

BE-MOBILE'S

END USER

SERVICES IN THE

SOCRATES 2.0

PROJECT

SOCRATES^{2.0}

FAST

SAFE

GREEN

BEMOBILE

a revolution in traffic



SOCRATES^{2.0} is co-funded by
the European Commission

1. ONTF ANTWERP

1.1 Description of Be-Mobile's SOCRATES 2.0 Services

Be-Mobile's Optimizing Network Traffic Flow service aims at providing routing advice to travellers crossing the river Scheldt in Antwerp. The route advice is given in the Flitsmeister navigation application.

When the measure 'toll reduction in Liefkenshoektunnel' is activated, Be-Mobile's end user service will contribute to the objective of improving the distribution of traffic over the 2 tunnels, by shifting specific travellers from Kennedytunnel to Liefkenshoektunnel. When a Flitsmeister user requests a route to his/her destination, and this route goes via the Kennedytunnel, then the service will first check whether the toll reduction measure is activated by the traffic manager.

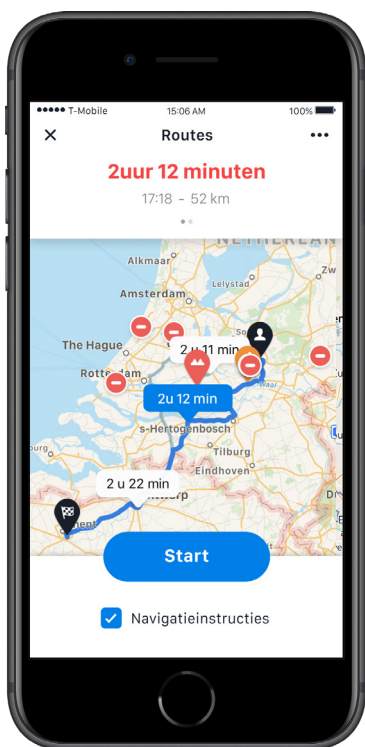


Figure 1: USER REQUESTING A ROUTE IN THE FLITSMEISTER SERVICE

If the toll reduction measure is activated, the routing engine in the navigation service will calculate an alternative route via Liefkenshoektunnel. Expected travel time on this alternative route is compared to the expected travel time on the original route via Kennedytunnel. If travel time on the alternative route is not much longer compared to travel time on the original route, the end user will be presented with the option to shift to this alternative route. A pop-up will be shown that informs the traveller on the alternative route, thereby offering a voucher to pass the Liefkenshoektunnel for free. By offering toll reduction vouchers, road users are incentivised to follow up the re-routing advice. When accepting the alternative route, the voucher is sent to the user.

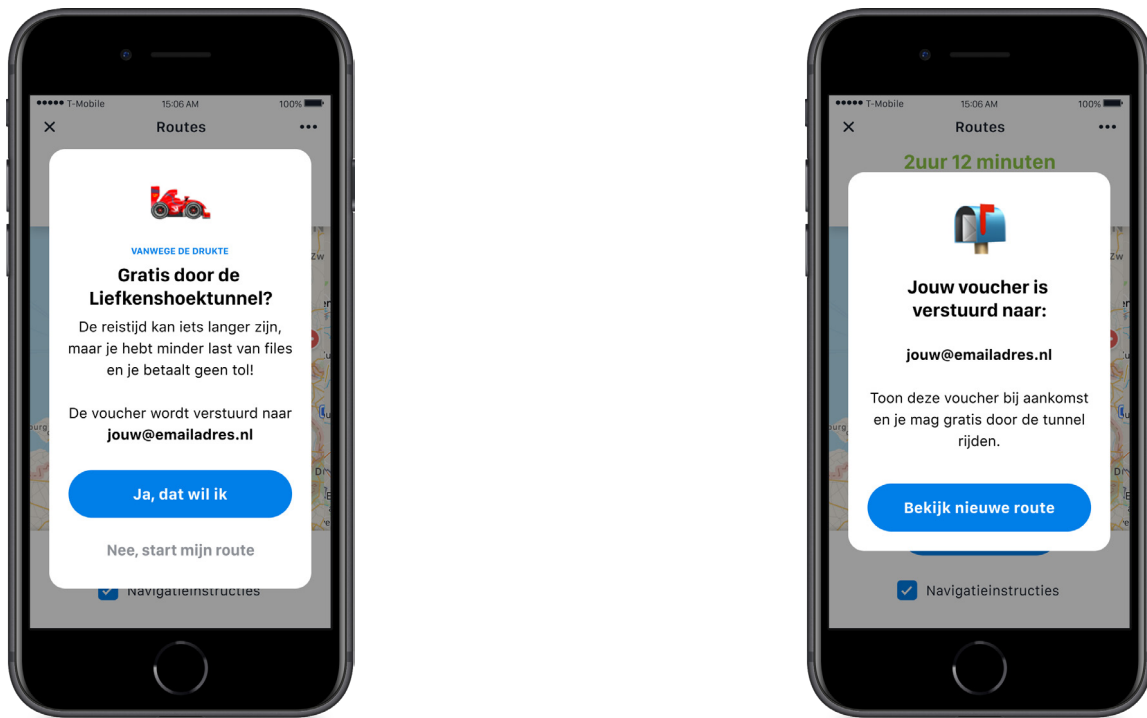


Figure 2: Re-route advice in the Flitsmeister service

When the traveller arrives at the Liefkenshoektunnel, he/she can have his voucher (QR code) scanned by a toll booth operator and he/she can continue his route without paying a toll. To avoid misuse, the QR code is presented together with i/ information on the applicable driving direction (towards Ghent vs towards the Netherlands) and ii/ information on the expiration date and time.



