Bike Theft Barcelona 2021

ICTA Institut de Ciència i Tecnologia Ambientals - UAB

UNIVERSITAT AUTÒNOMA DE BARCELONA

INSTITUT DE CIÈNCIA I TECNOLOGIA AMBIENTALS (ICTA)

CITY LAB BARCELONA

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Excecutive Summary

The prevalence of bike theft is an inconvenience to cyclists and a barrier for more widespread adoption of the bicycle as a form of urban transportation. Despite the renewed attention given to cycling as a clean and healthy transportation mode, bike theft remains largely ignored and understudied. We review the spatial and temporal patterns of all reported stolen bicycles in the city of Barcelona in 2021. We find that 870 bicycles were reported stolen, averaging more than 2 bicycles per day. Most bikes were reported stolen in the districts of Sant Martí, Eixample and Ciutat Vella (Old City), with much fewer bicycles reported stolen in Gràcia, even though this neighborhood stores a large of bicycles on city streets. The peak season for stolen bikes appears to be the month May, and most bikes are stolen during daylight hours. A comparative analysis with other cities suggests that many victims of bike theft in Barcelona probably do not report the loss, leaving us with a severe underestimate of the magnitude of the problem. Collaboration between the scholarly community and the public agencies will be necessary to successfully address bike theft and give it the seriousness it deserves. As cycling policies gain a new centrality in efforts to address climate change, so too must more attention be devoted to combating bike theft.

Keywords: Bicycle Theft, Bicycle Parking, Barcelona

Bicycle theft is often dismissed as a minor crime, an inconvenience, or an accepted risk associated with urban living. Yet as cycling gains a new centrality in urban mobility policy, we must reassess the seriousness with which we examine the problem of bicycle theft.

Cities in Europe and around the world promote cycling as a clean and healthy alternative to motorized transportation [1]. A cycling city is a more livable, safer and healthier city. Many city governments have invested in new cycling infrastructure in order to promote cycling, and yet the provision of infrastructure alone may not be enough to encourage bicycle riding. Fear of bicycle theft is a critical barrier to cycling and active travel [2]. Furthermore, bicycle theft risk is perceived similarly among different population segments, which implies that it is a widespread problem in the city from the users' point of view.

In a survey by the Government of Catalonia, respondents identified the risk of bike theft as one of the primary reasons why they do not use a bike for transportation, second only to interaction with motor vehicles [3].

Bike theft remains very common. 1 out of every 5 bike users in Catalonia have been victims of bike theft within the last 5 years of which 4% had more than one bicycle stolen. Theft is more prevalent in larger municipalities with populations over 500,000, where up to 27% of cyclists report having their bike stolen.

Bike theft discourages people from buying a bike and shifting to active travel. Research in the UK has shown that once a bike users suffer from bike theft, they are less likely to replace the bike with a new one. To be precise, 24% of bike users that experienced bike theft did not buy a bike again [4]. This makes bike theft an off ramp to active mobility, effectively undoing the difficult task of convincing people to engage in active travel.

If cities are serious about convincing citizens to shift to active travel, more attention must be devoted to bicycle theft. Addressing bicycle theft must be framed as part of the portfolio of actions needed to transition to a low-carbon economy. And our climate emergency elevates bike theft as a public health issue and a policy to mitigate climate change.

Our review of the literature on bike theft in Europe finds that the research on this topic is limited. Generally, it was found that more thefts occur in places with more bike users [5]. Furthermore, many authorities overlook bike theft [6], which may lead many to under-reporting [2]. Researchers who have examined bike theft have tried to understand patterns of when and where bicycles are more likely to be stolen. Using a spatial risk model, researchers in London found that bike theft is more closely associated with surrounding land uses, or facilities than area-based socioeconomic status[7]. The presence of train stations or vacant houses increases bicycle theft risk. Likewise, metro stations and universities are especially prone to bike theft [8]. Bike theft is more likely to occur in densely developed and commercial areas and at mid-blocks rather than at intersections [9]. Some cyclists tend to underestimate the risk of theft in their own neighbourhoods, as the perceived and real risk of bike theft do not necessarily align. [10].

