1. Publishable Summary

1.1. Summary description of project context and objectives

GPS positioning devices are becoming a commodity sensor platform with the emergence and popularity of smartphones and ubiquitous networking. While the positioning capability has been exploited in location-based services, so has its spatiotemporal cousin, tracking, so far only been considered in costly and complex fleet management applications.

The proposed project, SimpleFleet, will make it easy for SMEs, both, from a technological and business perspective, to create (Mobile) Web-based fleet management applications. For this purpose, we build a large data pool comprising base data such as maps and traffic data from dedicated providers. A simple interface will provide a means to connect user-contributed data streams to this pool. In addition and to increase the market potential of the data pool, we also want to address the related geomarketing domain, which uses travel information in various geo-statistical analysis methods as well as visualizations of the data to be used in online and print publications.

An algorithmic framework dubbed "TrafficIntelligence" that includes map-matching algorithms, vehicle routing services and a statistics package will utilize the collected data and provide value-added service. SMEs will be able to access the data and services by means of a Web-based API, a Software Development Kit (SDK) wrapping API access for specific languages and environments and Application Frameworks for rapid application development for target platforms such as Web (JavaScript), and iPhone and Android mobile platforms.

1.2. Description of work performed and main results

The work performed in the period can be summarized as follows: implementation of a scalable and robust infrastructure providing the final SimpleFleet services (see Figure 1), encompassing fleet management, geomarketing and web publishing services (see Figure 2), improvements of the user interface (see Figure 3), improvements for faster shortest paths, more flexible isochrone requests and faster performance of the visualization; implementation of algorithmic business intelligence comprising new techniques for data fusion and fleet analytics; project dissemination by organization of several local workshops, by publication of scientific papers and by a next press release (announcing the availability of several public online demos); building the iFleet Demonstrator App (available in the iTunes App store), and, last but not least, successful testing and evaluation of the services on top of the TrafficStore prototype.

