



Counting and monitoring bike riding in WA

Frequently asked questions

Since 2008, the Department of Transport (DoT) has collected data from permanently installed piezoelectric bicycle counters strategically placed across the metropolitan and regional bicycle networks.

DoT collects this data to monitor bike riding movement trends and thereby inform decision making, especially with respect to key projects that arise from the WA Bicycle Network Plan and Grants Program.

What is a bike 'counter' and what does it do?

Each counter site consists of two piezoelectric sensor strips embedded into the path which detect passing bicycles, as well as a logger to collect and store the information, a modem to send the data remotely, and a small solar panel for power.

The counters can determine:

1. Day and time of the bike riding "event" (to the second)
2. Speed and direction of travel
3. Time between two isolated bike riding events (headway)
4. Number of front and back axles
5. Distance between each axle (wheelbase)

Detected events are stored in the logger and sent wirelessly to the technical providers for initial analysis and cleaning to create a usable dataset out of the correlated wheel events.

The data is then delivered in full to the Main Roads WA (MRWA) record management team which publishes the information to an internal database, shares the raw data with the cycling team at DoT, and distributes an aggregated summary to the publicly facing [TrafficMap](#) website.

How many counters are there and where are they located?

At December 2020 there were 64 counter locations around WA. Most of these are located in the Greater Metropolitan Area, although the number of regional counters has been increasing since mid-2017.

The counters are positioned based on strategic guidelines to ensure they collect the most accurate and representative data possible. Permanent counter placement is based upon two main considerations:

Strategic merit:

- Is this location expected to, or has been known to service a substantial amount of people riding bikes?
- Would it be beneficial for this location to be analysed to investigate an expected change in bike riding movements, possibly due to a recent or planned intervention, or extension of the route?
- Is the location representative of the corridor or route in question?

Physical location characteristics:

- Is this location preceded and succeeded by enough flat and straight terrain to allow cruising speed?
- Does this location have access to full sunlight for the solar panel OR to an underground power source?
- Does this location have enough space to allow access for site installation and maintenance?

Counter locations and some high-level statistics can be found at the MRWA Traffic Map website: <https://trafficmap.mainroads.wa.gov.au/map>

How is the count data accessed?

On the Traffic Map website the counter locations are presented on an interactive map, and the data for a selected site is visually summarised using descriptive statistics (such as graphs of average daily traffic) and can also be downloaded as a tabulated excel sheet with the data aggregated to 15-minute increments.

TrafficMap is an excellent resource for all stakeholders to gain a quick understanding of bike riding movements at specific sites. DoT, however, have access to the complete dataset and regularly conduct detailed analyses of movement trends across the bike counter network and along specified corridors or cordons.

What can the data tell us?

The data can currently only be used for aggregated or site-specific insights. Some examples of the kind of insights the data can provide are:

- How does volume/speed/temporal profile of this site compare to other sites with similar characteristics?
- Since an intervention (policy or infrastructure), what effect has been observed at this site(s)?
- How many bike riding counts have been detected heading in to and/or out of the CBD, and has this measure seen decline or growth over a given time period?
- What is the 85th percentile speed at this location and how has it changed over time?

What can the data not tell us?

The data cannot be used to determine user insights or origin-destination (O-D) information. Some examples of the kind of insights the data cannot provide are:

- Demographics of the people that crossed the site
- Where people come from or go to before/after crossing the site
- Travel time between counter sites for each individual bike count recorded
- A person's trip purpose

Are these counters the only way DoT monitor bike riding movements?

No, permanent bike counters are just one way to understand bike riding movements. Bike count data is currently compared with user and community surveys to gain a better understanding of bike riding trends and user preferences. DoT are investigating other data sources and considering ways to bring them together in a valid and consistent way so the insights can be reliably reported on.

For example, Strava¹ activity for a specific section of bike path could be normalised to the fixed counts that DoT already analyse. This would allow DoT to derive some demographic and O-D information about people who ride their bikes along or around a specific section of the bike network and correlate that with any user surveys conducted for that area.

Other means available to monitor bike riding movements include computer vision, inductive loops, infrared and radar technologies.

¹ The Strava Metro platform provides de-identified, aggregated data from users of the Strava fitness application which is similar to the data provided by permanent counters such as time of day, speed and direction. It also provides some demographics of the users such as gender, age, and whether they are visitors or locals.