Figure 3: Voucher for free passage through Liefkenshoektunnel in the Flitsmeister service

2.1 Objective: generating impact

The developed Optimizing Network Traffic Flow service offers a new communication channel for traffic management strategies towards travellers. The ultimate objective is to generate impact on the road authorities' goal to improve the distribution of traffic over the 2 tunnels crossing the river Scheldt in Antwerp, by shifting specific travellers from Kennedytunnel to Liefkenshoektunnel.

Compared to traditional solutions, a huge advantage of the developed service is that it allows for the targeting of individual travellers. It is possible to offer alternative routes via Liefkenshoektunnel and to provide corresponding vouchers to pass them toll-free, only for specific travellers, e.g. only for travellers who had an original route via the Kennedytunnel. This way, a targeted toll reduction can be applied, which is far more cost-effective compared to a general toll reduction. It is also possible to limit the amount of shifted travellers to pre-defined constraints.

The developed end user services can create a significant impact on the set objective.

Impact is the result of a number of factors and can be summarized as follows:

$\text{IMPACT RATE} = \text{OFFER RATE} * \text{ACCEPTANCE RATE} * \text{FOLLOW UP RATE}$

The OFFER RATE represents the probability that a user is offered a voucher when he/she has a route through the Kennedy tunnel when the ONTF Toll reduction service is active; the ACCEPTANCE RATE represents the probability that a user accepts the voucher when offered one; the FOLLOW-UP RATE represents the probability that the user will follow-up on the acceptance of the voucher and avoids the Kennedy tunnel.

The key takeaways can be summarized as follows:

- **The service reached almost 8000 unique users.** Uptake of the service was severely impacted by COVID and COVID-related measures.
- **Almost 70% of trips resulted in a voucher being offered to and accepted by the user.** The OFFER RATE is 78%, while the ACCEPTANCE RATE is 88%.
- **More than two thirds of users ended up avoiding the Kennedy tunnel (mostly taking a route via the Liefkenshoek tunnel).** The FOLLOW-UP RATE is estimated to be 69%. Follow-up rates are lower when the route via the Liefkenshoek tunnel is slower than the original route via the Kennedy tunnel, though follow-up rates are still considerable even in that case.
- **The data suggests that, through the service, 47% of targeted users can be diverted away from the Kennedy tunnel.**

In conclusion, the analysis suggests that the ONTF Toll reduction service could have a considerable impact on a traveler's incentive to pass by the Kennedy tunnel at peak hours. Users will typically be inclined to accept and use the voucher, even if travel times via the alternative route are somewhat higher. The eventual impact on rebalancing the traffic load between the Kennedy tunnel and the Liefkenshoek tunnel depends on the size of the targeted population. If, say, 5% of the traffic that intends to go through the Kennedy tunnel can be reached, then the analysis suggests that c. 2.5% of all traffic can be diverted away from the Kennedy tunnel.

2. SD AMSTERDAM

2.1 Generic description of end user services

The service offers road users smart individual route advice to a free parking space. In case of an event, when a visitor (and user of the navigation services of the SOCRATES2.0 partners) asks for a route to the Johan Cruijff Arena and/or ZiggoDome and/or AFAS Live Music Hall, he is presented with the possibility to choose an parking location as destination instead of the event location itself. The parking locations that are presented, depend on the origin of the visitor. In order to spread traffic across the area and avoid large flows of crossing traffic, visitors from the East, for example, are guided via the A1 and A9 to parking locations in the southeast of the Amsterdam Arena area. The selected parking locations are in line with the response plans of the road authorities.

On the way to the parking location, the route is constantly updated by the service providers, taking into account the travel time on the route.

At the same time, road authorities are monitoring the traffic and parking situation in the Operational Mobility Centre (OMC). This OMC fulfils the role of network manager in this SOCRATES2.0 use case. The OMC can decide on traffic measures (implemented by the traffic management centres) and on service requests to service providers (with recommendations for routes and parking garages). By processing the service request by the service providers, visitors can be offered a different route or parking destination in their navigation, so that they always have the fastest route to a free parking space.

Arriving at the destination, the user receives a map with a walking route to the event location (optional).

