

# **Scale and Cost of Litter and Flytipping**

**Scotland**

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# Scale and Cost of Litter and Flytipping

Scotland



# Report For

Scottish Government

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# Executive Summary



Scottish Government is devising a new National Litter and Flytipping Strategy. The current strategy, published in 2014, draws on the data included within a Zero Waste Scotland study that was published in 2013 and is now out of date. To address this, Scottish Government commissioned Eunomia Research & Consulting Ltd. (Eunomia) to undertake research, update the figures, and provide an overview of the scale and cost of litter and flytipping in Scotland. The following report provides an overview of the findings of this research.

The methodology deployed for this study included a combination of both primary and secondary research. Primary research focussed mainly on surveys supplemented by targeted interviews. Secondary research considered relevant, recent grey and published literature. Stakeholders considered within the scope of the study included Local Authorities (LAs), other public bodies with a responsibility to address litter or flytipped waste (e.g., Scottish Canals), other public bodies without that responsibility (e.g., schools), and private bodies.

Despite employing both pre-established and evolving mitigation strategies, the primary risk and setback to the project was the availability of data. Contacting the correct representative from each organisation proved difficult, and even once the correct individual was reached, it quickly became apparent that data were often limited and always inconsistently collected or reported. In addition, the complexities associated with the timing of this research (i.e., during the Covid-19 recovery period), and the challenges with accessing data that could be compared, combined, and assessed, has ultimately impacted the ability of the project team to update the figures.

Despite these challenges, a number of stakeholders were found to go above and beyond the asking to provide narrative and colour to the findings. Furthermore, thanks to the willingness of Scottish Government stakeholders to extend the research period, it was possible to create a good research base from which to draw key conclusions about the evolving nature and issue of litter and flytipping in Scotland. A breakdown of the costs incurred when addressing litter and flytipping in Scotland can be seen in Table 1-1 below.

**Table 1-1: Summary of Costs incurred to address litter and flytipping in Scotland**

	Cost
<b>Local Authority Litter Costs</b>	£48.0m
<b>Local Authority Flytipping Costs</b>	£12.7m
<b>Direct Costs to Other Public and Private Bodies</b>	£20.5m
<b>Indirect Costs</b>	£196.7m

<b>Value of Materials Lost</b>	<b>£416k</b>
<b>Value of Volunteering</b>	<b>£2.5m</b>
<b>TOTAL</b>	<b>£280.8m</b>

As can be seen, the majority of the costs are indirect (£196.7 million), meaning that they are costs incurred as a result of the presence of litter and flytipped waste rather than the costs incurred clearing up. This highlights the breadth of the impacts littering and flytipping can have on Scottish communities, individuals, and businesses.

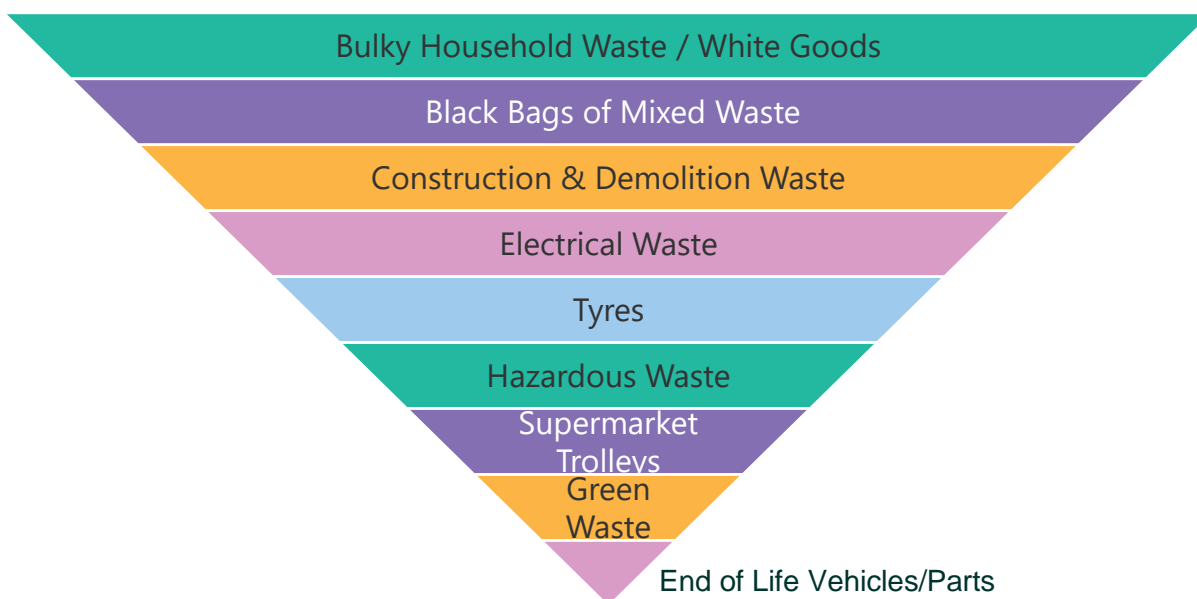
The direct costs to Local Authorities (£48 million on litter, £12.7 million on flytipping) have not been updated due to a lack of sufficient data. Rather, they are the costs reported in the 2013 report, increased to account for inflation and population growth. If Scottish Government wishes to update these figures in the future, a recommended next step is to introduce and mandate a standardised data collection and reporting methodology. Without this, it is expected that the lack of data, as well as data inconsistencies, will continue to prevail, making further studies difficult.

Typically, materials that are littered or flytipped are treated as residual waste once collected. When properly recycled, waste materials can be sold to secondary markets, thus bringing value to the economy. The value of materials lost was calculated using estimates for the tonnages of different materials commonly littered/flytipped and appropriate market values. Overall, the value of material lost in Scotland was found to be £416,320 per annum. It is expected that this loss will increase as greater importance is placed on recycle to enable circular economy/resource efficiency.

Alongside building a picture of the scale and cost of litter and flytipping in Scotland, this report also explored the value of volunteering to clean up litter. A figure of £2.5 million was calculated, although it is expected that this figure is conservative, and the actual value is considerably higher. As previously noted, the representatives consulted to understand the extent of volunteering to address instances of littered and flytipped waste were knowledgeable and helpful and deserve praise and thanks for their contributions to this report and to the wider clean-up efforts. It was apparent that there are many individuals and communities who consistently dedicate time to addressing these issues, and that pride of place is important to many. The value of volunteering calculated includes data obtained via Keep Scotland Beautiful as well as community groups (self-organised and coordinated through LAs).

In addition to the costs of litter and flytipping, the study also considered the most commonly littered and flytipped items. Whilst quantitative data pertaining to exact tonnage were not available, it was possible to identify a hierarchy of the most commonly littered and flytipped items. These hierarchies are shown in

**Figure 1-1. Commonly Flytipped Items**



**Figure 1-2. Commonly Littered Items**



Whilst all data (and the study itself) referenced the 2019/20 financial year, the potential impacts of the Covid-19 pandemic were also considered. It would appear that the pandemic increased the amount of litter and flytipping, although evidence is sparse and inconsistent. Anecdotally, the waste streams saw a shift, with personal protective equipment (PPE) such as masks, gloves, and wipes quickly appearing to be the most commonly littered items. Issues may have been further exacerbated by the closure of household waste and recycling centres (HWRCs) due to stay-at-home orders and staff shortages due to widespread sickness and/or isolation.

Overall, the research concluded that the cost of litter and flytipping in Scotland was £280.8 million. Whilst not possible to directly compare this to the previous report (due to the increase in scope for this report, and the data difficulties faced), it is clear that the breadth and depth of the impact is vast.

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# 1 Introduction, Background & Context

The Scottish Government is devising a new National Litter and Flytipping Strategy. The current National Litter Strategy was published in 2014 and includes an estimate on the cost of litter and flytipping to public bodies in Scotland. This figure is commonly quoted in parliament, as well as in anti-littering and flytipping messaging. The purpose of this study was to update this figure – and other key data points relevant to understanding the scale and cost of litter and flytipping – to reflect the current climate regarding the litter and flytipping situation in Scotland. The Scottish Government has commissioned Eunomia to undertake this research.

In order for this research to develop a holistic and comprehensive cost of litter and flytipping across the entire Scottish economy, the study had a broad scope, encompassing the scale and cost of litter and flytipping experienced and paid for by the following entities:

- The 32 Local Authorities (LAs) in Scotland;
- Other public bodies with a statutory duty to keep land clear of litter (such as the Crown Estate and Scottish Canals);
- Other public bodies without this obligation (such as SEPA or Police Scotland); and
- Private bodies / landowners (e.g., farmers, recreational land, housing associations).

This would require the collection, evaluation, and interpretation of primary data relating to litter and flytipping for the financial year 2019-2020, from LAs, other public bodies, and private bodies. As such, this process was heavily reliant on stakeholder engagement. The financial year 2019-2020 was picked because this is the most recent data available that is unaffected by the impacts of the COVID-19 pandemic on litter and flytipping services, and therefore is most likely to be representative of typical annual costs. In addition to this cost, the research also sought to cover:

- The most commonly littered and flytipped items;
- The value of materials (to the circular economy) lost from litter and flytipping;
- The value of volunteering in clearing litter and flytipping;
- The effect of the COVID-19 pandemic on litter and flytipping; and
- The specific challenges faced by the Scottish Highlands and islands as a result of litter and flytipping.

Whilst the risk of limited engagement was recognised prior to beginning the project and was continually revisited throughout, the mitigation strategies put in place (e.g., drawing on contacts who had previously engaged in a similar study, expanding the pool of stakeholders, using a letter of support from Scottish Government, etc.) were unable to

overcome the research challenges faced, and therefore only a very limited amount of data was able to be collected. Section 2.1.1 explores these research challenges, their causes, their impacts, and then includes a series of recommendations that Scottish Government may wish to consider should they decide to revisit or repeat this research exercise in the future.

## 1.1 Key Definitions

The first step in carrying out this study is to define both litter and flytipping. The Scottish Government's Code of Practice on Litter and Refuse defines the following terms<sup>1</sup>:

- **Litter** is “waste in the wrong place” where individual or a small number of items are thrown down, dropped or deposited in a public place by any person and is left there. Materials that could be considered as litter are wide ranging, including food packaging, drink containers, smoking related materials including cigarette ends, chewing gum, food items, paper and plastic bags; and
- **Flytipping** is the illegal disposal of controlled waste – from a single bag of waste to large quantities of domestic, commercial or construction waste.

Following the definition of litter and flytipping, *litter services* include:

- Litter picking (on the ground, or caught in trees and shrubs);
- Manual street litter sweeping; and
- Picking of dog fouling, chewing gum and sex/drugs/clinical litter.

As was the case in the previous study from 2013, litter placed in bins or associated with gully or road clearance (i.e., mechanical road sweepers) are explicitly excluded for two principal reasons. First, even if no littering occurred, public bins still need to be provided. Similarly, a significant proportion of the material cleared from gullies and roads is naturally occurring, consequently this service would still need to be provided even if no littering took place.

In this report the following distinction is made between direct and indirect costs of litter:

- **Direct costs** of litter are the costs to LAs and other bodies with and without statutory responsibilities of engaging in the clean-up of litter and clearance of flytipping, including treatment/disposal of the associated waste; and
- **Indirect costs** are those costs visited on other actors in the economy (and on nature and wildlife).

Further to direct and indirect costs, a differentiation is made between the “spend” and “cost” related to litter and flytipping. The “spend” refers to the amount currently spent on clearing and disposing of litter and flytipping; whereas “cost” refers to the amount that would need to be spent to clear all littered and flytipped material in the environment.

<sup>1</sup> Scottish Government (2018) *Code of Practice on Litter and Refuse (Scotland) 2018*, <https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2018/05/code-practice-litter-refuse-scotland-2018/documents/00535494-pdf/00535494-pdf/govscot%3Adocument/00535494.pdf>

## 2 Scale and Cost of Litter and Flytipping in Scotland





## 2.1.1 Challenges and Impacts

This section explores the research challenges faced during the project that had a direct impact on the data that was able to be collected from both LAs, and other public and private bodies. This section investigates the potential causes of these, and outlines the complications, limitations, and impacts that they elicited. The challenges faced allowed us to provide recommendations, outlined in the conclusion (section 6) of the report, that Scottish Government may wish to consider should they decide to revisit or repeat this research exercise in the future, further extended in the conclusion of this report. The section primarily focuses on challenges encountered when engaging with LAs as their reporting practices and obligations align closer with those of the Scottish Government than private bodies or smaller public bodies. However, challenges and impacts affected other public and private bodies as well.

It should be noted that the data requests were made during a period of intense demands on LAs – in addition to the process of recovering from the impacts of the Covid-19 pandemic on services, many LAs were undergoing significant changes in organisational structures, personnel, and practices. This meant that there were instances where the officials contacted, and the organisational structures encountered, were different from those that contributed to the original report nearly 10 years ago. This may have impacted the ability of LAs to provide the data requested.

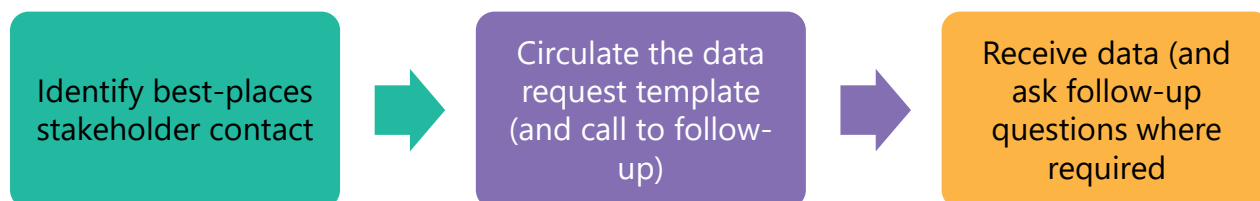
## 2.1.2 Challenges

Updating the figures for the estimated scale and cost of litter and flytipping in Scotland requires recent data gathered from a range of sources (e.g., LAs, other public bodies, private bodies). Recognising that time and resource for the study was finite, it was made clear from the outset that it would not be possible to include data from *all* potential stakeholders. Instead, the objective was to identify enough data points in each stakeholder category to representatively scale the findings to cover all of Scotland. For LAs, this meant initially selecting a subset of the 32 Scottish LAs to target. For private organisations, stakeholders were grouped around relevant themes (e.g., stadiums, festivals, theme parks, and golf clubs were grouped into outdoor recreation), and minimum data requirements established.

Despite concerted efforts to obtain sufficient data from each of these stakeholder groupings, significantly fewer data points were received than was anticipated. It is acknowledged that reaching out to a subset of LAs will have contributed to the limited data collection. An attempt to address this was made by broadening the pool of stakeholders contacted and contacting all LAs instead. Despite this effort, the data received remained fragmented. The availability and quality of this data formed the heart of the challenges faced in pursuit of the study's research aims.

The methodology used for obtaining data typically followed the process flow outlined in Figure 2-1.

**Figure 2-1. General process for obtaining data**



There were challenges at each stage of this process. The following sections provide an overview of the challenges and potential underpinning reasons for their occurrence. This assessment is primarily judgement-based although in some instances the suggestions have been corroborated by stakeholders.

1. **Low Response Rate** - The most prevalent challenge encountered was the widespread low engagement rate from the stakeholders contacted. This challenge was faced when contacting LAs, other public bodies, and private bodies.

Several of the LAs contacted did not respond, and only two full and six partial data responses were received. Despite attaching a Letter of Support to all stakeholders, the number of responses from contacts with regards to the provision of the data requested was low. Where responses were received but data were not, reasons included:

- Lack of available time for LA representatives to extract the data required. This was likely exacerbated by the timing of the research, which occurred during the pandemic recovery and therefore at a point where LA resources were already stretched;
- Inability to locate all the required data given the disparate nature of where or how it was recorded and stored; and
- Different department structures as well as differing responsibilities both amongst and between LAs, other public bodies, and private organisations meant that it was difficult to identify the most suitable stakeholder to provide data. In addition, contact information was not often readily available, and sourcing contact details was a time-consuming process. Furthermore, where individuals were identified through online research, reaching the correct person first time was rare. Therefore, the request was often passed on internally, sometimes multiple times, which further delayed the response.
- Lack of available time for LA representatives to extract the data required (likely exacerbated by the timing of the research occurring during the pandemic recovery, which stretched LA resources).

