etc.) to ask for specific information related to their mobility needs. No additional app download is ever required. For these deployments of Social Traffic Managemet we collaborated with Livecrowd.

Experiences are that 80% of the requests and comments can be answered with standard responses, which is a procedure that could over time be largely performed by robots. For the remaining 20%, 1 to 1 communication is needed to answer specific questions of individuals, such as pick-up locations, routes, finding parking areas, travel options, etc. An important added value of the traffic centre is that detailed knowledge of the traffic system of the area is available and continuously monitored in real-time. This allows to immediately anticipate to any type of delay, disruption or expected traffic flow developments and provide pre- and on-trip information to travellers.

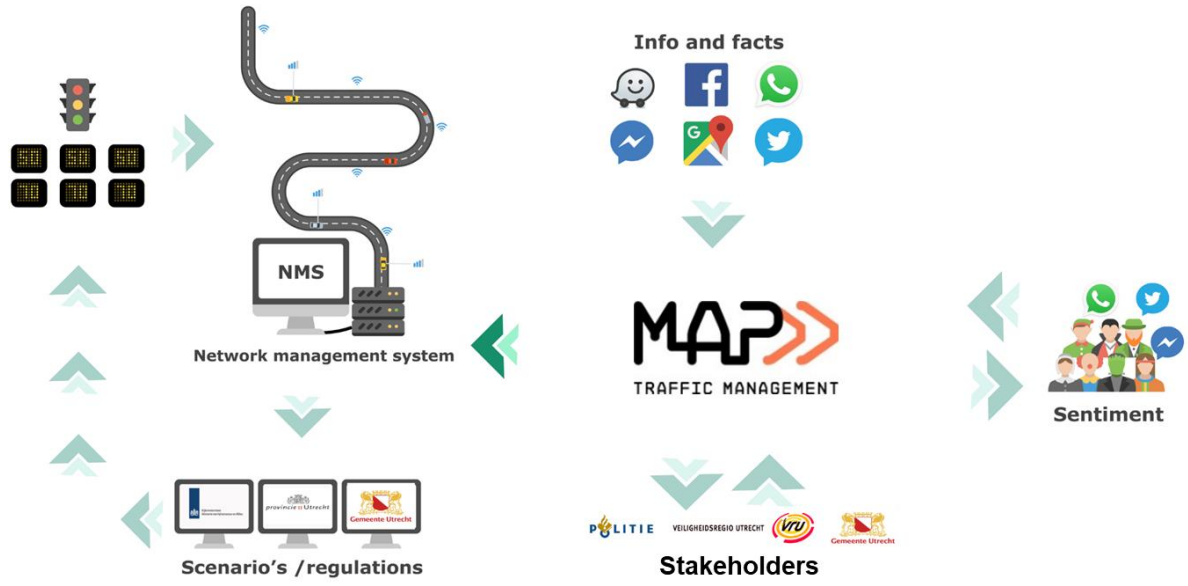

Figure 1 – Social Traffic Management

This goes for a range of scenarios, including public transport options taking into consideration occupancy, preferred walking routes, dynamic Kiss&Ride locations and approach routes, parking recommendations taking into consideration accessibility next to availability, etc. As the Social Traffic Management platform learns from experience, it builds a valuable library of varying events, at specific venues, with typical weather, a unique crowd, etc.

This enables us to 'predict' approaching incidents within the network based on the historical data, the current situation and pattern recognition. Not only the event organizers but also public emergency services benefit from a Social Traffic Management platform as it enables them to push public messages if they have to, to inform about temporary re-routings related to en-mass departures from a concert or to request information from travellers who are already at an incident location.

Recently the same platform has been used to provide traveller information in the context of large road works activities with constant change of road conditions. Both road users crossing large Road work Areas as well as vicinity communities and stakeholders are informed on actual road disturbances, planned and unplanned re-routings together with personal advice matching actual conditions with their specific needs. This service is also used to "attract" road users to other routes or (temporary) travel options which normally they would not know about or would be willing to experiment. The Livecrowd approach is schematically shown in the image 1 above.

