Testing Aspects

- Analysis of route characteristics and crossing phases at intersections
- Practical long-term testing of hard- and software within the testfield Application Platform for Intelligent Mobility (AIM)

Key Research Aspects of AIM

AIM is created by the German Aerospace Center (DLR), together with the federal state of Niedersachsen, the city of Braunschweig and other partners.
AIM integrates and draws on the current transport environment in the city and region of Braunschweig and includes special test tracks as well as a powerful set of instruments to simulate large-scale and microscopic aspects of mobility. AIM enables users from science, research, development and industry to study a wide range of topics from the world of transportation.

Project Partners

DLR
OECON
SIEMENS
TRANSVER
Technische Universität Braunschweig
ITS Niedersachsen GmbH
DBSV

Contact Information

TU Braunschweig
Institute of Transportation and Urban Engineering
38092 Braunschweig
Germany

Steffen Axer
Phone: +49 531 391-7911
Fax: +49 531 391-8100
E-Mail: s.axer@tu-braunschweig.de
www.inmobs.de

InMoBS

Intra-urban **Mo**bility-support for the **B**lind and vi**S**ually impaired

Project Duration:
January 2012 - December 2014

Gefördert durch:
Bundesministerium für Wirtschaft und Technologie
aufgrund eines Beschlusses des Deutschen Bundestages

InMoBS Objectives

Today's mobility of blind and visually impaired persons is associated with many barriers. Most trips are limited to well-trained routes. Especially crossing streets becomes a huge challenge paired with high risks. Traffic lights equipped with special guidance systems often do not meet the individual needs of affected persons.

The aim of the research project InMoBS is to improve the mobility of blind and visually impaired people. Therefore a complex system concept based on existing techniques has to be developed which provides the user with all necessary information and guarantees a safe and continuous navigation in intra-urban road networks.

Required route information will be easily generated and transferred to the portable navigation device by the user himself or its confidants. The navigation device will also be able to receive real-time traffic light information based on latest Car-2-X-communication techniques, which are used for an acoustic and haptic user-friendly guidance through the urban road network. To realise all of these aspects blind and visually impaired people are involved in all project development steps.

The use of InMoBS shall provide more safety, flexibility and autonomy of orientation, movement and mobility of blind and visually impaired persons in intra-urban road networks. That means, that common deficits and hazards (e. g. too quiet signals of pedestrian facilities; improper positioning accuracy of current navigation devices) shall be improved and handled. Information on the characteristics of crossings and their surroundings shall be provided.

InMoBS System Concept

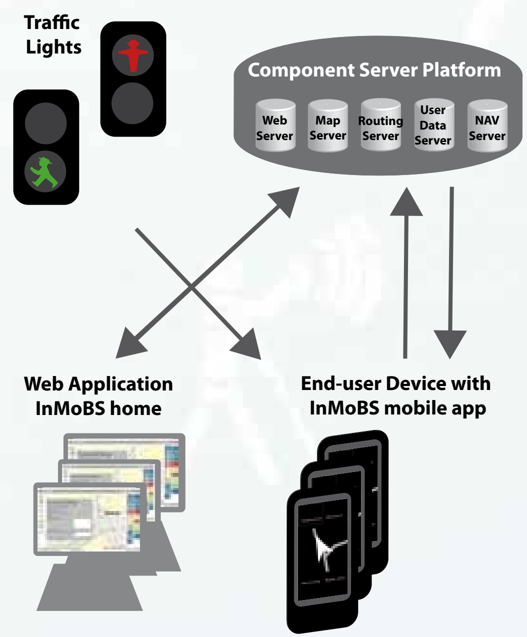
The InMoBS system distinguishes between infrastructure components

- Traffic lights
- Component Server Platform

and end-user components

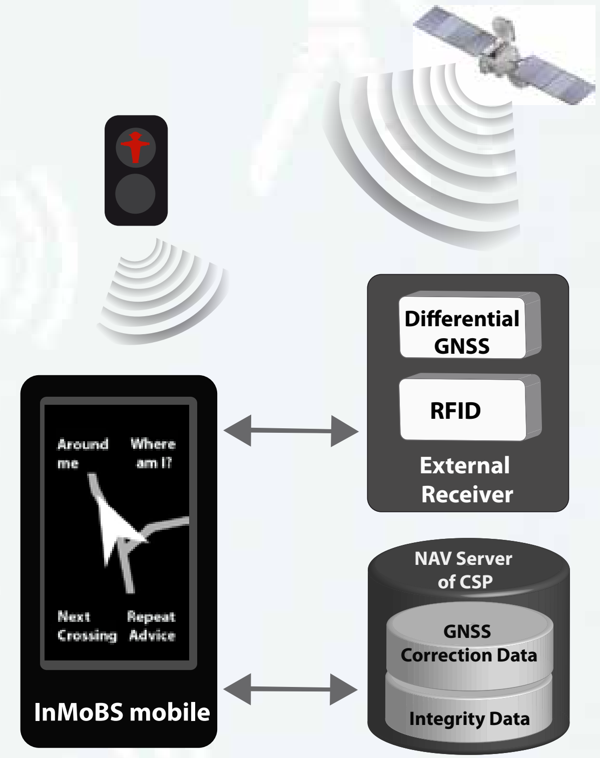
- Website „InMoBS home“
- End-user device (smartphone) „InMoBS mobile“

The Component Server Platform (CSP) combines several software modules which are used as servers for web, map, routing, user and navigation data. The user (via website app at home or via smartphone app on the way) puts a routing request on the server. On the server a route suitable for blind and visually impaired persons is calculated and provided. Local information on the signal (e. g. „red lights“) and the topology (e. g. position of the pedestrians' passage) is broadcasted by the traffic lights. Those information is received and processed within the smartphone in order to ensure a safe crossing. Additionally, differential correction data for satellite navigation is transferred via the mobile network to allow a higher positioning accuracy.



InMoBS Positioning

Smartphones can estimate their position using satellite navigation (GNSS), but only with limited accuracy worse than 5 to 20 m. That does not meet the requirements for guidance of blind and visually impaired persons.



Using an external GNSS receiver a more accurate positioning within 1 to 3 m is possible. Therefor the receiver uses differential GNSS correction data which are provided by the Component Server Platform. The positioning solution is supported by the RFID technique; i. e. small transmitter integrated in the traffic lights allowing additional reliability on crucial waypoints.

Considering the rapid technological development one can expect that the smartphone-internal positioning will meet the requirements of blind and visually impaired persons in the foreseeable future.