Key elements of the service are:

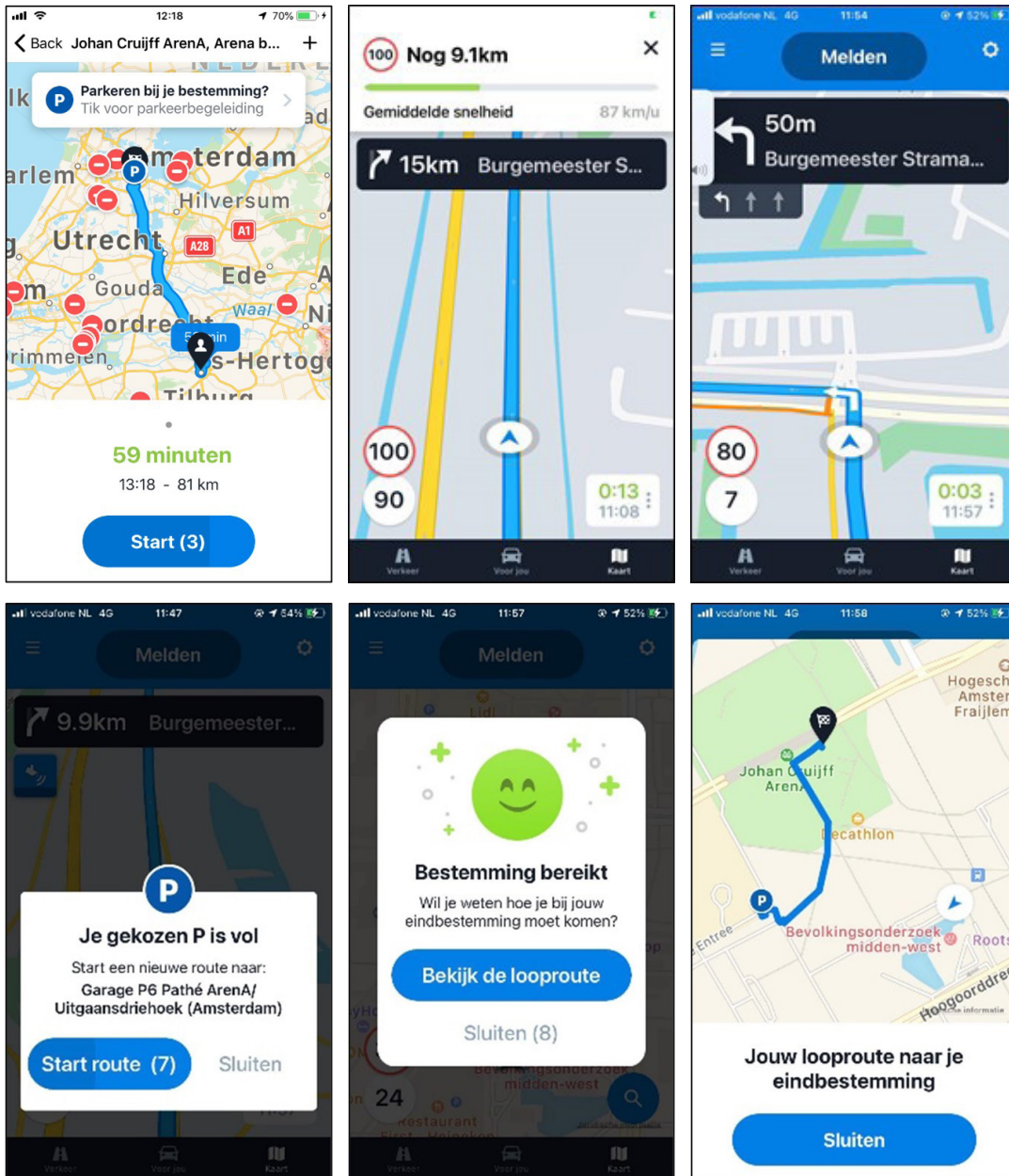
- Pre-trip: Choose a parking location as the destination (instead of an event location)
- Pre-trip: The parking locations presented depend on the origin of the user
- On the way: change parking location (and possibly route) if the parking location is almost full
- On the way: change route (and possibly parking location) in case of higher travel time
- On the way: change route (and possibly parking location) in case of implemented measures by the traffic management centres (road closures)
- Post-trip optional: A map with a walking route to the event location

2.2 Description of Be-Mobile's end user service

Be-Mobile (Flitsmeister)

- Navigation in Flitsmeister app
- From the message (service request) of the Traffic Control Centre Amsterdam, only the parking destination is used, not the route. The fastest route is calculated by the navigation of Flitsmeister itself.

- Parking guidance can be selected after entering the destination "Johan Cruijff ArenaA"
After sending a service request with a new parking destination from the OMC, the destination is automatically adjusted in navigation and a new fastest route is calculated.
- Upon arrival at the parking location, a walking route to the Johan Cruijff ArenaA is shown.



3. BENEFITS / WIN-WIN-WIN

3.1. Benefits for Road Authorities

The main goal of Be-Mobile's services is to support traffic management strategies of road authorities, to increase reach and to generate impact on the predefined public or common objectives.

3.2. Benefits for End users

The services allow travelers to contribute to common objectives and to take better informed decisions.

3.3. Benefits for Service Provider Be-Mobile

We hope to find a new business model where we can be rewarded for generating reach and/or generating impact on road authorities' objectives.



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