This low response rate was also experienced when reaching out to other public and private bodies – for instance, no responses were received from stakeholders responsible for litter and flytipping in woodlands or farmlands, roads or canals, nurseries, or private schools.

2. **Availability of the Data** - A significant proportion of the stakeholders that did respond expressed that they did not, as standard, collect the data that was

requested. For many bodies, there is no requirement to gather and record these data and is therefore not common practice. Additionally, if similar data were recorded, they did not always fit the questions that were asked. For LAs, more specific reasons were given. Some stated that they did not apportion costs into individual services and instead tracked expenditure at a less granular level. Here, they deemed the quantity and detail of the data requested to be overly complex to interpret, translate, and align with the spend categories they maintained oversight of. Others stated that the data requested was cross-departmental and therefore could not be compiled easily (and was not the responsibility of one individual, which also complicated accessing the data).

In general, quantitative data on costs relating to litter and flytipping were scarce – the partial responses from LAs only contained data relating to certain areas (budget, expenditure, staff, education, enforcement, disposal). Other LAs provided only high-level figures for overarching services that included litter and flytipping, or qualitative observations on scale. This was also encountered when reaching out to other public and private bodies, as the costs for litter and flytipping were mostly encompassed within an overall spend on cleansing the premises of the organisation, and data on the scale of litter and flytipping mostly consisted of high-level qualitative observations.

- 3. Inconsistencies in Data Collection** – There does not appear to be a standard data collection format for information pertaining to litter and flytipping. This appears to be true even within organisations with a statutory responsibility to collect litter and flytipping. The variation in structures of LA departments meant that the collection methods and format of data received varied widely between LAs (for instance, in where different costs are apportioned). This meant that breaking down these high-level costs was challenging, and often deemed impossible within the project timeframe. Similarly, many other public and private bodies referred to different and sometimes incomparable units (e.g., minutes, shifts, percentages, tonnages, quarters, volunteer hours, GBP spent). As a result, comparing, compiling, and extrapolating the data had to be built on assumptions to convert into common units (e.g., the tonnage of flytipped waste within ‘one truckload’).

## 2.1.3 Impacts

The lack of usable data restricted the analysis by limiting the extent to which the data could be scaled to represent all of Scotland in the model. Consequently, the applicability of any conclusions and the degree to which the data could be used to shape evidence-driven and impactful policy decisions were limited.

### 2.1.3.1 Modelling and Analysis

The lack of comprehensive and representative quantitative data meant that the modelling was dependent on assumptions from former research to split out broad costs into litter and flytipping. Population data were also relied upon as a proxy to scale up (mostly incomplete) costs from the 6 contributing LAs to be representative of Scotland. Though population is suitable as a broad indicator of litter and flytipped waste generated, this extrapolation limited the robustness of the final cost figures as they were not directly calculated. The scaling of the 6 LAs to represent national data was also less

robust than desired as it obscured any trends in litter and flytipping between urban and rural LAs, which would have been a valuable outcome of the research.

### 2.1.3.2 Robustness of Results and Conclusions

The limited data received and analysed for this research fundamentally restricted the conclusions that could be drawn. Though the figures calculated were evidence-based, they are unable to capture the heterogeneity of the scale and cost of litter and flytipping experienced around Scotland. The total figures are drawn from too small a sample of results, which render the results unrepresentative and make the degree of error larger than can be considered acceptable for conclusions to be drawn.

The limited data received also restricted the analysis that could be completed across other research questions:

- **Indirect costs.** The calculation of the indirect costs was reliant on receiving qualitative data from stakeholders on the indirect impacts of litter and flytipping. Due to the difficulty in getting stakeholders to respond, the information received regarding this was limited.
- **Impact on highlands and islands.** This research also included specific consideration on how litter and flytipping are experienced in Scotland's remote highlands and islands. As with the other LAs, little quantitative data was received from the relevant LAs to these regions, though some qualitative observations were shared.

## 2.2 Scale of Litter and Flytipping and Cost to Local Authorities

Due to the challenges with collecting data outlined in section 2.1.1, the methodology that was initially planned to carry out the study and calculate the scale and cost of litter and flytipping to LAs in Scotland unfortunately had to be changed. This section of the report is structured as follows: section 2.2.1 outlines the methodology that was initially planned to conduct the study, section 2.2.2 points to the challenges faced in the data collection process, section 2.2.3 then outlines the low response rate, and finally section 0 outlines the final methodology that had to be used instead, and the respective results.

### 2.2.1 Methodology

The first stage of the initial methodology involved collecting primary data from a selection of LA representatives. These representatives were asked questions, through both surveys and interviews, pertaining to a variety of cost, spend, scale, and composition components related to litter and flytipping. Then, the data obtained would be used as a basis to extrapolate to a national level through population and geographic (i.e., rural, urban, mixed) data, to calculate the national cost of litter and flytipping to LAs in Scotland.

### 2.2.1.1 Local Authority Selection

Initially, a subset of LAs was selected to collect data on scale and cost of litter and flytipping for this study. Data from these Authorities would then be used to extrapolate to Scotland as a whole, using a series of assumptions outlined below. This list featured the 13 LAs who had provided complete datasets in the 2013 study. These LAs, shown in Table 2-1, were determined to be significantly diverse based on their geographic spread (including Highlands and islands) and urban/rural classification.<sup>2</sup> The Highlands and Scottish Islands were selected for their distinct topographical characteristic that are expected to leave them facing specific and unique challenges in relation to littering and flytipping compared to other regions, including the distribution of these activities and the costs to address them.

Finally, population data for the LAs, in combination with the classifications in Table 2-1, were to be used as a scaling method to extrapolate the data gathered from the LAs to Scotland at a national level.<sup>3</sup> It was to be assumed that LAs of the same classification would have tonnages and costs related to litter and flytipping which scaled with their overall population.

**Table 2-1: A list of Local Authorities contacted for data collection.**

Urban	Rural	Mixed	Highlands/Islands
<ul style="list-style-type: none"> <li>• City of Edinburgh</li> <li>• Falkirk</li> <li>• North Lanarkshire</li> </ul>	<ul style="list-style-type: none"> <li>• Aberdeenshire</li> <li>• Argyll &amp; Bute</li> <li>• Dumfries and Galloway</li> </ul>	<ul style="list-style-type: none"> <li>• East Renfrewshire</li> <li>• East Lothian</li> <li>• Fife</li> <li>• Stirling</li> <li>• West Lothian</li> </ul>	<ul style="list-style-type: none"> <li>• Council of the Western Isles</li> <li>• Highlands</li> </ul>

### 2.2.1.2 Expansion to All Local Authorities

Both a low response rate and difficulties in collecting enough robust data from the 13 LAs contacted (outlined in section 2.2.1.2) led to only 1 set of full data and 5 sets of partial data being collected. Given this outcome, the decision was made to expand the scope of the study and contact the remaining LAs in Scotland with the hope of improving the response rate and collecting a fuller set of data that could be used to calculate the overall cost and scale of litter and flytipping (still with the respective assumptions and extrapolation methods). The following section 2.2.1.3 outlines the survey that was sent to all 32 LAs in Scotland. It is important to note that following an initial round of data collection, the survey was simplified to a less complex survey with less detailed cost splits with the aim of increasing the response rate and data coverage.

<sup>2</sup> Defined by Audit Scotland and obtained from: SEPA and Natural Scotland (2012) *Waste Data Digest 12: Key Facts and Trends*

<sup>3</sup> National Records of Scotland (2020) *Mid-2019 Population Estimates Scotland*, <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates/mid-2019>

### 2.2.1.3 Survey

A survey with a combination of quantitative and qualitative questions was developed and sent to appropriate contacts at the Scottish LAs. The primary data received was used as a basis for the data analysis. To make the study as representative as possible, the requested costs were for the 2019 financial year, eliminating the potentially significant variations in costs as a result of changes and disruptions caused by the COVID-19 pandemic.

The survey was split into three sections. The first section sought to determine the direct costs associated with littering and flytipping incurred by LAs. This section was further split into the following categories, which were considered the scope of the direct costs to LAs in this study:

- **Clearing and disposing of litter and flytipped materials.** Including;
  - **Personnel costs** – The cost associated with human resources directly involved in clearance, as well as administrative and management personnel;
  - **Equipment costs** – The cost associated with equipment used and required for clearing purposes, including uniforms and non-mechanical equipment such as bags, orderly carts and litter pickers;
  - **Fleet costs** – The costs associated with vehicles involved in collecting litter and flytipping, including for staff supervision, and fuel and maintenance costs;
  - **Facilities** – The costs associated with depots, park-ups and vehicle maintenance workshops used for vehicles utilised in litter and flytipping services;
  - **Disposal** – The cost associated with the disposal of flytipped material (the cost of disposal of ground litter is not deemed additional for the LA); and
  - **Other** – The cost associated with miscellaneous items or services provided by LAs.
- **Indirect costs with an internal impact** – The costs indirectly related to littering and flytipping that are incurred by the LAs. For example, a member of the local waste collection service injuring themselves whilst carrying out their duties and subsequently unable to work;
- **Enforcement costs** – The costs associated with enforcing flytipping and littering laws, accounting for the income from doing so; and
- **Education cost** – The cost associated with activities surrounding raising awareness of the issues associated with littering and flytipping, and funding any required behaviour change campaigns.

The second section asked a series of questions regarding the most commonly littered and flytipped items. Finally, the third section focused on the impact of the COVID-19 pandemic on the scale, composition, and distribution of litter and flytipping.

### 2.2.1.4 Interviews

Interviews were used to supplement the data received through the questionnaires. This approach afforded LAs the opportunity to provide further details surrounding the narrative and contextual understanding of some of the specific challenges they faced. This was particularly important when considering the Highlands and Islands authorities, as this study sought to gain insight into the unique challenges faced by these areas.

### 2.2.1.5 Costs of Littering and Flytipping

The costs associated with addressing instances of littering and flytipping were split into five categories:

1. **Personnel** - Personnel costs were divided into frontline staff, management resources, administrative resources, and central resources. LAs either provided full-time equivalent (FTE) hours spent, full cost of resources including pensions and insurance, or both. Where available, the full cost of resources was used. Some LAs also provided an estimate of the percentage of FTE time spent addressing flytipping instances, carrying out litter picking, or conducting other litter-related activities. Where available, this information was used to calculate the personnel costs for addressing littering and flytipping more accurately:

*Littering & flytipping personnel costs = FTE cost × percentage time spent addressing littering & flytipping*

It should be noted that, as not all authorities provided full personnel data relating to the four main requested categories, not all data provided is comparable on a per LA basis.

2. **Equipment** - Surveyed authorities were requested to provide details of equipment costs relating to the clean-up of litter and flytipping. This included costs relating to uniforms, personal protective equipment (PPE) and other non-mechanical equipment, etc. Authorities were asked to exclude bin costs from this data as this were considered out of scope (bins are considered external to the cost of littering). Authorities who provided a response to this category generally did not have this degree of granularity and grouped uniforms and PPE into one revenue cost.
3. **Fleet** - Each surveyed authority was asked for their fleet costs (including fuel and maintenance) relating to clean-up and excluding street-sweeping vehicles which were determined to be primarily used for non-litter purposes. Additionally, each LA was asked to allocate the split between litter and flytipping that each vehicle was used for. This was used to apportion total costs.

Most authorities were unable to provide this information, and those who did typically provided broader costs regarding their entire waste management fleet. Here, cost was apportioned based on the vehicles known to be used to address litter and flytipping as a percentage of the overall number of vehicles. If possible, this was then broken down into the proportion of time spent addressing litter vs. flytipping.

4. **Facilities** - Information regarding waste related facilities and the ongoing costs of running these facilities was also requested. Facility costs include the costs associated with depots, park-ups and vehicle maintenance workshops used for vehicles utilised in litter and flytipping services. These are either authority owned facilities or more commonly, facilities leased by the LA. Most authorities were unable to provide facility costs citing difficulties in gathering these costs from other departments.

5. **Other** - In addition to being asked questions related to the aforementioned categories, LAs were also asked to consider ‘other’ costs they may incur. In general, where councils provided costs for non-primary departments, as these were not further defined, they were included within the ‘other’ category. This included:

- Costs associated with litter reporting. These were accounted for under the ‘other’ category, namely Local Environmental Audit and Management System (LEAMS) and the Cleanliness Index Monitoring System (CIMS). The LEAMS approach standardises the recording of the presence of litter. Whilst it takes other environmental indicators (e.g., flytipping) into account, its primary focus is on litter, therefore all LEAMS related costs were apportioned entirely to litter.
- Additionally, the Highlands Local Authority funds a Ranger service who provided information regarding the resources they spend on removing litter in a typical 6-month period. This was included in the ‘other’ category as it was supplied separately to the response from the Highlands Local Authority with respect to their personnel costs.

## 2.2.2 Challenges

The challenges faced in the data collection process include a low response rate, poor data availability and inconsistencies in data collection. Section 2.1.2 outlines these challenges in detail, as well as the impacts these had on the study.

## 2.2.3 Response rate

Overall, only two LAs (City of Edinburgh and Inverclyde Councils) provided a full set of cost data, covering all the requested categories. A further six authorities provided partial data, and the remaining 24 provided none or minimal data. The reason cited by most LAs as to why they were not able to provide substantial data was that the data was not readily available, cross-departmental, and/or would take considerable efforts to source. Others had difficulty in apportioning departmental costs as their council did not record flytipping, litter, and street sweeping costs as separate expenditures. Some authorities provided brief responses and mentioned that they did not have the data or resources needed to acquire the data requested. Table 2-2 below summarises the state of play with data availability in Scottish LAs.

**Table 2-2: A summary of the data received by contacted Local Authorities**

Full data <sup>4</sup>	Partial data <sup>5</sup>	None/minimal data <sup>6</sup>
<ul style="list-style-type: none"> <li>• The City of Edinburgh</li> <li>• Inverclyde</li> </ul>	<ul style="list-style-type: none"> <li>• East Lothian</li> <li>• Fife</li> <li>• Highland</li> <li>• Orkney Island</li> </ul>	<ul style="list-style-type: none"> <li>• Aberdeen City</li> <li>• Aberdeenshire</li> <li>• Angus</li> <li>• Argyll &amp; Bute</li> <li>• Clackmannanshire</li> </ul>

<sup>4</sup> Full data – Authority provided at least 1 data point for each of the cost categories requested.

<sup>5</sup> Partial data – Authority provided at least 1 data point for some of the cost categories requested.

<sup>6</sup> None/minimal data – Local authority provided data for none of the cost categories requested (e.g., Authorities that provided just 1 data point on the number of flytipping incidents or an overall expenditure on waste services without a break down)



- South Lanarkshire
- West Lothian
- Council of Western Isles
- Dumfries and Galloway
- Dundee City
- East Ayrshire
- East Dunbartonshire
- East Renfrewshire
- Falkirk
- Glasgow City
- Midlothian
- Moray
- North Ayrshire
- North Lanarkshire
- Perth & Kinross
- Renfrewshire
- Scottish Borders
- Shetland Islands
- South Ayrshire
- Stirling
- West Dunbartonshire Council

## 2.2.4 Summary of Collected Data

Table 2-3 and Table 2-4 presents a summary of the data collected on litter and flytipping costs from the eight LAs who provided either partial or full data. The data has not been attributed to specific LAs for the purposes of anonymity but is intended to give an idea of the costs being faced by different LAs, and the data coverage achieved.

