

# How to measure cycling and new forms of micro mobility


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- There are no data sources or collection methods that capture all aspects of cycling
- Travel behaviour surveys, which are the most widely used, are well suited to describe mode choice. Cycle counters can better capture changes over time. App data - which is still not widely used - can measure route choice, but is just as vulnerable as RVUs to low response rates and selection biases
- Bike counter data from Oslo municipality and from the Norwegian Public Roads Administration show an almost 80% increase in cycling from 2014, while the RVU figures show an increase of 20 per cent in the same period.
- As of today, bicycle counters cannot distinguish between bicycles and electric scooters, which there has been a great need for
- Compared to other countries, Norway has a more active approach towards obtaining data on micro-mobility. At the same time, internationally, there is a strong development towards greater use of sharing platforms for bicycle data between local and national actors, and that the authorities work closely with private suppliers for this

Data about bicycle use are used for many purposes, including to describe changes in risk and changes towards more sustainable and active transport. Such data is traditionally collected with surveys and various forms of counters, but technological developments provide new opportunities. At the same time, we see a development in the transport sector itself. In particular, the rapid growth in electric scooters has created a need for insight into new ways of measuring bicycle use (to distinguish cycling from micromobility), their strengths and weaknesses, and what kind of strategies the authorities should have in order to be equipped to meet future changes in the transport field.

This report attempts to meet these challenges by answering the following questions:

- I. What data sources exist?
  - I. *What are the different sources used for?*
  - II. *What can they measure and not measure?*

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- II. What do the various data sources say about
    - I. *Scope of cycling?*
    - II. *Change over time?*
    - III. *Distribution over different forms of cycling and other forms of micromobility?*
  - III. How is this solved in other countries?
  - IV. What kind of data sources are needed to meet the needs of the administration?

In the report we treat cycling and micromobility as two separate phenomena, in line with the Norwegian Public Road Authorities' way of defining these.

## Different measurement methods solve different needs

In order of saying something about the strengths and weaknesses of the different methods, you must have a clear picture of your knowledge needs before defining which measurement method to use. *More cycling* is eg. not a precise operationalization, because it is not clear whether you are referring to an increase over time, an increase relative to other means of transport (increased proportion of bicycles) or only more kilometers cycled (or trips).

Travel behaviour surveys (TBS) are the most used, and best-known, method used to measure cycling levels. The TBS measures, among other things, mode shares, ie. what proportion of the population chooses to cycle, and how much they cycle. A strength of the national TBS (Norwegian: RVU) is that it is a longitudinal survey, which renders time series data for a long period of time. Another advantage is that the combination of travel information and background variables makes the TBS well suited to analyze characteristics of cyclists and of the cycle journey itself (purpose, time, length, etc.). At the same time, there are many challenges. The most important ones are low response rates, few registered cycling trips and the fact that data is rarely published.

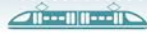
When it comes to bicycle counters, several technologies are available. Counters are best suited to describe *developments* in bicycle use, besides the ability to describe volumes in particular streets. For this purpose, they are more suited than TBS, since they capture more of the total bicycle use than a TBS can. We have analyzed the bicycle counters in Oslo municipality, and find that they capture 42 per cent of the cycling trips, and 61% of cycled kilometers.

Our mapping shows that all Norwegian cities have bicycle counters in one form or another. But even the municipalities with the most counters, Oslo and Bærum, will not be able to detect all travel flows, and how cyclists choose different routes based on the measures being implemented.

If you want to describe route choice, app data is the best tool. App data can also, in the same way as TBS, say something about mode choice. An important limitation with app data is recruiting participants. In principle, there is no difference between TBS and app data in this respect. In both cases, people must be contacted and be willing to use their time, and to share information about their movements.

## What do different data sources say about the extent of cycling and micromobility?

The most important source to say something about the amount of cycling today is TBS. When determining the amount of cycling, we use a combination of the average number of cycling trips each person makes each day and the length of these cycling trips. By doing so, we get a measure of the number of transport kilometers by bicycle. In the last TBS (2020), each person



cycled just under 0.1 trip per day, and this amounted to approximately 0.4 km per person per day.

As a separate exercise, we have done some simple validation tests of various counters in this report. These tests showed that the detection rate varied widely (from 12% to 170%). None of the counters could identify electric scooters as a separate category.

