

Evaluation report

Pilot Rope light

City of Aarhus

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Short description

This ITS intervention concerns the installation of a LED rope light on a big cycle superhighway (CSH) in Aarhus. The CSH goes through a green area with forest connecting a big residential area with the presence of a hospital and a big business park. The cycle path is mostly used for commuting to and from work and due to regulations on nature area, the city of Aarhus is not allowed to put up continuous lighting on the CSH. The rope light installation winds 400 meters along the cycle path and is adapted to the season. The cycle path will light up in the dark by means of sensors measuring light quality. The sensors also measure temperature the rope turns blue in frosty weather, red in autumn, green in spring as can be seen on the photos below.

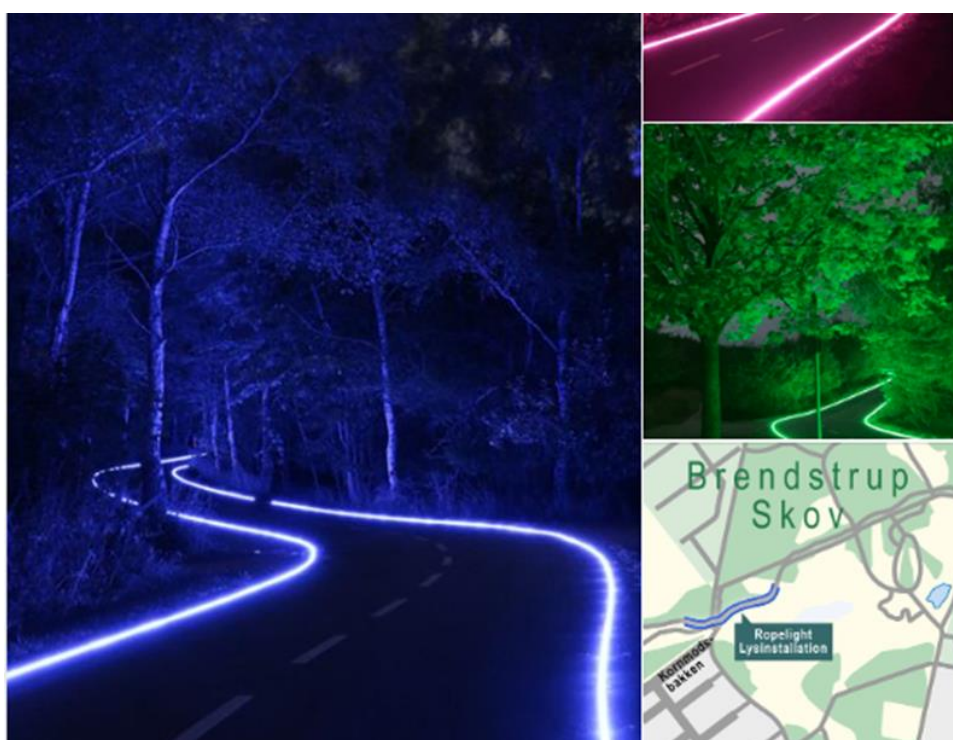


FIGURE 1: PHOTOS ON THE INTERVENTION BY ROPE LIGHT CHANGING ACCORDING TO TEMPERATURE



FIGURE 2: MAP SHOWING FORESTED LOCATION OF THE ROPE LIGHT INTERVENTION

Type of ITS

Rope light, sensors reacting on light and temperature

Timeline

The rope light was installed and up running on the 7th of September 2022. In terms of obstacles, the project has been delayed due to the pandemic, where the supplier couldn't get the material for the rope light. Therefore we didn't have the time to test it, with sensors and all its possibilities. Between the 15th and 31st of October 2022 an evaluation survey has been administered among the users of the CSH. Afterwards a Facebook page has been created to collect reactions on the experience concerning the rope light accompanying the cyclists for 400 meters of the CSH. In December 2022 a recommendation workshop collected some lessons learned by stakeholders of the pilot.