This study aims to organize and analyze data on the reported bike thefts in Barcelona in 2021 with the purpose of bringing attention to this understudied topic. A greater understanding in patterns of bike theft may contribute to the identification of mitigation measures and solutions.

Methodology

Collecting and analyzing data on bike theft is notoriously difficult. Official data from police will underestimate the real magnitude of the problem if many victims of bike theft do not report their loss.

In this research, we obtained all reports of bike theft in the city of Barcelona in 2021 through a formal request to the Catalan Department of the Interior (Departament de l'Interior). This database includes all reported bike theft to the local and regional police (*Guardia Urbana and Mossos d'esquadra*). The total number of reported bikes stolen is certainly an underestimate of the actual number of theft, since many thefts go unreported. Bike owners may not report stolen bikes because they feel that it is not worth the effort or do not feel it will lead to a bike recovery [2]. Nevertheless, the reports of bicycle theft provide us with a glimpse of what the real patterns of bike theft might be like in the city and let us estimate the lower boundary of the real magnitude of the problem.

For each reported theft, the following data was available: City District, Neighbourhood, Month, Hour, Location and Age. We summarized this data with figures and maps, and then aimed to compare the results in Barcelona with other cities, using both total number of stolen bikes and the number of thefts per 100 000 inhabitants. We have aimed to contextualize our findings in Barcelona with a comparative analysis of bike theft data in other cities. Without a reliable database with comparable data on bike theft across cities, in some in-

stances, we have relied on reports from media sources. The absence of standardization can make comparisons across cities difficult. Some sources report total theft per year, others theft per capita, and others per bicycle or per cyclist. Private insurance companies have attempted to quantify the risk of bike theft in cities. For instance, the Luko insurance company has created an index on bike theft that is comprised of a mix of indicators including stolen bikes per 100 000 cyclists, and the homicide rate, which was included to account for low report rates of bicycle theft[11]. One might question the inclusion of other crime indicators in the index of bike theft risk.

Results

By District and Neighbourhood

A total of 870 bicycles were reported stolen in the city of Barcelona in 2021. This is more than 2 bicycles per day, and an increase from the 826 reported bikes stolen in 2019 and 608 bikes in 2020 [12]. Reports of bike theft in Barcelona are concentrated in three districts: Sant Martí, Ciutat Vella (Old City) and Eixample. Together, these three districts make up 65% of all reported bike thefts in Barcelona. The district with the most reports of stolen bikes is Sant Martí, with 207 bikes reported as stolen in 2021, closely followed by Ciutat Vella (Old City) with 191 and Eixample with 172.

When we examine the bike theft data at the neighborhood scale, the most affected neighbourhood is the Raval (Ciutat Vella) (Figure 1). It is followed by the Dreta de l'Eixample, Barceloneta (55), el Parc i la Llacuna del Poblenou (38) and the Barri Gòtic (37). Barceloneta and el Parc i la Llacuna del Poblenou are neighbourhoods close to the beach, while Raval and Barri Gòtic are in the city center. Dreta de l'Eixample is also a central neighbourhood but contains a lot of car traffic and wider streets.

We find that the districts that are most affected by bike theft are generally the ones where most bikes are used [13].The districts of Sant Martí, Eixample and Ciutat Vella have the the most bikes parked on city streets (Appendix Figure 8), reinforcing the thesis that bikes are stolen where bikes are parked. However, looking at the ratio of Stolen Bikes/Parked bikes (Table 1), we observe that proportionately more bikes are stolen in *Sarrià* and *Sant Andreu*. These are districts that are less central than Sant Martí, Ciutat Vella and Eixample, with also con-

