

## CITIZENS AND NEIGHBOURHOOD COLLECTING DATA TO UNDERSTAND MOBILITY PATTERNS

### EVIDENCE AND KEY ISSUES

Device-tracking using WLAN enables high spatial accuracy (Ahlers & al., 2016).

Mobile phone data tracing is another solution (Calabrese & al., 2013).

Travel behaviour varies according to characteristics of users: it has been documented for example that across the European Union caregivers (often women) tend to undertake multiple small trips in a day using public transport when working men will tend to use a motorised vehicle and travel mostly to and from work in a day (URBACT, 2019).

**Data sharing and newly available forms of tracking can allow planners to respond to specific mobility needs by shaping appropriate and inclusive infrastructure and policies. Although understanding mobility forms in a city has always been a key issue for transport planners, new forms of mobility like ride-hailing or dockless bike schemes pose a new challenge to public authorities' understanding of movement.**

### LONDON CONTEXT

In London, Transport for London is the main transport operator. It handles most of the public transport (underground, bus, tram, overground) and is responsible for the majority of the main traffic arteries. London boroughs are responsible of most of the road network (95%).

The traditional option to understand mobility choices is surveying. It is widely used in London as elsewhere, for example, to understand [cycling choices](#) (2016). Surveys may help inform policy like the [Cycling Action Plan](#) (2018), where user demographics were examined to try and overcome the gender or ethnicity

imbalance in cycle usage as well as rebrand cycling infrastructure.

Beyond that, automated means of counting have been developed. [Various tools exist](#), with onboard technologies such as vehicle load counting or Electronic Registering Fareboxes (ERF) (more simply put ticket counting). TfL's Oyster Card is such a system. It maps all public transport trips but does not have a tap-out option on buses. Part of the journeys are therefore not being counted. In order to access that missing data, TfL developed a model, the 'Origin-Destination Interchange Tool' that integrates bus entry tapping with other taps using the same card as well as bus location data to act as a proxy for end of bus journey calculation. In 2018, TfL conducted a [trial on automated passenger counting for buses](#). It ran on seven lines, using cameras for tracking footprint, sensors at doors, weight analysis and depersonalised Wi-Fi data. Both methods allowed for increased understanding of mobility patterns.

Another issue is the lack of information of in-tube journeys, as only origin and destination are known. For a month in 2016, TfL conducted a [pilot using depersonalised Wi-Fi data](#) from mobile connections in 54 of its stations. It collected over 500 million connection requests to understand mobility paths inside the network. The pilot was implemented for less than £100,000 and allowed for a better understanding of mobility in busy stations, trains and times as well as preferred route options. TfL's [EDMOND \(Estimating Demand from Mobile Network Data\) project](#) is more widely looking at transport demand across London.

TfL shares data through a [unified API](#) that is accessible to all and that powers over 650 apps. The operator also provides monthly statistics on public transport use on [London's open data portal](#). UK-wide, the Department for Transport published in 2018 [guidance on local transport data usage](#).

Understanding mobility is also understanding modes such as cycling. In 2017, following an initiative by Transport for

Greater Manchester, TfL installed cycle counters on the border of its Cycle Super Highways. Boroughs have similar initiatives. Camden publishes [regular updates](#) of its own cycle counters' results, also using open data. [Camden Cyclists re-use that data](#) to provide useful and readable graphs on cycling data in the borough. Boroughs also use resources provided by private companies. Lewisham for example has in the past used data from fitness social network Strava to understand cycling patterns.

With regards to private operators, TfL require private hire vehicle (PHV) operators to [share weekly data](#) on drivers and vehicles used the previous week as well as any changes to their operating systems. New mobility services that have been trialling their services on an independent level with boroughs have various arrangements according to boroughs' requirements. The services are usually provided with a dashboard allowing them to plot the journeys of all vehicles in operation, be it [Lime e-bikes in Islington](#) or [Mobikes in Ealing](#). That data is sometimes too limited for boroughs to develop a strategy.

## INSPIRATION FROM ELSEWHERE

Some European projects led by cities also have a focus on mobility patterns: [MoTiV](#), a Horizon 2020 funded project, looks at Value of Time Travel. The idea is to understand mobility choices through an app that acts as a multi-modal journey planner and a mobility diary. Authorities can participate in data collecting campaigns and request the app. The project has also experimented with other means of counting trips: around the Sagrada Familia in Barcelona [MoTiV deployed a mix of Wifi sensors, GSM and 3D cameras to obtain real-time data of mobility flows to understand tourist behaviour](#). The Los Angeles Transportation authority [recently used data from 5 million cell phones to understand mobility patterns](#) in its urban area, using data provided by a transportation consultancy. By combining this data with their own, they were able to determine the 'transit mode share'.

Similarly, [the TRACE project](#) developed tracking tools in eight pilot areas to better promote active mobility and plan for sustainable urban mobility in general. Regarding cycling data, many EU cities have put in place counting methods, such as [Utrecht in the Netherlands](#).

The question of who maps the city has become a major governance stake, notably in the US, where new mobility services have been implemented for longer than in Europe and public transport is not as attractive. There, new actors have seized the mapping of mobility, be it private transport operators which often have their own agenda, companies, major consultancies or mixed initiatives like [Shared Streets](#). However, traditional actors such as academics and transport operators still act as entry points when it comes to data collecting, as they hold most of the mobility data. For example, Madrid's operator, CRTM, recently launched a [multimodal mobility platform](#). To operate in the city, providers must provide usage data to the platform. At the national level, as part of the Single European Transport Area agenda, members states have been encouraged to put in place [National Access Points](#) that act as portals with standardised formats.

As private mobility providers launch their services across cities, one of the stakes becomes the unification of data requirements: can there be a standardised means of collection? The Los Angeles Department of Transport requires micro-mobility managers to share data in order to operate in their city and has done so through the creation of an [open source mobility data specification](#) that can be taken up by any city. Our enhanced ability over the last years to gather more and more data is providing a clearer picture of how our citizens interact with the city and transport network. What is important is that the city has free and open access to it to successfully deliver clean and sustainable streets of the future.