**Table 2-3: Summary of data collected on littering costs to LAs**

	Total	People	Education	Enforcement	Equipment	Fleet	Facilities	Other Costs
LA 1		£4,910,347	£236,500	£343,200	£58,617	£625,081	£406,122	£42,018
LA 2		£2,743,243						
LA 3		£2,070,000			£50,000	£470,000	£100,000	
LA 4		£906,000						£41,164
LA 5		£131,876	£0	£0	£3,216	£131,876	£54,680	
LA 6		£340,079						
LA 7		£4,758,267			£121,130	£1,545,110		
LA 8	£2,117,105							

**Table 2-4: Summary of data collected on flytipping costs to LAs**

	Total	People	Education	Enforcement	Equipment	Fleet	Facilities	Other Costs
LA 1		£846,612	£172,500	£800,800	£10,106	£149,853	£339,368	£5,882
LA 2		£783,784		£5,094				
LA 3		£517,500			£20,000	£20,000	£5,000	
LA 4		£120,800						
LA 5		£3,435						
LA 6	£203,321							

## 2.2.5 Final methodology and results

### 2.2.5.1 Final methodology

Due to the data collection challenges outlined in 2.1.2, unfortunately both the number of responses received, and the amount of data collected (outlined in section 2.2.4), was not enough to be able to scale this data to update the total cost of litter and flytipping in Scotland for the year 2019/2020.

Instead, as a temporary solution, before better and more widespread data is able to be collected, the total cost of litter and flytipping for 2019/2020 was calculated by taking the 2012/2013 costs as a basis, and then doing the following adjustments:

1. Adjusting these upwards for the seven years of inflation between 2012/2013 and 2019/2020. The inflation figures were taken from the ONS<sup>7</sup> and are outlined in Table 2-5 below:

**Table 2-5: UK annual inflation rates**

Year	Annual inflation
2013	2.30%
2014	1.50%
2015	0.40%
2016	1.00%
2017	2.60%
2018	2.30%
2019	1.70%
<b>Compounded inflation over 7 years (2013-2019)</b>	<b>12.39%</b>

The compounded (aggregate) inflation rate of 12.39% means that the cost of £1 in 2012/2013 would cost £1.12 in 2019/2020.

2. Following the adjustment for inflation, adjusting this figure upwards further by factoring in the population growth in Scotland between 2012/2013 and 2019/2020, which according to ONS<sup>8</sup>, is 2.82%.

<sup>7</sup> ONS (2022) CPIH ANNUAL RATE, <https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/l55o/mm23>

<sup>8</sup> ONS (2022) Scotland population mid-year estimate, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/timeseries/scpop/pop>

### 2.2.5.2 Overall Cost of Litter

With the 2012/2013 costs adjusted upwards for inflation and population, the total cost of litter across all Scottish LAs in 2019/2020 is estimated to be £48,033,069 per year and are summarised in Table 2-6. The direct costs accounted for £41,869,595 and the additional costs accounted for £6,163,474. The total cost of litter was split into the categories outlined in section 2.2.1.3 using the same splits as in the 2013 study, given that the 2019/2020 data gathered from the select few LAs was not enough to support a different split of costs between the different components. Therefore, as in the previous study, personnel costs are the largest contributor to overall costs (£32,240,582, 67%). Enforcement costs were the second largest cost component (£5,224,629, 11%), followed by fleet costs (£5,016,674, 10%), equipment costs (£2,680,210, 6%), other costs (£1,242,915, 3%), education costs (£938,845, 2%), and facilities costs (£689,214, 1%).

It is important to note using these figures carry a large degree of uncertainty as they assume the costs have remained the same when compared to 7 years ago, except for the adjustment for inflation and population growth in the 7 years period.

**Table 2-6: A summary of overall costs of littering split by components**

Cost Type	Component	Cost (£)	Percentage of total (%)
Direct Cost	Personnel	£32,240,582	67%
	Equipment	£2,680,210	6%
	Fleet	£5,016,674	10%
	Facilities	£689,214	1%
	Disposal	N/A	N/A
	Other Costs	£1,242,915	3%
Additional Cost	Education	£938,845	2%
	Enforcement	£5,224,629	11%
<b>Total</b>		<b>£48,033,069</b>	

The cost of disposal was excluded from the total cost of littering as it is expected that Authorities would incur this cost regardless of whether it was gathered from bins or as litter on the ground.

The additional costs with an internal impact were not quantified as LAs had limited knowledge of the number and severity of such incidents and did not have a way of evaluating these. It is likely that at least some of this cost will be accounted for in the overall indirect costs section (see Section 2.4).

### 2.2.5.3 Overall Cost of Flytipping

With the 2012/2013 costs adjusted upwards for inflation and population, the total costs of flytipping incurred by Scottish LAs in 2019/2020 is estimated to be £12,331,616 and is summarised in Table 2-7. The total cost of flytipping was split into the categories outlined in section 2.2.1.3 using the same splits as in the 2013 study, given that the 2019/2020 data gathered from the select few LAs was not enough to support a different split of costs between the different components. Therefore, as in the previous study, the largest contributor was found to be personnel costs (£6,019,907, 47%). The second largest was related to enforcement (£2,355,413, 19%), followed by disposal (£2,281,575, 18%), fleet (£1,067,446, 8%), equipment (£538,842, 5%), facilities (£240,392, 2%), other costs (£69,780, 1%) and education (£60,679, 0.5%).

**Table 2-7: A summary of overall costs of flytipping split by components**

Cost Type	Component	Cost (£)	Percentage of total (%)
Direct Cost	Personnel	£6,019,907	47%
	Equipment	£583,842	5%
	Fleet	£1,067,446	8%
	Facilities	£240,392	2%
	Disposal	£2,281,575	18%
	Other Costs	£69,780	1%
Additional Cost	Education	£60,679	0.5%
	Enforcement	£2,355,413	19%
<b>Total</b>		<b>£12,679,034</b>	

### 2.2.5.4 Scale of Litter

As was the case in the 2013 study, LAs generally did not have clear indications of the tonnages of litter or flytipped material which they disposed of. Only one LA (North Lanarkshire) provided data for their estimated litter tonnage. Therefore, ground litter tonnages have been estimated using data from Waste Data Flow (WDF) for the year

2019, where 27 of the 32 LAs provided data under “Street Cleaning”. This data was used as a proxy as it is likely an underrepresentation of overall litter tonnages.

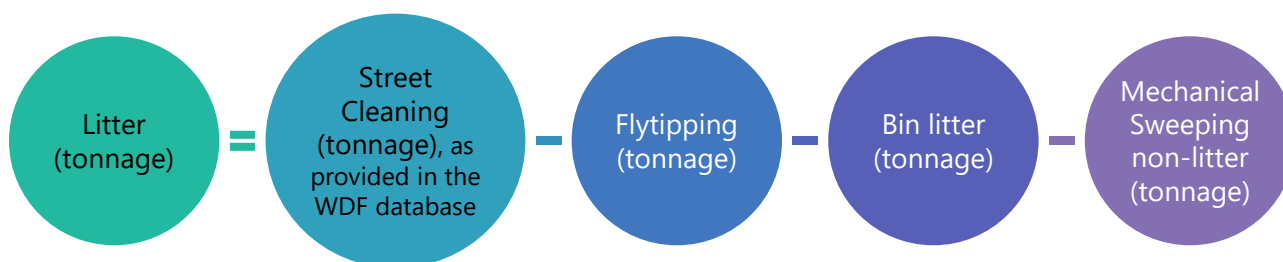
Therefore, it has been considered a conservative estimate. For the five authorities who did not report this data for 2019, the values were estimated by extrapolating based on authority classification (urban/rural and mixed) and their respective population. For example, the ground litter tonnage of a rural LA with a population of 85,430 that did not provide data under Street Cleaning would be calculated by multiplying 85,430 by 0.008 (which is the per capita average for a rural LA).

To calculate litter tonnages, the same methodology implemented in the 2013 ZWS study<sup>9</sup> was used, with the starting point being the “Street Cleaning” tonnage, as provided in the WDF database. To account for the fact that LAs aggregate several data categories into one overall “Street Cleaning” tonnage figure (which is what they report), and to exclude certain data categories that are not considered litter in this study, the following data points were subtracted from this overall Street Cleaning figure to find the true litter tonnage figure:

- **Flytipping** – Several LAs highlighted that a significant proportion of flytipped waste was aggregated with the Street Cleaning data reported in WDF. Where this was the case, the estimated tonnage of flytipping was subtracted from the Street Cleaning data point.
- **Bin litter** – a percentage of reported tonnage was also removed to account for the bin litter. For the authorities who did not participate in the survey or interview process, the percentage of ground litter was again assumed to be the same as in the previous study.<sup>10</sup>
- **Mechanical sweeping** – Mechanical sweeping collects organic materials (e.g., leaves) alongside litter. To calculate the overall litter tonnage, any materials recovered during sweeping that are **not** litter must be excluded from the total. Due to the limited data received from LAs through the survey, the values used in the 2013 report have been used. There, non-recyclable (i.e., non-litter) materials were assumed to account for 60% of the overall material gathered.

The equation in Figure 2-2 represents the method used to calculate the litter tonnages for each authority, which were then summed to calculate a total litter tonnage for Scotland.

**Figure 2-2: Methodology for the calculation of litter tonnage**



<sup>9</sup> Zero Waste Scotland (2013) *Quantifying Direct Costs of Litter to Scottish Local Authorities and other Duty Bodies*

<sup>10</sup> *ibid*

A summary of the results is shown in Table 2-8. Using the equation above, the total litter tonnage was calculated to be 22,246 tonnes at a recycling rate of 40% for mechanical street sweeping, and 15,176 tonnes assuming no mechanical street sweeping material was recycled. This equates to an average of 18,711 tonnes.

**Table 2-8: Estimated tonnages of litter in Scotland**

Litter tonnage at 0% mechanical street sweeping recycled	Litter tonnage at 40% mechanical street sweeping recycled	Average litter tonnage
15,176	22,246	18,711

### 2.2.5.5 Scale of Flytipping

An average weight per flytipping incident was calculated using data from the WDF database, data from Flymapper, and survey responses. Where survey responses were available, the inclusion of these data were prioritised. Where survey responses were not available, the data were supplemented with Flymapper and WDF. The results are shown in Table 2-9. The figure calculated, 0.404 tonnes per incident, is comparable to the 0.437 tonnes calculated in the previous study.<sup>11</sup> However, the significant variation on a per authority average must be noted. The figures ranged from 0.053 to 1.264 tonnes per incident. This indicates significant uncertainty in the data provided by LAs both through WDF and interviews. Whilst in most cases LAs only provided the number of flytipping incidents, several also had total tonnages which were reported in the WDF database.

The number of flytipping incidents for each LA were compiled from the following data sources in order of priority (based on availability) for consistency:

1. Waste Data Flow (WDF) 2019 data;
2. Data provided by LAs through surveys and interviews;
3. Extrapolation of data on a per capita basis through LA groupings of urban, rural and mixed.

Using the method above the total number of incidents for all authorities was estimated to be at 66,159 incidents, an increase of 8.0% relative to the figure of 61,277 in 2011.

**Table 2-9: Estimated tonnages of flytipping in Scotland**

Number of flytipping incidents in Scotland	Tonnage per flytipping Incident	Tonnage of all flytipping incidents
66,159	0.404	26,739

<sup>11</sup> Zero Waste Scotland (2013) *Quantifying Direct Costs of Litter to Scottish Local Authorities and other Duty Bodies*

## 2.2.6 Considerations for Islands and Remote Locations

Due to their rurality relative to the other authorities within Scotland – with corresponding variations in population density and availability of waste management services, which impact litter and flytipping – this study included specific consideration of the litter and flytipping challenges experienced by Highland and island areas of Scotland.

The Highlands and Islands is a broad term for the regions in northern Scotland encompassing the Scottish Highlands and the Western Isles. The Highlands Council is the administrative body for much of the Highlands, with the respective councils of Orkney, Shetland and Comhairle nan Eilean Siar (Western Isles) governing Scotland's main islands. Some other LAs also include Highlands areas.<sup>12</sup>

Though the data collected from these Authorities was limited, it is nevertheless evident that the scale and cost of litter and flytipping varies compared to within other locales in Scotland. Evidence from island Authorities suggested that litter and flytipping are not overly prevalent. Orkney Council stated that they do have a small budget for litter (relative to their other areas of spend), but that the Council do not generally perceive it to be a problem. Shetland Council reported that litter is insignificant and that, with only six incidents of fly-tipping reported in 2021, flytipping is not a notable drain of council resources nor a noteworthy environmental issue.

Volunteers on the Isle of Skye observed that the quantity of litter experienced on the island appeared to vary according to the volume of tourists visiting. This trend was also noted by the Highland Council, who stated that an increase in visitor numbers – though welcomed in bringing tourism to the region – led to additional challenges regarding increased instances of littering and flytipping. Whilst these observations were largely anecdotal and cannot be considered conclusive, it should be noted that the location of the worst affected areas (popular walking spots, car parks) suggests that littering tends to occur during recreational activities. Specific types of littering that were identified as challenges by Highlands and islands include:

- Litter being thrown out of cars and into roadsides and lay-bys;
- Campers and caravan waste disposal;
- Flytipping of camping equipment; and
- Left food and drink waste and barbecues.

Beach litter was also mentioned by research participants as a persistent issue along coastlines of island authorities. Though beach and marine litter are out of scope of this research, it is worth noting that beaches tend to be hotspots of litter and flytipping in island authorities.

<sup>12</sup> Aberdeenshire, Angus, Argyll and Bute, Moray, North Ayrshire, Perth and Kinross, Stirling, and West Dunbartonshire



Members of the Highland Council and of volunteer groups across the Highlands outlined that the rurality of the council area renders frequent clearing services uneconomic to run. Despite covering some of the largest areas of any LA, population density is extremely low. The distance from operational depots to littering incidents in rural Highland locations means that council monitoring and clearing of litter and flytipping is expensive, as travelling to these locations is time-consuming and there is little opportunity to implement operational efficiencies.

Moreover, schemes to prevent or prosecute fly-tippers do not have the required resources (in terms of persons and vehicles required to clear flytipped waste) to cover the whole area. Orkney Council outlined how when flytipping is reported on outer islands, it is challenging to arrange the necessary travel to clear it, as many of these very remote locations are difficult to access and require travel by boat.

## 2.3 Scale and Cost of Litter and Flytipping to Public and Private Bodies

This section outlines the scale and cost of litter and flytipping to public and private bodies. The focus of the section has been on the cost of litter, rather than flytipping, as the majority of the bodies contacted experienced issues with, and therefore incurred costs from, litter but not flytipping. Section 2.3.1 outlines the methodology used to estimate the cost of litter, including how the public and private bodies were selected, how they were contacted (through surveys and direct calls), what assumptions were used, and how the individual data points collected were scaled up to estimate overall national figures. Section 2.3.2 then outlines the results of the direct cost of littering, and section 2.3.3 outlines the results of the scale and direct cost of flytipping, for those few bodies who did report issues with flytipping.

### 2.3.1 Methodology

#### 2.3.1.1 Public and Private Bodies Selection

Outside of LAs, the tender identified three categories of organisations to be included in the study, each with different obligations and impacts from litter and flytipping:

- Public bodies with a statutory requirement to address litter;
- Public bodies without a statutory requirement to address litter; and
- Private bodies.

Public Bodies with a statutory requirement are obligated to address litter and flytipping around their premises. It was therefore expected that these organisations would have information and data on the scale and cost of litter and flytipping. Public bodies without

a statutory requirement to address litter and flytipping, on the other hand, were less likely to collect data as they were expected to be more heavily reliant on LA services to clear any litter and flytipped items outside their premises. However, some may take it upon themselves to clear it.

Littering and flytipping that occurs on private land is the responsibility of the landowner to clear. Therefore, it can be assumed that these private bodies would incur costs in clearing litter and flytipping. However, if the litter and flytipping occurs outside their premises, they may either deal with it themselves or leave it for the LA to clear as part of their street cleansing services.

Whilst it was acknowledged that these three groups were distinct from one another (and could therefore incur different costs and have different access to data), the chosen approach to primary data gathering was consistent across all (see section 2.3.1.2).

The selection of organisations started with an internal brainstorming session at Eunomia to work out the different categories and sub-categories of organisations who may both be 1) impacted by litter and flytipping, and 2) likely to collect data on litter and flytipping. Task 1 of the brainstorming session involved brainstorming the types of organisations likely to experience litter and flytipping. Task 2 involved grouping these organisations together into similar groups. Task 3 involved plotting these groups on a matrix of expected relative scale of litter/flytipping vs. expected availability of data. Organisations who were deemed to be extremely unlikely to hold any data or information on litter and flytipping, or who were likely not affected by litter, were removed. From this exercise, 9 main categories and 31 sub-categories of stakeholders were identified (see Table 2-10).

