Hamburg’s ITS Strategy: Providing Future Urban Mobility and Logistics Solutions
The digital transformation is in full swing. It creates huge opportunities for the transport sector, which we will exploit to shape tomorrow’s mobility. New technologies will help us make the mobility of people and goods safer, greener and more efficient.

To ensure the successful introduction of innovative technologies in Hamburg, Hamburg’s Senate approved an Intelligent Transport System (ITS) Strategy in April 2016 and updated it in June 2018. The strategy outlines our goals and the reasons for our involvement in the various areas for action. We have made significant progress: our project management office operates efficiently, we have a wide range of projects underway and we know what we want to have achieved by 2030. In addition, we will host the ITS World Congress in 2021, which is a great motivation for us to do everything we can to make mobility more diverse, more convenient and more comfortable for people.

Cosmopolitanism, courage, curiosity and vision have always characterised our city. We therefore aspire to become Germany’s model city for intelligent mobility and smart logistics solutions.

HAMBURG AND TRANSPORT IN NUMBERS

What does “ITS” mean?

Intelligent Transport Systems (ITS) refers to all information systems and communications technologies combined that make transport and logistics processes safer, cleaner and more efficient.

THE ITS STRATEGY OBJECTIVES

• Improving transport safety
• Reducing transport-related impacts on the environment
• Increasing reliability and efficiency
• Supporting accurate and secure data collection
• Promoting innovations
DIGITISING MOBILITY & LOGISTICS SERVICES

Cities of the future offer a high quality of life that is characterised by a mix of open-mindedness, cultural diversity and sustainability which delights residents, visitors and newcomers alike. Hamburg is a perfect example and well on its way to setting new standards as a metropolis in Germany and Europe – not least because the city always approaches the issues of the future with an eye on the transferability of its concepts to other metropolises. We strive to apply available information systems and communications technologies in the best possible way to actively help to shape future mobility services and build a modern city logistics system. In April 2016, as part of the Digital City Strategy and based on the objectives of transport development planning, Hamburg’s Senate approved an ITS Strategy that sets out an ambitious vision for the future and addresses six areas for action.

Our areas for action:

- Promoting Innovation
- Cooperation
- Data and Information
- Intelligent Traffic Control / Routing
- Intelligent Infrastructure
- Intelligent Parking
- Mobility as a Service
- Automated and Connected Driving

Safer, greener, more efficient and more comfortable ways to get around

Many municipal authorities, Hamburg state agencies and organisations are collaborating to reach the set objectives: making future mobility services safer, greener, more efficient and more comfortable. Hamburg provides an excellent testing ground for smart transport innovations. To move mobility into the future, Hamburg counts on the expertise of strong industrial partners. In 2016 and 2017 the city therefore entered into strategic partnerships and cooperation agreements with Volkswagen, BMW, Daimler, HERE Technologies and Deutsche Bahn.

The organisational structure to implement the ITS Strategy has meanwhile been established. Competencies and ideas have been brought closer together and monitoring of the many projects developed has made considerable progress. What is more, Hamburg’s bid to host the Intelligent Transport Systems World Congress in 2021 was successful. Our work, however, will not stop after the event is over. We have updated the ITS Strategy as outlined in our progress report (June 2018) and defined the goals for all areas for action up to 2030.

More than 50 ongoing projects

Roughly 30 ITS projects have been successfully completed in Hamburg; over 50 projects are currently (as of March 2019) underway. For some of them federal funds under the Emergency Clean Air Programme could be secured. When it comes to implementing the projects, one question always takes centre stage: how do the citizens benefit from it? Data security and data protection also play a pivotal role as people rely on both when on the move in Hamburg. Providing information about the progress of projects at regular intervals is equally important.