Hypothesis

This ITS intervention is a pilot project and provides both a different experience and more safety on the bike ride. The hypothesis is that the intervention will contribute to the comfort of cycling as well as to the safety feeling on the cycle path. We recollect: the overall BITS-survey showed a connection between safety and comfort on the one hand and the motivation to use a bike on the other. As such, a higher user satisfaction due to this intervention can possibly add to this equation and thereby support an increase of cyclists and ultimately a decrease of CO² emission (the final BITS objectives).

Data sources

- Evaluation interviews with users within the Cycle Superhighway (CSH) project (period of 15th to 31st of October 2020)
- User satisfaction opinions collected via Facebook after installation
- Report of a meeting with project managers about the evaluation of the pilot

Analysis

Survey among user of the cycle superhighway before installing the rope light

After the installation of the cycle path – the cycle superhighway (CSH) - in Aarhus, about 40 cyclists were interviewed during the period of 15th to 31st of October 2020 about their satisfaction with the CSH. This survey showed that a large majority of the users of the CSH are commuters: 83% of the respondents use the CSH to commute to and from work and 78% indicated to use the CSH on weekdays only. These interviews generated some ideas on what could be improved to make the cycle path more user friendly. The interview explicitly asked about the feeling of safety. A large majority felt safe when using the CSH. Only 30% does not feel safe. Darkness and lack of light was mentioned as the most common reason for not feeling safe. Similarly, several respondents referred to the importance of light as the one thing that could encourage them to use the CSH more frequently and a large majority of the respondents said that light would make the CSH better. The results of the survey showed thus the importance of light for increasing feelings of safety and comfort and thereby formulated the idea that would lead to the LED rope light pilot.

Facebook reactions on the rope light pilot

To evaluate the impact of the intervention a post-measurement could have been done. However, the project managers lacked time to work in a systematic and scientific manner. Therefore, a Facebook page has been created that collected multiple reactions of users of the CHS once the rope light has been installed. We present a selection of these comments. We highlight in yellow the central ideas. Since the Facebook page was open to the public, we mention the names of the commentators.

“I use the path every day and am really glad there is finally light! Now that you are not allowed to put up real lights in the forest, this is **a really good solution** 👍” Julie Sofie Larsen

“Well Magasin does not make Christmas lights because we need to save electricity so although it looks very nice, I think if security is the goal, they could have made **a more electricity friendly solution**.” Simon Nørgaard

“Simon Nørgaard agree. Reflective thermoplastic is somewhat cheaper. **It doesn't create security** when you can't see your surroundings. The light source is mounted at ground level and shines upwards. therefore, it will appear dazzling. I think you should stick to calling it design lighting. Højbjerg Ebbe Pedersen

“What are you hoping to achieve with the installation and who is behind it? Is it traffic and roads, or lights on the Aarhus? To me it doesn't make sense in the context of lighting technology and road safety, but as a lighting design it lives its own life, I guess. you might have to be a bit precise with the wording about **what the goal of the installation is**”. Højbjerg Ebbe Pedersen

"Aha have been cycling and wondering what was going on. But apropos the bike path, are there any plans to connect it with the broadside? Coming from Brabrand and going to Skejby there is not really any sensible way to get on the super bike path?"
Kristian Møller Overgaard

"Wow! **How many tax dollars did the 400 meters cost?** We who cycle in Aarhus thank you for the reply. But speaking of road safety, I would like to see new bike lanes in the catchment area, rather than "fancy" lights on already existing bike lanes. Now the cycle path between Solbjerg and Tranbjerg is jammed again. **It is a strange priority in my opinion.** If you were unsafe as a cyclist on the 400 meters, **you have a problem that could be solved with, for example, a headlight.** It works on the small roads in the outskirts of Aarhus, where there are no lights but poor asphalt. Also, good weekend to you!" We Who Cycle in Aarhus.