Traveller experience

The Social Traffic Mangement platform, in essence, is a premium personal assistant right in your smartphone or on your computer. Its core purpose is to take the visitors of an event, exhibition or even city on a journey towards the event, guide them during the event and guide them safely home afterwards. It does this by sharing content and doing program announcements. The idea behind this is to extend the pleasure around an event. Creating a perfect visit experience, so that the visitors will want to visit the location again. By doing so, STM generates an event specific community. This community can use the platform for all their questions, about event specifics such as the location of entrances, Kiss&Ride locations, what beer is on tap, but also, where can I park, where can I buy a parking ticket and can I reserve a parking space? What is the quickest route to the parking location with parking space upon my arrival and near entrance C? Where can I eat near the event, so I can leave/travel early to be on time. It does this through existing commonly used social media channels and communication apps. It mainly uses Whatsapp, Twitter, Facebook. Customers already use these channels, making access to our Social Traffic Management service hassle free. Our service team is in constant contact with event organizers, the venue owner, road authorities even the police, ensuring that every question can be answered quickly and with an answer that is valid for the current or upcoming situation.

Applications area: large scale road maintenance

We also implement Social Traffic Management within large scale road maintenance and reconstruction projects. It is our experience that a well-informed road user passing the worksite has a higher awareness of possible delays and obstructions and provide context to the situation in the real world. This will contribute to an overall more positive experience and expectance of possible delays and obstructions. It will be even better when that road user is given personal information. More aware road users will more readily follow instructions, as they are for their own benefit. For a major project

starting in 2017, in which in five years, a new tunnel will be build connecting two highways while passing a major city, our Social Traffic Management service is being used as the primary communication channel for the project interaction with road users and surrounding communities. Motorists are informed on the latest road layouts, traffic information, most optimal route in space and time. In a later stage the service will also function as a virtual visiting centre for the project. The public and specific stakeholders can ask questions which will be answered through the platform based on information from the actual workers involved. We will post digital content, pictures 360-videos, and even VR-content for people to experience the project and get a closer insight in the work done. In this way, we build a well-informed community that becomes part of the project. They know what's going on, what to expect, when to travel and when not. They are part of the project. Resulting in fewer traffic jams and accidents and a higher acceptance rate.

Relation to Traffic Management Centres – Socrates 2.0 Project

Slotting traffic to give road users a specific arrival time can be used for everyday commutes. For example, travellers towards large offices or industrial areas can be given timed slots to arrive at a given time. Smart Routing can be used to reduce pollution in certain areas. Avoid noise pollution or create a saver environment near schools. We would like to call that Impact Aware Routing. Our platform can aid in achieving this by targeting the right community through the platform they prefer and by highlighting alternatives which are a direct benefit to the traveller and implicitly even traffic demand at the same time, as explained earlier.

Along with appointing slots to traffic, we can fill a gap in ride sharing. By knowing certain aspects of the community like where they live and work and through apps like Facebook, Twitter, Spotify and YouTube, it would even be possible to find a perfect match, e.g. to find a neighbour who works near your own office and also likes listening to Grunt Rock on your daily commute.

As an extra and very effective tool, the platform has access to Google Maps and Waze which offers insights in traffic flows from app data and can alter traffic maps in real-time. In doing so all road users navigating with Google Maps and/or Waze will get real-time routing advice based on current events on the road network around the event, or along the route towards the venue. In doing so traffic flow can be managed to reach the most suitable parking location for their origin and with available space.

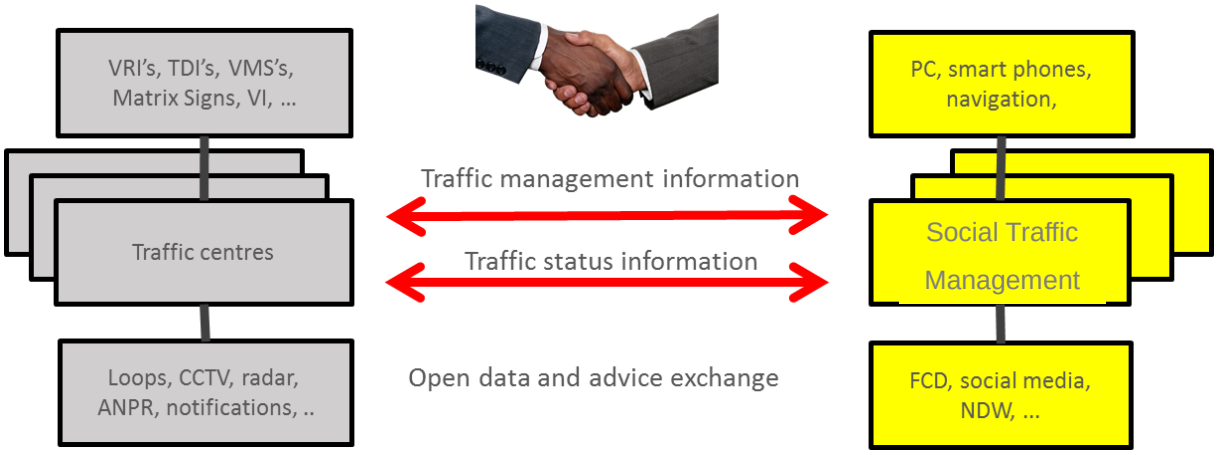

Figure 2 - interaction between service providers and traffic centres within project SOCRATES2.0

By doing so, we are able to manage the road network in an optimal way, with road users who receive a personal routing advice which they will follow for their own benefit. This is an advantage for the road operators, as they can focus their attention to all other traffic. And the visitors will experience an almost VIP-like, personal service.