**Table 2-10: Categories and Sub-Categories of Stakeholders**

<b>Category</b>	<b>Sub-Category</b>
<b>Food</b>	<b>Take away and fast food</b>
Nature based attractions	National parks
	Holiday parks
	Country parks
	Woodlands
	Farmlands
	The Crown Estate
Night-time economy	Nightclubs
	Pubs and bars
Retail/ commercial	Supermarkets
	Shopping malls/ retail parks
	Business parks
Transport hubs	Ports
	Train and coach stations
	Airport
Transport infrastructure	Railways

	Roads
	Waterways
Education facilities	Universities
	Primary Schools
	Secondary Schools
Indoor recreation	Cinemas
	Theatres
	Aquariums & zoos
	Museums & historical sites
Outdoor recreation	Stadiums
	Sports grounds
	Golf courses
	Car parks
	Theme parks
	Music Festivals
<b>9 categories</b>	<b>31 sub-categories</b>

Following this and as required, many of the 31 sub-categories of stakeholders were further divided into groupings to ensure more representative and adequate coverage of data. For example, for fast food restaurants, the aim was to collect data from one fast food restaurant located in a town centre with a high footfall, from one in a rural setting, from one with outdoor seating, and from one with a drive through. For country parks, the aim was to collect one for a country park with facilities, one with no facilities, one which charges an entrance fee, and one that does not. This exercise was undertaken to reflect the expected variation within sub-categories, such as differences in footfall, area covered, and urban vs. rural differences. The urban vs rural distinction is particularly important because rural areas have much lower footfalls and population densities and are likely to have different consumption patterns and behavioural habits compared to urban areas. This further sub-division yielded a list of 56 data points to be collected, as can be seen in section 7.3 of the Appendix.

### 2.3.1.2 Survey and Direct Calls

To collect the necessary data from other public and private bodies, a survey questionnaire containing a series of questions was developed (which can be found in section 0 of the Appendix). This was based on the survey developed for LAs but modified and simplified to reflect the lower level of detail expected from these bodies. Through a combination of quantitative and qualitative questions, the aim of the survey was to determine:

1. The scale of litter and flytipping experienced,
2. The direct costs of litter and flytipping incurred,
3. The composition of litter and flytipped items collected, and
4. Any impacts the COVID-19 pandemic has had on numbers 1-3.

Following a low survey response rate<sup>13</sup>, a decision was made to make direct calls to organisations within the stakeholder sub-categories with the aim of improving the overall response rate and increasing the amount of data collected. The organisations were selected using a semi-random process, using a web search and sector knowledge to select different organisations that fit within each stakeholder sub-category.

The questions asked during the phone calls were similar in nature to the survey but were further simplified. The full interview guide used can be found in section 0 of the Appendix, but some of the questions included the following: “Does your organisation experience any issues with litter around your premises/the premises that you are responsible for?”, “Does your organisation clean up this litter? Either directly using employee time or through an additional, purchased service?”, “How much time do you spend collecting it?”.

The aim was, in a best-case scenario, to collect at least one data point for each of the 56 sub-divisions identified. However, if this was not possible, the aim was to collect data from at least one organisation belonging to each of the sub-categories of stakeholder (total of 31 sub-categories).

### 2.3.1.3 Assumptions used

To calculate the cost of clearing litter by sub-category, various assumptions specific to each sub-category were used, these are outlined under each sub-category in section 2.3.2. However, the following general assumptions were applied to all sub-categories:

- Unless specifically stated otherwise, the minimum wage used to convert labour time spent clearing litter into a cost was the National Minimum Wage for those aged 25 and over. For the period April 2019 to March 2020 this was £8.21 per hour.<sup>14</sup>
- Population statistics used to scale figures were ONS population figures for 2020.<sup>15</sup>

### 2.3.1.4 Scaling Up

Once the data was collected using a combination of surveys and direct calls, a method was devised to scale up each data point collected to find a national figure for every stakeholder sub-category. Different scaling up methods were used for each sub-category, and these are outlined in further detail below. However, the method most commonly adopted was scaling up the data point based on the number of organisations of that sub-category in the country. Others included the area of land covered and the number of visitors (or footfall).

<sup>13</sup> 17 completed surveys by the end of the process (some with minimal to no data), but a much lower number at the point the decision was made to make direct calls

<sup>14</sup> GOV.UK (2022) *National Minimum Wage and National Living Wage rates*, <https://www.gov.uk/national-minimum-wage-rates>

<sup>15</sup> ONS (2020) *Population estimates for the UK, England and Wales, Scotland and Northern Ireland: mid-2020*, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/>

### 2.3.1.5 Response rate

In total, 29 out of 31 stakeholder categories were successfully contacted (94% response rate). The two for which it was not possible to speak to a relevant contact were Stadiums and Music Festivals. Of the 29 sub-categories contacted, 24 yielded data on either the scale of litter, the cost of litter, or both. While five sub-categories did not provide data, only two (the Crown Estate, train and coach stations) noted that they did not collect data. The other three (Farmlands, Railways, Roads) reported that they could provide data. However, at the time of writing, this data had still not been received. For those sub-categories for which primary data was not collected, secondary data gathered through desk-based web research was used instead, where available.

## 2.3.2 Direct Cost of Littering

This section presents the direct costs of littering incurred by different stakeholder sub-groups. For each sub-group, the data collected is outlined, the methodology used to scale up the data point collected is explained, and the total cost given. More details for each individual responses are in tables in section 7.6 of the Annex.

### 2.3.2.1 Food

For the food stakeholder group, only take away and fast-food chains was included:

**Table 2-11: Direct costs to take-away and fast-food chains**

<b>Data points used</b>	Two fast food restaurants indicated their annual cost of clearing litter was £250
<b>Methodology for scaling</b>	In 2018, there were more than 3,500 food-to-go outlets in Scotland. This figure was multiplied by the annual cost. <sup>16</sup>
<b>Cost of clean-up</b>	£874,023

### 2.3.2.2 Nature based attractions

For the nature based attractions stakeholder group, six sub-groups were included: national Parks (Table 2-12), holiday parks (Table 2-13), country parks (Table 2-14), woodlands (Table 2-15), farmlands, and the Crown Estate.

There was no reliable data (primary or secondary) available to define the costs incurred by the entities responsible for farmlands in Scotland. It is expected that these entities are likely to incur costs due to anecdotal reports of flytipping on farmland. However, lack of data prevented this category from contributing to overall costs. In addition, Crown Estate Scotland could not provide quantitative data. However, representatives were able to provide qualitative commentary, shown in section 7.6.2 of the Annex.

<sup>16</sup> THE SCOTSMAN (2018) *Calls to tackle the soaring number of fast food outlets in Scotland*, <https://www.scotsman.com/news/politics/calls-tackle-soaring-number-fast-food-outlets-scotland-555192>

**Table 2-12: Direct costs to national parks**

<b>Data points used</b>	The annual cost of clearing litter for one national park was reported as £17,980
<b>Methodology for scaling</b>	The annual cost incurred by one national park was scaled up using the number of annual visitors to the two national parks in Scotland. In 2009, the two national parks revied 5.9 million visitors collectively. <sup>17</sup>
<b>Cost of clean-up</b>	£26,520

In addition to staff dedicated to litter picking, the national park consulted highlighted that they also have a ranger service that conducts litter picking across land that they do not formally own or manage. They also support a significant amount of volunteering hours for litter picking: over 500 hours in the 2021 season alone.

**Table 2-13: Direct costs to holiday parks**

<b>Data points used</b>	The annual cost of clearing litter for one holiday park was reported as £1,498
<b>Methodology for scaling</b>	The annual cost incurred by one holiday park was scaled up using data from Visit Scotland. <sup>18</sup> The total number of camping grounds, recreational vehicle parks, and trailer parks in Scotland is 312. <sup>19</sup>
<b>Cost of clean-up</b>	£467,367

**Table 2-14: Direct costs to country parks**

<b>Data points used</b>	The annual cost of clearing litter for one country park was reported as £35,960
<b>Methodology for scaling</b>	The annual cost incurred by one country park was scaled up using a blended approach taking into account the number of country parks in Scotland and the average number of visitors at each. There are 48 country parks in Scotland. Using data from the Association of Scottish Visitor Attractions (ASVA), the average number of visits to the ten parks for which data was available was 981,175 per annum. <sup>20, 21, 22</sup>
<b>Cost of clean-up</b>	£1,604,364

<sup>17</sup> National Parks UK (2014) *Key Facts and Figures for all 15 UK National Parks*. Available at:

<https://www.nationalparks.uk/app/uploads/2020/10/Key-Facts-and-Figures-for-the-15-UK-National-Parks.pdf>

<sup>18</sup> Insight Department (2020) *Key Facts on Tourism in Scotland - 2019*. Available at:

<https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/key-facts-on-tourism-in-scotland-2019.pdf>

<sup>19</sup> As a second data source to use as a comparison, the British Holiday & Home Parks Association (BH&HPA) own and manage 2,951 parks. This figure can be scaled down by population to find the number of holiday parks in Scotland, equal to 240.

<sup>20</sup> MonkeyandMouse (2019) *Scottish Country Parks, Days Out With The Kids*, <https://monkeyandmouse.co.uk/scottish-country-parks-days-out-with-the-kids/>

<sup>21</sup> Nature Scot (2020) *Country Parks*, <https://www.nature.scot/enjoying-outdoors/find-country-park>;

<sup>22</sup> ASVA (2019) 2019 ASVA ANNUAL VISITOR TREND REPORT. Available at: <https://asva.co.uk/app/uploads/2021/02/ASVA-Annual-Visitor-Trends-Report-2019.pdf>

**Table 2-15: Direct costs to woodlands**

<b>Data points used</b>	The annual cost of clearing litter incurred by one entity responsible for woodlands is £60,000.
<b>Methodology for scaling</b>	It was not possible to determine the percentage of overall woodland (open to the public) covered by the entity that provided data. Therefore, it was not possible to scale the data.
<b>Cost of clean-up</b>	> £60,000

### 2.3.2.3 Night-time economy

For the night-time economy stakeholder group, two sub-groups were included: pubs and bars (Table 2-16), and nightclubs (Table 2-17).

**Table 2-16: Direct costs to pubs and bars**

<b>Data points used</b>	The annual cost of clearing litter for one pub is £375.
<b>Methodology for scaling</b>	The annual cost for one pub was scaled up using an estimated figure for the number of pubs and bars in Scotland. There were found to be 1,045 pubs and bars in Scotland's four largest cities. <sup>23</sup> Using the population of other urban and rural areas in Scotland, a country-wide total of 3,933 was calculated. <sup>24</sup>
<b>Cost of clean-up</b>	£1,473,310

**Table 2-17: Direct costs to nightclubs**

<b>Data points used</b>	The annual cost of clearing litter for one nightclub is £370.
<b>Methodology for scaling</b>	The annual cost for one nightclub was scaled up using an estimated figure for the number of nightclubs in Scotland. There were found to be 150 nightclubs in Scotland's four largest cities. <sup>25</sup> This scales up to a total of 307 taking the population of other urban areas into account. It was assumed that rural areas had no nightclubs, which is likely to be a conservative estimate.
<b>Cost of clean-up</b>	£113,636

<sup>23</sup> The Scottish Parliament Information Centre (2020) *Scotland's night-time economy and Coronavirus (COVID-19)*, <https://spice-spotlight.scot/2020/06/16/scotlands-night-time-economy-and-coronavirus-COVID-19/>

<sup>24</sup> As a second data source to use as a comparison, the Visit Scotland 2019 report states that there are 3,419 business units of "beverage-serving activities".

<sup>25</sup> The Scottish Parliament Information Centre (2020) *Scotland's night-time economy and Coronavirus (COVID-19)*, <https://spice-spotlight.scot/2020/06/16/scotlands-night-time-economy-and-coronavirus-COVID-19/>

### 2.3.2.4 Retail/commercial

For retail/commercial, three sub-groups were included: supermarkets (Table 2-18), shopping malls and retail parks (Table 2-19), and business parks (Table 2-20)

**Table 2-18: Direct costs to supermarkets**

<b>Data points used</b>	The estimate for time spent clearing litter from supermarkets was 10 minutes per day, equating to £499 spent annually.
<b>Methodology for scaling</b>	The annual cost was scaled up by the estimated number of supermarket stores in Scotland. According to estimates, the top 17 supermarket chains have a total of 14,753 supermarkets in the UK. <sup>26</sup> Scaling this by population gives an estimated 1,202 supermarkets in Scotland.
<b>Cost of clean-up</b>	£600,392

This is likely an underestimate, only including stores from the 17 largest supermarket chains and excluding stores from smaller chains (e.g., Londis, Spar) and other grocery & convenience stores. Data on these was not available within the project constraints.

**Table 2-19: Direct costs to shopping malls and retail parks**

<b>Data points used</b>	When contacting shopping malls and retail parks, most responded that they had their own dedicated cleaning service to deal with litter. One data point was collected for a Glasgow shopping mall, who said their annual cost is £180,000.
<b>Methodology for scaling</b>	The annual cost given by the shopping mall covered all “litter clearing”, which likely covers both bin litter and ground litter removal. Bin litter is excluded. Using the findings of a previous study conducted by Eunomia for WRAP, it was assumed that it was likely that only 50% of this time was spent removing ground litter (i.e., £90,000). <sup>27</sup> This was scaled up by a blended approach of the estimated number of shopping malls and the average footfall per mall. There were found to be an estimated 550 shopping malls in the UK. <sup>28</sup> Scaled down by population leaves 45 malls in Scotland. The average annual footfall for the malls and shopping malls was found to be 11.2 million, and 14.5 million respectively. <sup>29, 30</sup>
<b>Cost of clean-up</b>	£3,113,952

<sup>26</sup> Aldi, Asda, B&M express, Booths, Budgens, Co-op Food, Farmfoods, Fulton's Foods, Heron Foods, Iceland, Lidl, Marks & Spencer, Morrisons, Ocado, Sainsbury's, Tesco, and Waitrose & Partners

<sup>27</sup> Wrap (2021) *Financial cost of packaging-related litter in the UK*

<sup>28</sup> Data Beats (2018) *Are all UK shopping centres the same?*, <https://databeats.medium.com/are-all-uk-shopping-centres-the-same-a18726e50d1c>

<sup>29</sup> CompletelyRetail (unknown) *Shopping Centres*, <https://completelyretail.co.uk/shopping-centres>

<sup>30</sup> RetailGazette (2022) *Footfall now less than 10% of pre-Covid levels*, <https://www.retailgazette.co.uk/blog/2022/05/footfall-now-less-than-10-off-pre-covid-levels/>



**Table 2-20: Direct costs to business parks**

<b>Data points used</b>	The annual cost for clearing litter at one business park is £1,284.
<b>Methodology for scaling</b>	As business parks are difficult to define, data were not found for the number of business parks in Scotland. As such, data were not scaled up.
<b>Cost of clean-up</b>	< £1,284

### 2.3.2.5 Transport hubs

For the transport hubs stakeholder group, three sub-groups were included: ports (Table 2-21), train and coach stations, and airports (Table 2-22). No quantitative data were received for train and coach stations. Therefore, no annual cost has been calculated. However, qualitative commentary was provided by one coach station and one train station – this is shown in Section 7.6.5 of the Annex

**Table 2-21: Direct costs to ports**

<b>Data points used</b>	Data points were collected for two ports. The average annual cost was £849.
<b>Methodology for scaling</b>	The annual cost was scaled up by the estimated number of ports in Scotland. According to Marine Scotland, there are 16 major ports in Scotland and a total of 128 smaller LA ports, taking the total to 144 ports. <sup>31</sup>
<b>Cost of clean-up</b>	£122,279

**Table 2-22: Direct costs to airports**

<b>Data points used</b>	The annual cost of clearing litter for one airport is £13,699.
<b>Methodology for scaling</b>	Annual cost was scaled using total number of passengers flying through Scotland's 4 major commercial airports and the 11 smaller airports operated by Highlands and Islands Airports Limited (HIAL). In 2019, a combined 30.7 million passengers flew through all 15 airports. <sup>32, 33, 34</sup>
<b>Cost of clean-up</b>	£28,496

<sup>31</sup> Marine Scotland (2016) *Maritime Transport - Ports and Harbours - Statutory harbour limits*,

<https://marine.gov.scot/information/maritime-transport-ports-and-harbours-statutory-harbour-limits>

<sup>32</sup> Edinburgh Airport (2019) *A record year*, <https://corporate.edinburghairport.com/media-centre/news-releases/a-record-year>

<sup>33</sup> Highlands and Islands Airport Limited (2021) *HIAL publishes 2020/2021 annual report for pandemic-hit period*, <https://www.hial.co.uk/news/article/60/hial-publishes-20202021-annual-report-for-pandemic-hit-period#:~:text=Final%20figures%20for%202020%2F21,felt%20across%20all%2011%20airports.>

<sup>34</sup> Websites of Aberdeen Airport, Edinburgh Airport, Glasgow Airport and Glasgow Prestwick Airport

### 2.3.2.6 Transport infrastructure

For the transport infrastructure stakeholder group, three sub-groups were included: waterways (Table 2-23), roads (Table 2-24), and railways (Table 2-25).

