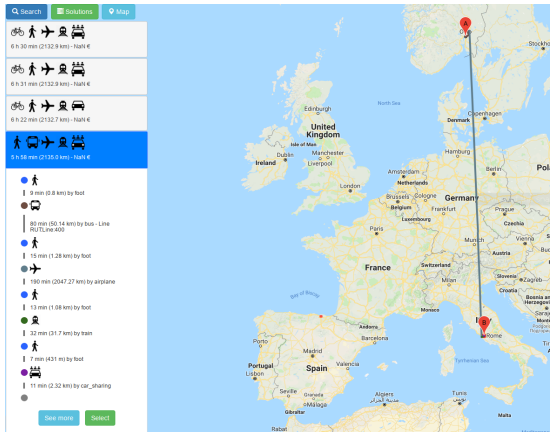
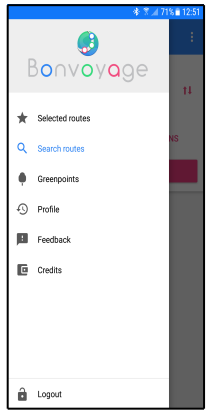
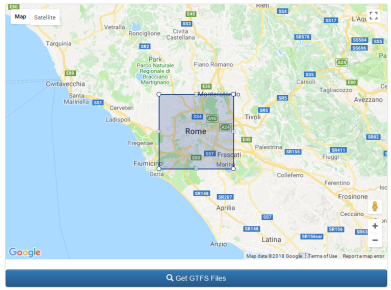
Demonstrators:

|| Multimodal door to door trip planning based on a federated infrastructure in Norway, Spain and Italy





|| Discovery Services for GTFS files and soloists, based on three National Access Points



Who:

Atos · cnit · TRENITALIA GRUPPO FERROVIE DELLO STATO · azkar DACHSER Group · mlc·its·euskadi clúster de movilidad y logística mugikortasun eta logistika klusterra · SINTEF · Bilbao · Statens vegvesen Norwegian Public Roads Administration · CRAT · Fluidtime · leti

Bonvoyage

Where:

When:

April 2018

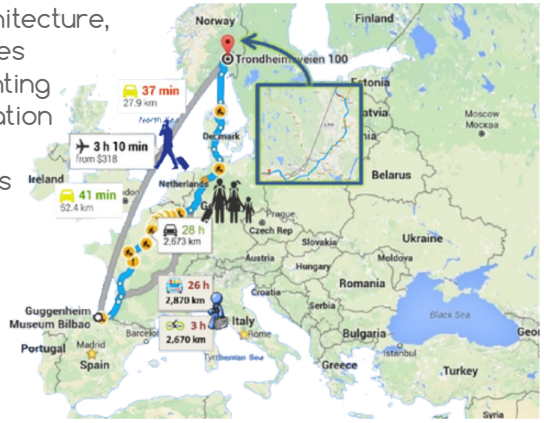
What:

\\ For end-users:

providing the best information to go from a place to another, before and during the travel, door to door, with any combination of any transport means, taking into account real-time conditions and user preferences

\\ For the EU and ITS community:

providing a scalable federated architecture, clustering national routing services and data sources, and implementing the Directive 2010/40/EU regulation about EU-wide multimodal travel information services



HORIZON 2020

http://bonvoyage2020.eu

Main achievements

- A system architecture compliant with Directive 2010/40/EU
- Information-Centric-Network system supporting publish/subscribe and Federation of NoSQL Spatial Databases for discovery services
- Scalable, multimodal, cross border, hierarchical route resolution made by local solvers (soloists) linked by an orchestrator (linking services)
- Open interface both at orchestrator and local solver level simplifying service stacking
- Machine Learning Profiling, Green Policy, Tariff Scheme, stress level and transport mode recognition
- Business Model for National Access Points

>> Why:

Trip mode:

Multi-modal (e.g. bike+train+bus+on foot) VS. Mono-modal

Trip service:

Based on: user preferences behaviours profiles VS. Un-personalized User independent Schedule driven

Routing service providers:

Many small scale, local public transport, private providers VS. Internet and Transport top players

Secure Data Sharing:

New Information-Centric Network with data centric security VS. The current TCP/IP Internet with connection level security

Open Data or Open Service:

Transport operators may not disclose their data but only expose routing services through their servers and insert metadata in a trusted National Access Points VS. Ask to transfer data to a third, centralized party and to comply with specific formats

Data and service liability

Data and services signed by originator. Intermediate entities (National Access Points) can not be blamed for altering them VS. Data and services are signed by the final provider

Operations and solutions:

Federated operations thus Implementing Directive 2010/40/EU to make ITSs interoperable across borders VS. Centralized solutions

\\ How:

\\ **National Access Points** providing discovery services for national route resolvers (soloists) and data sources.

\\ **Soloists** offering monomodal or multimodal routing resolution for bounded area (e.g. a web service of a transport operator).

\\ **Orchestrators** linking the needed soloists to provide a personalized multimodal door-to-door trip plan

\\ **Information Centric Networking** providing access to data rather than end-hosts, with native data-centric security. Used to implement **OpenGeoBase**, the NoSQL federated spatial database forming the National Access Point infrastructure, and for implementing **publish-subscribe** services for easy data update and on trip assistance

\\ **Secure Open Interfaces** to interact with orchestrator, soloists and National Access Points

\\ **Secure Open Metadata** stored by National Access Points to describe data sources and soloists with georeferenced and signed information

\\ **Machine learning-based user profiling techniques** to analyze data from user feedback and sensors

\\ **Stress level and transport mode recognition** using wearable devices, to identify user preferences and context