Relation to Mobility-as-a-Service (MaaS)

Social Traffic Management can be a powerful personal assistant, at home, on location and en-route. It is even a powerful traffic management tool giving personal routing advice and incentives to alter departure and arrival times. By adding support for a multi-modal transport choice, our platform can grow into a powerful MaaS solution. This is what is envisioned within the EU-funded H2020 MyCorridor project (grant agreement number 723384).

MyCorridor's mission is to facilitate sustainable travel in urban and interurban areas and across borders by replacing private vehicle ownership by private vehicle use, as just one element in an integrated/multi-modal MaaS chain, through the provision of an innovative platform, based on mature ITS technology, that will combine connected traffic management and multi modal services and thus facilitate modal shift. It will propose a technological and business MaaS solution, which will cater for interoperability, open data sharing, as well as tackling the legislative, business related and travel-behaviour adaptation barriers, enabling the emergence of a new business actor across Europe; the one of a Mobility Services Aggregator. It enables travellers to use all modalities using one account with one token or with one fixed monthly subscription fee. MyCorridor has the aim to develop the necessary means that connects all current and up-coming modalities from where any MaaS operator can present these modality options (or a chosen selection) to its customer. The customer can choose his preferred modality, pays for it with a universally accepted token and be on the way in seconds.

Within this concept, our Social Traffic Management platform will have a role as a customer service, i.e. a personal assistant which suggests upon request the most suitable mode of travel, based on expected traffic conditions, user preferences, weather, parking availability at the destination, traffic

management schemes, etc. Whether it be by car, train, bike, bus, carpooling, taxi or any given combination, we will inform based on the best option for the individual, given present constraints, will book those options and will manage all financial transactions needed to be able to choose all transportation modes. Our vision is that the user should be able to u se the transport service of his choice, be it Uber, SnapCarr, a standard taxi, GreenWheels or Waze Carpool, and when selected it should be available.

Within the MyCorridor project it is our goal to blend the best of Social Traffic Management with MaaS and to establish an open platform and a one-stop-shop to every mobility service known at this moment, or starting at some point in the future can connect to. It should be possible to check, book and pay the desired service through existing channels (e.g. Facebook, Whatsapp, Twitter) and unlock the service 'capsule' too (unlock bike, unlock GreenWheels vehicle, check-in at public transport, etc.). All the user would need is their phone with Whatsapp, Facebook or whichever social media/chat platform they like most.

MyCorridor Pilot – Amsterdam

The MyCorridor project consists of 6 pilots sites in which and between which Mobility is provided as a Service. The pilots have a local, urban, interurban and cross-border scope. This means that the MaaS products will be available for a large region and will be available throughout European Countries.

The Amsterdam pilot will be focussing on urban and interurban aspects and also on cross-border travel. The pilots aim will be creating a hassle-free, impact driven, integrated, door-to-door journey. Meaning that we will provide the best routing option through any modality taking into account current and projected traffic states, personal preference of the end-user, and what the best mode of transport should be for the system of travel infrastructure as a whole. Thus, satisfying travel and road authority needs.

To achieve this we will be relaying on the principals of Traffic Management 2.0 (TM2.0) and also the pratical approach of TM2.0 within the CEF project, Socrates2.0.

During the pilot the existing (near day-to-day) Livecrowd service (own by Brand MKRS and MOJO) for the large event area around the Johan Cruiff Arena in Amsterdam will be extended for this purpose. We aim to achieve this by incorporating integrated ticketing within the Livecrowd channels. By doing so, users have a one-stop shop available on his phone/laptop/computer through which they have access to;

- Event information
- Area Information
- Travel Information
- Travel 'Ticketing'

In this way Social Traffic Management will be able to inform users on their best travel options and also provide users with the needed tickets. For this users will be able to pay for the tickets through the

platform of choice (i.e. WhatsApp, Facebook, Twitter). In return users will receive a personalized travel advise and information including all tickets and if needed reservations (i.e. parking, seating, etc).

