© LSBG, 2025

ITS-CUBE

Using Intelligent Transport Systems to prioritise sustainable mobility

Insight Paper – Second Edition

January 2026

ITS-CUBE

Hamburg

bax

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No ELENA-2020-179.

Introduction

Vision

"Hamburg's citizens need to get from A to B in an economically efficient and climate-neutral way. To achieve this mobility transition, our citizens will need local public transport they can use much more."

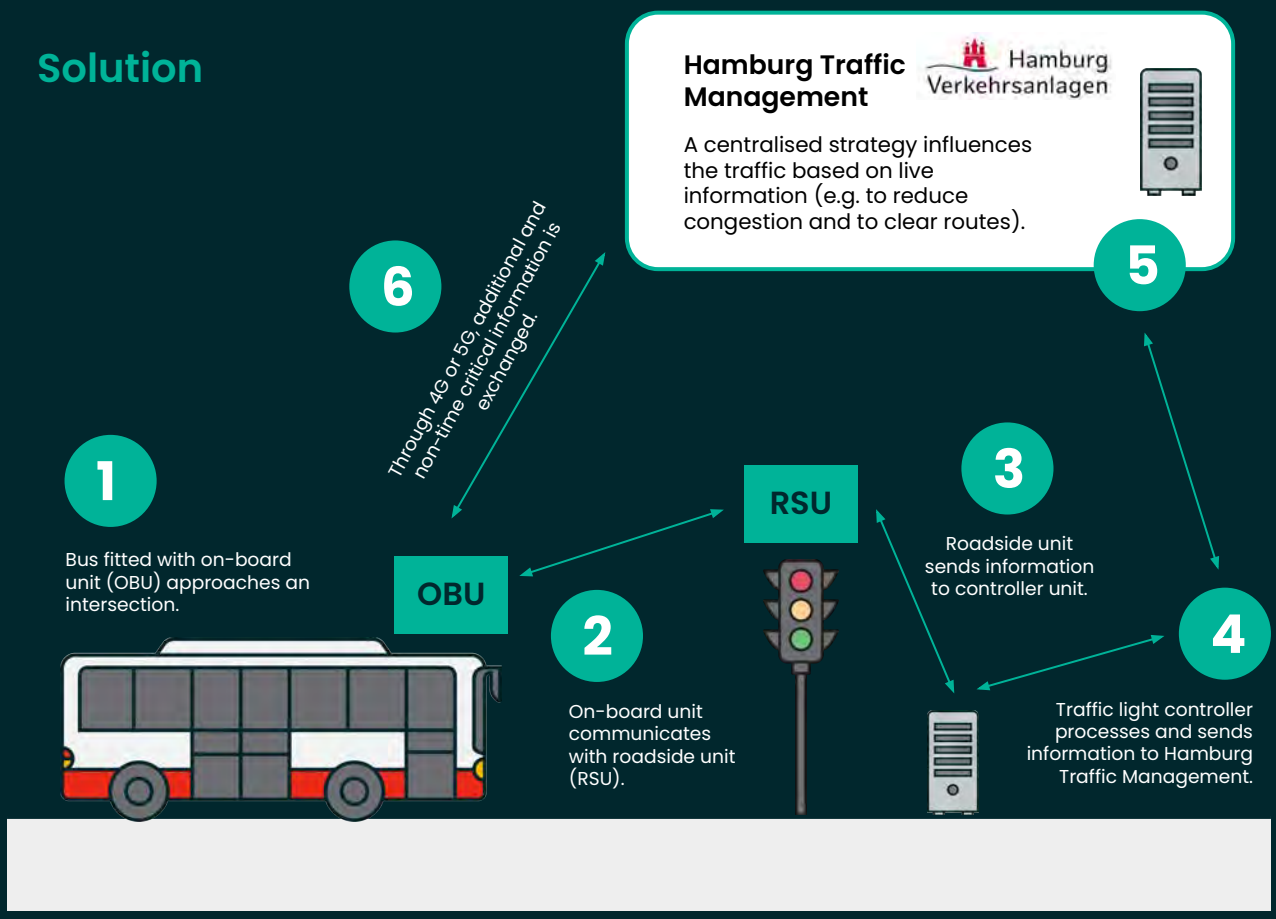
Dr Anjes Tjarks, Senator of Hamburg

Challenge

"Faced with a fast-approaching deadline for analogue radio reassignment, the city was conscious it needed a new system that fits wider sustainability objectives. Setting up this system would require expertise, testing & coordination between multiple stakeholders, all scaled in a new investment programme."