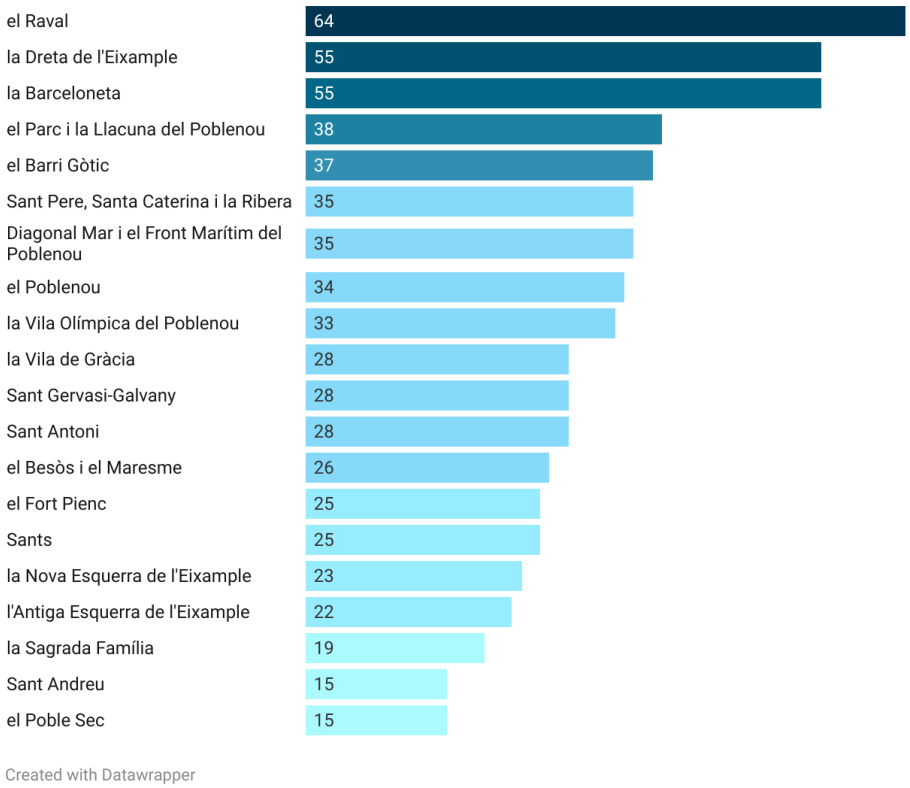


Figure 1: Reported Bikes Stolen in Barcelona by Neighborhood in 2021

trasting socio-economic profiles.

On the other hand, the highly bikeable neighbourhood of Gràcia has a relatively low number of reported bike thefts, when accounting for the high number of bicycles parked on the streets in that neighbourhood[13] (Table 1). It is possible that the urban form of the Gràcia neighbourhood, with many plazas, squares and ground level activity, might create an environment less conducive to theft.

District	Ratio Bikes stolen/Bikes parked
Sarrià-Sant Gervasi	0.12
Sant Andreu	0.09
Nou-Barris	0.06
Horta-Guinardó	0.05
Ciutat Vella	0.05
Sants-Montjuïc	0.05
Les Corts	0.05
Sant Martí	0.05
Eixample	0.04
Gràcia	0.02

Created with Datawrapper

Table 1: Ratio of Bikes Stolen/Bikes Parked

Seasonal and Daily Patterns

Reports of bike theft peak in May (86) and November (84) (Figure 3). The peak in May might be explained by the higher potential sale value of stolen bicycles as the weather improves in spring and more people start to use their bike. Data on bike theft in other cities also show a clear seasonal pattern, with more reported stolen bikes in the spring and summer [14]. The theft data from the police identifies the "time of incident", allowing us to analyze when bikes were stolen over the 24 hour day. We observe low numbers of bike theft from 1:00 to 7:00 hours with a sudden rise at at 8:00 hrs (26) followed by a peak at 15:00 hrs (81 bikes) (Figure 3). This diurnal pattern illustrates that most reported bike theft occurs during daylight hours, or at times when streets are busy. This confirms the findings by Van Lierop et. al. [10] that most bikes are stolen during daytime. The late night and early morning are the times with the fewest reports of bike theft. The theft during the day might be partially explained by inadequate bike locking practices, although the data does not specify how the bikes were locked or protected when stolen.

We also note that most bike thefts seem to occur in neighbourhoods that are frequently visited by tourists and people pursuing leisure activities, which in theory, would make bikes safer due to the additional “eyes on the street” [15]. However, despite this additional street activity, or perhaps because of it, bike theft goes unnoticed, even in busy neighbourhoods during daylight hours.