**Table 2-23: Direct costs to waterways**

<b>Data points used</b>	The annual cost of clearing litter for Scottish Canals is £187,760
<b>Methodology for scaling</b>	There was no scaling up involved for this sub-category of stakeholder as Scottish Canals are assumed to be the sole public body responsible for managing inland waterways.
<b>Cost of clean-up</b>	£187,760

**Table 2-24: Direct costs to roads**

<b>Data points used</b>	No primary data were collected on the cost of littering on roads. However, secondary data were found. In 2012, Zero Waste Scotland reported that Amey plc spend over 14,000 hours annually collecting rubbish from motorway verges through their Scottish Trunk Roads Unit (STRU) contract. <sup>35</sup> This amounts to £114,940 in labour.
<b>Methodology for scaling</b>	N/A
<b>Cost of clean-up</b>	£114,940

This is the estimated cost for litter clean-up for major roads and highways. Smaller roads are under the jurisdiction and responsibility of LAs. This is the cost of one Amey plc contract, but others are likely in place. As such, this is likely an underestimate.

**Table 2-25: Direct costs to railways**

<b>Data points used</b>	No primary data were collected on the cost of littering on railways. However, secondary data were found. Network Rail Scotland report that they remove over 1,000 tonnes of rubbish from Scotland's Railways each year. <sup>36</sup>
<b>Methodology for scaling</b>	To convert tonnage into costs, the rate of litter removal used for the Amey report (14,000 hours for 160 tonnes) was applied. Using these figures, it would cost an estimated £718,375 to remove 1,000 tonnes of rubbish.
<b>Cost of clean-up</b>	£718,375

<sup>35</sup> Zero Waste Scotland (2012) *Scotland takes action to rid roads and rail stations of litter*, <https://www.zerowastescotland.org.uk/content/scotland-takes-action-rid-roads-and-rail-stations-litter>

<sup>36</sup> Network Rail (2020) *Fly-tipping risk for Scotland's Railway*, <https://www.networkrailmediacentre.co.uk/news/fly-tipping-risk-for-scotlands-railway>

### 2.3.2.7 Education facilities

For the education facilities stakeholder group, three sub-groups were included: primary schools (Table 2-26), secondary schools (Table 2-27), and universities (Table 2-28).

**Table 2-26: Direct costs to primary schools**

<b>Data points used</b>	Annual cost of clearing litter for a primary school is £1,249.
<b>Methodology for scaling</b>	The annual cost was scaled up using the total number of students in primary school in Scotland. The primary school that provided data has a total of 240 students, and there were 398,794 primary school students in Scotland in 2019. <sup>37</sup>
<b>Cost of clean-up</b>	£2,074,733

**Table 2-27: Direct costs to secondary schools**

<b>Data points used</b>	Annual cost of clearing litter for a secondary school is £7,492.
<b>Methodology for scaling</b>	The annual cost was scaled using the total number of students in secondary education in Scotland. The secondary school that provided data has a total of 960 students, and there were 292,063 secondary students in Scotland in 2019. <sup>38</sup>
<b>Cost of clean-up</b>	£2,279,194

**Table 2-28: Direct costs to universities**

<b>Data points used</b>	Two major Scottish universities provided data points for the annual cost of clearing litter: £100,000 and £12,843
<b>Methodology for scaling</b>	The annual cost given by the first university covered all aspects of outside cleaning. It was estimated that 50% of this time was spent removing ground litter (i.e., £50,000).  The figures from the two data points were then combined (£62,843). There are 67,497 students between these two institutions. This annual cost was then scaled up to a national total by the total number of students in higher education in Scotland. According to the Scottish Funding Council, there were 307,215 higher education students in Scotland in 2019/20. <sup>39</sup>
<b>Cost of clean-up</b>	£284,137

<sup>37</sup> Scottish Government (2019) *Summary statistics for schools in Scotland no. 10: 2019 edition*, <https://www.gov.scot/publications/summary-statistics-schools-scotland-no-10-2019-edition/>

<sup>38</sup> *ibid*

<sup>39</sup> Scottish Funding Council (2020) *Higher Education Students and Qualifiers at Scottish Institutions 2019-20*, [http://www.sfc.ac.uk/web/FILES/statisticalpublications\\_sfcst032021/HE\\_Students\\_and\\_Qualifiers\\_2019-20.pdf](http://www.sfc.ac.uk/web/FILES/statisticalpublications_sfcst032021/HE_Students_and_Qualifiers_2019-20.pdf)

### 2.3.2.8 Indoor recreation

For the indoor recreation stakeholder group, four sub-groups were included: cinemas (Table 2-29), theatres (Table 2-30), aquariums and zoos (Table 2-31), and museums and historical sites (Table 2-32).

**Table 2-29: Direct costs to cinemas**

<b>Data points used</b>	The annual cost of clearing litter for a cinema is £1,209.
<b>Methodology for scaling</b>	The annual cost was scaled up by the total number of cinemas in Scotland, found to be 101. <sup>40</sup>
<b>Cost of clean-up</b>	£122,146

**Table 2-30: Direct costs to theatres**

<b>Data points used</b>	The annual cost of clearing litter for two theatres belonging to a chain theatre is £5,565, and the annual cost for an independent theatre is £67.
<b>Methodology for scaling</b>	There are an estimated 1,100 active theatres in the UK. Scaling this using population data gives an estimate of 90 theatres in Scotland. <sup>41</sup> It was assumed that 25% of these share similar characteristics to the chain theatre (i.e., similar capacity, frequency of shows, and level of littering), while the remaining 75% were more similar to the independent theatre. These assumptions were used to calculate an overall annual cost of addressing instances of litter in Scottish theatres.
<b>Cost of clean-up</b>	£67,128.75

**Table 2-31: Direct costs to aquariums and zoos**

<b>Data points used</b>	The annual cost of clearing litter for an aquarium is £5,993.
<b>Methodology for scaling</b>	It was assumed that the cost of clearing litter will be similar between aquariums and zoos. There are more than 300 licensed zoos and aquariums across the UK. Scaling this using population data provides an estimate of 25 in Scotland. The annual cost of clearing litter from zoos and aquariums was scaled up using this figure. <sup>42</sup>
<b>Cost of clean-up</b>	£149,825

<sup>40</sup> Cinema Treasure (2022) *Movie Theatres in Scotland*, <http://cinematreasures.org/theaters/united-kingdom/scotland>

<sup>41</sup> Theatres Trust (unknown) *How many theatres are there in the UK?* <http://www.theatrestrust.org.uk/discover-theatres/theatre-facts/167-how-many-theatres-are-there-in-the-uk>

<sup>42</sup> Born Free (2022) *Zoos and Aquaria: UK*, <https://www.bornfree.org.uk/uk-zoos>

**Table 2-32: Direct costs to museums and historical sites**

<b>Data points used</b>	The annual cost of clearing litter for a museum is £250.
<b>Methodology for scaling</b>	The annual cost was scaled up by the number of museums & historical sites in Scotland, estimated to be 380. <sup>43</sup>
<b>Cost of clean-up</b>	£94,894

### 2.3.2.9 Outdoor recreation

For the outdoor recreation stakeholder group, six sub-groups were included: stadiums (Table 2-33), sports grounds (Table 2-34), golf courses (Table 2-35), car parks (Table 2-36), theme parks (Table 2-37), and music festivals (Table 2-38).

**Table 2-33: Direct costs to stadiums**

<b>Data points used</b>	No primary data were collected. However, secondary data were found. The response to an FOI submitted by Online Gambling revealed that Premier League clubs spend a combined £599,518 on cleaning up each season. <sup>44</sup>
<b>Methodology for scaling</b>	The total aggregated capacity of the 20 UK Premier League stadiums amounts to 853,212. To find an equivalent figure (and thus cost) in Scotland, the aggregated capacity of the 94 football stadiums in Scotland was used 596,455. <sup>45</sup>
<b>Cost of clean-up</b>	£419,105

This is the estimated cost for litter clean-up in Scottish football stadiums only. However, there are many more stadiums for other sports in Scotland (e.g., rugby stadiums), each of which will attract thousands. As such, estimated costs are likely an under-estimate.

**Table 2-34: Direct costs to sports grounds**

<b>Data points used</b>	Annual cost of clearing litter for a sports ground is £15,379.
<b>Methodology for scaling</b>	Annual cost was multiplied by the number of sports grounds in Scotland (763). <sup>46</sup> The data collected were for a national sports centre - assumed to be larger than a typical sports ground. As such, the figure was reduced by a factor of 10.
<b>Cost of clean-up</b>	£1,173,386

<sup>43</sup> Insight Department (2020) *Key Facts on Tourism in Scotland - 2019*, <https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/key-facts-on-tourism-in-scotland-2019.pdf>

<sup>44</sup> onlinegambling.ca (2022) *Football stadium's wastage*, <https://www.onlinegambling.ca/content-hub/football-stadiums-highest-wastage.php>

<sup>45</sup> Football Stadiums (unknown) *Scottish Premiership Stadiums & Stats*, <https://www.football-stadiums.co.uk/leagues/scottish-premiership/>

<sup>46</sup> Insight Department (2020) *Key Facts on Tourism in Scotland - 2019*, <https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/key-facts-on-tourism-in-scotland-2019.pdf>

**Table 2-35: Direct costs to golf courses**

<b>Data points used</b>	Data was collected for three different golf courses, all said they had no issues with litter and spent no time clearing it. As a result, it was assumed that golf courses do not spend money clearing up litter.
<b>Methodology for scaling</b>	N/A
<b>Cost of clean-up</b>	£0

**Table 2-36: Direct costs to car parks**

<b>Data points used</b>	The annual cost of clearing litter for a car park is £428.
<b>Methodology for scaling</b>	<p>The annual cost of cleaning up litter in car parks was scaled using the estimated number of car parks in the country. According to the RAC Foundation, there are between 17,000 and 20,000 non-residential car parks in Great Britain.<sup>47</sup> The mid-point was selected (18,500) and subsequently scaled using population data for Scotland.</p> <p>It is expected that many of the 1,551 car parks in Scotland are run by LAs. Therefore, costs incurred whilst addressing litter would be accounted for in Section 2.1.1. Identifying exactly how many car parks are privately owner proved complex. However, the RAC Foundation report noted that 8% of car parks are multistorey – these are unlikely to be council-run. A conservative estimate of 10% has been assumed for non-residential, privately owned car parks (i.e., approximately 155 car parks). The actual proportion may be much higher.</p>
<b>Cost of clean-up</b>	£66,409

**Table 2-37: Direct costs to theme parks**

<b>Data points used</b>	The annual cost of clearing litter for a theme park is £3,000.
<b>Methodology for scaling</b>	The annual cost was scaled up to by the number of “theme parks and amusement parks” in Scotland, reported to be 25 by Visit Scotland. <sup>48</sup>
<b>Cost of clean-up</b>	£75,000

<sup>47</sup> RAC Foundation (2012) *Keeping the Nation Moving*,

[https://www.racfoundation.org/assets/rac\\_foundation/content/downloadables/facts\\_on\\_parking.pdf](https://www.racfoundation.org/assets/rac_foundation/content/downloadables/facts_on_parking.pdf)

<sup>48</sup> Insight Department (2020) *Key Facts on Tourism in Scotland - 2019*, <https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/key-facts-on-tourism-in-scotland-2019.pdf>

**Table 2-38: Direct costs to music festivals**

<b>Data points used</b>	<p>It was not possible to obtain data on the cost of addressing litter at music festivals through primary research (calls or emails). As a result, the figure that has been used is scaled from estimates gathered through secondary research.</p> <p>It has been reported that in 2017, it cost Glastonbury Festival £785,000 to clean-up and remove rubbish from the site.</p>
<b>Methodology for scaling</b>	<p>Glastonbury Festival attracts 200,000 festival goers every year. This means that the cost per person of litter removal is estimated at £3.93 per person. According to Statista, in 2018, nearly 30 million people attended live music events in the United Kingdom. This figure was scaled down by population, to an estimated 2.44 million festival goers in Scotland, and then multiplied by the cost per person to give an estimated total cost of £9,594,691.</p> <p>Given the varied nature of music festivals, it is difficult to ascertain whether the cost per person would be equal across festivals. The figure of £9.6 million appears to be disproportionately high, and this may be because Glastonbury festival covers a very large area of land, and therefore the cost per person would be higher as more land would need to be covered by litter pickers. Given this, a assumption has been taken that the average cost per person for music festivals in Scotland is 50% of the cost per person at Glastonbury festival, and therefore this figure has been revised down accordingly.</p>
<b>Cost of clean-up</b>	£4,797,346

### 2.3.2.10 Summary of direct costs

The direct costs to private bodies calculated and presented in the above tables are estimates derived using primary data, averages, and population/geographic information. Therefore, all figures are subject to a level of uncertainty. However, at all points deemed appropriate, lower bounds and/or diminishing scaling factors have been used to mitigate for this uncertainty.

Table 2-39 provides an overview of the direct costs incurred by each of the sub-groups of private organisations, as calculated using the above methodologies.

**Table 2-39: An overview of the direct costs of litter incurred by public and private bodies**

Category	Sub-Category	Annual direct cost (£)
Food	Take away and fast food	874,023
Nature based attractions	National parks	26,520
	Holiday parks	467,477
	Country parks	1,604,364
	Woodlands	60,000
	Farmlands	Unknown
	The Crown Estate	Unknown
Night-time economy	Nightclubs	113,636
	Pubs and bars	1,473,310
Retail/ commercial	Supermarkets	600,392
	Shopping malls/ retail parks	3,113,952
	Business parks	Unknown
Transport hubs	Ports	122,279
	Train and coach stations	Unknown
	Airport	28,496
Transport infrastructure	Railways	718,375
	Roads	114,940
	Waterways	187,760
Education facilities	Universities	284,137
	Primary Schools	2,074,733
	Secondary Schools	2,279,194
Indoor recreation	Cinemas	122,146
	Theatres	67,129
	Aquariums & zoos	149,825
	Museums & historical sites	94,894
Outdoor recreation	Stadiums	419,105
	Sports grounds	1,173,386
	Golf courses	0
	Car parks	66,409
	Theme parks	75,000
	Music Festivals	4,797,346
<b>Total</b>		<b>£20,461,749</b>



### 2.3.3 Scale and Direct Cost of Flytipping

Most of the public and private bodies contacted for this study had litter issues and therefore incurred a cost to clear up litter. However, very few reported issues with flytipping and therefore very few reported data on the cost of clearing up flytipped waste. Table 2-41 shows the data responses received from individual survey responses on both the scale and cost of flytipping experienced.