The latest information on the implementation of the strategy is available at: www.hamburg.com/business/its

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2015 Hamburg develops an ITS strategy

October 2015 Hamburg announces its bid to host the ITS World Congress 2021

2016 April 2016 Hamburg’s Senate approves the ITS strategy

2017 The project management office and network management office officially launch

March 2017 Hamburg submits its bid to host the ITS World Congress

Oktober 2017 Hamburg wins the bid to host the ITS World Congress 2021

2018 January 2018 ITS Hamburg 2021 GmbH is founded

June 2018 Hamburg’s Senate approves the progress report

September 2018 ITS World Congress in Copenhagen

2019 October 2019 ITS World Congress in Singapore

2020 October 2020 ITS World Congress in Los Angeles

2021 11 – 15 October 2021 ITS World Congress in Hamburg

Start of 2030 Areas-for-action goals achieved

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MANY PARTIES ARE WORKING TOWARDS THE GOALS

Digitalisation crosses existing structures and organisations, and many parties and networks are involved in the implementation of the ITS Strategy. Below are some of them:

- **Municipal authorities, Hamburg state agencies, companies**
  - ITS Steering Committee
  - ITS Working Group

- **Digital Hub Logistics**
  - Start-ups and industrial partners

- **Hamburg Ministry of Economy, Transport and Innovation**
  - Chief Digital Officer (CDO)
  - Directorate-General for Transport and Roads

- **ITS Hamburg 2021 GmbH**
  - Staging the ITS World Congress 2021 in cooperation with the organisers, ERTICO – ITS Europe, the city, the federal government and the federal states
  - Presenting the city as a mobility laboratory of the future at the ITS World Congress
  - Acquiring project partners and sponsors
  - Initial contact partner for questions all about the ITS World Congress 2021

- **Network Management Office Logistik-Initiative Hamburg**
  - Promoting and implementing innovative ideas in business
  - Developing specific projects, in particular in the logistics and port industry
  - Initiating platforms, creative workshops and hackathons

ITS WORLD CONGRESS 2021 IN HAMBURG

**Experience Future Mobility Now**
The Free and Hanseatic City of Hamburg won the bid to host the ITS World Congress 2021 dedicated to intelligent transport systems and services. The announcement that Hamburg submitted the winning proposal for hosting the ITS World Congress 2021 was made at ITS World Congress in Montreal 2017. In conjunction with ERTICO-ITS Europe, the Federal Ministry of Transport and Digital Infrastructure, Hamburg will host the world’s biggest congress on intelligent transport systems at the Congress Center Hamburg (CCH) and the Messehallen, Hamburg’s trade fair grounds, with presentations at selected locations in the city from 11 to 15 October 2021.

- **Strong support from industry, research and associations**
  - Hamburg’s bid was backed by the transport sector both in and beyond the city and the strategic partnership with the Volkswagen Group. More than 100 partners as well as the Hamburg Convention Bureau and the Hamburg Chamber of Commerce provided substantial support for the activities leading to the bid.

- **In Europe every three years**
The ITS World Congress takes place in Europe every three years. In between, cities on the American and Asian continents host the event. Each year over 10,000 people attend the conference sessions, visit the associated exhibition, take part in live demonstrations and share information about the latest developments regarding intelligent traffic management and transport systems.

- **The ITS World Congress 2021 will focus on the following topics:**
  - Autonomous and connected driving
  - Mobility as a service (MaaS)
  - Ports and logistics: next generation goods delivery
  - Intelligent infrastructure
  - Urban air mobility
  - Sustainable transport

itsworldcongress.com
TEST TRACK IN HAMBURG’S CITY

- Establishing a 9 km long test track to test automated and connected driving on public inner-city roads
- Open platform for different vehicle manufacturers, technology companies and research institutions for testing innovative mobility services in real traffic
- Equipping 37 traffic lights and 1 bridge with V2X technology by 2020
- Laying the foundation for a Germany-wide vehicle-to-infrastructure communication standard, increasing safety and efficiency of transport for all participants
- Coordination center handles operation and enquiries
- Funded by the Federal Ministry of Transport and Digital Infrastructure