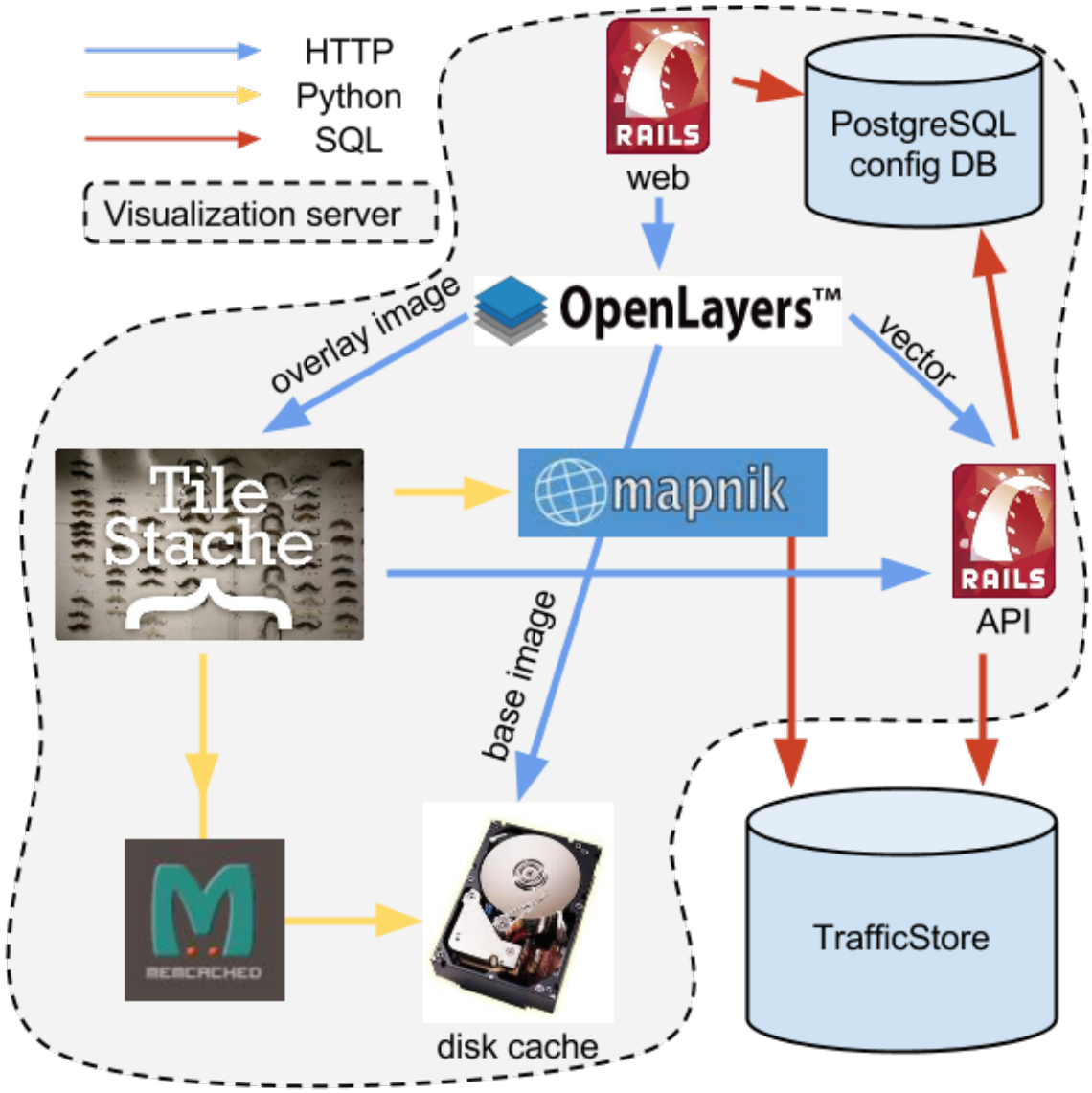

Figure 1: Architecture of final SimpleFleet service

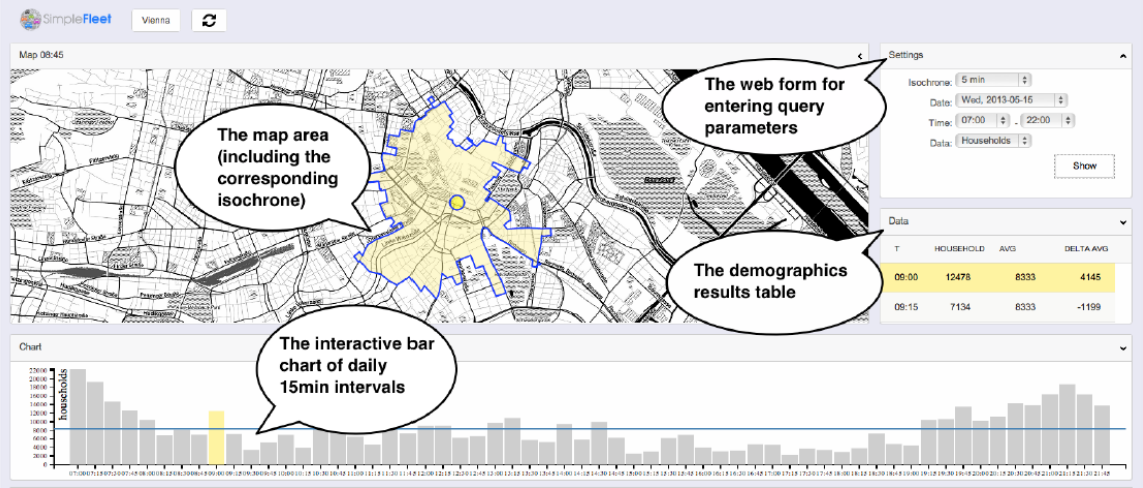

Figure 2: Vienna city center, on Wednesday 15th May 2013, at 09:00 am. Approximately 12k households are reachable within five minutes from the city center at that time