**Table 2-40: Responses from private and public bodies on the scale and cost of flytipping**

Category	Sub-Category	Scale	Direct Cost
Nature based attractions	One Country Park	15 incidents of significant littering/fly tipping in incident log from the last 12 months (not all incidents reflected in the log)	No data
Nature based attractions	ANONYMISED	No data	Cost per individual incident of clearing a large flytipped item: - The cost for removal and disposal (from an outside contractor): £550+VAT. - Workforce time involved: £275 (3 members of staff). - Total cost per incident = £935
Nature based attractions	ANONYMISED	For the 2019/2020 financial year, 5 incidents of flytipping were recorded.	Costs associated with managing flytipping that is borne by the organisation include the cost of managing agents, spending time monitoring and recording, cost of disposal as required and if the LA are not willing to remove items. 1 incident had a direct

Category	Sub-Category	Scale	Direct Cost
			disposal cost of £286 + VAT. 3 incidents were garden waste, which were likely not removed. No action for the last case was recorded.
Retail/ commercial	One supermarket	In 2020, there were 13 reported incidents (excluding overflowing charity banks), and in 2021 there were 22	In 2020, uplift costs (call out, collection and disposal costs) amounted to £3,509 and in 2021 it amounted to £3,916.
Retail/ commercial	One shopping mall	900kg of flytipped items.	An estimated £25,200
Transport infrastructure	Waterways	In 2019/20 an estimated 117 tonnes of waste (litter and flytipped items) was uplifted via skips - 90% of this litter, 10% flytipping.	
Outdoor recreation	One large sports ground	Flytipping incidents occur 2 or 3 times a year. Estates team use tractors to clear this up and dispose of into skips. 10 tonnes per year, 5 of which is flytipped waste.	For both litter and flytipped waste, cost of clearing amounts to £15,379 a year.

Estimating a national figure for the cost of flytipping to other public and private bodies was not possible for the following reasons:

- Most organisations contacted did not experience flytipping on their premises.
- Flytipping tends to be experienced by organisations who own or manage larger areas of land, this only applies to a small subset of the sub-categories in this study.
- Attributing responsibility is difficult.

Challenges with data collection the aim of this project was to update the figures for the estimated scale and cost of litter and flytipping in Scotland. The agreed methodology in pursuant of this aim was heavily reliant on stakeholder engagement. A low response rate was experienced when reaching out to public and private bodies – for instance, no responses were received from stakeholders responsible for litter and flytipping in woodlands or farmlands, roads or canals, nurseries, or private schools. A significant proportion of the stakeholders that did respond expressed that they did not, as standard, collect the data that was requested. For many bodies, there is no requirement to gather and record these data and is therefore not common practice. Additionally, if similar data were recorded, they did not always fit the questions that were asked. The costs for litter and flytipping were mostly encompassed within an overall spend on cleansing the premises of the organisation, and data on the scale of litter and flytipping mostly consisted of high-level qualitative observations. There does not appear to be a standard data collection format, even in organisations with statutory responsibilities to collect litter and flytipping which caused inconsistencies in the data collected.

The lack of usable data restricted the analysis by limiting the extent to which the data could be scaled to represent all of Scotland in the model. Consequently, the applicability of any conclusions and the degree to which the data could be used to shape evidence-driven and impactful policy decisions were limited. Population data were also relied upon as a proxy to scale up (mostly incomplete) costs from the 6 contributing LAs to be representative of Scotland. Though population is suitable as a broad indicator of litter and flytipped waste generated, this extrapolation limited the robustness of the final cost figures as they were not directly calculated.

## 2.4 Indirect Cost of Littering

The direct costs associated with littering and flytipping, explored in earlier sections, are those incurred by LAs and other duty bodies when addressing immediate impacts – i.e., the costs of clean-up, clearance, treatment, and disposal. In contrast, indirect costs are here considered to be costs that are incurred by individuals or organisations as a result of littering and flytipping, but not due to directly removing or processing them. For example, a cyclist coming into contact with certain ground litter may experience a puncture. The cost they experience to fix their puncture would be an indirect cost of littering.

Indirect costs can be further split between ‘internal’ and ‘external’ costs. Internal costs are those which are experienced through a market transaction (e.g., the previously mentioned bicycle puncture example). An external cost, however, is a cost that is not ‘internalised’ by a market transaction. An example of an external cost could be the

sense of welfare loss associated with the visual disamenity of a park being strewn with litter.

The following section builds on the methodology used to calculate the indirect costs in the 2013 study “Exploring the Indirect Costs of Littering”.<sup>49</sup> This methodology saw industry experts identify connections between activities that were likely to result in littering and the potential consequences on amenity, residents, economic sectors, and wildlife. This exercise was undertaken for litter only, and for each of the urban, rural, and marine contexts. The objective of this task was to identify the more distal impacts of litter in order to highlight where potential costs may be incurred. The scope of this section was to update the 2013 report. Therefore, only the indirect costs of litter have been included – i.e., indirect costs of flytipping were considered out of scope.

Throughout this study, the methodologies established in the 2013 study were used as an initial starting point.<sup>50</sup> This was supplemented by desk-based research to update figures, identify any costs that were no longer deemed relevant or useful, and calculate the potential impacts and costs for 2019. Value of materials lost, and the costs of volunteering are discussed in Section 3 and Section 4 respectively and so have not been included here. Additionally, beach and marine litter was identified as out of scope for this report.

## 2.4.1 Litter as a Causal Factor in Crime

In 2013, the costs of crime associated with litter was between £225,000 and £22.5 million.<sup>51</sup> It was estimated that the contribution of litter lies in the upper half of this range. A report presented by the Scottish Government during the Crime and Justice Statistics User Day 2012 attempted to breakdown the costs of crime on a wider scale. Only 39% of costs were attributed to the criminal justice system in Scotland (around 50% of the 39% or costs were attributed to police costs). As such, it was assumed that 20% of the total cost of crime was police costs.

To update the cost of litter as a causal factor in crime, a 2019 figure for the total cost of policing was used. According to the Scottish Police Authority 2019/20 annual report, the total cost of policing was £1.7 billion.<sup>52</sup> Assuming the cost of policing is 20% of the total cost of crime, the overall figure for crime would be £8.55 billion. Using the same assumption (based on the studies in Massachusetts), it is estimated that 4.6% of crime can be attributed to the local environment condition, which provides a figure of £393 million.<sup>53</sup> If litter contributed to between 0.1% and 10% of this impact, the cost would be

<sup>49</sup> Zero Waste Scotland (2013) *Exploring the Indirect Costs of Littering*

<sup>50</sup> *ibid*

<sup>51</sup> Zero Waste Scotland (2013) *Exploring the Indirect Costs of Littering*

<sup>52</sup> Scottish Police Authority (2020) *Annual Report and Accounts 2019/20*, [https://www.spa.police.uk/spa-media/nolejnkq/34250-spa-annualreport-2020\\_final-4.pdf](https://www.spa.police.uk/spa-media/nolejnkq/34250-spa-annualreport-2020_final-4.pdf)

<sup>53</sup> Anthony Braga et al (2008) *Policing Crime and Disorder Hot Spots: A randomized Controlled Trial*

between £393,392 and £39,339,200. Assuming a conservative mid-point for this range, the likely contribution of litter lies is £19.7 million.

## 2.4.2 The Impacts of Litter on Mental Wellbeing

Research shows that there are links (both direct and indirect) between the cleanliness of one's physical environment and the status of one's mental wellbeing.<sup>54</sup> Factors that impact the cleanliness of a physical environment include graffiti, abandoned buildings, vandalism and – of particular relevance to this study – litter. Each of these are known predictors of distress and depression amongst residents. The following section explores the potential indirect costs of litter on mental wellbeing.

### 2.4.2.1 Costs of Anti-Depressants

The previous report identified litter as a likely causal factor in 5% of anti-depressant prescriptions.<sup>55</sup> In 2013, this resulted in a total indirect cost of litter on anti-depressant dispensing of £1.57 million.

In 2019, the overall cost of dispensing anti-depressant drugs was £42 million.<sup>56</sup> Assuming the same causal factor (5%), the indirect cost of litter of litter on anti-depressant dispensing was £2.1 million.

### 2.4.2.2 Poor Mental Health

The previous report monetised the impact of litter on poor mental health using a 2011 study undertaken by the Scottish Association for Mental Health (SAMH).<sup>57</sup> The study estimated the total cost of mental health in Scotland to be £10.7 billion. This was differentiation by 'human costs' (52%), 'output losses' (30.1%), and 'health and social care' (17.9%). The previous report determined litter to be a likely contributing factor to 0.5% of these costs, resulting in a total of £53 million per annum.<sup>58</sup>

Neither an update of the SAMH report nor more recent figures on the total cost of mental health spending in Scotland could be found. However, a 2019 report by the Scottish Health Services concluded human costs (staff) were £5.9 billion.<sup>59</sup> Assuming the same ratio of costs as was included in the SAMH study (i.e., human costs are 52%), the total cost of mental health in Scotland in 2019 was calculated to be £11.3 billion. Attributing 0.5% of this to litter, the cost of litter on poor mental health is £56.7 million per annum.

<sup>54</sup> Cooper, R. B. C. C. R. (2008) *Mental Capital and Well-being: Making the Most of Ourselves in the 21st Century*

<sup>55</sup> Zero Waste Scotland (2013) *Exploring the Indirect Costs of Littering*

<sup>56</sup> Information Services Division (2019) *Medicines used in Mental Health*, <https://www.isdscotland.org/Health-Topics/Prescribing-and-Medicines/Publications/2019-10-22/2019-10-22-PrescribingMentalHealth-Report.pdf>

<sup>57</sup> SAMH (2011) *The social and economic costs of mental health problems in Scotland*, [https://www.samh.org.uk/documents/What%CC%81s\\_it\\_worth\\_now.pdf](https://www.samh.org.uk/documents/What%CC%81s_it_worth_now.pdf)

<sup>58</sup> Zero Waste Scotland (2013) *Exploring the Indirect Costs of Littering*

<sup>59</sup> Information Services Division (2019) *Scottish Health Service Costs*, <https://www.isdscotland.org/Health-Topics/Finance/Publications/2019-11-19/2019-11-19-Costs-Report.pdf?>

### 2.4.3 Indirect Costs of Drug-related Litter

From the evidence presented in the 2013 report, there appears to be minimal medical costs to society from needle related drug use.<sup>60</sup> The larger issue potentially rests with public perception, and according to Defra, the belief that drug litter is a signifier of other, more problematic issues<sup>61</sup>. There were no costs associated in Scotland from drug-related litter, therefore there are no updated figures.

### 2.4.4 Cost of litter related Injuries

Whilst there were several calculations and figures in the previous report around litter related injuries, it was not possible to state, with confidence, either the extent of litter related injuries in Scotland, or the associated costs. Therefore, there have been no associated costs in Scotland to update.

### 2.4.5 Costs of Injuries to Duty Body Staff

Injuries to duty body staff are defined as crew injury during litter picking. There was no figure given in the previous report for the associated costs of injuries to duty body staff in Scotland. The data found suggests that the cost would be very small and not significant.<sup>62</sup> Therefore, no updated figure has been provided.

### 2.4.6 Costs of litter-related Road Traffic Accidents

The previous report derived estimates for the cost of litter-related road traffic accidents ranging from £1.03m to £4.8m.<sup>63</sup>

In 2019, there were 306,316 road traffic accidents across the UK, and the cost of all accidents amounted to £33 billion per year.<sup>64</sup> This results in an average figure of £107,732 per accident. In 2019, UK Government reported 50 accidents in Scotland that were caused by objects in the carriageway.<sup>65</sup> According to a study by American Automobile Association (AAA), on average, 24% of accidents are due to debris (including litter).<sup>66</sup> The 2013 report assumed that half of these accidents could be directly attributed to litter – i.e., 12% of all accidents caused by objects in the

<sup>60</sup> Zero Waste Scotland (2013) *Exploring the Indirect Costs of Littering*

<sup>61</sup> DEFRA (2005) Tackling drug related litter: Guidance and good practice, October 2005

<sup>62</sup> <http://www.hse.gov.uk/press/2011/coi-em-11.htm>; <http://www.hse.gov.uk/press/2010/coi-se-0510.htm>

<sup>63</sup> Zero Waste Scotland (2013) *Exploring the Indirect Costs of Littering*

<sup>64</sup> GOV UK (2021) *Reported Road accidents, vehicles and casualties tables for Great Britain*,

<https://www.gov.uk/government/statistical-data-sets/reported-road-accidents-vehicles-and-casualties-tables-for-great-britain#reported-road-accidents-ras10>

<sup>65</sup> RAS50011: Accidents and vehicles included in the contributory factor analysis within source above

<sup>66</sup> Gerry Forbes (2004) *The safety impact of vehicle related road debris*

carriageway. Using these assumptions, the total cost of accidents in Scotland directly linked to litter is £646,400 per annum.

## 2.4.7 Costs to Repair Punctures Caused by Litter

Certain ground litter can cause vehicle tyre punctures. Whilst Section 2.4.6 includes the cost of road traffic accidents caused by litter-related punctures, the following section explores the costs incurred when carrying out puncture repairs for both cars and bicycles.

### 2.4.7.1 Cars

The 2013 report stated that a third of drivers experience a puncture or a flat tyre every year, and on average these cost £34.<sup>67</sup> The cost for a tyre repair was approximately £30 in 2019.<sup>68</sup> Whilst a figure could not be found on the total number of drivers in Scotland, it was assumed that this is proportional to the number of licenced vehicles. In 2013 there were 2.8 million licenced vehicles and 3.2 million drivers. In 2019 there were 2.99 million licenced vehicles, equating to 3.4 million drivers.

If a third of these drivers pay £30 each year to repair a tyre, the total cost would be £34 million. Again, assuming that between 0.1% and 10% were caused by littered glass items, the associated cost of repair would be between £34,000 and £3.4 million per annum. A reasonable estimate of 5% has been used, equating to £1.7 million.

### 2.4.7.2 Bicycles

It is estimated that 35% of Scottish households have at least one bicycle.<sup>69</sup> Based on the household figure for 2019, this would be 875,000 households. Using the same assumption as was used in the 2013 report, each household can be expected to experience one puncture per year.<sup>70</sup> Based on 30 minutes of work at the national living wage (£8.21 an hour) and the cost of a puncture repair kit (£1), each puncture repair costs approximately £5.10.<sup>71</sup> If it is assumed that between 0.1% and 10% can be caused by litter such as broken glass, the cost of bike repairs due to litter were between £4,500 and £450,000. Again, using an estimate of 5% results in a total of £225,000.

## 2.4.8 Indirect Costs of Litter to the Rail Networks

<sup>67</sup> Zero Waste Scotland (2013) *Exploring the Indirect Costs of Littering*

<sup>68</sup> heycar (2022) *How much does it cost to get a tyre repaired?*, <https://heycar.co.uk/guides/how-much-does-it-cost-to-get-a-tyre-repaired>

<sup>69</sup> Cycling Scotland (2019) *Annual Cycling Monitoring Report*, <https://www.cycling.scot/mediaLibrary/other/english/6353.pdf>

<sup>70</sup> Zero Waste Scotland (2013) *Exploring the Indirect Costs of Littering*

<sup>71</sup> SQUIRE (2018) *New UK National Living and Minimum Wage Rates From 1 April 2019*, <https://www.squirepattonboggs.com/en/insights/publications/2018/10/new-uk-national-living-and-minimum-wage-rates-from-1-april-2019#:~:text=The%20rate%20of%20the%20compulsory,%C2%A35.90%20to%20%C2%A36.15>

The 2013 report found that the cost of litter to the Rail Network in Scotland was directly related to damage caused by rats.<sup>72</sup> This was based on Battersby's 2004 research exploring the cost of rat treatments, delays to passengers, and penalties faced each year.<sup>73</sup> More recent figures were not available. Network Rail does have a breakdown of spend by Scotland's Railways for maintenance, which is £164 million.<sup>74</sup> However, it was not possible to estimate the proportion of this spend directly caused by litter.

## 2.4.9 Litter-related Costs of Vermin

The presence of litter and the associated organic matter (i.e., food) can attract vermin. These vermin cause damage to infrastructure, require paid for services to be managed, and result in the need for clean-ups of public and private spaces. The following section explores these costs.