Location

The majority of reported bicycle thefts occur in public streets (63 %), including beach and parks (Figure 5). Parking garages, both public and private, are also a common location for bike theft (15 %). We find that 11 % of theft occurred in homes or residences. Commercial locations such as stores or shops were 6 % of all bikes stolen. However, the data does not indicate the theft took place inside or outside the shop.

Schools, sports and leisure facilities, libraries, hospitals, universities and others are included in the category public facilities which make up the small percentage of 2%.

Regarding the reports of bikes stolen in residential locations, the share of bikes stolen in the entrance of houses makes up 34 %, while the bikes stolen directly out of the apartment make up 28%.

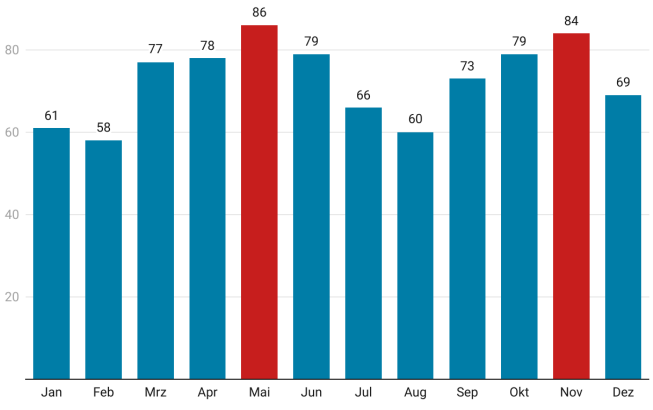
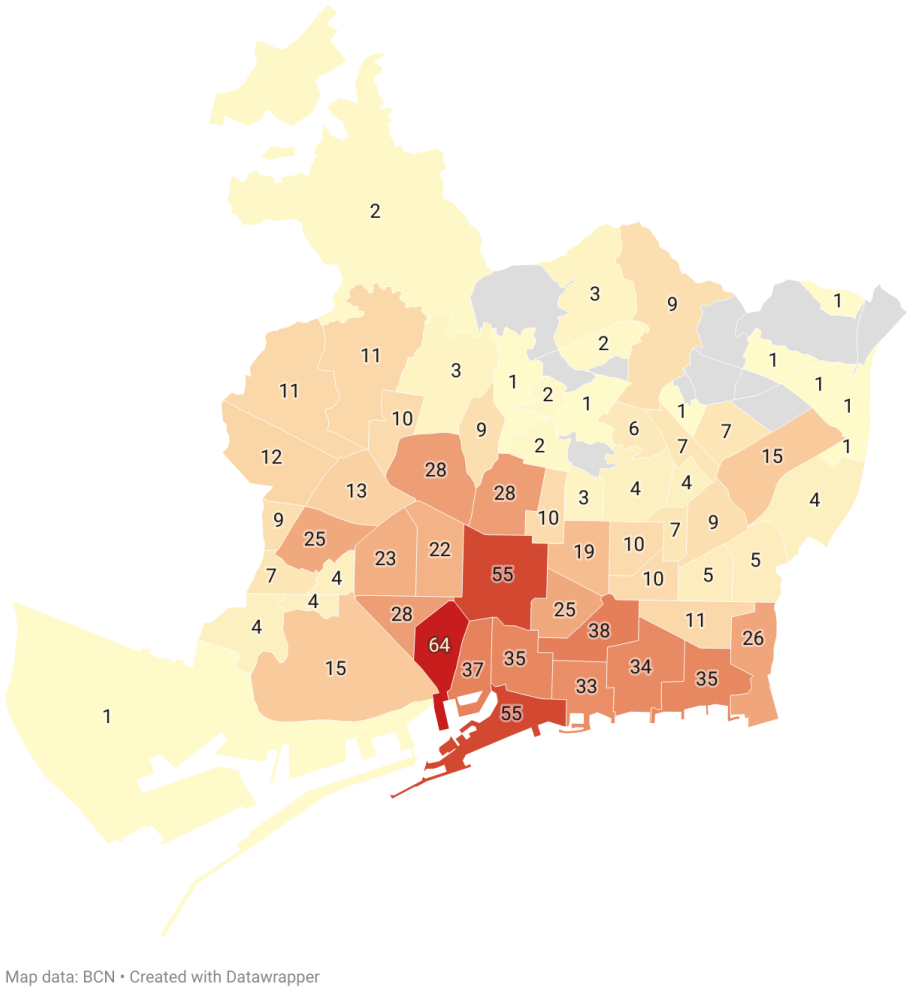


