Smart&Connected

Stockholms stad

What is a smart city?

A smart city is quite simply a city that utilizes digitalization and new technology to simplify and improve the life for its residents, its visitors and business. In the smart city, new smart services are constantly created to make the city even better. A smart city is a sustainable city. The smart city is made possible through connectivity, publicly accessible data, IT platforms that can communicate with each other, sensors and other technologies.
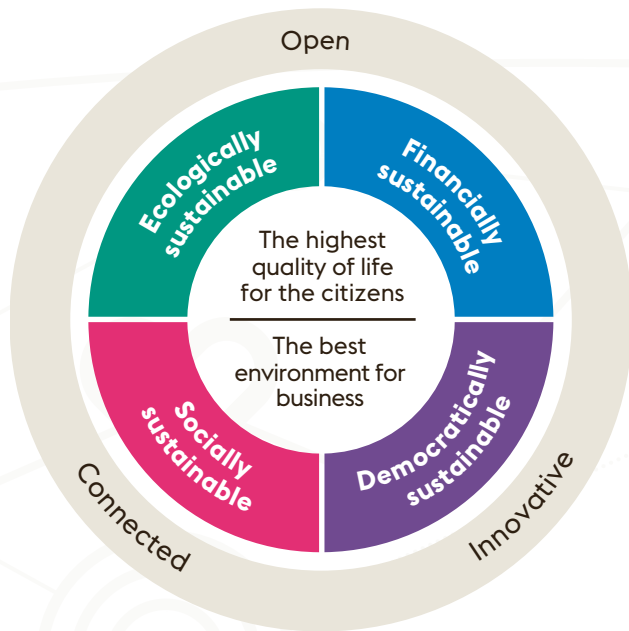
Why should Stockholm become a smart city?

Globally, more and more people are leaving rural areas and moving to the cities. People live longer and the international mobility of labour increases. Stockholm is no exception. This create opportunities but also needs within the city. At the same time, developments in digitalization continue rapidly. Anything that can be digitalized will be digitalized. The developments in digitalization and new technology create opportunities and benefit all segments of society. Old and young, IT-savvy and those less familiar with IT. In Stockholm, digital sophistication is high and the digital infrastructure is well developed. This means that the city is well placed to take advantage of the opportunities presented by digitalization. In today's fast-moving and innovative environment, this is a great advantage. Stockholm also has a long history of being a leader in information and communications technology with many prominent companies, startups as well as established multinationals. With new technology, we want to use this advantage to make life easier and better for all who live in, work in, and visit Stockholm. So that Stockholm becomes a smart and connected city.

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Open, sustainable and including

Stockholm must be a sustainable and including city. A society where growth, innovation, low environmental impact, equality and accessibility are a given. In the City's Vision for 2040 of a Stockholm for all, a clear goal is set: **By the year 2040, Stockholm should be the smartest city in the world.**

Open

Ecologically sustainable

Financially sustainable

The highest quality of life for the citizens

The best environment for business

Socially sustainable

Democratically sustainable

Connected

Innovative

By making the city sustainable in four areas, the target for the City's digital development is achieved.

Stockholms as a smart and connected city

In order to reach its vision of becoming a smart city, Stockholm will stimulate, guide and coordinate different digitalization projects. The strategy for Stockholm as a smart and connected city, together with the City's upcoming digitalization program, describes how this should be done. There are already many good local examples from the City of activities and projects that make the city smarter. Implementation of the strategy and the digitalization program will build upon all that is currently done and that has been done in Stockholm. All new investments should be based on the needs of the people who live or work in the city – and also those just visiting.

The way forward to make Stockholm a smart and connected city is through innovation, openness and connectivity. And by making the city sustainable in four areas – economic, ecologic, democratic and social sustainability – the target is achieved: A Stockholm for all.

Together

The strategy to become a smart and connected city has been developed together with residents, academia, business and analysis of global developments.

→ The City has invited inhabitants of all ages to a direct dialogue at the Stockholm City Hall.

