Institute of Transport Economics
Norwegian Centre for Transport Research

ENGLISH Summary

Buffered Bicycle lane

Evaluation of pilot study in Oslo

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- The measure *buffered bike* lane consists of a regular bike lane with a 90 cm painted buffer between the bicycle and driving lane, and is part of the Norwegian Public Roads Administration's bicycle pilots
- After the introduction at Dyvekes vei, the driving lanes became wider; despite this, compliance with speed limits increased among both cars and buses
- The average distance between vehicles and cyclists increased after the measure was introduced
- Cyclists found the street to be safer and more comfortable after the measure, even if there was a ceiling effect in the before situation – the street was already quite safe and comfortable
- Bus drivers experienced fewer conflicts and obstacles from cyclists

Introduction

The project's background is a pilot project initiated by the Norwegian Public Roads Administration, conducted in 2022. Over a section of approximately 400 meters in Dyvekes vei, a bike lane with a buffer was established to promote safer and more comfortable conditions for cyclists. The measure consisted of increasing the bike lanes from about 1.3 meters in width to 2.25 meters. Additionally, a 90 cm wide buffer was painted against the driving lane. This was achieved by removing the bus lane. A key aspect of this initiative was to create a physical, but not completely separated, barrier between the bike and driving lanes, distinguishing this solution from traditional bike lanes. The goal was to evaluate the effect of the measure on traffic patterns, safety, and user satisfaction among all traffic groups, including cyclists, pedestrians, public transport, and car traffic.

Method, Approach and Analysis

The methodology behind the study was comprehensive and involved several different approaches. The literature search was primarily conducted via Google Scholar, focusing on studies comparing protected bike lanes with conventional bike lanes, and their impact on various aspects of traffic behavior and safety. A significant part of this search was to identify relevant studies that could provide insights into how such measures affect accidents, cyclists' and motorists' experiences, as well as traffic patterns in similar urban areas. We conducted video observations to evaluate changes in traffic patterns and behavior after implementing the

bike lane with buffer. The focus was on traffic volumes, speed characteristics, lateral distances of different categories of road users, and the use of infrastructure. We conducted interviews with cyclists, pedestrians, and bus drivers. We recruited participants by boarding buses and at the street's endpoints for cyclists and pedestrians, as well as along the stretch itself. We analyzed the responses to understand the degree of safety, conflicts, satisfaction, and route choice among the various traffic groups.

Literature Study

Protected bike lanes vary significantly in both design and implementation. This includes differences in the width of the bike lane and the design of the buffer. For example, some bike lanes have colored asphalt while others do not. The buffer may be painted, as in the project in Dyvekes vei, or consist of physical measures such as bollards or flower pots. These differences in design play a significant role in how bike lanes are perceived and used by cyclists and other road users. Results from empirical studies vary regarding how protected bike lanes affect the risk of bicycle accidents. Some studies found an increased risk compared to conventional bike lanes, while others showed a reduction in accident risk. This underscores that the effects of bike lanes with buffers can depend on many factors, including road type, traffic volume, and specific design. Just like other measures to protect cyclists, protected bike lanes increase the risk compared to conventional bike lanes at intersections, while the risk is reduced on sections.

Survey among Cyclists and Pedestrians

Surveys with cyclists and pedestrians provided a deeper understanding of how the changes on Dyvekes vei were perceived by those who actually used the street. In general, cyclists perceived cycling in Dyvekes vei as safer and more comfortable after the measure was implemented. Given the significant change, almost a doubling of the available area for cyclists, it is a pertinent question whether the perceived improvement should have been even greater. However the street was initially perceived as relatively safe, so there was little room for improvements. Had the measure been carried out on a more "unsafe" street, the effects would likely have been even clearer. Pedestrians also experienced an improvement, as the wide bike lane created greater distance to vehicles and reduced their speed.

Survey among Bus Drivers

Bus drivers, who play a critical role in urban transport, also participated in a survey so we could better understand how the changes affected their interaction with other road users. The response rate was lower than anticipated, especially in the post-situation, which renders less reliable results. With this reservation, we found that the drivers reported fewer near-accidents and hindrances with cyclists and electric scooters. There was no increase in hindrances by cars.

Video Observations

There was a significant decrease in the proportion of cars and buses driving over the speed limit as a result of the measure. The main finding regarding the lateral distance is, that in the after situation the cyclists and e-scooterists in the cycle lane were further removed from the motorised traffic (taking the advantage of the wider cycle lane in the after situation). The lane with and the buffer increased their distance from motorised traffic significantly compared to the before situation. Also, the share of cyclists using the traffic lane decreased in the after situation, because the faster cyclists can use the wider cycle lane and buffer for overtaking,

and not the traffic lane. In the analysis of video data, we also examined whether the measure could create dangerous situations and/or conflicts between road users. We observed only one conflict. Although this was in the post-situation, there is nothing to suggest that it is related to the measure. We also observed several types of situations that had the potential to develop into conflicts, or that could be experienced as unpleasant by cyclists, electric scooters, or pedestrians. These were not attributed to the measure but were related to local conditions.

Overall assessment

Overall, the findings from this study demonstrate that bike lanes with a buffer can be an effective solution to increase road safety and improve the experience of road users on midblock sections in urban areas, but its success depends on many factors, including the design of the bike lane, buffer, road, local traffic conditions, and intersection design.