



# OSLO AS A SMART CITY

SMART CITIES &  
GOVERNMENTS

IE SCHOOL OF HUMAN  
SCIENCES AND  
TECHNOLOGY

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BLU

## Smart City Strategy

In 2019, Oslo started the year as the “European Green Capital”, awarded by the European Commission. When visiting, you can see electric or hydrogen busses driving by, hitch a ride with the tram run on electricity, park your car and pay with your phone, pay for public transportation on your phone, connect your travel route by city bikes and public transportation in the transportation planner app, check how your children are doing in kindergarten by a few clicks on your phone and much more. The city of Oslo is about digitalization, and what can be digitalized, will be digitalized. Oslo is committed to making the city as green and best for people as possible, with many projects at their hand. A few of them will be discussed when looking at different use cases about Oslo’s data strategy, smart people, smart mobility and smart environment.

*“The vision for Oslo is to make it a smarter, greener, more inclusive and creative city for all citizens – a city that innovates with the citizens’ interest and well-being at the core.”*

200.000 citizens of Oslo live with levels of harmful air pollution level, and the work of reducing this has already started. By 2030, Oslo has the goal of lowering the climate gas emission level by 95 %. By the same year, the city of Oslo plans to reduce the use of fossil fuel to zero, making the city of Oslo a much nicer place to live and breathe. To help with this process, all new buildings are much taller than previous buildings, most noticeable in the area of the Opera House by the fjord. Here it is less accessible with a car in general, leading on to a sustainable city for the future. Oslo is also removing parking spaces for cars in favor of new bike lanes, building more subway stops where the subways never went before. Oslo illustrates the future of the city by the story of Tim and the video can be viewed by [clicking this link](#). Tim’s story illustrates everything how you and I wish for the future of a city, where everything is efficient.

Oslo was granted 225.000 € by the European Commission for a project on sustainable transport solutions through procurement. How they are spending this money, although never specified in what amounts, will become clearer when reading about smart mobility.



Figure 1: Barcode in Oslo to the right, with new tall housing to the left and middle of the picture, with the new “Munch Museum” by the fjord and the opera house behind it.

## Open Data Strategy

A couple Google searches does not give you much information about how Oslo as a city view an open data strategy. Thankfully, there are many employees of Oslo municipally willing to devote their working hours to help master's students. Hilde Solli, an employee in the climate department of Oslo, said: "We do not currently have an extensive policy in the Oslo municipality for data sharing, but that being said, in the Parliament Report "Digital Agenda", in the "Digitization Strategy" and in our own city council declaration, it states that data should be shared, so we are very positive to this development."

To get where they are today, there has been a forum for open data enthusiasts in Norway, where over 500 members met bi-monthly for talks and presentations with different themes. This was initiated by Svein-Magnus Sørensen in 2009, and after reaching out to him on Instagram he said that the forum has been inactive for a couple of years now, where most of the members of the forum no longer saw the need to have this forum. The forum was based in Oslo, however, Oslo was not the only topic in mind, as they wanted a more open data strategy for the whole country of Norway.

On January 1<sup>st</sup>, 2020, Origo, a department for Oslo Municipally, was established to "realize the City Council's vision of a greener, warmer and more creative city with room for everyone". Their main task is the digitalization of the city, where they have an ongoing project working on defining principles for data sharing. This is currently on hold due to work with Covid-19. Although Origo is only a couple months old, this illuminates Oslo's commitment to the task of digitalizing and making the city a better place for its' citizens.

