



THE SMARTEST CITY IN WORLD:

How INRIX is helping Copenhagen realize its goal to become carbon neutral by 2025

The city of Copenhagen has embarked on one of the most ambitious carbon reduction strategies in the world with a stated goal of becoming the first carbon neutral capital by 2025. INRIX is proud to play an essential role in this pioneering project.

Since automobiles account for 22 percent of Copenhagen's carbon footprint, the city has prioritized low-carbon alternatives such as mass transit and biking over automobiles helping to support a "green wave" of commuters. A key part of the strategy is becoming a smart city that relies upon Intelligent Transportation Systems (ITS), linking together data from a variety of sources to create new types of mobility solutions and services. However, citizens of Copenhagen don't have to wait until 2025 to reap the rewards and benefits of this program. Thanks to numerous interventions, improvements and pilot projects conducted since 2009, Copenhagen has established one of the lowest congestion rates in Scandinavia. With an average commute time of just 38 minutes, Copenhagen drivers spend just 7.5 minutes in traffic per day, as verified by INRIX data.



Becoming the world leader in smart city solutions

Copenhagen recognizes that the battle to slow climate change will be won or lost in cities. In fact, cities are responsible for more than 70 percent of global CO₂ emissions and two-thirds of worldwide energy consumption.

Early plans for Copenhagen's smart mobility initiative included deploying a highly complex network of traffic monitors and sensors throughout the city to gather traffic data. But the concept was reconsidered because city planners determined that there were better sources for traffic data using new and emerging technologies with zero or low-cost service and maintenance costs. Enter Floating Car Data. Using hundreds of millions of real-time data points from over fifty different sources including connected vehicles, commercial vehicles, taxis and mobile devices – not just road sensors—INRIX provides the level of detail, breadth and data validity cities and transportation departments need to guide strategic solutions.

The ITS initiative is part of the Climate Plan CPH 2025. It is the plan for how Copenhagen will be CO₂ neutral by 2025. We're working with known as well as new and innovative solutions to support green mobility so Copenhagen can become the world's first CO₂ neutral city by 2025. We also need out-of-the-box thinking to support this vision.

Mads Gaml, Program Director for the City of Copenhagen

Seven areas of improvement



ECO Driving: To reduce stop-and-go traffic, which can lower emissions from automobiles, the city is improving traffic flow around half of the “Ring Road” by giving drivers a speed recommendation so they can catch the next green light.



Variable Message Signs (VMS): Digital signage informing bicyclists of estimated commute times and route options based on live traffic reports.



Traffic Signal Optimization: Optimizing traffic flow by coordinating traffic lights along corridors and intersections.



Intelligent Street Lights: Lighting management dims street lighting to 50% after 10 PM. When cars, bikes or pedestrians are present, street lighting switches back to full illumination.



Dynamic urban spaces: Reclaiming parking spaces along urban streets during low-use times for public use.



MobiMastro: A digital platform for network-wide traffic management coordination.



Sensor Network: Sensors to allow dynamic communication between transit, signals and other monitoring.

Of the seven areas described, INRIX traffic data contributes the most benefit in four areas: ECO Driving, VMS, Traffic Signal Optimization and MobiMastro. Working in partnership with Technoloution, the Dutch technology company that developed the MobiMastro platform, INRIX data is used to establish important benchmarks as well as evaluate the effectiveness of proposed models before, during and after implementation. Prior to being selected as the traffic data source of MobiMastro, INRIX was working with the Danish Road Directorate agency to provide real-time traffic information throughout the country of Denmark. With that said, Technoloution did their due diligence and put INRIX data to the test with Bluetooth readers throughout the city. They were impressed with the results.

Smart corridors and green waves

Part of the success has been Copenhagen's prioritizing of certain corridors for designated types of mobility. For instance, eight corridors support transit and automobiles into and out of the city with GPS-enabled public buses for better mobility. Other corridors are focused on supporting a “green wave” of bicyclists and pedestrians, which is a dramatic shift in focus. Most U.S. cities' mobility strategies focus only on improving traffic for automobiles and transit, and bicyclists are seldom a priority. That is not the case in Copenhagen where 36 percent of all commuting trips to work or school are made by bike.

The improvements for cyclists include traffic signals set to the speed of oncoming bikes, angled footrests that enable cyclists to rest without dismounting at intersections, and an additional 44 miles of cycle tracks. Moreover, concrete curbs are used to separate bike paths from roadways helping make cyclists safer. To entice suburban commuters to exchange cars for bikes, Copenhagen is partnering with nearby cities to add wider, smoother, better-lit bike paths. In 2012, an 11-mile link connecting Albertslund with Copenhagen opened and was dubbed the first “bike superhighway.” More than 26 such bike routes are either planned or are under construction and by 2025, the city expects that 75 percent of all city trips will be made by bike, on public transit or on foot.



Achieving service goals

Given that 2025 is only less than seven years away, how is Copenhagen doing with its service goals? While preliminary models are still under review and being tested, Copenhagen has developed simulations that are encouraging. While not actual results, these models show improved journey times in 85 percent of the 66 corridors they’ve targeted for improvement in 2018. **What are those service goals?**



BICYCLES

Reduce travel time and stops by 10 percent.



BUSES

Reduce travel time by 5 to 20 percent, depending upon route, and increase travel time reliability by 10 percent.



CARS

Reduce the number of stops and travel time reliability by 10 percent, avoid increasing travel times on most roads, and decrease travel time up 5 percent on select routes.



PEDESTRIANS

Give pedestrians enough time to get across the street safely improve access to shopping.

Data driving innovation

INRIX data delivers unexpected innovation for VMS signs. Originally built to give cyclists updates on traffic, weather and construction, INRIX also supplied travel estimates for both bikes and motorists on VMS signs along key corridors. “That was a surprise to us. Floating Car Data made it possible to show both,” said Mads Gaml. The side-by-side time comparison shows motorists that riding a bike is an acceptable alternative. Equally important is the fact that it reinforces the decision of bicyclists to commute to work on two wheels, especially when the time saved by driving might not be worth the hassle and expense of parking.

Another area where being a smart city is expected to pay off is during large events, such as the ones held at Parken Stadium, where up to 55,000 commuters can create congestion before and after football matches. To remedy this, the city will be able to modify traffic signals through MobiMastro to remain green longer, allowing commuters to exit the area quickly. “In our simulations, traffic jams around Parken Stadium could clear out in 15 minutes or so,” said Gaml.

On the consumer side, INRIX is helping Copenhagen commuters through its free smartphone apps. INRIX XD Traffic and INRIX ParkMe apps help drivers get to their destination faster and navigate to available on- and off-street parking. This enables consumers to save time, fuel and frustration along the way, as well as improve service goals as commuters become savvy to the many benefits these mobility applications offer.

For more information reach out to INRIX at busdev@inrix.com



“Copenhagen is clearly doing something right when it comes to traffic management. As more cities around the world look to become smarter, Copenhagen is a best practice example. Data from pedestrians, cars, public transport and bicycles is integrated with weather forecasts, construction work and public transport schedules to give a clearer picture of congestion. Copenhagen’s vision is to give cyclists, public buses filled with passengers, and people leaving football games and concerts longer green lights. These solutions are all aimed at improving congestion and reducing noise in residential areas, making Copenhagen a true pioneer in data-driven traffic innovation.”

Greg Hallsworth, Lead Data Analyst at INRIX