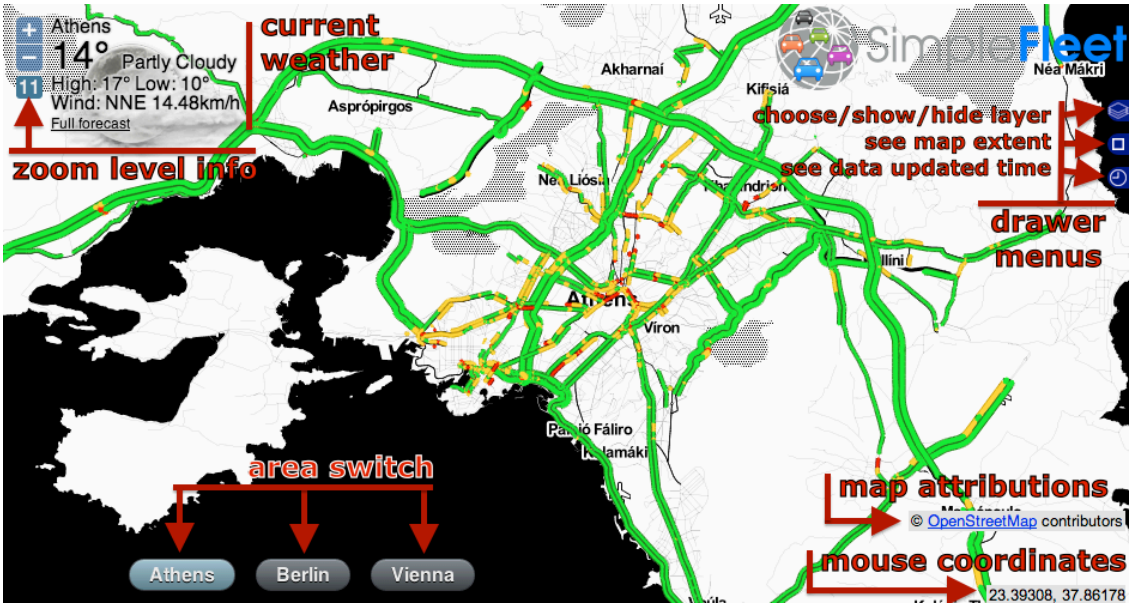

Figure 3: New visualization server user interface

1.3. Final results and potential impacts

The final results are dynamic services, extending static location-based services (e.g., POIs) to services for the management of moving objects data, i.e., non-static objects that change their location over time providing high-quality and (very) low-cost fleet management solutions. In more detail:

A first result is a data pool, collecting and aggregating relevant tracking data, deriving historic speed profiles, and assessing current (live) traffic conditions, resulting in time-parameterized road networks.

A second result is "TrafficFleet", a fleet management solution for mobile phones (demonstrator) utilizing smartphones.

A third result is "Geomarketing", data analysis software that is based on the traffic data pool, for e.g. the computation of catchment areas.

A fourth result is "TrafficVis", data-driven visualizations suitable for online print publications, e.g. traffic heat maps.

The results are relevant for a number of services including fleet management, geomarketing, and Web publishing in the application domain of fleet management, with the ultimate goal being to provide and put interesting SMEs in the position of providing high-quality and (very) low-cost fleet management solutions (to the point where this solution becomes even interesting for individuals, e.g., keeping track and analyzing one's own travels). In addition and to increase the market potential of the data pool, we also addressed the related geomarketing domain, which uses travel information in various geostatistical analysis methods as well as visualizations of the data to be used in online and print publications (cf. traffic heatmap of the day).

Future prospects include the smooth integration of the SimpleFleet services with existing commercial solutions, e.g., proprietary fleet management and dispatching solutions. On this track, the range of potential specific application functionality includes capacity planning for taxis, fleet distribution, and vehicle routing.

Inasmuch as SimpleFleet supports the easy setup of advanced fleet management services, dispatching services, geomarketing analytics and movement visualization in urban areas, it "does the right thing at the right time": SimpleFleet will facilitate the penetration of fleet management and tracking solutions in the presence of increased availability of mobile internet, increasingly low communication cost, and the availability of large amounts of low-cost data sources. The immediate market for the SimpleFleet approach are small software companies providing fleet management solutions, geomarketing firms, and Web and print publication outlets, Application programmers who want to integrate data into existing solutions, institutions who need good and low-cost traffic data for their own modeling (governments, municipalities, even up to educational organizations and the research sector), system integrators (Web, desktop) offering network based calculations, solution providers in transport and logistics (customers are express-, forwarding-, and freight companies). There is also an implicit market: that is the large number of companies currently not being able to afford fleet management solutions, due to their costliness and complexity.

Direct benefits for the transport economy arise with SimpleFleet's easy integration into existing applications through standard technologies for commercial and non-commercial use, and with the provided free demo data. This all comes together with helpful information: in our suite of online demos, examples, all necessary documentation is available for the interested public. It has become possible to enhance the quality of routing services with precise traffic data. In turn, this allows for more precise calculations in logistic and customer service

applications. Public authorities, municipalities, and Transport Planning Offices can benefit from the outcomes of SimpleFleet by better prognoses of arrival times (that is, the possibility to base an optimization of traffic planning on SimpleFleet's data is another direct benefit of SimpleFleet).

It is expected that this will also help accelerating the development of European Wide Service Platforms (EWSP) offering map-based, smart mobility solutions, given that the services have been deployed in major European Cities like Berlin, Athena, Budapest, and Vienna.

1.4. Project public website address

http://www.SimpleFleet.eu