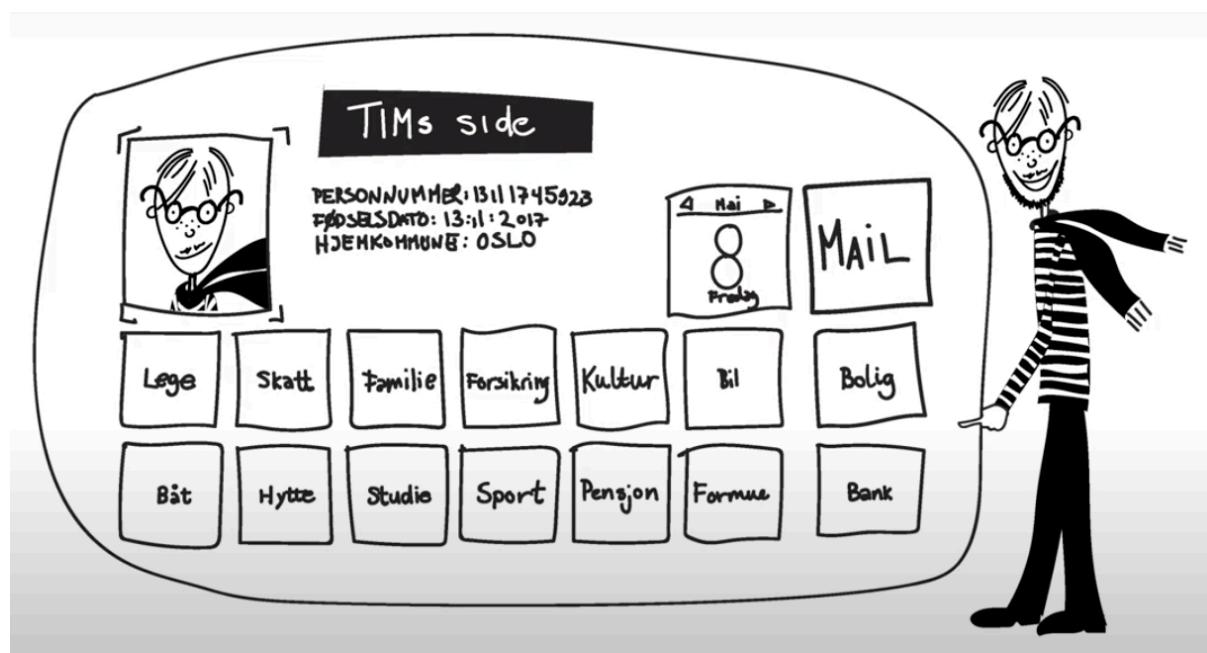


Figure 2: Tim's story from the video introduced about the mission for the city of Oslo. Here illustrating how Tim can view all the information that Oslo has about him in one page, without having to log in on multiple pages. If Tim wants to make his house bigger, he can now apply and get his application approved much faster because he is not the only one who has all this information in one place, it is the same for Oslo municipally.

## Smart People

For young kids aged 6 and below, they usually attend kindergarten. For parents, there is a lot they don't know what is going on for their kids, and as a parent you put an immense trust that your kids are well taken care of and are safe in the hands of the employees taking care of your child. For single- or divorced parents, this puts even more pressure on communication and trust between the parents and the kindergarten, and through an app both parents can be involved at the same time. The city of Oslo has a good solution to this, where they March 20<sup>th</sup>, 2018 launched an app for parents to interact with the public kindergartens.

The app, "Oslobarnehagen" which directly translates to "Oslo kindergarten", is an app where you as a parent can see photos of what your kids are up to, let the kindergarten know when your child will be staying at home, send messages to the kindergarten, see the schedule that your child has for the next days and weeks, get notified when there is a parent meeting, diaper-changes, what food the kids are served and more. This interactive app is a gamechanger for parents, as well as for the employees, as it makes communication much easier for both parties. If you have more than one child in kindergarten, this is an even more innovative helper, because you are able to choose which child you would like to get information about, no extra user or switches needed, which helps a lot for parents spending less time on having to follow up their child in kindergarten. After asking friends with kids about their user experience and what features this app has, I got feedback about several apps that Oslo is using for this purpose. Depending if your kindergarten is private or public, they have different apps, but all serving the same purpose. "Oslobarnehagen" is the default one for public kindergartens, where public kindergartens are using other apps such as "MyKid" and "Tyra".

I have talked with friends who have children in kindergarten in Oslo, and Rikke, whose daughter goes to a public kindergarten in Oslo, use "Oslobarnehagen". Rikke says: "The app saves me a lot of time since I can quickly let the kindergarten know if my daughter is sick, or if for example her grandparents are the one picking her up that day, as only legal guardians are allowed to pick children up unless notified otherwise. Since I don't live with the father, the app makes it much easier for us, because we have both our individual user and get all messages and information as PDF-files in the app. It is also a relief to digitally notify when my child will not come to the kindergarten, as opposed to having to bring a note to them personally". Karoline, whose daughter goes to a private kindergarten use "MyKid". Karoline says: "When my daughter first started attending kindergarten, it felt very safe that they posted photos of her. That way I could tell that she was doing good and was enjoying her time there. They logged when she arrived, when she was picked up and when she slept. We also use the app for communication with the kindergarten, where we let them know about vacation, days off and special considerations that need to be considered".