For the Amsterdam pilot this will be possible through QR-codes for most travel modes. We envision to also include a wireless payment/access integration through NFC. The goal will always be to let users use the system without the need for extra physical cards or additional apps/software. For an example see image 3

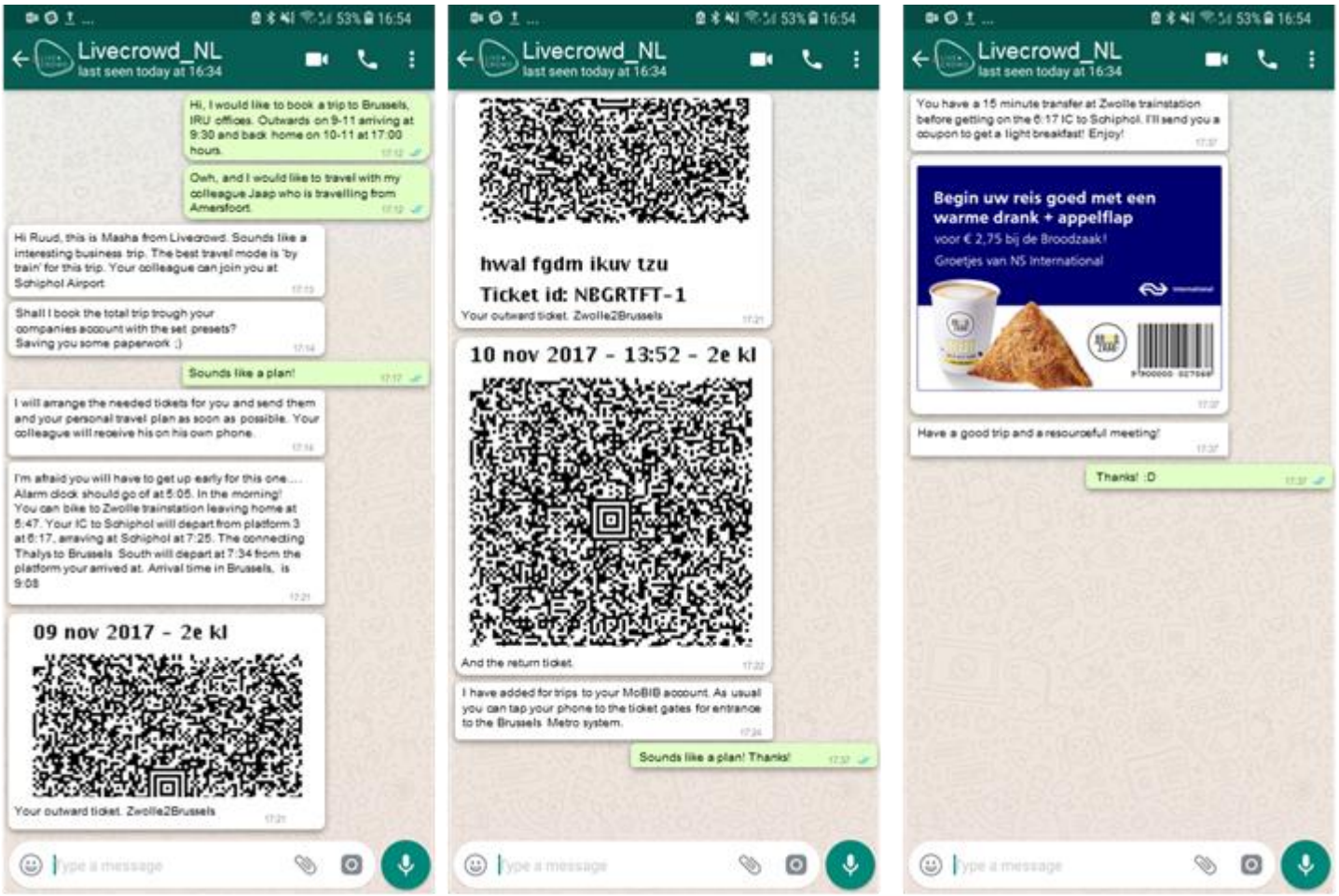

Figure 3 - Livecrowd interaction with a traveller to plan and book a trip including ticketing.

Conclusions

Social Traffic Management offers a new approach to traffic management based on social media. In 2016 and 2017 the approach was successfully applied at multiple large-scale events and was selected as the primary instrument to inform travellers about travel options during a large road maintenance and reconstruction project running until 2022. For 2018 and 2019 Livecrowd Mobility will become a full blown MaaS application and the go to tooling for Road Operators to extend their traffic management effects.