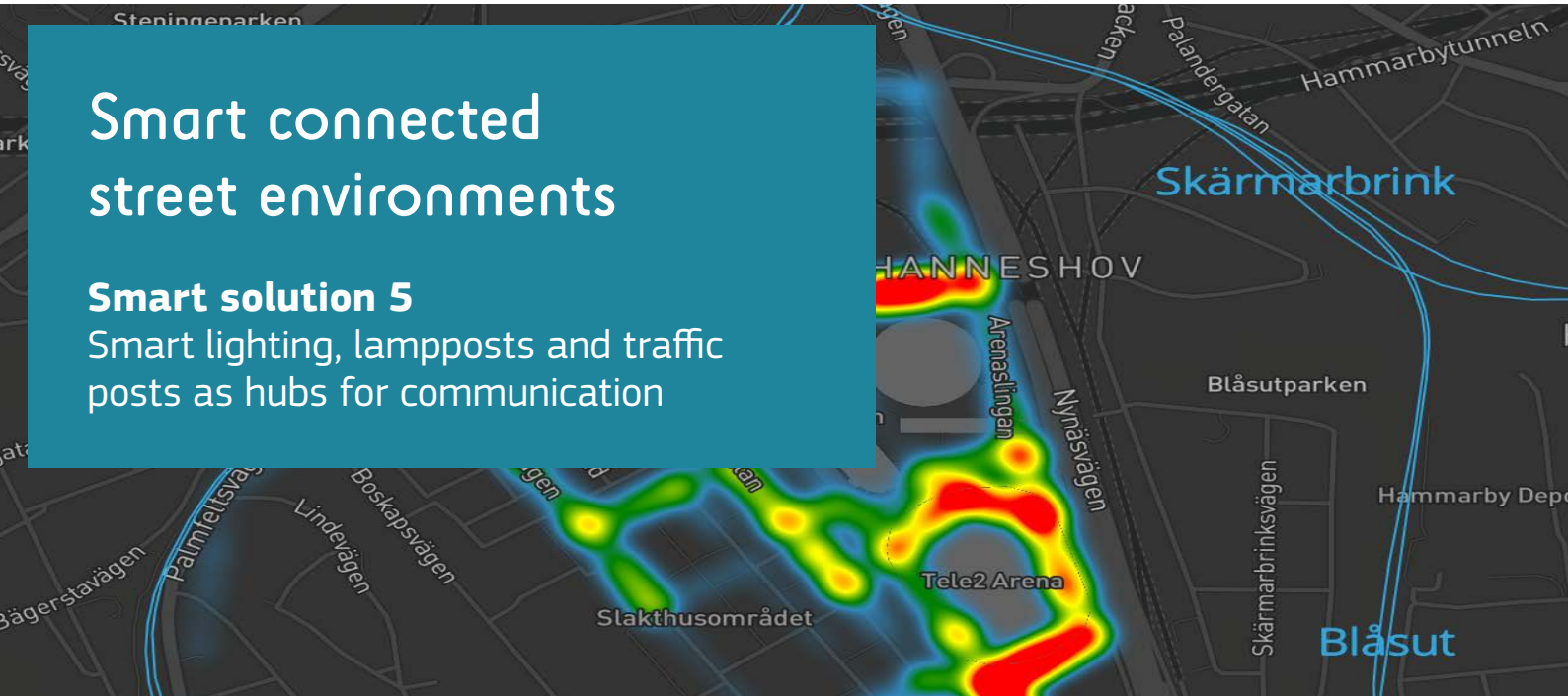

Smart connected street environments

Smart solution 5
Smart lighting, lampposts and traffic posts as hubs for communication

Impacts

PROVIDE
accurate climate emission data in real-time

IMPROVES
accuracy of planning and decision making to reduce climate emissions

ENABLES
use of real-time data in planning traffic signals and flows according to people and vehicle flow.

Stockholm

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What is it?

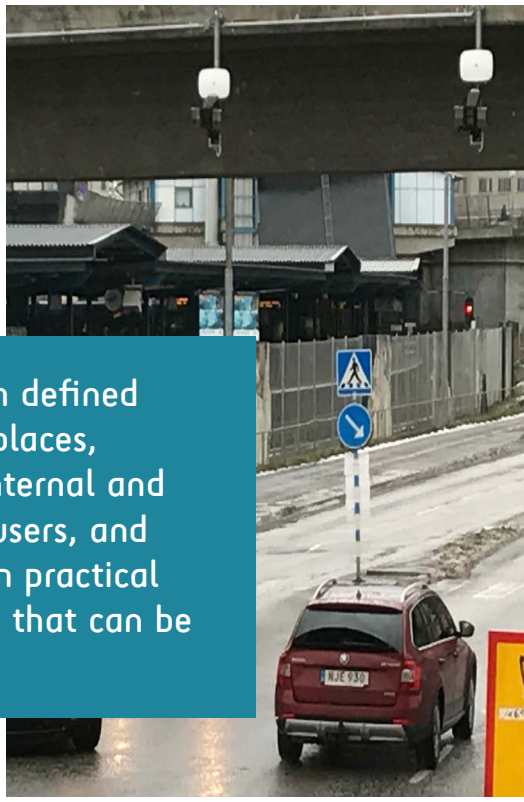
A combination of multiple functionalities within public infrastructure such as street lighting poles, traffic lights, and traffic signs can make walkable urban areas ubiquitously connected with sensors. By relying on the extensive fiber infrastructure prevalent in some cities, new Wi-Fi connections are made available for a variety of urban sensors whose data can be analysed and used. The sensor-data can also be used for visualization and fed into an IOT platform to test the possibility of using the data for direct communication with citizens and to pre-program and steer city infrastructure such as streetlights.

What did GrowSmarter do?

Originally, the idea was to add the sensors to street lights or traffic poles in Stockholm, but the traffic measuring sensors were too heavy for the street light poles. It was also impossible to use the same electricity for the sensors and street lights, so separate poles were used. Four traffic-measuring sensors were

installed on a pedestrian bridge running over the street with another four being installed in an already existing portal that had to be extended to make measurements possible on the other side of the street. The Wi-Fi-nodes they were installed in buildings owned by the city and used the existing connectivity (broadband) there. No additional cabling for electricity was needed as the WiFi-nodes were connected with power over Ethernet (PoE).

The existing infrastructures can be extended with other types of sensors if necessary and the City of Stockholm is looking into adding multi-sensors and/or air pollution sensors.



> Start with defined physical places, involve internal and external users, and work with practical use-cases that can be scaled-up

Lessons learnt

An important part of the implementation is understanding the end-users and their needs. A too common approach is to set up sensors in an area, collect data to share and then hope developers make innovative applications with the data. Unfortunately, this is rarely the case, so GrowSmarter took a different approach: The end users where asked in the beginning of the process about their needs and as a result the collection of data focused on collecting data on pedestrian movements and providing a better overview of vehicles in the city and what kind of pollution they create. With a clearly defined use-case was possible to get the most out of the sensors in the smart connected street environment as there was a defined user who gained from the collected sensor data (see more Factsheet 28, Big Open Data Platform).

Upscaling & replication potential

This is an enabling measure and the number of end-users is small. The data collected into the IOT-platform is very rich and can be used by both users inside a city organisation as well as stakeholders (different service providers) in the Slakthus/Globen of Stockholm area. The data collected was used to develop a mobile application for visitors, but was not tested in public as of October 2019. For upscaling purposes it is wise to standardise the sensors used and the initial workload is increased if the sensors are from different manufacturers using different logic. If standardised approaches are used, it is very easy to scale up the amount of sensors as the same protocols can be used.

How did the measure work?

Technical feasibility

The technical feasibility depends on the sensors used. The camera-based technology has a high technical feasibility and produced accurate data during the whole project. The WiFi-based technology on the other hand had a low technical feasibility in product quality and performance as well as data quality.

Economic feasibility

The initial economic feasibility is low with high cost, few users and little added value. However, as up-scaling costs are low, the amount of possible end-users and use-cases make the economic feasibility higher in the long term.

Replication potential

The replication potential is high on camera-based sensors, but lower on Wi-Fi nodes.