HEAT (Hamburg Electric Autonomous Transportation)

- Establishing a circle route for a public transport e-minibus that operates at a maximum speed of 50 km/h
- Will be gradually introduced: first tests start in 2019; Aim: operations fully automated by 2021
- Combines vehicles, intelligent infrastructure and the coordination centre into an efficient overall system
- Partners: Hamburger Hochbahn AG (project management), IAV GmbH, Siemens Mobility GmbH, Free and Hanseatic City of Hamburg, HySolutions GmbH, German Aerospace Centre (DLR), IKEM
- Funded by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

DRIVERLESS NEW UNDERGROUND LINE 5

- The new underground train line will run via the city centre, linking the north-east with the north-west
- Driverless operation allows trains to run more frequently
- Replaces very busy bus services and reduces road traffic
- Shorter journey times, more comfort for passengers
- First construction section from Bramfeld to City-Nord: 5.8 kilometres
- Connects densely populated districts with a combined population of over 150,000 people

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www.tavf.hamburg
**TaBuLa**

- Setting up a test centre for autonomous buses serving in Lauenburg on the Elbe
- Implementing a 2.5 km long test route with real mixed traffic
- Test route challenges: major road with two sets of traffic lights, historic cobblestone street and an approximately 500 m long ramp with a gradient of up to 16%

**DIGITAL REGIONAL TRAINS OPERATION**

- Highly automated regional train line service S21 between stations Berliner Tor and Aumühle by 2021
- Fitting four trains with the required technology
- European ATO (Automatic Train Operation) standard using the radio-based European Train Control System (ETCS), level 2
- Long-term goal: digitalisation of Hamburg’s entire regional train network
- Advantage: higher train frequencies

**ITS PROJECTS IN HAMBURG**

- "switchh-points": a range of transport sharing options at metro and regional train stations and in residential areas
- more than 50 locations all over the city
- car2go and DriveNow (merged, now operating as SHARE NOW), cambio, Emmy and StadtRAD offer a network of 1,500 vehicles and 2,500 bicycles
- Integrates electric charging points
- switchh customers enjoy reduced fees
- Planned integration in the HVV (Hamburg public transport association) app

**SWITCHH**

- Key research point on the acceptance and integration of autonomous public transport buses
- Funded by the Federal Ministry of Transport and Digital Infrastructure

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ON-DEMAND SHUTTLES

- CleverShuttle: hydrogen vehicles in operation since 2017
- ioki/VHH: accessible electric vehicle shuttle service in the districts Osdorf and Lurup; extended by two years after successful pilot phase in 2018
- MOIA: operations started in April 2019: service planned to be introduced throughout Hamburg, initially with up to 500 fully electric vehicles

CHECK-IN/BE-OUT

- Pay-as-you-go smart payment system on public transport buses and trains
- App recognises start and end of a journey
- System calculates the best fare for passengers
- 2019: completion of the trial phase; finding a system provider and awarding the contract
- Significantly more convenient for passengers as they don’t need to buy a ticket

DIGITAL PARKING

- Goal: real-time information on available car parking spots
- Q1/2019: T-Systems starts to install parking space sensors in the city
- Saves drivers time and is more convenient
- Reduces parking search trips and improves road safety
- Optimises traffic control and parking space management

SynCoPark

- Testing and certifying car park and vehicle standards for automated parking (valet parking) that apply to all manufacturers
- Saves drivers time and reduces parking search trips in the city
- Up to 20% better use of available parking capacities
- Transfer of the results from the project in Braunschweig to the multi-storey car park of Hamburg’s Elbphilharmonie in time for the ITS World Congress 2021
- Funded by the Federal Ministry of Transport and Digital Infrastructure
SMART LOCKER

- Goal: establishing a city-wide network of automated transfer points
- First network of intelligent lockers planned for 2019
- Gradually extending the network to include up to 50 highly frequented stations
- Additional service offered to commuters, residents and people visiting the station
- Helps to reduce inner-city congestion and makes the city’s logistics processes more efficient
- Increase of convenience for online and offline customers