Figure 3: Bikes Stolen by Month in 2021



Map data: BCN • Created with Datawrapper

Figure 2: Stolen Bicycles Reported in Barcelona by Neighborhood

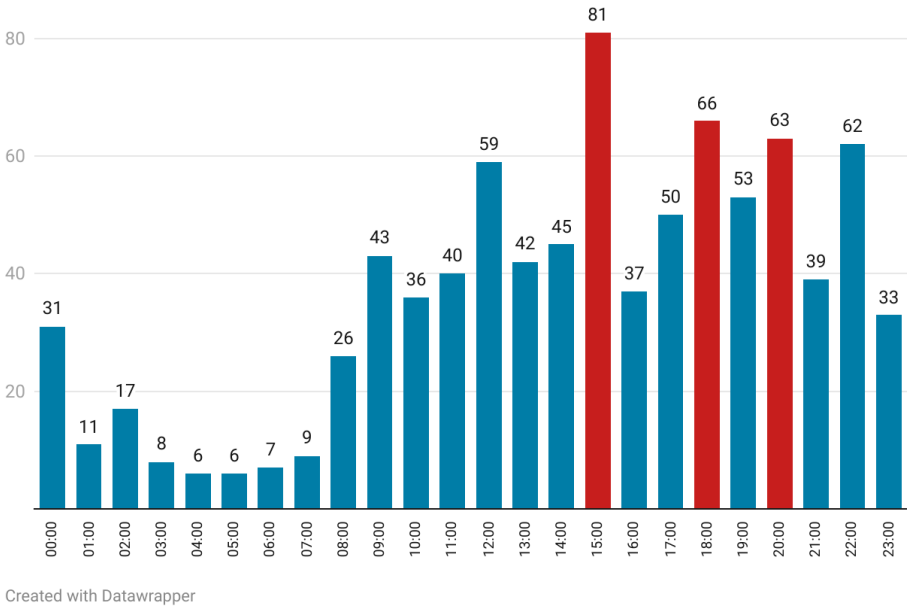


Figure 4: Bikes Stolen by Hour in 2021

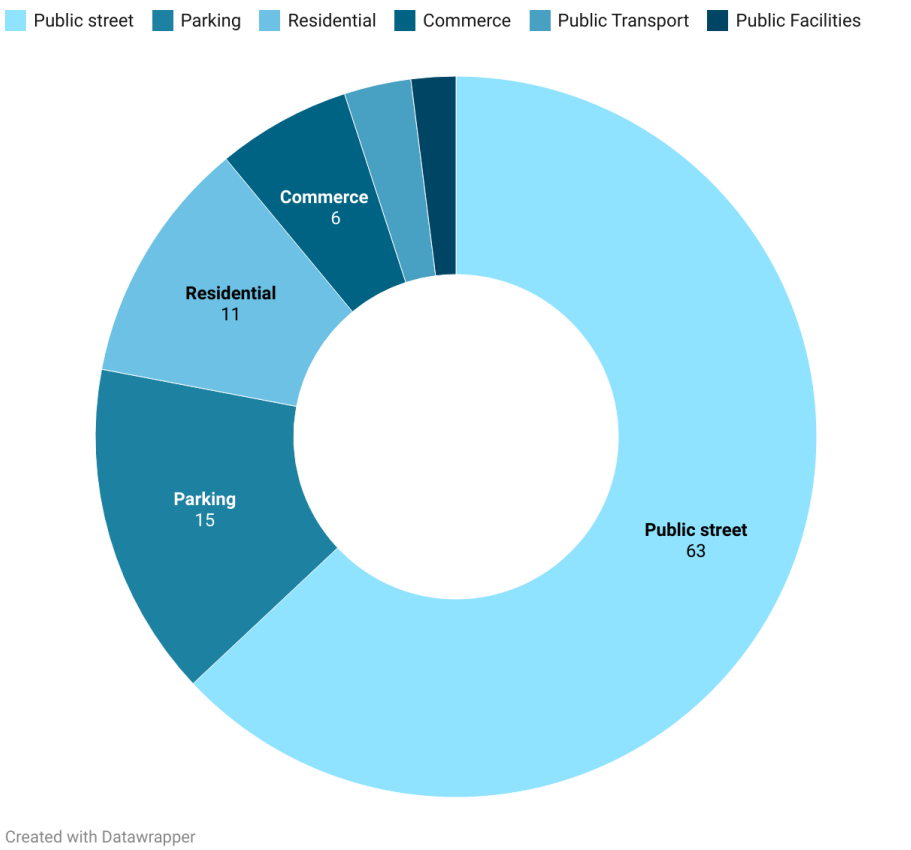


Figure 5: Bikes Stolen by Location

Comparative Analysis

We compiled reports of bike theft from various sources, including official police data (London, Berlin), academic research (Montreal) and from the press (Paris, Amsterdam). We compare the total number of bicycles stolen per year, as well as the number of bikes stolen per capita. In comparison with other European cities, the total number of reported bikes stolen per year in Barcelona is low. In other European cities examined, the total number of bike thefts range between 27,000 (Berlin) and 2,395 (Madrid), making the 870 in Barcelona an order of magnitude lower than what is reported elsewhere (Figure 6). Re-scaling the data to the number of bike thefts per capita does not change the story. With a population of 1.6 million, there are 54 reported stolen bikes per 100,000 inhabitants in Barcelona. Our comparative analysis reveals values per 100,000 inhabitants between 70 - 767, making Barcelona once again an outlier on the lower end (Figure 6).

The low number of reported bicycle theft in Barcelona might have three possible explanations: (1) there are fewer bikes in Barcelona, (2) severe under-reporting, or (3) there is less bike theft.

Each of these possible explanations deserves consideration. First, might our results be because there are simply fewer bicycles on the streets of Barcelona? Cities in Spain have a comparably low bicycle ownership rate [21]. Highly bikeable cities like Amsterdam and Copenhagen report having 847,000 [22] and 265,700 [23]bicycles respectively. In contrast, research on public bicycle parking estimates that there are 18,500 bicycles parked on the streets of Barcelona every day [13]. This figure does not include bicycles parked in private garages or in homes. Still, the number of total bicycles in Barcelona is in the tens of thousands.

