

VIIMSI (EST)

A SMART PEDESTRIAN CROSSWALK (SPC) USE CASE STUDY

Location: Estonia, Harju County, Viimsi Parish, Lubja-Pärtlepõllu intersection

Contact person (client): Imre Saar, senior transport specialist of Viimsi Parish Government

Road conditions: 1 + 1 public tarmac road without a safety island, mixed traffic

Number of SPC installed: 1

Time from idea to implementation: 26.08.2020 - 29.10.2020 - 8 weeks (now half less)

Customer wishes: improvement of pedestrian safety, differentiation of trucks, traffic statistics

INTRODUCTION

The Lubja - Pärtlepõllu intersection underwent reconstruction in the autumn in connection with the construction of a nursing home and a new road. At the end of October, the domestic company Bercman's Smart Crosswalk (SPC) was installed at the intersection, and now the road crossing between the kindergarten and the new nursing home is much safer.¹

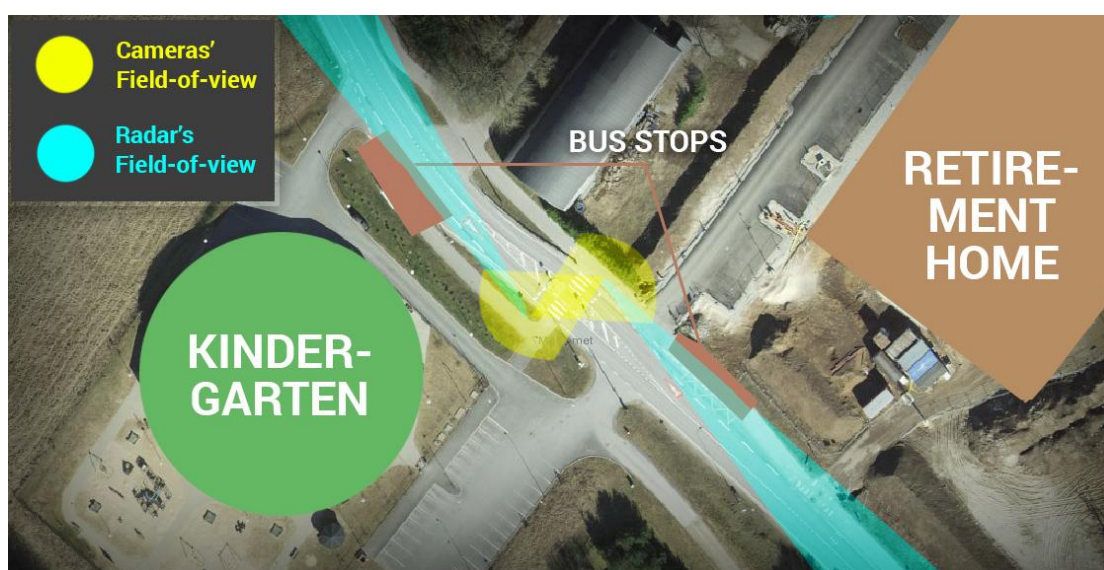
The new technological solution is not only a means of alerting road users by means of flashing lights and speakers, but also an intelligent traffic management system that measures and transmits traffic data.



The Smart Pedestrian Crosswalk (SPC) installed at Viimsi.

LOCATION

The SPC is located in a place with an increased traffic risk - between the elderly retirement home and the kindergarten. According to the General Statistics of the Estonian Road Administration, 26% of pedestrian accidents involving minors and 24% of people over the age of 65 occurred in 2019.² These statistics confirm that this pedestrian crossing and its location are of great importance and need to be made safer by modern intelligent transport systems.