WEIGH-IN-MOTION

- Research project at a motorway bridge to identify overloaded heavy goods vehicles through weight monitoring while they are in motion
- Developing and certifying a system to produce documentation that is admissible in court (24/7)
- Extends the service life of road and bridge structures
- System is more efficient than common manual monitoring methods
- Project partners: Hamburg State Agency for Roads, Bridges and Waters (LSBG) and Traffic Data Systems GmbH

GREEN4TRANSPORT

- Adaptive traffic flow management using intelligent traffic signal control and driver information systems installed in the vehicle
- Lorry convoys that form and dissolve ad hoc are guided through the port in the test area
- More efficient and safer freight traffic flows on the roads in the port
- Lower emissions and immissions as drivers do not have to interrupt their journeys
- Project partners: Hamburg Port Authority, Scania CV AB, NXP Semiconductors Germany GmbH, Siemens Mobility GmbH, Technolution B.V.

BiDiMoVe

- V2X technology: intelligent speed assistance advises bus drivers on optimum speeds
- Shorter waiting times for all road users; more precise traffic signal predictions
- Increased safety for vulnerable road users as the system warns bus drivers who want to turn of cyclists and pedestrians in blind spots
- Pilot project for future use cases at EU, federal and state level
- Funded by the Federal Ministry of Transport and Digital Infrastructure
TRAFFIC LIGHT FORECAST 2.0

- Developing and introducing a platform that offers non-discriminative access to traffic light data
- Goal: smoother, optimised traffic flows
- Potential users: app developers and mapping service providers generating forecasts and developing services for cars, bicycles and buses
- Funded by the Federal Ministry of Transport and Digital Infrastructure

GeoNetBake

- Sensor-supported warning signs to close off roadworks
- Live information about construction sites, e.g. location, position, travelling direction, area, lanes, start and end of works
- Visualisation of construction sites as an area in digital maps
- The data are published on the Hamburg Urban Data Platform for developers of further applications and portal solutions
- Funded by the Federal Ministry of Transport and Digital Infrastructure

AUTOMATED TRAFFIC VOLUME DETECTION

- Traffic lights equipped with infrared cameras generating real-time data
- Establishing vehicle counting throughout the city
- Calculating travel times
- Delivering accurate and anonymous data for traffic management
- Funded by the Federal Ministry of Transport and Digital Infrastructure

DigITAll

- Integrating route approvals and special permits to use the roads
- New cooperations by combining different systems into one central internet portal
- Obtaining and distributing real-time information generated by various projects

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HACKATHONS ON MOBILITY TOPICS

- Competitions between teams made up of software developers, designers and founders
- Developing ideas within 24 or 48 hours
- Organisers: Hamburger Hochbahn, NextReality, Deutsche Bahn and ITS Network Management Office (Logistics Initiative Hamburg)

HAMBURG URBAN DATA PLATFORM

- The data platform links existing and future municipal IT systems and services, including the mobility service sector
- Interactive processes and analyses to improve city operation
- Integrates sensor data of all municipal processes
- Provides simulations and live feedback
- Basis for use of artificial intelligence to support decision making

CYCLING DATA COLLECTION NETWORK

- Digital collection and evaluation of real-time data at about 40 permanent data collection points
- Less expensive than previous collection methods and easier to evaluate
- More traffic management options as diversion routes can be recommended
- Data on impacts such as weather, large events and roadworks
- Funded by the Federal Ministry of Transport and Digital Infrastructure

CARGO 24/7

- Integrates and coordinates slot booking systems between the cargo terminals in the port and logistics hot spots in the hinterland
- Shifts freight transports to less congested periods of the day
- Improves the port’s performance due to more evenly distributed traffic
- Lowers emissions and violations of the permissible driving period
- Produces more efficient transport chains
Further Information

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