→ Dialogues have also been held through social media. More than 3350 people provided feedback through digital channels. Here, they expressed their views on the vision to become a smart and connected city, evaluated the city's current digital interfaces as well as made suggestions for solutions that can be part of the smart city.

→ Work meetings have also been held with employees of the City of Stockholm, as well as with representatives from startups, academia and business.

→ The City of Stockholm, in cooperation with the Royal Institute of Technology, Ericsson, Vattenfall, ABB, Skanska and Scania, has established the innovation arena Digital Demo Stockholm. The arena will run projects to develop sustainable, innovative, digital solutions that contribute to improving quality of life for the people of Stockholm. Another partnership is Urban ICT Arena in Kista Science City, where the City together with the industry and universities tests new technology and new services.

→ An analysis of global developments has been carried out to gain a broader understanding of the experiences of other countries and cities. Selected initiatives in other smart cities have been used as inspiration in working meetings.

→ An active exchange of best practice has taken place with other cities that have made progress in their efforts to become smart cities.
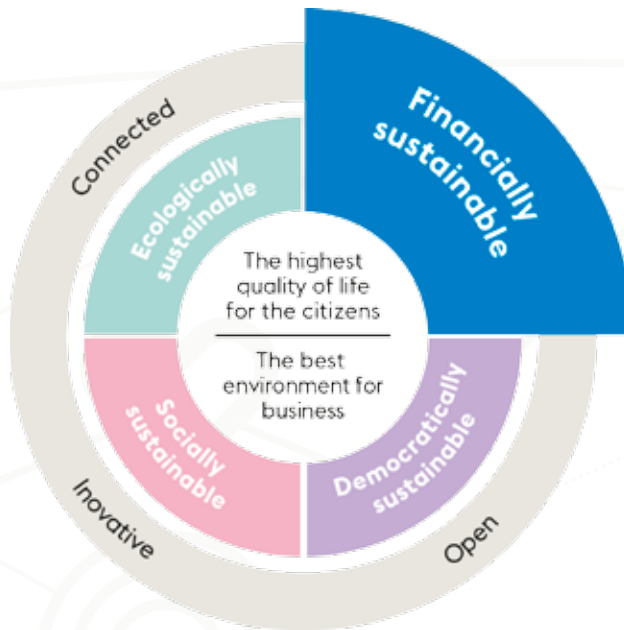
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The smart city is economically sustainable

The highest quality of life for the citizens

The best environment for business

Connected · Financially sustainable · Ecologically sustainable · Socially sustainable · Democratically sustainable · Open · Inovative

Stockholm has high economic growth and a high employment rate. In order to make this economic growth sustainable, digitalization and new technologies are considered enablers.

The objective is to make Stockholm a city that

➜ is attractive, innovative and growing, with the perspective of making an investment or establishing a business
➜ is a central node in a global network of successful cities
➜ is one of the best startup scenes in the world
➜ develops and grows through entrepreneurship and intrapreneurship in digitalization and new technologies
➜ attracts talent and visitors, international and national
➜ cost efficiently manages it public operations by making full use of digitalization and new technologies
➜ has a wide range of businesses, with a favourable environment for an inclusive labour market.

Smart examples

Traffic control

WHAT:
Main bus lines (blue buses with many passengers and many services) are prioritized at traffic lights before other sorts of traffic.Buses that are a minute or more behind schedule are given preference.

HOW:
The buses send a request to the traffic signal controller via its radio system.

BENEFITS:
➜ When the buses are prioritized at traffic signals the travel time for buses decreases.
➜ Reduced waiting times lead to reduced environmental impact.

Meal optimization

WHAT:
Absentee reporting by parents and pupils are synchronized with the school kitchens' meal planning in order to avoid overproduction of food.

HOW:
A report is sent to the school kitchen from the absentee system, The report serves as a basis of information before the daily production decision is made.