Just as important as the ability to detect cyclists, is reliability and operational stability of the measuring instruments. In our analyzes of data from Oslo, we find many gaps in the time series (complete omissions), and abnormal results (apparent data, but systematically lower than previously, for example). This is quite problematic, since long time series are the main advantage of cycle counters.

Interestingly, there are hardly any registered trips with micromobility in TBS. This is the case, even if the last TBS was done after the first wave of electric scooters came to Norway. Based on data from our counts with a video camera in Oslo, there are almost as many electric scooters as pedal bikes in the streets of Oslo (they make up about 40% of the "bicycle traffic" past the stationary counters in the city centre). This is probably an extreme case, and not representative of the rest of the country, but it still says something about the weakness of TBS.

It is still unknown to what extent counters can detect and classify electric scooters. As far as we know, none of the suppliers currently deliver data with electric scooters as a separate class.

## What do the data sources say about change over time?

To look at development over time, we have compared figures from the Norwegian Public Roads Administration (NPRA) and Oslo municipality's bicycle counters with figures from two different series of surveys (The national TBS and Ruter's local TBS). While bike counter data from Oslo municipality and NPRA show an increase in cycling of around 80 per cent from 2014, the two TBSs show an increase of around 15-20 per cent.

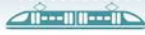
An argument against relying too much on the counters is that, although the counters are strategically placed to capture as much cycling as possible, much of the cycling is not captured. It may be that all the increase in cycling has taken place in areas close to the city centre, and that it would therefore be wrong to project a corresponding increase in more peripheral parts of the cities. On the other hand, we know that there are very few cycling trips in the TBS. They are thus not very sensitive to changes that take place.

None of the existing tools are particularly suited to describe micromobility as a whole. As mentioned, the dramatic increase in the use of electric scooters has not been captured either in the TBS or among the counters.

## What are the experiences from other countries?

There are great similarities between Norway and the other countries we have examined, but also some differences. In all countries, the TBS is the foremost source for reporting bicycle use and changes in use, despite that its weaknesses are acknowledged. Sweden and Denmark have a slightly different definition of how a journey is defined than Norway, so direct comparisons of the shares of different travel mode are not entirely straightforward. The Netherlands has a definition that is more similar to the Norwegian one.

In Sweden there has been a greater focus on validating data and testing alternative ways of collecting data, for example using the TravelVU app to supplement the survey data, than on perfecting the TBS-data. Other methods are also being tested in the Netherlands, and there are several more or less private initiatives underway to collect data with apps.



When it comes to micromobility, it seems that Norway has come further than the other countries, since we have a system for collecting data from providers that the other countries (at least according to our informants) did not have.

In Denmark and the Netherlands, better systems for coordinating and sharing data seem to have been created than in Norway and Sweden. An interesting difference is that in Denmark it is purely a government responsibility (Vejdirektoratet) to ensure data sharing, while in the Netherlands there are several initiatives, both at the regional and national level, and private actors have also taken such initiatives.

In an international comparison from 2017, Norway comes out as one of the best countries when it comes to the collection and use of data on walking and cycling. It is an open question whether we can still adorn ourselves with such a status, or whether the other countries have now caught up with us.

## Conclusion and recommendations

This report results in some concrete and some more open recommendations. The first is, that one must always have a clear needs analysis, which results in a relatively precise operationalization, before going to the step of collecting new data.

The next is that one must strive for close contact between policy makers and the industry in order to be able to capture development trends, without getting stuck in technological dead ends. Furthermore, a platform should be established for data sharing between the local and national levels, which to a greater extent opens up interaction between local (municipalities) and national (Vegvesenet) actors. It is important to play on local actors' own perceived benefit from data sharing, to increase motivation for sharing with others. Our proposal is to seek a solution where data is shared to a greater extent beyond the individual collection point, as has been done in Denmark and the Netherlands.

We propose the establishment of a knowledge center for cycling in Norway, which can play a central role in providing guidance on the collection and exchange of data. An important role for such a center will then be to act as a link between the administration, knowledge producers and suppliers.

If you do not know where you are going, every road will get you nowhere. The purpose of this report has been to outline the existing landscape, so that the policy makers can more easily identify strategies to meet the opportunities and needs of the future. The report can only fill part of the task. As several of the informants pointed out, one of the biggest needs is to gain practical experience with different solutions. In such a context, good documentation is important, and in short supply. Creating good arenas for communication and experience sharing is just as important, as an outcome of this current project.