



Contents lists available at ScienceDirect

## Waste Management

journal homepage: [www.elsevier.com/locate/wasman](http://www.elsevier.com/locate/wasman)

## Predictors of illegal dumping at charitable collection points

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## ARTICLE INFO

## Article history:

Received 29 August 2017

Revised 22 December 2017

Accepted 28 January 2018

Available online xxx

## Keywords:

Charity

Charitable recyclers

Charitable collection points

Illegal dumping

Unusable donations

Residential waste disposal

## ABSTRACT

Cleaning and disposal of illegal dumping at charitable collection points costs charities and diverts funds from their charitable programs. However, there is no published literature that attempts to better understand this problem. The current study assesses site-specific characteristics, community level indicators and sociodemographic factors as predictors of both charity stores and collection bin dumping in the metropolitan area of Perth, Australia. Multiple regression analyses revealed that higher levels of dumping at stores were predicted by being open on Sundays, the presence of gates/fencing, bringing bins in at night, greater 5-year mobility and lower levels of education and occupation in the area. The analysis also suggests that preventative measures have not necessarily been effective at reducing the amount of illegal dumping at stores. For charity bins, significant predictors of higher levels of dumping included private land ownership, if the site is shared with bins from another charity, the number of bins at the site, the number of days serviced per week, if the bin/s are located at a park/reserve and greater 5-year mobility. These results indicate that there is a combination of site-specific characteristics and community level indicators that play a role in illegal dumping at charitable collection points and indicate the type of interventions which may be successful in reducing illegal dumping. These may include improved maintenance, better placement of bins and signage and collaborations with real estate agents.

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## 1. Introduction

Charitable organisations provide individuals with an environmentally and socially just means of disposing of unwanted household goods, and the revenue from selling reusable donations also funds charitable programs and community projects. Individuals can legally dispose of unwanted items in-store, at donation bins located at stores, and via charity collection bins located in public spaces. However, not all donated items are fit for reuse or recycle and must be disposed of at landfill at the cost to the charitable organisation (National Association of Charitable Recycling Organisations, 2013). In addition to the donations received through appropriate channels, charities must also contend with items that are illegally dumped, that is, items that are placed outside charity stores when the store is closed or outside collection bins. An important distinction for dumping at charitable collection points is that not all items left outside stores or bins are intentionally dumped. There are well-intentioned donors who try to donate items but the store may be closed or the item may not fit in a collection bin and therefore these items are left in front of closed

stores or outside of collection bins which then contributes to the problem of illegal dumping.

When unusable goods are left at charity stores or bins, the cost to charitable organisations is substantial. In Australia, the Salvation Army alone spends approximately \$2 million annually disposing of waste, including that from illegal dumping. It is currently estimated that approximately 40% of waste disposed of by charitable recyclers comes from illegal dumping (National Association of Charitable Recycling Organisations, 2010). The cost of waste disposal that charities incur, which is exacerbated by the amount of illegally dumped materials, diverts funds from charitable programs (Smethurst, 2013).

Despite these consequences, limited research has been conducted to better understand the drivers of illegal dumping at charity collection points. From the research that has been conducted, it appears that community attitudes and increased landfill levies may at least be partly responsible for high levels of illegal dumping. For example, charity organisations report a widespread belief in the community, that it is the role of charities to sort through anything donated and to process any unusable items or materials. Coupled with this is a reported view that charities can dispose of waste for free, therefore making it acceptable to offload waste at charities (New South Wales Environmental Protection Authority, 2015). At the same time, charitable recyclers also report that some

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individuals are simply misguided, in that they donate inappropriate items unintentionally, while others maliciously dump waste with the intent of avoiding the costs associated with appropriate waste disposal.

This third factor is perhaps magnified by the increase in landfill levies which have been introduced by most Australian states and territories to encourage diversion of waste from landfill and encourage investment in alternative waste treatment options (National Association of Charitable Recycling Organisations, 2010). Increases in landfill costs (including landfill tax and landfill gate fee) have been associated with increases in public space dumping in other countries, including England (Liu et al., 2016).

Despite beginning to identify drivers of illegal dumping at charitable collection points, much remains unknown. There may be broader contextual drivers which may influence levels of illegal dumping such as the socio-economic status of the surrounding area or the population density. There may also be site-specific differences in donation collection points that help explain why some sites receive more illegal dumping than others. Therefore, understanding potential drivers requires drawing on evidence from a broader range of literature. In particular, evidence from public space dumping as well as evidence from deviant behaviour literature is useful in outlining a suite of potential drivers.