BENEFITS:
➜ Fewer portions of food need to be disposed of due to pupils being absent. The reduced food waste has both cost and environmental benefits.
➜ The system has been tested in a pilot project at a secondary school. Decisions taken at 8.30 am saved over SEK 6,000 and reduced environmental impact by almost 0.5 tonnes of greenhouse gases (CO_2e). On an annual basis, it holds a potential of saving over 10 tonnes of greenhouse gas emissions, and more than SEK 135,000 for the pilot school alone.
➜ The pilot project also showed positive side effects, such as the system rapidly discovering major disease outbreaks.

The smart city is ecologically sustainable

The highest quality of life for the citizens

The best environment for business
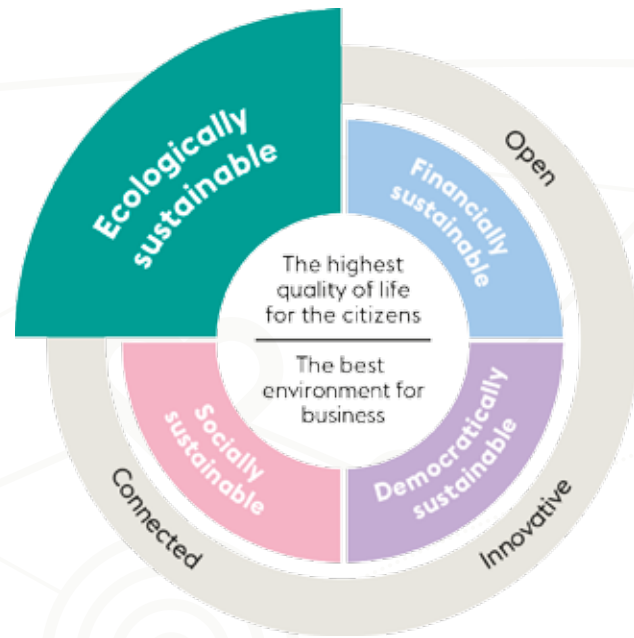
All construction, urban planning and production of goods and services are carried out with great attention to long-term ecosystem carrying capacity. This applies to both the City of Stockholm and to the entire region. To make the ecological development sustainable, digitalization and new technologies are considered enablers.

The objective is to make Stockholm a city that

→ uses digitalization and new technologies to make it easier for residents and businesses to be environmentally friendly
→ is well prepared to deal with the possible effects of climate change such as heavy rainfall and rising sea levels
→ reduces its energy consumption and carbon footprint
→ provides sustainable solutions for modern transport
→ uses digitalization and new technologies to stimulate biological diversity and conservation
→ produces goods and services in a resource efficient way with minimal environmental impact.

Smart examples

BigBelly

WHAT:
Waste bins that automatically pack the garbage and notify when they need emptying. In March 2017 153 of them were deployed in Vasastan, Östermalm and on Kungsholmen.

HOW:
The bin uses solar power and packs the trash automatically when needed. BigBelly automatically detects how full the bin is and notifies the waste collector when it is time for emptying.

BENEFITS:
→ Holds five times as much garbage as a regular waste bin.
→ The need for emptying has been reduced by over two thirds.
→ The number of complaints about sanitation has decreased dramatically.
→ Increased transparency within the City's sustainability efforts.

Smart lighting

WHAT:
Smart lighting is part of the project Grow Smarter, a collaboration between eight European cities and various greentech companies to test and develop twelve smart solutions for urban sustainable growth. Sensor-controlled LED lighting for pedestrian and bicycle paths, self-controlled LED street lights with preset lighting schedules and remote-controlled LED street lights are being installed on Valla Torg in Årsta.

HOW:
LED lighting with motion sensors. Communication via the lampposts' electrical wiring and radio communication via special mesh networks of radio transmitters in the lampposts.

BENEFITS:
→ The lights shine with maximum strength only when someone approaches the lampposts.
→ When a cyclist or pedestrian gazes further ahead in front of him or her, the paths are lit with only 40 percent brightness. This is enough for those who use pedestrian and bicycle paths to perceive the path ahead as illuminated.
→ The demand controlled lighting levels can result in reduced electricity costs of about 40-50 percent.
→ When traffic is very sparse, the brightness of street lighting can be reduced to 70 percent and in some cases 50 percent.
→ Lampposts send automatic notifications when the lights need to be replaced.