Figure 3: "Oslobarnehagen" app

## Smart Mobility

As noticeable from the strategy, Oslo is a city about digitalization, and smart mobility and environment is one of the key strategies for the city. Oslo has as long as I have lived in the city (2014-2019) used apps for public transportation, and their ticket app, “Ruter Billett” was actually introduced as early as 2012 by the public transportation company “Ruter”. Since then, as a citizen or visitor of Oslo, you have had the opportunity to purchase and hold on to tickets on your phone. You rarely see any young people with a refill card, but for elderly, visitors or others who does not want to use the app, or for some reason don’t own a smart phone, they can still purchase and refill these refill cards in all “Narvesen”-kiosks around the city. As Norway have regulations not allowing tracking individual people’s movement, there is no scanners or specific gates to enter a subway station. These were built by Ruter, but not allowed to be in use because of these regulations, as data could be collected on each person based on where they entered and left the stations. Now, you only have to hold on to a ticket on your app or carry a refill card that is valid, and you will not get a ticket from the many public transport attendants.

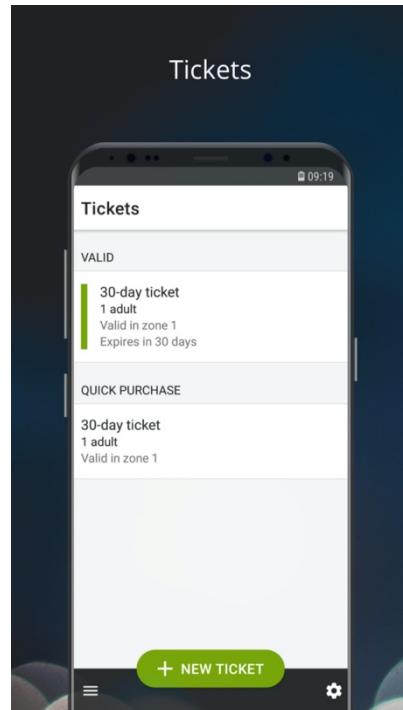


Figure 4: The "Ruter Billett" app showing you your purchased ticket

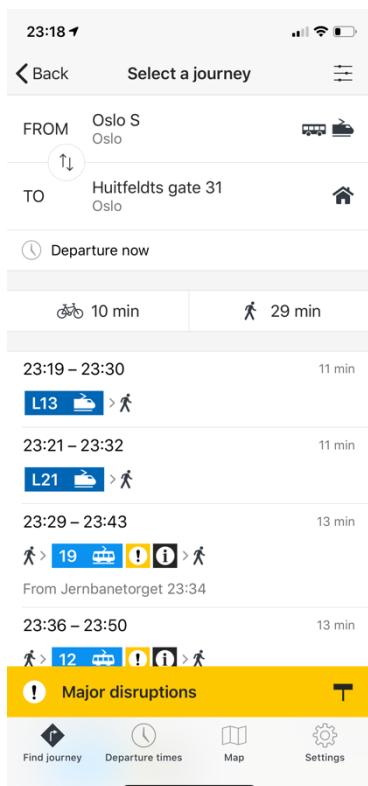
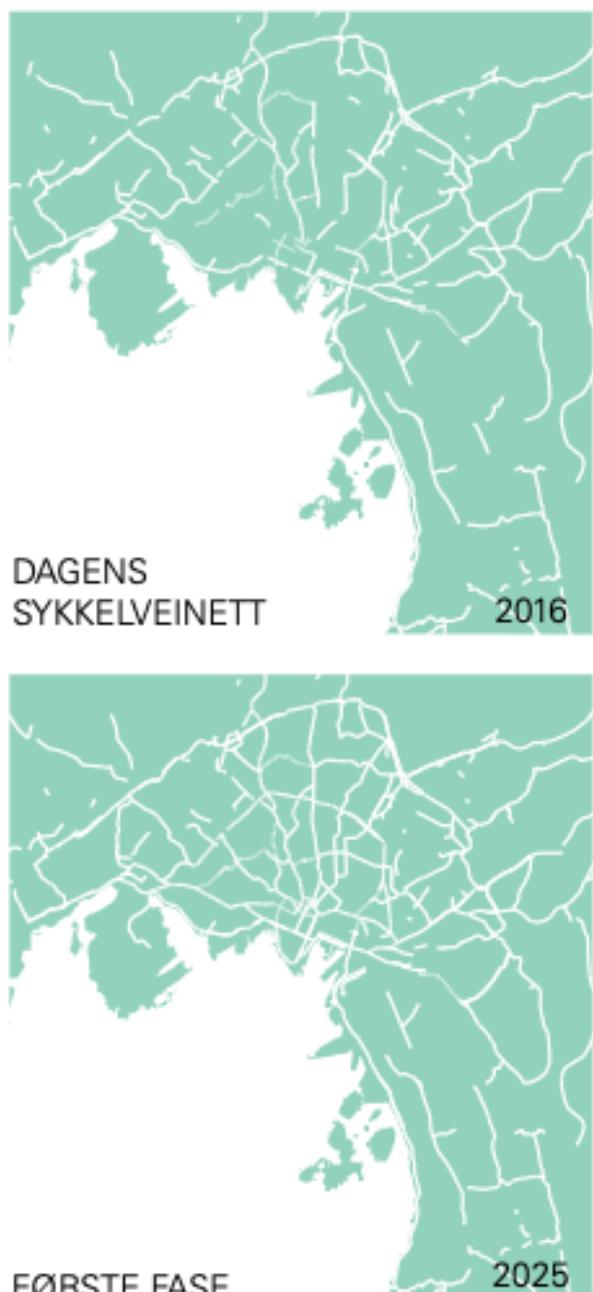