### 2.4.9.1 Cost of Rat Damage

In 2019, there were an estimated 120 million rats in the UK.<sup>75</sup> Assuming the rat population is proportional to the human population, this equates to around 10 million rats in Scotland. According to the 2013 report, each rat can cause approximately £10.45 worth of damage.<sup>76</sup> For Scotland in 2019, the cost of damages caused by rats to all infrastructure equates to circa £104.5 million. Assuming between 0.1% and 10% can be attributed to edible litter, this would provide an annual range of £104,500 and £10,450,000. Taking uncertainty into account, it is recommended that the lower end of this range is used. Using a value of 1% provides an estimate of £1.1 million.

### 2.4.9.2 Cost of Rat Control

There are 2.5 million households in Scotland.<sup>77</sup> On average, 3% of households have a rat infestation and 75% of these are treated.<sup>78</sup> Treatment and removal of rat infestations can cost between £90 and £240.<sup>79</sup> Conservatively using the lower figure provides an annual cost of £5 million in rat control.

If litter can be said to directly contribute to between 0.1% and 10%, the costs incurred due to rat control as a result of litter are between £5,000 and £500,000. Again, using a reasonable midpoint provides an estimate of £250,000.

### 2.4.9.3 Cost of Pigeon Deposit Clean-up

<sup>72</sup> Zero Waste Scotland (2013) *Exploring the Indirect Costs of Littering*

<sup>73</sup> Attersby, S. (2004) *Public health policy – can there be an economic imperative? An examination of one such issue*

<sup>74</sup> Network Rail (2021) *Network Rail expenditure in 2019/20*, <https://www.networkrail.co.uk/wp-content/uploads/2021/02/Annual-expenditure-2019-20.pdf>

<sup>75</sup> pest.co.uk (2021) *Council cuts could send rat populations spiralling out of control in 2021*, <https://www.pest.co.uk/council-cuts-could-send-rat-populations-spiralling-out-of-control-in-2021/>

<sup>76</sup> Battersby, S. (2004) *Public health policy – Can there be an economic imperative? An examination of one such issue*

<sup>77</sup> Scottish Household Survey (2019) *Scotland's People Annual Report 2019*

<sup>78</sup> British Pest Control Association (2012) *National Survey 2012*

<sup>79</sup> HouseholdQuotes (2022) *Pest Control and Extermination Costs: How to Save in 2022*, <https://householdquotes.co.uk/how-much-is-pest-control/>



Pigeons are attracted to litter and the associated organic matter (i.e., food). Where pigeons are present, there are pigeon deposits, which have an associated clean-up cost. It can be assumed that more litter results in more pigeons, resulting in more pigeon deposits and therefore a higher clean-up cost.

The 2013 report referenced the cost of removing pigeon deposits to be £20 million.<sup>80</sup> This was calculated using inflation rates and a previous cost of £15 million from a 1999 BBC news article.<sup>81</sup> This was then used to assume a per-pigeon cost and an associated figure attributable to litter.

To update this figure requires a more recent cost for cleaning up pigeon deposits. However, there are no more recent figures available. Using inflation rates to further increase the cost associated with addressing pigeon deposits was deemed likely inaccurate, and as such no 2019 figure has been established.

## 2.4.10 Litter Related Business Losses

The presence of litter may prevent potential customers from entering businesses. As a result, those businesses will experience a loss/incur costs. Whilst the costs businesses face when addressing instances of litter have been explored in Section 2.3, this does not include the indirect costs incurred due to loss of customers. A 2011 Keep Britain Tidy study explored the indirect costs faced by McDonalds as a result of the presence of unaddressed litter around their premises. Whilst the study attempted to quantify these indirect costs, the figures it presented incorporated the costs associated with clean-up. As Section 2.3 accounts for this, any attempt to disaggregate the KBT data was likely to result in double counting. Therefore, this figure has not been updated.

## 2.4.11 Litter as a Cause of Wildfires

According to the Scottish Fire and Rescue service, there were 4,385 grassland fires in Scotland in 2019.<sup>82</sup> Around 84% of these can be assumed to be caused by humans.<sup>83</sup> Most human-caused fires are one day incidents which covering an average of 15ha.<sup>84</sup> A 2019 study found that the average cost of a small fire was €1,706 per hectare (ha), equivalent to £1,474 in 2019.<sup>85</sup> Using this cost, it was calculated that each one-day fire cost £22,110. Estimating that between 0.1% and 10% of these are caused by litter, the cost to Scotland is between £84,349 and £8.4 million. Using a reasonable midpoint results in an estimate cost of litter as a cause of wildfires to be £4.2 million.

<sup>80</sup> Zero Waste Scotland (2013) *Exploring the Indirect Costs of Littering*

<sup>81</sup> BBC (1999) *UK Pigeons: Not a problem to poo-poo*, <http://news.bbc.co.uk/1/hi/uk/257284.stm>

<sup>82</sup> Scottish Fire and Rescue Service (2020) *FIRE AND RESCUE INCIDENT STATISTICS 2019-20*, [https://www.firescotland.gov.uk/media/1144151/fs\\_officialstatistics\\_2019\\_20.pdf](https://www.firescotland.gov.uk/media/1144151/fs_officialstatistics_2019_20.pdf)

<sup>83</sup> Daley, J. (2017) *Study Shows 84% of Wildfires Caused by Humans*, <https://www.smithsonianmag.com/smart-news/study-shows-84-wildfires-caused-humans-180962315/>

<sup>84</sup> Jonathan Aylan (2009) *Costs of Suppressing Wildfires*

<sup>85</sup> Florec V., et al. (2019) *Cost of Suppression*

## 2.4.12 Cost of Dealing with Impacts of Litter on Wildlife and Livestock

Primarily due to ingestion, wildlife and livestock can be negatively impacted by the presence of unaddressed litter. Veterinary bills and loss of animals represent an indirect loss due to littering. The 2013 report stated that the indirect cost of dealing with impacts of litter on wildlife and livestock was equivalent to 0.6% of SSPCA annual income.<sup>86</sup> In 2019, SSPCA's annual income was £15.4 million.<sup>87</sup> Using the 0.6% assumption results in an annual cost of £92,400.

## 2.4.13 Costs of Litter Related Flooding

Whilst the presence of litter can cause drain blockages leading to localised flooding, research suggests that there is no indication that littered or flytipped waste has any greater a contribution than incidental. Accordingly, there is insufficient evidence to attribute costs, therefore there is no figures to update.

## 2.4.14 Effects of Litter on House Prices

The reduction in cleanliness and sense of place caused by the presence of litter can negatively impact the property values. Instances of littering or flytipping can reduce the desirability of a neighbourhood or street, thus reducing house prices. The 2013 report found that the presence of litter can devalue a property by between 2.7% and 11.8%.<sup>88</sup>

In 2019, the average house price in Scotland was £163,248.<sup>89</sup> Conservatively using the lower end (2.7%) of the devaluation impact results in a reduction in property value of £4,409 per house. If just 1% of the 2.5 million households in Scotland were devalued by £4,408 due to the presence of litter, the potential devaluation of the Scottish housing stock would be £110 million.

## 2.4.15 Impacts of Litter on Tourism

Due to unreliable evidence in the previous report, there were no costs provided for the impact of litter on tourism in Scotland. Therefore, no costs have been updated.

## 2.4.16 Summary

The indirect costs of litter can be difficult to identify and often require a number of assumptions to be combined to enable any quantitative calculations. The above section

<sup>86</sup> SSPCA (2012) *Annual Review 2011 and Onwards*

<sup>87</sup> SSPCA (2019) CONSOLIDATED FINANCIAL STATEMENTS, <https://www.scottishspca.org/sites/default/files/2020-01/SSPCA%202018%20signed%20accounts%20-%20Web%20Version.pdf>

<sup>88</sup> Zero Waste Scotland (2013) *Exploring the Indirect Costs of Littering*

<sup>89</sup> Law Society of Scotland (2020) *Scottish house prices forge ahead in latest figures*, <https://www.lawscot.org.uk/news-and-events/legal-news/scottish-house-prices-forge-ahead-in-latest-figures/>

updates the calculations and values derived in the 2013 report undertaken for Zero Waste Scotland.<sup>90</sup> In general, conservative figures for the total cost have been used to account for the uncertainty. The total indirect costs due to litter are listed in Table 2-41.

**Table 2-41: Summary of indirect costs**

	2013 annual cost	2019 annual cost
Litter as a causal factor in crime	£225,000 - £22.5 million	£19.7 million
Litter related anti-depressants	£1.57 million	£2.1 million
Poor mental health	£53 million	£56.7 million
Drug-related litter	-	-
Litter related injuries	-	-
Injuries to duty body staff	-	-
Litter-related traffic accidents	£1.03 - £4.8 million	£646,400
Car tyre puncture repairs	£40,000 - £4 million	£1.7 million
Bike tyre puncture repairs	£6,500 - £650,000	£225,000
Rat damage repairs	£1 million	£1.1 million
Rat control	£250,000	£250,000
Pigeon deposit clean-up	£1,680 - £168,000	-
Litter related business losses	< £500,000	-
Litter as a cause of wildfires	£66,000 - £6.6 million	£4.2 million
Impacts of litter on wildlife and livestock	£315,000*	£92,400
Litter related flooding	-	-
Effects on house prices	£100 million	£110 million

<sup>90</sup> Zero Waste Scotland (2013) *Exploring the Indirect Costs of Littering*

	2013 annual cost	2019 annual cost
Impact on tourism	-	-
<b>TOTAL</b>	N/A**	<b>£196.7 million</b>

\* This includes cost to marine wildlife, which was out of scope for this study.

\*\* It is not possible to calculate an overall total for 2013 given the ranges used.

## 2.5 Commonly Littered and Flytipped Items

### 2.5.1 Background and Context

An important step in tackling litter and flytipping is understanding trends in the types of items that are most frequently discarded. This can facilitate identification of likely sources and responsible individuals. Currently, exact data on the proportion of waste that falls into different categories is rarely regularly collected in significant detail, as most clearers of litter are more focused on clearing the waste rather than documenting its composition (this was flagged by both LAs and volunteer groups). However, LAs do report types of litter in their council areas through the annual LEAMS survey (run by Keep Scotland Beautiful), which involves local environment quality surveys at randomly selected sites. Assuming representativeness, this can provide a detailed breakdown of commonly littered items for each LA.

### 2.5.2 Results

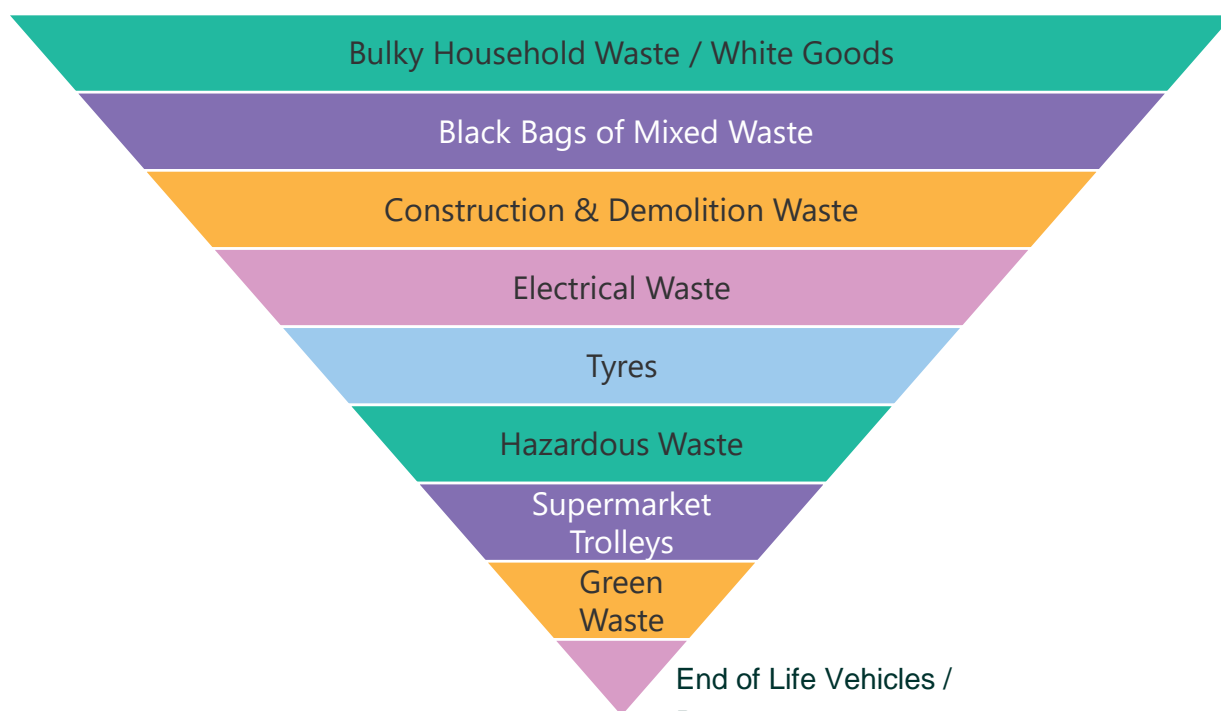
This section has compiled the quantitative data received from stakeholders (from all the different groups within scope of this research) to ascertain which items are the most frequently littered and flytipped across Scotland. This breakdown of commonly littered and flytipped items represents the frequency at which these wastes were noted relative to other categories. A quantitative breakdown of waste composition and the consequent value of materials lost is found in Section 3.

Figure 2-3 shows the items that are frequently flytipped, from most to least common. The findings from the stakeholder engagement on commonly flytipped items have been combined with Flymapper data for 2019/20 to cover all areas of Scotland in this analysis. In addition to the items listed in Figure 2-3, various other items were mentioned and reported as flytipped waste by various stakeholders. These include traffic cones, pallet boxes, wheelie bins and mattresses. The reported loads of flytipped

waste varied in size: the Flymapper data showed that the most frequently experienced size is a small van or transit van load of waste, with tipper lorry loads or small carloads being the next frequent.

Likewise, Figure 2-4 indicates the most frequently littered items. The findings from the stakeholder engagement on commonly littered items has been combined with results of KSB’s first annual Scottish Litter Survey<sup>91</sup> and the LEAMS survey from 2020/21<sup>92</sup> in order to gain a holistic perspective from all stakeholders on this issue. In addition, other types of litter mentioned during data collection included: nitrous oxide cannisters, oil drums, paint pots, wood chippings, sanitary waste (needles and syringes, cotton buds, pills, tampons, and wet wipes), expanded polystyrene, clothes, aerosols, toys and balloons. It is difficult to ascertain the prevalence of these items as they were mentioned by only a few stakeholders.

**Figure 2-3. Commonly Flytipped Items**



<sup>91</sup> Keep Scotland Beautiful (2021) *Scottish Litter Survey 2021*, <https://www.keepsotlandbeautiful.org/media/1568594/littering-in-scotland-survey-2021-final-071221.pdf>

<sup>92</sup> Keep Scotland Beautiful (2021), Local Environment Audit and Management System (LEAMS), <https://www.keepsotlandbeautiful.org/environmental-services/leams/>

**Figure 2-4. Commonly Littered Items**



Stakeholders also provided contextual information regarding locations that appeared to be particularly susceptible to litter and flytipped waste. Almost every stakeholder stated that roadsides are the most frequently littered areas. Specifically, major roads, grass lay-bys, and motorway slip roads. Respondents noted that this waste was likely being thrown out of vehicles or left behind by visitors whilst travelling. Similarly, car parks also appeared to be hotspots (although perhaps more so for flytipping than littering).

Stakeholders also noted that nature sites that were frequently visited by wild campers or people picnicking are common spots for litter. Several specifically highlighted that both urban and rural rivers are regularly littered. Whilst some found that secluded regions are most at risk of flytipping (presumably due to the lower likelihood of perpetrators being apprehended), others found that waste is often flytipped in obvious locations so that it is impossible for the Council to ignore.

The sources and perpetrators of litter and flytipping varied too. Some issues are localised, such as debris blown from a local landfill site, litter accumulating at tourist destinations, or the number of flytipping instances increasing following the introduction of charges for bulky waste collections by some councils (these incidents were all reported qualitatively). Others are prevalent across all areas – multiple stakeholders pointed out that the volume of litter increases significantly near schools and is a persistent issue despite efforts to increase education regarding the topic.