The second reason why Barcelona might have a low number of total bike theft in comparison to other cities might be more under-reporting. Is it possible that bike users in Barcelona are less likely to report their stolen bicycle than in other cities? This seems to be a plausible explanation for the relatively low number of thefts reported.

Finally, it is also possible that there is simply less bike theft in Barcelona in comparison to other cities. The perception that bike theft is a major problem remains high but it is possible that the perception does not match the material reality.

Recovering Stolen Bicycles

With over (63 %) of the bikes stolen in public space, local authorities should take responsibility for reducing these crimes.

Best practices to reduce bike theft include [6]

- surveillance or tracking
- registration system
- safe parking
- improved locks & locking practice
- urban design (placement & lightning)

Many stolen bikes are re-sold on online market platforms and some bike owners succeed in recovering their bikes pretending they were interested buyers. Monitoring these platforms might help the cycling community identify stolen bicycles and learn about the dynamics of the re-sale market.

Conclusions

On average, at least 2 bicycles are reported stolen a day in Barcelona. Since many instances of theft are not reported to the police, the real number is likely to be much higher. Bicycle theft seems to be concentrated in a few districts in Barcelona. In absolute numbers, the districts with most parked bicycles also have most bicycles stolen. The district of Gràcia has a relatively low theft rate given the number of bicycles parked on the street, while others with few parked bicycles have a relatively high theft rate (Sarrià, Sant Andreu).

Furthermore, it was found that most bicycles are stolen on the street, not in private parking garages or buildings. This gives public authorities the possibility to reduce these thefts by implementing effective policies.