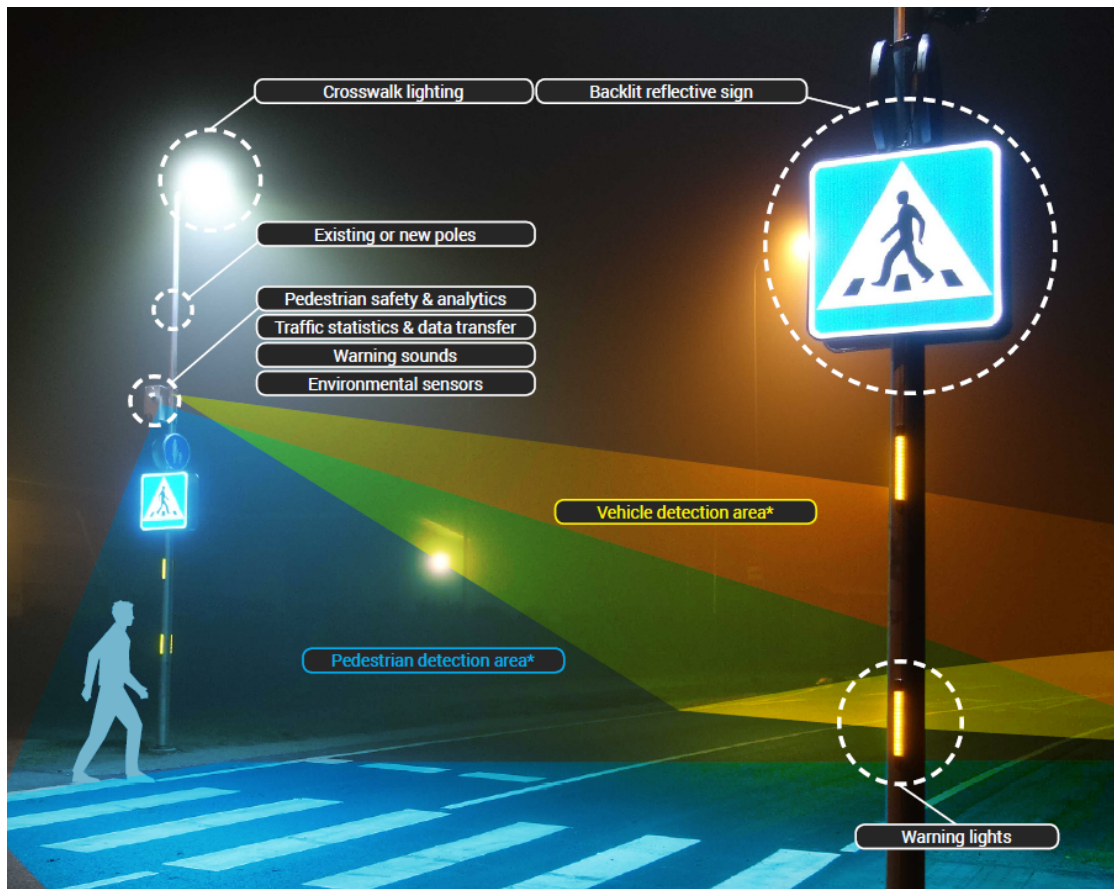


Viimsi pedestrian crossing map with strategically important objects and identification areas.³

WORKING PRINCIPLE

SPC uses high-definition cameras aimed across the Lubja Road to detect pedestrians and vehicles on the pedestrian crossings. To detect vehicles approaching the crossing, SPC uses modern radars that can cope with both the slight curvature of the north-west road and the small (up to 5%) rise of the south-east road. When the SPC detects a vehicle approaching from afar, the backlit pedestrian crossing signs become brighter, drawing drivers' attention to the crosswalk early on, even in the worst weather conditions. This is especially true in situations where pedestrian crossing signs using a standard reflective sticker are often overlooked (including with fog, during twilight, rain, or even after a bend or road drop).

When the SPC system detects a pedestrian approaching the pedestrian crossing, the warning lights on the post will start flashing. They draw the attention of drivers to people crossing the road at the drivers' eye level. This lighting method ensures that the driver's attention is directed to the right place, there is a longer response time for the drivers and the pedestrian crosswalk is safer for all parties.



SPC components, pedestrian detection area and detection area for cars coming from further afield.



View from the SPC system cameras: lanes of pedestrians marked in purple and vehicles in green.

