

# 1 Introduction

Every year, millions of pounds of trash are dumped all over American cities and towns. Over the past 36 years in Virginia alone, volunteers have removed approximately 7.1 million pounds of litter (Press Release, 2025). Large trash items, such as mattresses, old tires, and appliances are often dumped in recreational areas, which makes it difficult for visitors to attempt to remove them to an appropriate location. Illegal dumping has also led to about 100,000 marine animal deaths every year (*Effect of Littering*, 2023) and an estimated drop of property values by 7% to 10% in Hampton Roads (*Litter in America*, n.d.). Finally, when the general public witnesses illegal dumping or littering, they are more likely to litter in that area as well (Blouin, 2016).

Current solutions to the problem of illegal dumping are often ineffective in the long term, especially regarding proper resources, communication between people, lack of convenience, and the complexity of the overarching issue. Since the general public may or may not have knowledge of proper disposal methods, this makes it hard for them to know who to contact in order to inform others of illegal dumping. Many volunteer organizations and local governments often struggle with tracking and removing litter from outdoor recreational areas, such as parks, river, lakes, and beaches, which makes it much more costly each year. When trash is encountered by the public, people also lack the proper tools to organize clean-up efforts and often require prior coordination with organizations to maximize efficiency. Due to the lack of convenience, people are unable to immediately communicate with others regarding illegal dumping. Thus, the general public are forced to contact multiple organizations, often through email or social media, just to ensure the problem gets enough attention and is hopefully solved.

The solution to illegal dumping aims to improve the litter clean-up process by developing a mobile app named “TrashTag.” TrashTag would give the public, volunteers, and organizations a way to properly and efficiently report piles of trash and help clean-up cities and recreational areas. The app’s features would include live reporting and mapping; a litter report system; digital rewards; and a verification process to ensure users that the trash was cleaned up or not. The live reporting system would give users the ability to take a picture of the litter with their phone, upload it to the app, and geotag the photo onto a live map of their local area. This system would also allow organizations to properly allocate time, resources, staff, and funding to the clean-up of polluted areas. The litter report system would work in tandem with the mapping system as it would provide users with a visual understanding of the problem and allow them to prepare for proper clean-up. The reward system, named “Litter Hero!”, would be for users who successfully clean up polluted areas from the map; it would also give users a trackable incentive for them to easily measure their impact on the community. Finally, TrashTag would have a verification process to ensure that users can verify if trash is still in a certain area or if it has been cleaned up.

## 2 References

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