

TRANSPORT FINDINGS

Patterns in Bike Theft and Recovery

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Findings

Limited research on the patterns of bicycle theft and recovery makes it difficult to tackle the issue of bicycle theft. Our goal is to generate knowledge that can reduce the negative impacts of bicycle theft by better understanding patterns in bicycle theft and recovery. We analyzed data from a North American survey on bicycle theft conditions and recovery circumstances. Results indicate that the reported stolen bicycles were usually locked (59%), and stolen overnight (41%) from enclosed spaces (28%). 15% of stolen bicycles are recovered. Reporting the stolen bicycle on a variety of channels could increase the chance to recover them.

1. Questions

Bicycles are more likely than cars or motorcycles to be stolen (Kesteren, Mayhew, and Nieuwbeerta 2000), and concerns about bicycle theft are a barrier to people using bicycles, especially for transportation (Poulos et al. 2012; Winters et al. 2011). Reducing bicycle theft is challenged by a lack of data; thefts are chronically underreported and there is no centralized reporting of recovered bicycles. The rise of e-bikes, which tend to be more expensive than other bicycles, is increasing concerns about theft. Understanding of patterns and conditions that lead to bicycle theft and recovery is a first step towards mitigating the negative consequences of theft. In this paper we answer two questions.

- What are patterns in where and when bicycles are stolen?
- What are common circumstances that lead to increased chance that a bicycle will be recovered?

2. Methods

We deployed an online survey to people that had bicycles stolen to understand the conditions that lead to bicycle theft and recovery. Survey participant recruitment was mostly accomplished in partnership with [BikeIndex.org](https://bikeindex.org). [BikeIndex.org](https://bikeindex.org) is a non-profit bicycling registration group that has helped recover more than 13,000 bicycles since 2013. [BikeIndex.org](https://bikeindex.org) emailed over 4000 registrants that had bicycles stolen to invite participation in the survey. We also recruited survey participants through social media and bicycle advocacy organization email listservs. We received 1823 responses from the United States and Canada.

Our survey included questions broadly related to conditions surrounding bicycle thefts and recovery, demographics of bicycle owners, and impacts of theft on ridership (Supplement 1). In order to identify patterns in responses to

questions of bicycle theft and recovery, we use univariate summary statistics. We used cross-tabulation to analyze responses to theft and recovery questions for demographic groups and for quantifying associations between bicycle attributes, theft incidents, and likelihood of recovery.

3. Findings

The majority of bicycle thefts were reported to occur overnight (41%) and morning is the least likely time for thefts to occur (9%). The most common location for bicycle theft was inside a shed or garage (28%). Among these incidents, thefts predominantly took place at night (57%) and the bicycles were often left unlocked (66%). Outdoor bicycle racks were the second most common theft location (18%), typically targeted in the afternoon (40%), and with a high incidence of bicycle locking (95%). When it came to reporting theft incidents, 17% of incidents were reported to the police, 20% were also reported to the registry/recovery system, and 34% were also shared on social media (Supplement 2).

Respondents indicated that 99% of the time entire bicycles were stolen. Most of the time stolen bicycles were locked (59%). Among those who locked their bicycles, cable locks (35%) and U-locks (26%) were the most commonly used locks. The majority of stolen bicycles (46%) had a value of less than \$1000. Hybrid/city/Dutch bicycles and mountain bicycles were the most commonly stolen, with each group accounting for 31% of thefts. E-bikes accounted for 12% of all stolen bicycles (Supplement 3).

We found a low likelihood of recovering stolen bicycles, but a higher percentage than previously reported; 15% as opposed to just 5% (Asgard 2023; Socalcycling 2022). Only 9% of respondents who were unaware of the time at which their bicycle was stolen were able to recover their bicycle, as compared to 15% of those who were aware of the timing of theft. Secondly, 17% of those who reported the theft through three channels - police, social media, and a registry/recovery system - were more likely to retrieve their bicycles. Recovery likelihood decreased to 16% when it was communicated through two channels - the police and the registry/recovery system. Communicating through one channel resulted in 12% recovery when reported to the police and 10% recovery when notified the registry/recovery system (Supplement 4).

Police support and bicycle registration were factors in bicycle recovery. Of recovered bicycles in person police involvement was associated with (39%) recovered bicycles, and an additional 24% were assisted by police via phone/email. Online support was the second most effective means of recovery, with 20% of recovered bicycles benefiting from online support. However, bicycle owners who had registered their bicycles were less likely to retrieve their bicycles through online support (16%) compared to non-registered bicycles (24%). Instead, registered bicycle owners seemed to rely more on police support, with 38% retrieving their registered bicycles in comparison to 32% of non-registered bicycles. It is also possible to recover stolen bicycles by looking at whether

they are being sold online. 27% of recovered bicycles were sold online, most commonly through Facebook in the US (9%) and Kijiji in Canada (8%) (Supplement 4).

Most recovered bicycles were reported to be either rideable (53%) or repairable (38%), and only 7% were salvage or junked. We found that road bicycles are generally returned in rideable condition (67%), while gravel/cyclocross and delivery/cargo bicycles are typically in repairable condition (57%).

A spatial pattern analysis of bicycle thefts and recovery is presented in [Figure 1](#) which displays the distribution of theft records across different cities. The survey findings suggest that the recovery rate of stolen bicycles in the nine reported cities of California, primarily situated in the counties of San Francisco and Los Angeles, is comparatively low; between 5% and 10%. Edmonton, Alberta has the highest percentage of recovery (33%). Calgary is second on the list, also from Alberta. Our analysis of the other questions revealed that in Edmonton and Calgary, police were more involved in recovering stolen bicycles (by finding them or providing assistance) than in other cities. In these two cities, 61% of the stolen bicycles were recovered by police (compared to 27% elsewhere), and 84% of the respondents who recovered their bicycles had some assistance from the police (compared to 58% elsewhere). These findings may be due to efforts made by the authorities and the close collaboration between them and Bike Index in Edmonton (BikeIndex.org 2023; Edmonton Police Service 2023) and Calgary (Calgary Police Service 2023).

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SUPPLEMENTARY MATERIALS

Supplemental Information Tables

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