

## Summary

# Evaluation of cycle lanes in Oslo

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*Cycle lanes are implemented in attempts to improve the traffic flow, safety and security of cyclists. In this project, cycle lanes on the following busy streets of Oslo are examined in terms of behaviors and perceptions among cyclists: Maridalsveien, Kierschows gate, Sognsveien and Østensjøveien. Video records show that the cycle lanes are used mostly as intended. At least eight out of ten cyclists using the study streets make use of the cycle lanes, and cycle in the intended direction. Almost all cyclists cycling against the flow of traffic cycle on the pavements. Across the four streets examined, between 5 and 15% of cyclists cycle on the pavement.*

*Cycling speed is found to vary between streets. It is highest in Østensjøveien, which has a highest percentage of "transport cyclists". Overtaking manoeuvres between cyclists occur within the cycle lane to a greater extent in Maridalsveien, which has an extra-wide cycle lane. Few near-misses or other incidents happen, but those that do occur are most often caused by blockages in the cycle lane (e.g. cars conducting parking manoeuvres) that force the cyclists out in the driving lane.*

*A field survey suggests that cyclists using the study streets are most satisfied with the cycle lane in Maridalsveien, which is at least two meters wide with red asphalt. Multivariate analyses reveal that heavy traffic contribute to cyclists' perception of insufficient cycle lane width. Both width and red asphalt make a statistically significant contribution to cyclists' feeling of safety.*

## Do wider bicycle lanes improve traffic flow, safety and security?

Cycle lanes are implemented in attempts to improve the traffic flow, safety and security of cyclists. Cycle lanes are defined as follows in the Norwegian Public Road Authority's (NPR) "Bicycle Handbook": *A lane in a carriageway intended for cyclists and marked by official traffic signs and road markings.* According to the Norwegian handbook, cycle lanes should have a minimum width of 1.25 m. In busy streets (ADT over 8000) the minimum width should be 1.55 m. Cycle lanes generally function well both with respect to traffic flow and safety, but since cyclists are not separated physically from car traffic, some riders experience cycle lanes as unsafe.

There is reason to believe that wider bike lanes may make cyclists both feel safer and allow them to remain in the cycle lane when overtaking other cyclists. The purpose of this project was to investigate whether such effects are found for wider bicycle lanes, in different street sections in Oslo.

## Video recordings in four streets - interviews in five streets

Four cycle lane sections in Oslo were selected for analysis. Selection criteria were that the chosen stretches should have relatively large bicycle traffic (at least 100 cyclists passing during the busiest hour), and be located alongside heavy road traffic containing a relatively large proportion of heavy vehicles. In addition, the sections were chosen to enable comparison of cycle lane widths.

The following four road sections were selected:

- Maridalsveien (by Scandic Vulkan hotel)
- Kierschows gate
- Sognsveien (between Ullevål Stadion and John Collets plass)
- Østensjøveien (between Hakon Tveters vei and Harry Fetts vei)

Of these Maridalsveien had new and wide bicycle lanes (2.0-2.3 m), while the others had ordinary bicycle lane widths (1.50 – 1.55 m). Another marked difference was that Maridalsveien and Sognsveien had bicycle lanes with red asphalt, while the other two did not.

Video recordings were completed in June 2016. As a basis for analysis we have used records from a random weekday. In Maridalsveien and Kierschows gate, we have used records from Wednesday, 22 June; Sognsveien Tuesday 21 June and in Østensjøveien Tuesday 28 June. In each cases all traffic was recorded from 06:00 h in the morning until 21:00 h at night.

Cyclists using the sections were also contacted at natural stopping points and asked to participate in a field survey. In addition to the four mentioned routes where we made video recordings, we also asked cyclists in Geitmyrsveien to participate in the survey. We chose to interview cyclists also here because the cycle lane in Geitmyrsveien is particularly narrow (1.25 m).

## **Bicycle lanes are used as intended**

In all the streets there were significant increases in bicycle traffic during rush hour. Everywhere there was relatively heavy traffic towards the city center in the morning (especially 8:00 to 8:30 a.m.) and heavy traffic from the city center in the afternoon (especially 4:00 p.m. to 4:30 p.m.). Morning traffic was denser than afternoon traffic. Busy rush hour traffic was particularly evident in Østensjøveien.

At least eight out of ten cyclists using the study streets make use of the cycle lanes, and cycle in the intended direction. Almost all cyclists cycling against the flow of traffic cycle on the pavements. Across the four streets examined, between 5 and 15% of cyclists cycle on the pavement.

The proportion who rode on the pavement was least in Østensjøveien and greatest in Sognsveien. The speed of the cyclists were also highest in Østensjøveien, where there was also a greater percentage of off-road, hybrid and racing bikes. Both traffic distribution over time, speed, pavement cycling and composition of bicycle types suggest that more of the cyclists in Østensjøveien are «transport cyclists» to a greater extent than in the other streets.

Overtaking manoeuvres between cyclists occur within the cycle lane to a greater extent in Maridalsveien, which has an extra-wide cycle lane. In Sognsveien and Kierschows gate this happens less often and in Østensjøveien this almost never occurs. Both the narrower cycle lane and the greater cycling speeds may account for this: cyclists who cycle faster need larger safety margins.

## **Blockages in the cycle lanes lead to potentially hazardous events**

We registered incidents and conflicts between road users (i.e. situations that are potentially dangerous) on three of the four sections. A common feature is that these situations occur when a cyclist comes out in the driving lane.

In general there seem to be two types of situation that cause the cyclist to enter the driving lane - either the cycle lane is blocked by vehicles, construction machinery etc., or a cyclist uses the driving lane to overtake another bicyclist. In Østensjøveien we registered a number of such incidents, and there is reason to believe that some, but not all, have had to do with construction work at the far end of the stretch captured by the camera. We know that such work was taking place, occasionally blocking the cycle lane, but it is difficult to see on the camera image.

We also registered some incidents and conflicts in Maridalsveien, but here the pattern is less clear. Maridalsveien by Vulkan has a much more varied traffic pattern than the other routes. Here there is heavy traffic with many cyclists, of various types, and many pedestrians, vans that stop etc. There is every reason to expect more incidents in such a traffic environment, but if we compare the proportion of critical events in relation to the number of cyclists, fewer events occur in Maridalsveien than Østensjøveien.

## **Cyclists feel safer with wide bicycle lanes and red asphalt**

Cyclists were interviewed in the field, and were asked how well the road system was designed for cycling in Oslo and how well it was on the section in question. They were also asked what they thought about the width of the cycle lane, and whether they felt safe when they rode on that stretch.

The results show quite clearly that cyclists prefer cycle lanes that are wider than standard. All respondents felt that the cycle lane in Maridalsveien is suitably wide. Among the cyclists in Geitmyrsveien half said the cycle lane there is too narrow. Similarly, more cyclists in Maridalsveien and Sognsveien say that the sections are well designed for cycling, than on the other sections. Both these routes have red asphalt and Maridalsveien has also much wider cycle lanes.

Multivariate analyses reveal that heavy traffic contribute to cyclists' perception of insufficient cycle lane width. Both width and red asphalt make a statistically significant contribution to cyclists' feeling of safety.

In many streets in Oslo, such as Østensjøveien, the transport authorities in Oslo now implement wider cycle lanes with red asphalt. Given the results from this study, this seems like a very sensible measure.