Dr Bernd Schober, Project Manager of ITS-CUBE

Solution



Preparing for C-ITS with EIB funding:
The ITS-CUBE project

To kick-start the delivery of its prioritisation across the city, Hamburg successfully applied for an ELENA grant from the European Investment Bank.

The ITS-Concept Urban Bus Equipment (ITS-CUBE) preparation programme is the first step towards Hamburg building a city-wide ITS-based prioritisation programme that supports their sustainable mobility ambitions.

The funding received will cover the first stages of the project - analysing, building and testing the optimal system architecture to be scaled across the city, including the development of new ITS-based traffic engineering logics..

Project duration	EIB Investment	EIB Funding Rate
2023 - 2027	€1.94m	90%

Which costs are covered in Hamburg's EIB ELENA project?				
Technical Support & Feasibility studies	Project management preparation	Communications	Development of system architecture and migration strategy	Development of ITS-based logics

European Investment Bank

Timeline

ITS-CUBE to date

By the end of 2025, ITS-CUBE has made significant progress. Besides finalising the new system architecture, we have brought a first version of the new ITS-based traffic engineering logics to Hamburg's public roads and refurbished 158 traffic lights with our new ITS-CUBE prioritisation technology.

Jun 23

It officially starts!

The project begins with the awarding of €1.94m in funding from EIB ELENA.

Sep 23

Kick-Off in Hamburg

ITS-CUBE is kicked off by Dr. Anjes Tjarks, Senator for Transport and Mobility Transition in Hamburg (BVM), along with technical project manager Dr. Bernd Schober from the Department of Roads, Bridges and Waters (LSBG) and Ozhan Yilmaz, representative of the European Investment Bank (EIB).

The meeting is also attended by leading transport operators Verkehrsbetriebe Hamburg-Holstein GmbH (vhh.mobility) and HOCHBAHN who will implement the ITS solution in their fleets.

Nov 23

The technical foundations are laid

Requirement analysis is completed for traffic engineering, infrastructure, bus operation, a test track identified and the first draft of system architecture produced.

Timeline

ITS-CUBE to date

Feb 24

The first investments

Using the knowledge of ITS-CUBE, HHVA, a Hamburg-owned company responsible for planning, construction and operation of the city's +1,700 traffic lights, begins refurbishment of the first 7 C-ITS ready units, equipping them with new Roadside Units.

Mar 24

Demonstrations in the depot

Software and hardware converter solutions - essential for the transition from the old prioritisation system to the new C-ITS solution - are demonstrated for the first time at the HHVA depot.

May 24

Best practice at polisMOBILITY 2024

Hamburg's bus prioritisation is selected as a best practice for the sustainable mobility conference polisMOBILITY 2024.

Jul 24

From the depot to public roads

Test track construction begins, creating a live environment in which five traffic lights with C-ITS will be tested. Finalisation in April 2025.

Jul 24

ITS-CUBE joins C-Roads Germany 3

Preparations in ITS-CUBE unlock up to €10m in funding through CEF-Europe to scale Hamburg's prioritisation systems, aiming to retrofit up to 700 buses and prepare an additional 100 traffic lights.

Nov 24

ITS-CUBE in Barcelona

Hamburg presents ITS-CUBE on-stage at the Smart City Expo 2024's Tomorrow Mobility World Congress in Barcelona.

Timeline

ITS-CUBE to date

Jan 25

Upgrade of Hamburg's buses

Public transport operators HOCHBAHN and vhh.mobility are purchasing the first on-board units (OBUs). These units act as the counterpart to the traffic lights' RSUs and enable C-ITS communication.

Jun 25

UITP Summit 2025 in Hamburg

Hamburg hosts the UITP Summit 2025, featuring ITS-CUBE as one of its lighthouse projects. Further details can be found on the highlights page.

Mar 25

Hamburg and Berlin join forces

ITS-CUBE organises a workshop and arranges a follow-up meeting with the City of Berlin and its public transport operator BVG.