In comparison to other cities in Europe, there are relatively fewer reports of bicycle theft in Barcelona. This may be due to severe under-reporting, or perhaps there is genuinely less bike theft in Barcelona. In the future, if more victims of bicycle theft report stolen bicycles, the total number of reports may increase, irrespective if the number of actual bike theft goes up or down. Understanding patterns in bicycle theft will need for greater reporting from victims, but also triangulating report data with survey data. The relatively low number of theft in Barcelona relative to other cities leaves open the possibility that under-reporting in Barcelona is particularly severe. Future research should examine how often victims of bike theft report their stolen bicycle to the police.

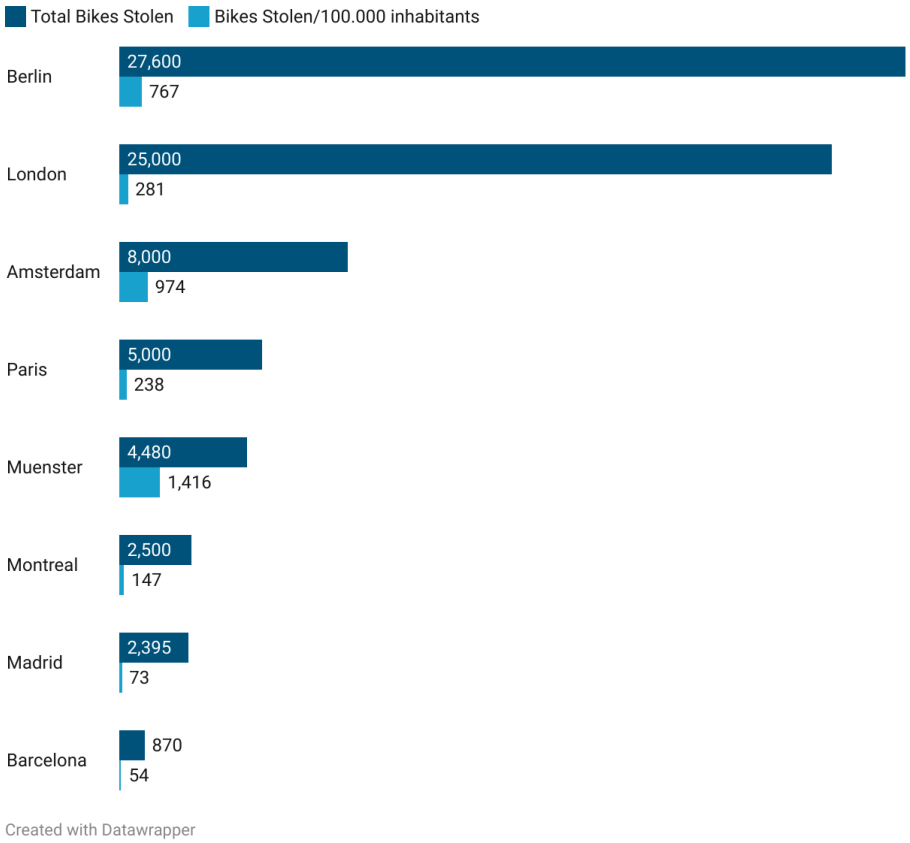


Figure 6: Total thefts and thefts/100.000 inhabitants in european and non-european cities. Sources: Berlin [16] London[14] Amsterdam[17] Paris[18] Muenster[19] Montreal[10] Madrid[20]

Collaboration between the cycling community and the police should aim to increase the reporting of theft in order to obtain a better understanding of the magnitude of the problem in the city. Fighting bike theft deserves greater attention by policy makers and police, because bicycle theft hurts everyone, whether you ride a bike yourself or not.

Acknowledgements

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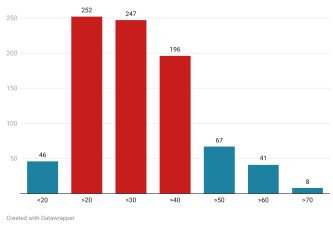