"**Love it. Cool idea**". Martin Faber

"**Anything that improves conditions for cyclists is welcome.** Let's then get on with bike lanes along Rosenvangs Allés part from Oddervej and in Bruunsgade etc etc, updated bike parking at the train station and not least repair of current bike lanes that in many places are dented by road trees' roots ". Claus Pedersen

"Undoubtedly, I look favorably on the idea although I would have **preferred ordinary street lighting** (read from above). But does this mean that the path will be swept in **autumn when leaves settle on the light** (There are still many leaves from last autumn and it gets greasy quickly in wet road)? Jannik Schøler

Reading the comments of the Facebook page shows immediately the disadvantage of not questioning the pilot in a more scientific and systematic way. The people leaving a comment, as "We Who Cycle in Aarhus" seem not the average commuter but rather activists. It's interesting to read their comments, but it does not represent the appreciation of the common users of the CSH. Apart from positive feedback on the fact the lights are pleasant, beautiful and increasing feelings of safety we read at least three important critiques. A first concerns the priority this pilot has. Here the activist-commentators look with a helicopter view. Given other issues of road safety and comfort in Aarhus, installing a rope light at an existing CSH is not top priority according to the commentators. A second critique is connected to this and refers to the cost of this intervention. Is it worthwhile for spending so much money? Aren't there other more important interventions to be done? These are important cycling policy questions. Third critique questions the impact on safety. The light of the rope light is diffuse and does not shine on the surrounding. The rope light in the comments on Facebook is appreciated more for its design and less for its support to feelings of safety. Moreover, some comments question whether the intervention is durable and if a less electricity consuming option would not have been better.

Experiences project managers

The rope light pilot has been discussed at the recommendation workshop in Aarhus in December 2022. The project partners and stakeholders agree with the Facebook comments concerning the cost of the rope light. "A rope light project can fail due to the price tag", they argue. At this moment they would not recommend the rope light to others, because they simply do not have accumulated enough experience and knowledge concerning the system, its capabilities, and its limitations. They neither know how the system will respond to the Danish weather, with cold freezing winters and hot summers. They hope that they will be able to build more evidence on the impact of the pilot so that they can recommend it to others. However, they already see in this phase the potential of the pilot, and its use in other places and for other purposes. Firstly, the rope light is a way to bring light to a bicycle path, where normal lights cannot be used, as it is with this project, where the path goes through a forest area. The rope light shows the turns and course of the cycle path and does not hinder the ecosystem and animals living in the forest. Secondly, they argue the broader use of a rope light intervention. The rope light can be used in other ways for example with 90 degree turns, as a way of signalling on coming cyclists. It can also be used at intersections or crossings with a bad overview, and it can moreover be connected to traffic lights. LED lights could be used to make it more visible that cyclists have a green light. This would put an extra support for vulnerable traffic user and alert car drivers to be attentive".

Conclusions

The rope light has been installed to bring light to the CSH located in a forested area. It adds to feelings of safety without disturbing the ecosystem and the animals living in the forest. The intervention is costly and brings an artistic dimension to the cycling experience. The aesthetic of the intervention is highly appreciated. However, there are some downsides to the intervention. Does it do what it is supposed to do? Does a rope light have the highest priority regarding the overall cycling policy in Aarhus? To end with, it is still a successful experiment because experimenting with the rope light showed the utility of introducing LED lights in many other situations, mainly to make traffic intersections safer. Because of its safety supporting qualities, it can be argued to have the potential to encourage an increase of cycling and a decrease of CO2 (cfr. BITS-survey).

Lesson learned

An important lesson learned here is the importance of a helicopter view and deciding on the priority of the intervention regarding the overall needs within a particular area. This does not mean that costly experiments cannot happen. However, it is an important element for integrating in the communication concerning the pilot. In the case of the rope light pilot, the argument that the technique could later be used and upscaled in other situations can justify the costly investment. Another lesson learned has to do with the art as part of cycling design. This is underscored in many pilots but could be beneficial for encouraging people to use their bikes more often. It brings an extra fun aspect to the cycling experience.