Figure 5: The "Ruter Reise" app showing you different travel options

When travelling around in Oslo, a must have is the Ruter-traveling app called “Ruter Reise”. The app will help you to get to your destination as fast as possible with the combination of tram, subway, train, airport-express train, bus, ferry, bike and walking. When you access the app, it will automatically show you your position based on your phone’s GPS. By entering details of where you want to go, the app will give you the fastest route options. “Ruter Reise” is able to use all of this information because of the collaboration between all 60 public transportation companies in Norway and the Norwegian Govenement, where they in 2016, under the Norwegian Ministry of Transport and Communications, created a hub for all public transportation. The app uses an API from “ENTUR”, directly translating to “one trip”, where the goal is to provide better offerings for the passengers, make sure that the government gains most for their investment of resources, and to stimulate new thought and innovation. The API is open for every developer to use for their services, not only letting passengers see routes and real-time departures cross providers, but also allowing passengers to buy one tickets across rail-operators, ensuring the public the minimum cost and most efficient travel option not only within Oslo, but also from Oslo to other major cities such as Bergen.

Oslo has much more to offer when it comes to getting around in the city, not limited to electric scooters, car sharing services and city bikes. Oslo is even trying out autonomous busses with sensors and video camera recording to improve the service, safety and speed of their bus in the long run. “Oslo Bysykkel” is the company that provides the citizens of Oslo with bicycles from spring to fall, also providing API for other services to include their bikes into their system. “Ruter Reise” has taken advantage of this, applying available city bikes into their map. Although the map is not illustrated in figure 4, clicking “Map” on the navigation panel on the bottom will show you all bicycle stations, as well as how many bicycles are stationed there at the moment you are looking for travel options. The map also shows bus, tram, subway, ferry and train stations nearby or selected location on the map, where you with a very few clicks can see real-time arrival times.



*Figure 6: bicycle-roads in 2016 and the goal of 2025 in phase one. Much is already built today in 2020, although not seen in the photo.*

“Oslo Bysykkel” also has their own app, constantly providing service to the population and visitors of Oslo. The year-round subscription for 2020 only costs 399 NOK, roughly equaling 37 €. They operate from 05:00 in the morning and 01:00 at night, leaving you the option to ride a bike for up to 60 minutes with no extra cost. In the recent two years, “Oslo Bysykkel” got new competition with electric scooters entering the market. There are several companies operating in Oslo, such as Tier Mobility, Voi, Flash, Zvipp and Ryde. All these companies provide the same service in Oslo, getting you fast to where you need to go for a small fee. I used this option many times to work when I missed my subway or was too tired to walk and wanted to get somewhere quickly, often leaving me with a cheaper means of transportation than taxi.

Oslo has in their 10-year plan taken responsibility upon Norway’s plan to have 8 % of all means of transportation by a bicycle. As the biggest city and capital of Norway, they have to take on a huge responsibility for these numbers. By 2025, Oslo plan to build 100 km of new bicycle-roads, with the focus of connecting already existing roads and build new ones in the city center of Oslo, removing many parking spots for cars. 70 km of these bicycle roads will be built by the city, and 30 km of these will be built by The Norwegian Public Roads Administration. Although not specified by date, Oslo plans to build 530 km of bicycle roads in the future, which depending on your driving route, equals a distance from Oslo to Bergen by car.