The smart city is democratically sustainable

The highest quality of life for the citizens

The best environment for business

- Innovative
- Connected
- Open
- Ecologically sustainable
- Financially sustainable
- Socially sustainable
- Democratic sustainable

Democracy and high trust produce a creative environment where new, innovative solutions can emerge. To make the democratic development sustainable, digitalization and new technologies are considered enablers.

The objective is to make Stockholm a city that

→ simplifies and enhances residents' influence and participation in the democratic process through digitalization

→ is open and accessible to everyone - residents, visitors and businesses

→ has transparent administrations and operations, where digitalization and new technologies are deployed to make the democratic processes and decisions within the city more visible to citizens and businesses.

Smart examples

"Make a suggestion"

WHAT:
A mobile application that offers residents the opportunity to influence the city. A corresponding web form at stockholm.se has also been created to provide the opportunity to express views . In 2016, 100,000 cases were reported and resolved through the system.

HOW:
Residents use the mobile app or the web form to describe their matter. The app treats the complaint or view with the help of GPS location on a map and integration with the systems for managing activities of contractors.

BENEFITS:
→ The City of Stockholm handles views and ideas about the traffic and external environment in Stockholm better and quicker , which makes the city cleaner, nicer and safer.

The Stockholm room

WHAT:
Urban planning in the city is made visible on touch screens. Visitors can zoom in to the models of buildings and get in-depth information on current and planned projects.
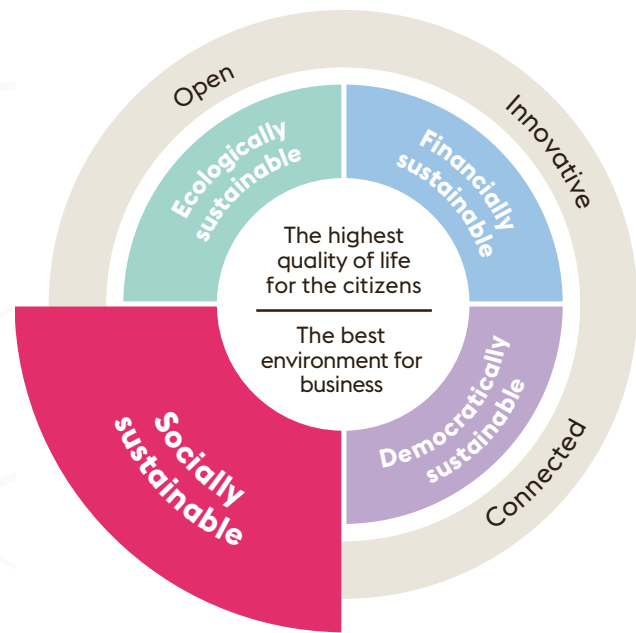
HOW:
Photo-realistic 3D models.

BENEFITS:
→ Increased transparency, facilitating greater engagement from the Stockholmers.

The smart city is socially sustainable

Open

Innovative

Ecologically sustainable

Financially sustainable

The highest quality of life for the citizens

The best environment for business

Socially sustainable

Democratically sustainable

Connected

Community resources should be distributed in a way which makes it possible for everyone to realize their lives through education, work and housing. Socially sustainable development builds a community and allows for participation in societal development. To make social development sustainable, digitalization and new technologies are considered enablers.

The objective is to make Stockholm a city that

➜ achieves digital inclusion, where digitalization and new technologies are deployed to bridge social divides, create a community, and work together to reduce exclusion

➜ helps city dwellers to communicate, work, study, experience, and have an active life, based on each person's unique circumstances

➜ increases perceived safety, both in private and in public spaces, and creates vibrant and safe neighborhoods.

Smart examples

The Digital Lift

WHAT:
The digital lift is a term gathering several digital efforts within the City's schools. The goal is to raise the schools' digital maturity and improve the use of IT. In the project called "Tools for self-assessment", teachers in primary and secondary schools asses their own digital skills within various fields. Based on the results, the tool suggests concrete actions that will form the basis for an action plan. "1:1 in 2016" is a project to improve high school students' learning by raising teachers' and librarians' digital maturity. The project was initiated in 2015 in connection with the decision that all high school students should have access to their own computer.