Jul 25

No summer break for ITS-CUBE!

We have a follow-up meeting with the City of Berlin & BVG for an exchange at working level.

The first version of the new ITS-based traffic engineering logics is tested in HHVA's laboratory.

Furthermore, our feasibility study on passenger dwell time has been finalised.

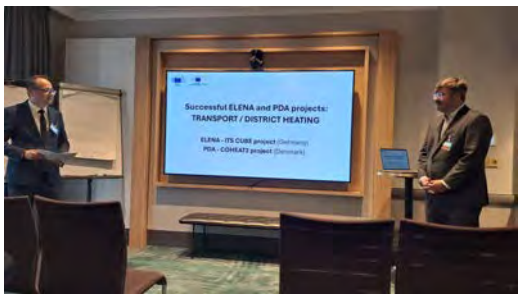
Timeline

ITS-CUBE to date

Aug 25

Collaboration is key!

ITS-CUBE teams up with Hamburg's second ELENA project FAST and investigates synergies between the prioritisation of buses, emergency vehicles and autonomous shuttles.



Sep 25

ELENA Contractors Meeting 2025

While we have participated as guest in 2023, ITS-CUBE project manager Bernd Schober has held a presentation of ITS-CUBE as a successful ELENA project.

Nov 25

Final stretch for 2025

Bernd Schober gives a presentation at the Car2Car forum in Ludwigsburg.
Also, we have unlocked a major milestone by deploying the first version of the new ITS-based traffic engineering logic on the test track.

Timeline

ITS-CUBE to date

Dec 25

100 years of traffic lights in Hamburg

It is the year 1925, and Hamburg introduces its first traffic lights. One hundred years later, the technology has become much smarter, and ITS-CUBE was chosen to showcase these developments on a press bus tour. The tour was a great success, attended by Dr Anjes Tjarks, Hamburg's Senator.

This technology can prioritise emergency vehicles, it can prioritise buses. This means that our bus prioritisation is more intelligent, will improve significantly, and we are laying the foundations for this today.

Dr Anjes Tjarks, Senator of Hamburg

Source: SAT.1 REGIONAL (YouTube): https://www.youtube.com/watch?v=Glo6lcgxAv4

Highlight

UITP Summit 2025 in Hamburg

The UITP Summit 2025 in Hamburg offered several opportunities to showcase ITS-CUBE to a broad and diverse audience.

Mobility Festival at Hamburg-Jungfernstieg.

Technical visit on the fully constructed test track.

ITS-CUBE as a lighthouse project: Dedicated stele and presentation

The next stop:

Looking to the future of ITS-CUBE

"We are very glad that we were able to conduct the first tests of the first version of the new ITS-based traffic engenieering logics on public roads before the end of 2025. Now its time to roll out the new technology across Hamburg's traffic lights and manage to upgrade the bus fleets our PTOs accordingly."

Olaf Koch
Project Manager

Upgrade of 59 additional traffic through financing of C-Roads Germany 3

Update of further 117 traffic lights with software converter solutions

Equipment of vhh.mobility and Hochbahn buses with on-board units

The journey ahead: Hamburg's long-term vision

ITS-CUBE is just the beginning of Hamburg's bus prioritisation ambitions. In the future, Hamburg will:

- Establish the current version of C-ITS logic as standard.
- Retrofit 2,000 buses with on-board unit devices by 2030.
- Prepare the installation of ITS-prioritisation at 600 intersections.
- Update transport management software to maximise efficiency of traffic patterns.

This is expected to:

- Cut down on private car trips by 16.5%.
- Increase the modal share of environmentally friendly modes.
- Lead to annual carbon reductions of 53,298 CO_2 equivalent tonnes.

Acknowledgements:

© LSBG, 2025

Learn more about ITS-CUBE

Dr. Bernd Schober
Hamburg - Project Manager
its-cube@lsbg.hamburg.de

Nicolas Freitag
Bax Innovation - ELENA Funding Support Manager
n.freitag@baxcompany.com

ITS-CUBE Hamburg

bax

The sole responsibility for the content of this insight paper lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the European Investment Bank nor the European Commission are responsible for any use that may be made of the information contained therein.