

Bicycle recovery

Of all stolen bicycles, as mentioned above, only 2.4% had been recovered. This small sample size reduces the reliability of information that characterizes recovered bicycles in comparison to unrecovered bicycles. However, some statistics appear relevant and bear mention. Two thirds of recovered bicycles were reported stolen, compared to only 34.8% of unrecovered bicycles. In the open-ended questions at the end of the survey, several respondents claimed that they had recovered their unregistered and unreported stolen bicycles by finding them again after a theft occurred. Recovered bicycles had been photographed 37.5% of the time and 12.5% were registered, in contrast to unrecovered bicycles (26.8% photographed and 8.2% registered). Reporting a bicycle theft should, and does, substantially improve the likelihood of recovery (testing significant at the 99% confidence interval [see Table 2]), if still to a very low rate. Photographing and registering bicycles also appear to have some positive effect, although the numbers involved are too low to make a strong claim. It is interesting that a third of recovered bicycles were not reported stolen: perhaps respondents recovered them on their own. Most compelling, however, is the evidence that, while measures such as reporting, photographing, and registering bicycles might improve chances of recovery, they offer little assurance that a bicycle will be returned. While only 22 stolen bicycles (2.3% of most recent thefts) were reported stolen, registered, *and* photographed, indicating substantial room for improvement on the part of owners, *not one* of these bicycles had been recovered at the time of the survey, suggesting currently insufficient police attention to bicycle theft that is echoed in 24% of written comments.

DISCUSSION

This research can be helpful for different regions and not only the City of Montreal in their efforts to better understand bicycle theft and upgrade theft-preventing infrastructure as it attempts to increase bicycle mode share in their regions. It provides an account of bicycle theft that includes information and instances not available from official police reports. Results from this study have driven public policy and are currently being used by the City of Montreal to create an educational theft-preventing campaign in the borough of Rosemont-Petite-Patrie. The study makes clear that public agencies should act to prevent theft by adding bicycle parking capacity and ensuring that parking facilities are strong (thick metal well-anchored), easy to properly use (locking to bicycle frame and removable parts), visible, and located near destinations such as work, school, shopping, and recreation. Improvements to bicycle parking facilities should also include removing unsafe racks and installing alternative racks that are secured to the ground and feature thick metal bars at an appropriate height for easy and effectual locking. Other actions that public agencies can take to help reduce bicycle related crime, are to fit both new and existing racks with prominent signage showing proper locking technique, and to offer workshops or audio-visual materials to schools and other organizations that provide information about bicycle theft prevention, stolen bicycle recovery, and registration. Police districts, such as those located in the downtown core, that are most in need of bicycle

parking improvements, were also the same areas that were known for having high rates of bicycle theft per rider. It is important to note that bicycle parking improvement should be determined based on field observations of existing rack quantity, quality, and vacancies, and not only based on theft statistics. Police departments need to be more transparent in the area of bicycle theft to report recovery rates and organize registration campaigns with local cycling agencies. Although bicycle registration had a little role in recovery, it is recommended to increase awareness of these services among cyclists and at bicycle shops.

Theft can likely be reduced by using better locks, securing removable parts, and practicing safe locking techniques. Although public agencies in cities are advised to take leading roles in bicycle theft prevention, cyclists must recognize that bicycles are likely targets of crime, and take preventative actions by always locking their bicycle and ensuring that frames, as well as easily removable parts, are secured. While the police should improve the transparency of bicycle theft investigation procedures, cyclists should register and photograph their bicycles, and report instances of theft to the police to improve the chance of recovery.

This study focuses on Montreal and many factors might be different in other cities or regions, but the magnitude both of the problem of bicycle theft and of the under-reporting seen here are compelling. Information on bicycle theft available through official means in other cities might be similarly incomplete and insufficient so other cities might benefit from conducting similar surveys. Too, insight gained here about cyclists' parking facility preferences and locking habits and effectiveness might be broadly applicable elsewhere, and might be used to influence cities to promote specific types of bicycle racks and education programs. Findings about cyclists' opinions on police involvement can be useful to assist in policy changes that improve the transparency of theft investigation procedures in hopes of increasing recovery rates and bicycle mode share.

CONCLUSIONS

This research has attempted to understand bicycle theft by asking 1) *who* are the victims of bicycle theft; 2) *where* does bicycle theft occur most frequently, and where is it perceived to occur most frequently; 3) *what* kind of bicycles and bicycle parts are most commonly stolen; 4) *how* are bicycles and bicycle parts most commonly stolen; and 5) *when* are bicycles most likely to be stolen. With regard to understanding *who* the victims of bicycle theft are, the most striking finding is that over 50% of participants were subjected to a bicycle theft in their life time as active cyclists. The logit model makes clear that the monetary value of a bicycle, lock type, and a cyclist's gender influence his or her likeliness to have been a victim of bicycle theft. Thematic maps make clear *where* thefts occur, and *where* thefts are perceived to occur. The maps illustrate that theft rates are, and are perceived to be, most prominent in the downtown police districts. However,

there appears to be a disconnect between actual and perceived theft locations in many regions, which suggests that some cyclists might underestimate risk of theft in their own neighborhoods.

The majority of theft victims had only once lost a bicycle to theft, but nearly 20% had been victims three times or more. Theft of bicycle parts is about half as frequent overall, but displays a similar pattern of multiple theft victims. Concerning *what* kinds of bicycles are mostly commonly stolen, the results show that the most frequently stolen bicycles are new bicycles, which at the time of the theft were valued between \$150 and \$500. Many more used bicycles priced at under \$150 were stolen compared to new bicycles in the same price range. Although cyclists are generally aware of *how* parts were stolen from their bicycles, the means by which the most recent theft of a whole bicycle occurred is unknown for the majority of victims.

With respect to understanding *when* bicycles are most likely to be stolen, theft evidently occurs most frequently in months when more bicycles are being used. Because the majority of thefts occur during the day, when bicycles are likely to be parked at a destination other than the rider's home and presumably visible to passers-by, there is substantial potential for theft reduction by improved bicycle parking facility provision and locking habits. Pertaining to bicycle parking facilities, respondents are largely unsatisfied with current parking facility security and availability at most destinations, and rack types such as racks 2, 3, and 6, in figure 4 are perceived as being more secure than others.

In future studies it would be interesting to track changes in theft frequency from year to year. In the current study, over a quarter of both complete bicycle thefts and partial bicycle thefts were reported to have occurred in 2011 and 2012, despite theft events being mentioned as long ago as 1990 or earlier. However, because respondents only detailed the most recent theft (as well as noting the number of thefts they have experienced), previous incidents for victims of multiple thefts are not dated and underrepresented. Additionally, people who had been bicycle theft victims in Montreal in the distant past are more likely than recent local victims to have since moved out of the region and not filled out the survey. Subsequent bicycle theft surveys might benefit by including questions for timing of all thefts, rather than just the most recent, as well as amount of time having lived in the chosen region and at the current address. Future research should also include putting the collected data to more extensive use, by modeling the relationships between the characteristics of the victims, as well the observed differences between the reported and perceived locations of bicycle theft.

This research, based on a survey of cyclists in Montreal, Quebec, Canada, provides new insights into bicycle theft. The main findings from this study can not only be useful to better understand and ultimately decrease bicycle theft in Montreal, but can also be beneficial for cyclists, police, and policy makers in any city aiming to decrease bicycle theft. The creation of urban spaces that encourage cycling and discourage theft nurtures

Montreal's cycling culture and encourages the use of the preferred transportation mode, working to reduce costly traffic congestion while contributing to an active, healthy population and workforce.