

Chapter 4

Privacy and Security in Data-Driven Urban Mobility

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ABSTRACT

A wide range of smart mobility technologies are being deployed within urban environment. These technologies generate huge quantities of data, much of them in real-time and at a highly granular scale. Such data about mobility, transport, and citizens can be put to many beneficial uses and, if shared, for uses beyond the system and purposes for which they were generated. Jointly, these data create the evidence base to run mobility services more efficiently, effectively, and sustainably. However, generating, processing, analyzing, sharing, and storing vast amounts of actionable data also raises several concerns and challenges. For example, data privacy, data protection, and data security issues arise from the creation of smart mobility. This chapter highlights the various privacy and security concerns and harms related to the deployment and use of smart mobility technologies and initiatives, and makes suggestions for addressing apprehensions about and harms arising from data privacy, protection, and security issues.

INTRODUCTION

The concept of a data-driven mobility involves an intensive use of information technologies for collecting and processing the information that the city generates using the sensors deployed or other data sources, such as traffic cameras or any other source of unstructured information. At their very core, data-driven mobility utilizes the power of data and connectivity to enable a better functioning environment. Like

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managing traffic lights in line with the street's flow, or introducing a smart parking system. Nevertheless, city-managing mobility is a tough one. The larger the city, the bigger the problem. Though restricting access, such as introducing traffic fees, could have its merits, a future solution may want to focus less on private cars and more on other players in the traffic system. The road, the buildings, the busses and taxi fleets are all part of the same city, the same problem, and could potentially be part of the solution. Thousands of sensors are constantly recording massive amounts of data which can help not only in predicting traffic trends, but also with making emergency events more seamless. Having better functioning public transport can contribute to decreasing congestion and better traffic management on its own. Using big data applications could potentially improve the public transport system with minimal investment. It could help with balancing supply and demand such as by tracking passenger flow and managing the fleet accordingly or provide customized solutions to users, and incentivize or penalize the use of a specific route choice as opposed to another. In this regard, first need to gather, validate, link, and store the data, which is an ongoing challenge for many cities.

Urban mobility technologies generate huge quantities of data, much of them in real-time and at a highly granular scale. These data about cities and their citizens can be put to many beneficial uses and, if shared, for uses beyond the system and purposes for which they were generated. Collectively, these data create the evidence base to run cities more efficiently, productively, sustainably, transparently and fairly. However, generating, processing, analyzing, sharing and storing enormous amounts of actionable data also raise many concerns and challenges.

Key amongst these are the data privacy, data protection, and data security issues that arise from the creation of smart mobility. Many smart mobility technologies capture personally identifiable information (PII) and household level data about citizens – their characteristics, their location and movements, and their activities – link these data together to produce new derived data, and use them to create profiles of people and places and to make decisions about them. As such, there are concerns about what a smart mobility means for people's privacy and what privacy harms might arise from the sharing, analysis and misuse of urban big data. In addition, there are questions as to how secure smart mobility technologies and the data they generate are from hacking and theft and what the implications of a data breach are for citizens. While successful cyberattacks on cities are still relatively rare, smart mobility technologies raise many cybersecurity concerns that require attention.

To date, the approach to these issues has been uncoordinated due to the ad-hoc way they were developed. However, given the potential harms to citizens and the

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