## Smart Environment

When talking about the environmental factors that defines Oslo as a smart city, we can of course talk about topics such as how Oslo re-uses and transforms collected garbage as fuel to run their busses, or how the citizens of Oslo use chips to unlock the garbage containers before dumping their garbage in them. We can also talk about how all citizens pay a tax on delivering garbage, utilizing all citizens with a unique QR-code to use for free delivery of trash to stations in the city, but these are not the most unique and important innovations Oslo has made. Oslo, as the first city in the world, has put pressure on vendors, resulting in the first ever zero-emission construction site (ZEMCONS) for building new houses. In Oslo, construction sites are the source of about 7 % of the greenhouse gasses emitted to the air, which helps considering construction is one of the most polluting industries in the world.

*“The City of Oslo aims to exploit its market power to ensure that all municipal projects are either fossil-free or zero-emission,” says Philip Mortensen of the City of Oslo’s Climate Agency.*

The Oslo City Government has a goal by 2025 to only have zero-emission construction sites, and by putting this pressure on vendors and rewarding companies who can offer zero-emission construction sites with contracts, they have a good chance to reach this goal. Philip Mortensen has said it has been hard to get the process started, with a market of electric excavators very immature. They have faced issues with how the membrane installed in the basement has to be heated with propane, but studies have been started and a solution will be on its way.

Recommended weighting	Criterion	Documentation requirements
50%	<b>Zero-emissions machinery</b> The Supplier is awarded points for the ratio of zero-emissions and/or biogas-based machines to be used when performing the contract.	List of machines and vehicles to be used on the contract
30%	<b>Transport of bulk materials</b> The Supplier is awarded points for the ratio of zero-emissions and/or biogas vehicles used to transport bulk materials to/from the building/construction site.	List of machines and vehicles to be used on the contract
20%	<b>Other transport and other measures</b> The Supplier is awarded points for their ability to reduce use of fossil vehicles for transport of materials, waste, equipment, personnel etc. at or to/from the building/construction site.  The Supplier shall describe other measures to be implemented in order to reduce local pollution and greenhouse gas emissions for execution of the contract.	The Supplier's description. The description shall have maximum 3,500 characters.

Table 1: Recommended focus on environmental factors for vendors bidding on city procurement contracts

Oslo is a part of the “Big Buyers Initiative”, which is a European Commission platform for promoting collaboration between big public buyers in implementing strategic procurement. The initiative has cities such as Helsinki, Amsterdam, Copenhagen, Trondheim, Oslo, Budapest, Brussels and Lisbon as members, all working for the same goal. Their first meeting

took place on May 2019<sup>1</sup> where they made plans of how to proceed to reach their mutual goals. They brought 90 buyers, suppliers and organizations to the meeting, to start the discussion of how to proceed.

Oslo wants fossil-free machines to run the whole process from start to finish within the fenced area, but what happens to the handling of garbage on construction sites? Waste management is weighted 20 % in table 1. Even though it is not noted as the most important, it is also a process that Oslo wants to improve. Oslo has had a trial project with construction on Oslo Central Station, where they were able to sort all garbage produced in the construction. The secret? Increasing knowledge, training and close follow-up.

Their goal of zero-emission sites is a wonderful initiative, and as Heidi Sørensen, Director of the Oslo Climate Agency states so well:

*“A scenario 5 years from now: Two people walking through the city center, one says to the other: “Can you imagine there was a time when it was allowed to use a diesel engine in the middle of a city?”.”*



Figure 7: The Opera House in Oslo with construction in the background

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<sup>1</sup> "Big Buyers Initiative". 2020. Eurocities.Eu.

<http://www.eurocities.eu/eurocities/projects/Big-Buyers-Initiative&tpl=home>.

## Final Remarks

Oslo has a lot going on, although they don't seem to brag too much about it if you do a quick Google search. Although their smart city strategy is never specified with numbers, statistics or clear measurable goals on their website, I think it is safe to say that Oslo is doing the right things to become a leading city in the field of building a smart city in Europe. From implementing technology in the kindergarten to trying out new means of transport and reducing greenhouse emissions, Oslo is setting new standards for other cities to follow. When writing this report, I found negative aspects of what to write about, and I thought that I found some really good negative aspects multiple times. However, every time I fact checked if my beliefs were correct, I was proven wrong. Nothing of what I have written about has negative implications. They are all improving the life of the citizens in Oslo.

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