HOW:
The project has identified arenas, individuals, forms and processes to increase the digital maturity of the schools. The project has resulted in the completion of three self-assessments, a network of inspired teachers to manage the digital development at secondary schools, and support to the management of the schools to steer the digital evolution.

BENEFITS:
➜ Enhanced digital maturity.
➜ Improved use of digital tools in education, allowing for better education.

Digital tool detects reading and writing difficulties

WHAT:
Eye scanning to identify literacy obstacles of pupils in school. The project was tested in 2016, where a first screening of 800 students were successfully performed.

HOW:
Digital technology scans eye movements when a pupil reads for about two minutes. The result is then examined using AI (artificial intelligence) which can identify pupils who are at risk for reading and writing difficulties with a certainty of 95 percent.

BENEFITS:
➜ All students can be screened in a simple and time-saving manner. Thus, teacher resources are freed up by switching the individual time-consuming screenings of selected students, to quickly carrying out the screening of whole classes.
➜ A possible perceived stigma is removed when the whole class is screened.
➜ The school can also monitor and evaluate various measures to increase reading and writing skills of all students.

How the smart city develops

There are several important principles to make Stockholm a smart and connected city. Their purpose is to facilitate the work to make the city smart and connected. A number of important themes are found among the principles, including:

Collaboration

The smart city is built in collaboration with residents, businesses, academia and the public sector. It is their needs, interests and opportunities that guide the development.

Common IT-solutions

Technology oriented principles say that the services and functions in the smart city build on common IT solutions allowing multiple suppliers to develop and operate them. This will, amongst other things, facilitate the exchange of information both within the City of Stockholm and with other stakeholders. Common IT solutions make it easier to scale up services to multiple locations. It also makes it easier to create new innovative solutions by facilitating further development and reducing the risk of services and functions having to be replaced if underlying IT solutions are replaced.

Open and shared data

Data from the City's administrations and companies should be made available as far as possible to facilitate use by both internal and external stakeholders. It can, for example, promote data-driven innovation.

Security and privacy

At the same time, it is important that all new solutions meet the security and privacy requirements of the city's policies and of applicable laws. Projects undertaken must clearly meet the City's needs and objectives. It is through the projects of the future that the smart city finally takes shape.

The Stockholmers make Stockholm a smarter city

The City's efforts to become a smart and connected city is constantly ongoing. New projects are being developed continuously. It is important that those who live in the city know about the smart services for the project to have the desired effect. There are several interfaces for dialogue:

→ The website **stockholm.se/smartcity** collects information about the smart city in general.

→ The blog **smartsthlm.stockholm.se** is continuously updated with news of the services being developed and with ongoing projects.

→ The Twitter account **@smartsthlm** quickly reports on new services, projects and ideas regarding the smart and connected city.

→ **Stockholmsrummet** in Kulturhuset is a physical place where visitors can experience the emerging city through 3D models, digital tours and a large physical model of the city.

As the City's key objective is to raise the quality of life for those living and staying in Stockholm, and to create a better climate for entrepreneurship, it is important that everyone in their daily life can make use of the services and solutions offered. Some of the smart city's solutions are used or consumed without being noticed a such, e.g. when the main bus is ushered through quickly by the traffic lights in morning traffic. Some solutions offer more obvious interaction and encourage that we seek out smart services ourselves, such as reporting issues through the "Make a suggestion" app.

Stockholm's efforts to become a smart and connected city also operates in a broader context. Many smart solutions are developed by other users, public and private. Again, each and everyone can explore the possibilities offered by digitalization, and how new technology can make life easier and better. We make Stockholm a smart and connected city together.

Stockholms stad

Stockholm – a smart and connected city
Stockholm should be a city for all. A society where accessibility, growth, innovation, low environmental impact, equality and accessibility are a given. For old and young, IT-savvy and those less familiar with IT. By using digitalization opportunities we will make life easier and better for all who live, work and stay in the city.