From a sociological approach, the theory of the ecology of crime by Stark (1987), highlights factors that can contribute to an environment that increases deviant behaviour or crime. These factors include; population density, poverty, mixed land use and population mobility (Stark, 1987), which may help create an environment where there is increased likelihood of behaviours such as dumping. Indeed, public space dumping has been linked social factors such as population density (Jordá-Borrell et al., 2014), percentage of renters in an area (Brandt, 2017), unemployment (Matsumoto and Takeuchi, 2011), and income (Brandt, 2017; Jordá-Borrell et al., 2014).

Areas with greater population density or higher population mobility may have more items for disposal. Either because there are more individuals and families who accumulate items or there are more people moving; both these groups may need to discard more items more frequently. In high mobility areas, both formal and informal sources of social control (the process in which familiarity creates a shared system of social norms and social pressure to conform to order) may be weakened (Brunton-Smith et al., 2014; Stark, 1987). Transience in these areas may reduce levels of community surveillance. Population density can also contribute to this system of norms, in areas that are sparsely populated there are less people to observe behaviours. Again, elements of social control may be weaker. In short, it is likely that elements of population density and mobility may influence the level of dumping experienced by charities, but the direction of this effect is arguable.

An investigation of Social Disorganization Theory through public space dumping found increased dumping rates in areas with a high percentage of renters. Especially those who had to move quickly, leaving inadequate time to properly dispose of items such as furniture (Brandt, 2017). Social Disorganization Theory states that increased rates of crime are often found in communities with high rates of population turnover, cultural and racial heterogeneity, and poverty due to a decreased capacity to monitor and communicate when crime such as illegal dumping arises within a community (Brandt, 2017).

Additionally, characteristics of the land have also been identified as potentially important in understanding illegal dumping. Where residential and commercial land use coexist – i.e. where homes, apartments, retail shops, and light industry are located in close proximity – may provide more opportunity for illegal dumping if there are unoccupied areas or areas that lack traffic and lighting. Mixed-use land also increases familiarity with and easy access

to places offering the opportunity to dump items (Foster et al., 2013; Stark, 1987).

Characteristics of a site can also send signals to users or observers a lack of control and concern about the space and the values and intentions of others that share the space (Brunton-Smith et al., 2014). Areas with more signs of physical and social disorder such as graffiti, vandalism and the presence of teenagers hanging around are more likely to create a perception that crime is a problem and more likely to occur (Brunton-Smith et al., 2014).

As neighbourhoods change, dumping of items at charity stores and collection bins provides an alternative option when other avenues for item disposal may be tightening. For example, reduced or limited number of hard rubbish collections (verge collections) may increase the number and poorer quality of items that are donated. As other options decrease, a cost analysis of waste disposal indicates that illegal dumping is an economically rational decision for some people (Crofts et al., 2010). There is also the reality that as consumption increases so does our need to dispose of more material items. Thus, it is likely that cheap (or free) and easy avenues to fulfil this need will be considered. Crimes are often committed when the perceived benefits or rewards outweigh the costs, in the case of illegal dumping, while legal waste disposal is costly, illegal dumping, especially at charities, is free and unlikely to be punished (Crofts et al., 2010).

Additional local characteristics have also been associated with public space dumping including; shortage of proper waste treatment facilities, landfill regulations, increasing tax rates, fines (Crofts et al., 2010), enforcement power when waste regulation is violated, and price of legitimate dumping (Liu et al., 2016).

Beyond the characteristics of the community, illegal dumping can be described as a situation specific crime, as each 'hotspot' identified is unique not only in its environment but also in its perceived offender (Crofts et al., 2010). Situational crime prevention looks at the intersection of the decision to commit an offence at particular times and places (Brantingham and Brantingham, 1990; Weisburd et al., 2014). Therefore, characteristics of the stores and collection bins sites, such as opening hours, store size, access points, car parking and how often bins are emptied may be important considerations in gaining a deeper understanding of which locations are most prone to dumping.

It is likely that there are different drivers and motivators for illegal dumping at charity stores versus collection bins as these involve different plans and routines. This may be due to convenience factors such as accessibility and parking, as well as where people's 'route' takes them. Environmental characteristics are also likely to differentiate these two types of collection points. While stores are often located in strip shops or shopping centres, collection bins can be in any number of places including parks, carparks, or churches.

A number of interventions have been tried to reduce illegal dumping, whether that be in public spaces or at charitable organisations. Due to the ongoing nature of illegal dumping and increasing cost for charitable organisations, many charities now put in place preventative measures in an effort to combat illegal dumping. Enforcement has been reported to be effective at reducing illegal dumping (both anecdotally and in a number of illegal dumping reports) (Anderson, 2013; New South Wales Department of Environment and Climate Change, 2008). Attempts to discourage leaving items outside stores also include signage that states dumping is illegal and costs charities money. Sensor lighting and fencing have also been implemented at multiple stores. Overall, there is little information thus far on the success of these preventative attempts at charitable organisations and results on the efficacy of the programs are scarce. However, there is some evidence from interventions to reduce public space dumping or other situational specific crimes.

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