Litter and flytipping (as Figure 2-3 and Figure 2-4 indicate) comprise a mixture of household and commercial/industrial waste. Stakeholders highlighted that the age of these items varies significantly – some collected items are recently littered or flytipped, whereas some collected waste has been in the environment for considerable lengths of time. Stakeholders also commented that the distribution of waste varies temporally. In some cases, this is a relatively predictable change (for example, the composition and scale of waste may change from winter to summer), whilst in others, it is not (for instance, the composition of waste changed during COVID-19, which is discussed in section 5 – “Effects of the COVID-19 Pandemic”).

The sources and perpetrators of litter and flytipping varied too. Some issues are localised, such as debris blown from a local landfill site, or litter accumulating at tourist destinations, or flytipping increasing since councils started charging for bulky waste collections. Others are prevalent across all areas – multiple stakeholders pointed out that the volume of litter increases significantly near schools and is a persistent issue despite efforts to increase education regarding this topic. Litter and flytipping (as Figure 2-3 and Figure 2-4 indicate) comprise a mixture of household and commercial / industrial waste. Stakeholders highlighted that the age of these items varies significantly – some collected items are recently littered or flytipped, whereas some collected waste has been in the environment for long lengths of time.

## 2.6 Summary

### 2.6.1 Direct Costs

#### 2.6.1.1 Local Authorities

Overall, accounting for both direct and indirect costs, LAs incurred a total cost of £52.6 million in dealing with litter and a total of £16.1 million to deal with flytipping in FY2019. Both values represent a significant increase in comparison to 2011, where total litter and flytipping costs were £41,638,234 (26% increase) and £8,892,247 (80% increase) respectively. For both litter and flytipping, personnel costs were the most significant contributor to overall costs, and in the case of flytipping it appears that there has also been a significant increase in enforcement costs.

With regards to scale, for both litter and flytipping, this does not appear to have changed significantly over the period between 2011 and 2019. For litter, the latest estimated litter tonnage is 18,711 tonnes. The number of flytipping incidents has increased by 8.0% from 61,277 in 2011 to 66,159 cases in 2019. Due to the low level of participation from LAs in this study, it must be noted that the estimated costs include significant levels of uncertainty.

The scale and cost of litter varies according to the context of each area. Stakeholders in Highland and Island regions stated that litter and flytipping are not major issues, primarily due to the low population density. However, this rurality also means that addressing the few instances of flytipping that do occur is more costly. Additionally, these locations tend to be tourist hotspots and consequently suffer from seasonal litter from visitors.

#### 2.6.1.2 Other Public and Private Bodies

The direct litter costs incurred by other public and private bodies amount to £21 million annually. This is the estimated figure for litter costs incurred by organisations from the following nine categories: food outlets, nature-based attractions, night-time economy (pubs, bars, nightclubs), retail/commercial, transport hubs, transport infrastructure, education facilities, indoor recreation, and outdoor recreation. Notably it excludes costs incurred by farmlands, The Crown Estate, business parks, and train and coach stations, as figures for these were not available. The figure was largely determined by multiplying the time spent clearing litter with labour costs calculated based on the National Minimum Wage. For some sub-categories the costs were estimated using direct cost figures reported or other methods.

The cost of litter varies according to category of stakeholder. In terms of cost breakdown, the types of bodies that incurred the highest costs of dealing with litter were music festivals (£4.8 million, though this figure is estimated from secondary data and



thus should be used with caution), shopping malls and retail parks (£3.1 million), secondary schools (£2.3 million) and primary schools (£2.1 million).

Estimating a national figure for the scale of litter, the scale of flytipping, and the cost of flytipping to other public and private bodies was not possible as a very limited number of data points were collected.

## 2.6.2 Indirect Costs

Overall, the indirect costs of litter have increased since the previous report, as can be seen in detail in Anex 7.1. Occasionally it was not possible to update indirect cost categories as more recent data was not available, such as in the case of Indirect Costs of Litter to the Rail Networks, or to Business. The methodologies used to calculate the indirect costs have been kept consistent with those which were used in the previous indirect costs report<sup>93</sup>. Whilst the relevance of the methodologies was interrogated prior to any updates, it was not possible to account for any technological changes that may impact certain aspects of the costs. The total Indirect Costs are somewhere between £176,223,421 and £228,854,454 per year.

## 2.6.3 Commonly Littered and Flytipped Items

The research also compiled evidence from stakeholders on the types of items that are most commonly littered and flytipped. The prevalence of different categories of littered items broadly correlated with the findings of the LEAMS surveys undertaken annually by LAs, with food packaging, drinks bottles and cans, cigarette butts and dog fouling found to be the most frequently littered waste streams. Bulky household waste, electrical items and C&D waste were the most commonly flytipped items

<sup>93</sup> Zero Waste Scotland (2013) Exploring the Indirect Costs of Littering and Flytipping

# 3 Value of Materials Lost in Scotland



## 3.1 Background and Context

When material is littered, it either remains in the environment or it is collected and typically managed as residual waste. As a result, there is a loss of value associated with the potential for the correct sorting and recycling of the material. With a strong focus on circularity of materials and limiting the use of raw materials, this avoided loss can have a significant associated potential opportunity cost. Using the litter tonnage calculated earlier in the report, alongside the composition of littered material and the overall expected recycling rates in Scotland, the value of materials lost to littering can be calculated. Given the lack of updated compositional analysis of litter in Scotland, a litter composition analysis by Keep Britain Tidy focused on litter composition in England has been used as a proxy (recognising that this may not be completely representative of the Scottish context).<sup>94</sup> The study provides an analysis by count, which has been converted to weight using estimates, in order to assess the value of litter. Weight estimates were compiled as part of a 2020 study *Eunomia* conducted for WRAP.<sup>95</sup> The material values per tonne used are based on the aggregated and average prices provided by [letsrecycle.com](https://www.letsrecycle.com) for 2019.<sup>96</sup>

The Scottish government has set out a target of achieving an overall 70% recycling rate of household waste by 2025, with recycling rates at 44.9% as of 2019.<sup>97</sup> These values have been used to calculate the portion of potentially recovered material through the avoidance of litter. In this valuation, it is assumed that all litter goes to residual waste streams.

## 3.2 Results

Table 3-1 provides the outcome of the calculations pertaining to the value of materials lost in Scotland. At the current household recycling rate of 44.9% and assuming a litter tonnage of 18,711 tonnes, the material value lost to littering is £416,320. At Scotland's target of 70% recycling of household waste, the loss of material value would be £649,051. It must be noted that a large portion of litter is accounted for under "general litter" which includes items such as pens/pen lids, batteries, and elastic bands. For these categories, a conservative estimate of £20 per tonne has been assumed, as it is impossible to accurately quantify the value of miscellaneous items. In both outlined scenarios the majority of the value is due to the recovery of metal cans. Looking ahead, it can be expected that the value of the material lost will increase with recycling rates, assuming material values and total litter tonnages remain constant.

<sup>94</sup> Keep Britain Tidy (2020) *Litter Composition Analysis - Summary Report*, Keep Britain Tidy

<sup>95</sup> WRAP (2020) *Financial Cost of Packaging Litter – Phase 2 – Final Report*

<sup>96</sup> Letsrecycle.com (2019) *Material Prices*, <https://www.letsrecycle.com/prices/>

<sup>97</sup> Scottish Government (2021) *£70 million fund to improve recycling*, <https://www.gov.scot/news/gbp-70-million-fund-to-improve-recycling/>

**Table 3-1: Value of Material Lost (Excludes negative values)**

Material	% by weight	Unit Value (£/tonne)	Value per tonne litter (£)	Loss at 44.9% recycling	Loss at 70% recycling
<b>Glass Bottles</b>	7.0%	£12.00	£0.84	£7,057	£11,002
<b>Plastic bottles</b>	4.0%	£80.63	£3.23	£27,094	£42,240
<b>Cans</b>	4.0%	£754.58	£30.18	£253,577	£395,332
<b>Wrapper</b>	2.0%	£239.17	£4.78	£40,186	£62,651
<b>Paper</b>	2.0%	£16.79	£0.34	£2,821	£4,399
<b>Newspapers and magazines</b>	1.0%	£75.50	£0.76	£6,343	£9,889
<b>Cardboard</b>	1.0%	£44.46	£0.44	£3,735	£5,823
<b>Drink containers</b>	2.0%	£211.38	£4.23	£35,517	£55,372
<b>Other General Litter - non-packaging</b>	28.0%	£20.00	£5.60	£47,047	£73,347
<b>Other General Litter - packaging</b>	33.0%	£ 20.00	£6.60	£55,448	£86,445
<b>Other (unknown, food waste and other)</b>	16.0%	-	-	-	-
<b>Total</b>	<b>100%</b>			<b>£416,320</b>	<b>£649,051</b>

### 3.3 Summary

Overall, at current recycling rates the value of material lost in Scotland is £416,320, with this rising to £649,051 at a target recycling rate of 70%. The greatest contributor to this loss of value is metal cans at £253,577. In order to provide a more accurate representation of materials lost in Scotland, an updated study on litter composition focused on Scotland is required.

# 4 Value of Volunteering to Clean Up Litter



## 4.1 Background and Context

Though litter and flytipping have wide-ranging impacts (such as the impact on tourism and investment discussed in Section 2.4), for the most part the impacts are felt by local residents whose environment and quality of life is adversely impacted by litter. Litter and flytipping are tangible issues with clear solutions. Though the statutory responsibility for clearing litter usually lies with the LA or the landowner, the scale and quantity of litter often renders comprehensive litter clearing an impossible task. It is unsurprising, therefore, that litter clearing is an activity frequently undertaken by volunteers.

One research question for this study was to assess and quantify the contribution of volunteers to litter clearing. It is intrinsically difficult to accurately place a value on the contribution of volunteers to clearing litter – any statistic is likely to be an underestimate, because litter picking will primarily be undertaken by informal and localised networks, such as schools, community groups and individuals, and therefore accurate data on hours spent clearing litter is sparse.

Eunomia engaged with numerous volunteer groups who undertake litter clearing for this research<sup>98</sup>, requesting quantitative data (where available) on volunteer hours spent and litter tonnages (and types) collected. The level of detail provided by the groups varied and hence anecdotal and pictorial evidence was also important in gathering qualitative data. Keep Scotland Beautiful, a charity working to improve Scotland's local environment and who organise volunteer events, also contributed.

## 4.2 Results

### 4.2.1 Volunteer Hours

It is difficult to accurately ascertain the total hours spent by volunteers in Scotland clearing litter. Some litter clearing occurs through formally recognised events, such as the Spring Clean Scotland (organised by KSB annually) and KSB's Community Clean Up Hubs events, and therefore the hours contributed are well-documented. Using data on registered litter picks from KSB, almost **60,000 hours** were spent clearing litter by volunteers in 2019/20. This amounts to over **£525,000** contributed by volunteers through their time.<sup>99</sup>

However, this is likely to be an underestimate as, in addition to official events, this research identified from engagement with volunteering grounds that there is a

<sup>98</sup> The stakeholders who contributed to this section are Keep Scotland Beautiful, Brightons Community Council, Shieldhill and California Community Council, Polmont Community Council, Team Up to Clean Up Renfrewshire, Pitlochry Litter Action Group, Pentland Hill Regional Park, Dumbarton Litter Pickers, Friends of the Leven River Valley, Fife Street Champions and the Skye Community Litter Project.

<sup>99</sup> For the purposes of this research, we are using the minimum hourly wage in 2019/20 of £8.91/hour

significant contribution from smaller and localised volunteering efforts. Much litter clearing occurs on an ad hoc basis and, like much voluntary work, will be ‘under the radar’ and consequently not documented or quantified. Engagement with volunteers indicates that voluntary, informal litter clearing is done by community councils, local networks and groups focusing on a specific area (e.g., the Pentland Hills Litter Watch), in addition to individuals.

Using data collected from a sample of these networks, it appears that each of these groups (combined across its members) spends approximately **30 hours a week** clearing litter from their area that are not included in official totals and events. It is impossible to know exactly how many groups are active across Scotland, but online research shows that every authority contains at least one network, and sometimes up to ten or more smaller, localised groups in one authority.

Assuming that there is an average of three groups active in each LA (based on the prevalence of identified groups per LA), volunteers contribute 124,800 undocumented hours of litter clearing every year which, when monetised using the minimum wage for over 25s from 2019, is equivalent to nearly **£2 million**.

## 4.2.2 Litter Collected

The informal nature of volunteering means that most groups do not collect data on the tonnage and composition of waste collected (though some volunteering networks do – the Marine Conservation Society encourages beach cleaners to track and submit the types of waste collected).

KSB stated that throughout the Spring Clean Scotland campaign and via the Community Clean Up Hubs, volunteers collected roughly **88,000 bags** of litter (equivalent to approximately **580,000 kg**) in 2019/20.<sup>100</sup>

However, as with the quantification of volunteer hours, this sum is likely an underestimate, as volunteers contribute often undocumented time that is not part of official clearing events. The metrics calculated by KSB are that one person in 1 hour of clearing collects 1.5 bags, and each bag is roughly 6.6kg – using this, the tonnage of litter collected from the informal contribution of volunteers exceeds **187,000 bags** (equivalent to approximately **1.2 million kg of litter**).<sup>101</sup>

## 4.2.3 Commentary

Engagement with a variety of volunteer groups throughout Scotland yielded numerous insights into the contribution of volunteers to litter clearing and how this effort is coordinated and funded.

<sup>100</sup> Information provided by Keep Scotland Beautiful during an interview on 17<sup>th</sup> March 2022

<sup>101</sup> *ibid*

Our stakeholder engagement found that these groups are not standardised in their format and in the frequency of their litter collections. Some groups and networks will cover an entire LA (such as Renfrewshire Team Up to Clean Up), whereas others are more localised (such as a particular stretch of countryside, or a specific village or town, e.g., the Leven Litter Pickers). Some have upwards of several thousand members whereas others are groups of 5 – 10 individuals. Some groups are registered with KSB whereas others prefer to informally organise litter picking on an ad-hoc basis.

The KSB-organised events (primarily the Spring Clean Scotland) are the focus for many volunteer groups. For other groups though, volunteering takes place throughout the year or sporadically depending on resident response. Some networks organise group events (with a secondary aim being to promote community cohesion and social activities) whereas in other groups, individuals and households clear independently on their own schedules. Stakeholders reported that the demographics of volunteer networks are varied, with families and children taking part alongside retirees. Most groups have a wide membership network with a core group of active members. Many volunteer efforts are coordinated via Facebook. Sometimes smaller groups coalesce to share resources and have a larger impact over a wider area.

Another insight is the relationship of the volunteering groups with their LA. In some instances, volunteering is organised independently of the LA, with oversight resting with charities or individuals. However, in other instances volunteering is organised or supported by the LA, with their explicit support. The 'Team Up to Clean Up' group was created by Renfrewshire Council, who fund equipment. Other volunteers emphasised their positive relationship with Fife Council who organise the collection of collected and bagged litter and provide labels so that litter pickers are not prosecuted for flytipping. Numerous Community Councils communicate with council officers to arrange collections of bagged litter. The relevant department within the LA varies but the responsibility for liaising with volunteers and collecting the waste often lies with the Street Scene personnel. Engagement with volunteers also demonstrated that there is a perception amongst many groups that council spending on services related to clearing (and enforcing) litter and flytipping has decreased in recent years and is insufficient to keep the environment clear.

Some volunteering groups receive funding from KSB and report their litter picking hours to them. KSB estimate that there are approximately 300 of these groups – some are Community Clean Up Hubs, others are Anchor Groups, and others are 'Beautiful Scotland and It's Your Neighbourhood' groups. KSB distributes a Community Clean Up Hub Kit, which allows for around 15 people to contribute towards a litter pick (this includes litter pickers, Handihoops, gloves, kit bags and high-visibility jackets). These packs cost £300 for KSB to source and distribute. Some LAs also provide similar equipment for volunteers to borrow at no cost (we do not have an approximate value of the cost to LAs). However, registering litter picking with KSB is not compulsory and it is



clear that there are many local groups operating independently of this. It is likely that funding for these groups is sourced through local community grants, funded by local companies, or volunteers themselves (i.e., by purchasing their own equipment).

Volunteers stated that generally, the litter collected through volunteer efforts is not recycled. