

“Description of work“ zur Maßnahme S 5.06 im EU-Projekt MOVE

Objectives

This measure will develop a priority network for heavy goods vehicles (HGV) in Stuttgart and implement dynamic traffic guidance for HGV in a test corridor.

- Efficient operation of the urban HGV-transport by concentration on recommended priority network.
- Protection of sensitive urban areas from HGV-related impacts (noise, air pollution).
- Reduction of noise (minus 3 dB(A)) and air pollution (minus 10 %) based on a dynamic traffic guidance for HGV in the test corridor.

Situation before CIVITAS/ Base case (starting point and business-as-usual) and state-of-the-art (incl. work funded through other projects)

Stuttgart is located in the centre of a thriving economic region with a high incidence of traffic. Every day about 800,000 cars are coming to / going out of town. A completed peripheral ring road does not exist. Thus the car transport is forced to use the limited urban road network.

The urban road network covers about 1,500 km. About 1,000 km of the road network are classified as speed limited zones which are not suitable for the through traffic. About 500 km form the major road network which is the backbone of the car transport and suitable for HGV. Nevertheless large parts of the major road network are enclosed by sensitive structures as e.g. housing, shopping, or recreation areas. Those areas are affected by traffic based noise and air pollution.

According to the EU framework directive a clean air plan and a noise action plan was established for the City of Stuttgart. Within the clean air plan one outstanding measure is a through traffic prohibition for HGV. This prohibition was established in March 2010 for the city area and for parts of the Stuttgart region. Nevertheless still 6% of the urban car transports are HGV with origins or destinations in the city or parts of the region.

In spite of implemented measures the urban traffic causes high emission levels which are quantified at inner city measuring stations for air pollution and are documented in noise maps. Therefore a priority network for HGV will be developed, which

- guarantees short and efficient routes for urban HGV and
- protects sensitive urban areas from HGV-related impacts.

This network will be based on the existing major road network. Technical feasibility will be taken into consideration as well as major destinations for HGV. The particular sections of the network will be analysed considering the existing noise and air quality levels and the sensitivity of the adjacent urban structure.

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In a selected test corridor the existing dynamic traffic control system will be expanded to guide the HGV traffic on alternative routes. The corridor is located in the southern part of the city where two alternative routes connect the highway directly with the inner city area. Both routes are heavily impacted by car transport and are enclosed by dense housing structures. For the guidance a dynamic message sign will be implemented at an appropriate decision point. The effects on the environmental impacts - caused by the route guidance for HGV - will be analysed in the test corridor.

Motivation - innovative aspects

The chosen approach for identifying a priority network for HGV combines the aspects of urban development, transport planning, and environmental protection.

With a dynamic traffic control the HGV-traffic will be guided and the HGV-related impacts can be analysed.

Especially the integration of transport management and urban planning is a new and innovative aspect. In general those two aspects are hardly linked with each other.

The recommended priority network for HGV will be distributed via internet and leaflets.

Relation to existing transport development plan/urban mobility concept

Mobility is a major factor determining the attraction of the City of Stuttgart as an industrial location as well as a place for living and working. To ensure a sustainable urban development the municipal section for transport planning worked out an Urban Transport Development Concept (Verkehrsentwicklungskonzept, VEK 2030) for Stuttgart. This master plan follows up an integrated approach which identifies conditions and changes to be considered. Corresponding strategies, guidelines, and measures for all transport modes are recommended. Urban development and transportation planning are linked closely within this concept.

Action Field 'Integrated Planning'

- Realization of measures named in the noise protection and clean air plans, e.g. 'priority network for heavy-good-vehicles'.

Action Fields 'Commercial Transport'

- Establishing a priority network for HGV to support an efficient accessibility of commercial sites and to protect sensitive areas from HGV-related impacts.

In the described way the measure also contributes to the future Stuttgart SUMP by contributing to the following objectives of the SUMP:

- Ensure the accessibility offered by the transport system is available to all.
- Improve safety and security.
- Reduce air and noise pollution, greenhouse gas emissions and energy consumption.
- Improve the efficiency and cost-effectiveness of the transportation of persons and goods.
- Contribute to enhancing the attractiveness and quality of the urban environment and urban design.

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Description of the work to perform within CIVITAS

Research and technical development (RTD) activities

Task 5.06.01: Development of a priority network for HGV

This task develops the priority network for HGV including:

- Analysis of data base (structure and technical feasibility of road network, identification of sensitive areas adjacent to suitable road sections, air quality and noise levels along suitable road network)
- Traffic assignment, effects of network design on total distance travelled
- Identification of an appropriate priority network for HGV considering major destinations for HGV and the total distance travelled

Demonstration activities

Task 5.06.02: Dynamic guidance of HGV (test corridor)

This task implements the dynamic guidance for HGV in the test corridor including the steps:

- Identification of test corridor / concept of test
- Implementation of dynamic message sign
- Measure of transport volumes and share of HGV (without and with guidance of HGV)
- Modelling of air quality and noise levels

Dissemination activities

Task 5.06.03: Dissemination

The task will focus on the dissemination of the measure based on:

- Development of leaflet and Internet information.
- Distribution of information towards companies and peer groups (e.g. chamber of industry and commerce).

Evaluation activities

Impact Evaluation

- (a) for measure
- (b) at site level
- (c) integration of measures on same site

Priority Network for HGV

- Total distance travelled: Traffic assignment, based on an existing demand matrix. The assignment includes passenger cars and HGV. By doing that rebound effects can be shown.
- Based on the traffic assignment also the travel times and operation costs of HGV can be estimated.
- Modelling of emissions of noise and air pollutants for the main road network in Stuttgart with and without the priority network for HGV based on the traffic assignment.
- Estimation of impacts on traffic safety.

Dynamic guidance of HGV (test corridor)

- Measuring the traffic volume and the share of HGV before and after the implementation in the test corridor.
- Measuring of travel times of HGV before and after the implementation in the test corridor.

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- Based on the measured travel times calculation of operation costs of HGV of HGV before and after the implementation in the test corridor.
- Compliance rates of trucks following the recommendations based on the traffic counts (acceptance of the measure).
- Modelling the emission impact (air quality (esp. nitrogen dioxide and particulate matter), noise) based on the measured traffic volumes (before, after)
- Recommendation of (steps of) further application of the measure in Stuttgart.
- Evaluation of the costs of the measure (test corridor) (planning / design, implementation (capital costs), operation, maintenance and enforcement).

Based on the costs and the different impacts evaluated a rough cost-benefit-analysis will be done showing the overall impact of the dynamic guidance in the test corridor.

Evaluation at EU-level

Urban air quality control is one of the main topics just now in the European Union. The measure tests a solution which allows municipalities to react dynamic on present air quality levels. This will allow municipalities to act only when it is really necessary and to avoid restrictions when not necessary. The measure can be a good example to be adopted by other municipalities in Europe

Process Evaluation

- Regular feed-back meetings with the Site Manager, the Local Evaluation Manager, the Local Dissemination Manager and stakeholders.

Verifiable results/how CIVITAS contributes to the result

- Reduction of emissions.
- Compliance of the air pollutant limit in the city (§22 bzw. § 39 BImSchV).
- Reduction of about 10% nitrogen oxides (NOx) and about 15% particulate matter (PM10) in the test corridor.