Figure 9: Bikes Stolen by Age in 2021

Appendix

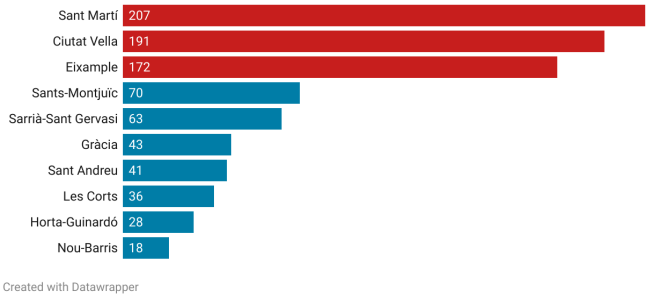


Figure 7: Bikes Stolen by District in 2021

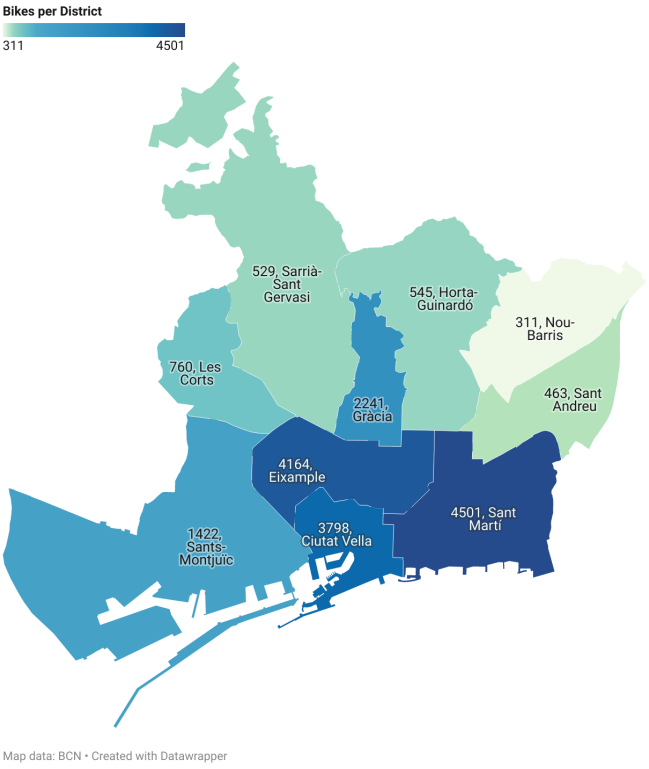
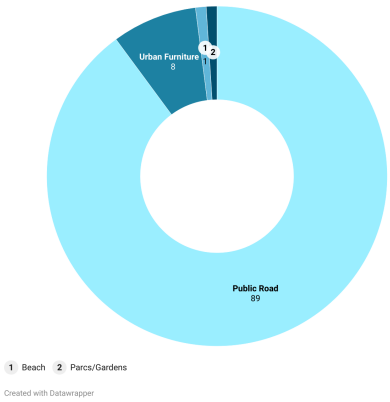
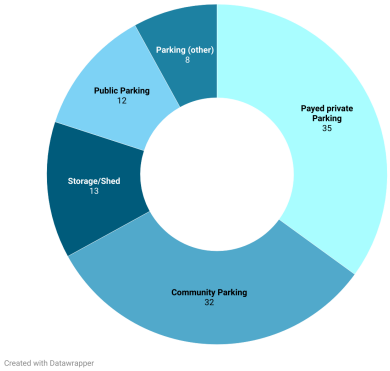


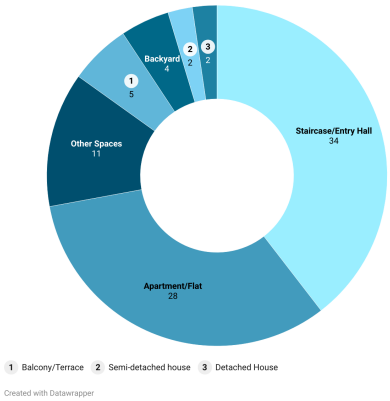
Figure 8: Bikes Used by District in 2021 (Data from [13])



(a) Public Street



(b) Parking



(c) Residential

Figure 10: Reported bikes stolen in % by locations public space, parking and residential in 2021

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CITY LAB BARCELONA
Institut de Ciència i Tecnologia Ambientals
Edifici ICTA-ICP Carrer de les Columnes s/n, Campus de la UAB
08193 Cerdanyola del Vallès, Barcelona
www.citylabbcn.org

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