ORDERING AND INSTALLATION PROCESS

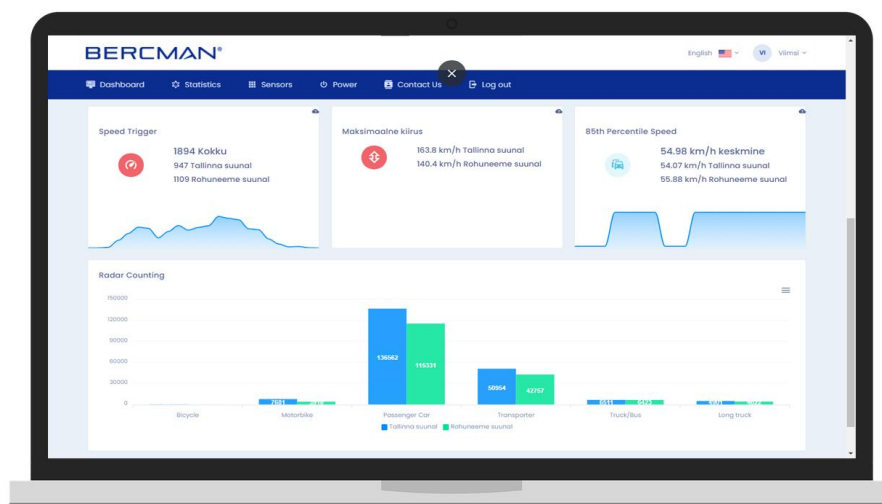
The Viimsi pilot SPC was installed 2 months after confirming the requirements. The complete renovation of the pedestrian crossing also took place during this time consisting of installation of new posts, lighting fixtures and communication cables, asphaltting and road markings.

After a half-day SPC installation process and a few hours of calibration, the device was immediately operational and able to collect and transmit statistics. As the Viimsi SPC was the first pair of devices of the latest SPC generation, the process took longer than usual. Currently the time from ordering the SPC to installation is about a month.



Berman installation team setting up Viimsi system on October 29, 2020

DATA



The Berman Management Console (BMC)

SPC collects anonymous information on the number and direction of pedestrians and the number, type, directions of travel, as well as driving speeds of vehicles. In this way, it is

possible for the rural municipality government to receive detailed traffic information regarding Lubja Road.

The system also collects data on environmental indicators to provide the best overview of local weather conditions (measurement of air and road temperature and air pollution). SPC solution is especially useful right now, when there is a lot of dark and rainy time and pedestrians can easily go unnoticed on pedestrian crossings.

SUMMARY AND FUTURE PLANS

After the installation of SPC and the adjustment of the street lighting, the visibility of pedestrians and the pedestrian crossing improved significantly. The customer also began to receive information on the number of people and vehicles crossing the pedestrian crossing per day, which helps to regulate the flow of traffic.



The Viimsi rural municipality government intends to use the information received from the Bercman Management Console (BMC) to assess:

- the daily traffic density of vehicles (incl. on holidays);
- differences in the traffic density of both ways;
- average vehicle speeds and speeding violations;
- the frequency of use of the general crossing;
- the daily number of vehicles and thus the noise level on the local road;
- etc

In the future, the Bercman team plans to add more tools to the BMC, which will allow customers to easily analyze data and make important conclusions and practical traffic management decisions. The API of the BMC, i.e. the interface connecting different softwares, is also being updated on an ongoing basis. With the help of BMC's API it is possible to transfer SPC data to the customer's existing management system if desired.

Viimsi and other latest SPC systems already have a built-in speaker. This allows us to add a voice warning message to all the devices in 2021. It will be activated if there is a pedestrian on the pedestrian crossing and the speeds of oncoming vehicles are not reduced. Through such activities, it is possible to prevent traffic accidents on pedestrian crossings even more.

Viimsi Parish will continue to test and pilot SPC solutions: next year the Aiandi tee and Pargi tee crossing will be rebuilt and fitted with a SPC solution together with Bercman.

Bercman offers all municipalities the opportunity to smarten their local pedestrian crossings. For more information and consultation, contact info@bercman.com or 5340 2902 (Mart Suurkask, company founder and CEO).

REFERENCES

1. Alar Mik, Viimsi Teataja, "A smart pedestrian crossing was installed on Lime Road" <https://viimsiteataja.ee/uudised/lubja-teele-paigaldati-nutikas-uлекаigurada/> (05.11.20)
2. Road Administration, role of traffic accident statistician in 2019, <https://www.mnt.ee/en/ametist/liiklusaasta-2019/osalejad-rolliti-2019> (v: 15.12.20)
3. Map of Delfi Estonia, <https://kaart.delfi.ee/> (viewed: 15.12.20)
4. Viimsi Teataja, "The noisiest areas of Viimsi will be mapped for the summer" <https://viimsiteataja.ee/uudised/viimsi-murarikkamad-piirkonnad-kantakse-suveks-kaardile/> (v: 15.12.20)