Green Light Optimal Speed Advisory for Cyclists (GLOSAC)

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INTRODUCTION

Copenhagen is one of the most cycle friendly cities in the world. The city use a lot of resources to build and change physical infrastructure to favour cyclists in the traffic. The main goal here is to get even more people to choose the bike over cars, trains and buses. Reasons for doing that include reduced environmental impact and improved public health.
This project reverse the solution space and focus on what the cyclist can change instead of changing expensive road hardware. By informing the cyclist about the phases of the upcoming traffic lights so advise can be given about optimal speed to catch the next green light, the project aims to reduce travel time and/or effort and improve the biking experience in any city around the globe.

THEORY

Traffic lights can roughly be categorized in two groups

1. light is controlled by predefined programs and the current program is selected according to the day of week and time of day
2. light is traffic actuated so it is able to extend and alter the duration of phases as a result of input from sensors detecting queues, incoming buses, pedestrians, et cetera.

This project focus mainly on getting optimal speed recommendations on the first category of lights. This has never been done before, as these light are not controlled centrally and communication about phases and durations can not be done without major investments.
The next generation of second category lights will soon see APIs and the Municipality of Copenhagen is starting up a pilot project to investigate the potential with these light, but as the majority of lights is from the first category, these has to be connected to the GLOSAC system as well.

METHOD

The main component in realising the GLOSAC system is the cyclist's mobile phones. The mobile phone acts as both sensors and as consumers to finally show the user the optimal speed informations. First iteration of the system take advantage of time tables handed out by the Municipality of Copenhagen. The second iteration investigate how well the system could scale to other cities only by letting users act as sensor and not relay on traffic light information from authorities. The task here is to auto detect traffic lights from movement pattern recognition on cyclists, learn the changing phases and synchronise these phases each day.

IMPACT

Preliminary field-tests show reduced travel speed on a training course. User studies show that cyclists have a perception of getting better through the traffic, thus enjoying their ride more. These effects of the GLOSAC system should hopefully make the old-fashioned bike a little smarter and contribute to the movement from motor vehicles towards pedal powered means of transport in any city - to the benefit of the environment and public health!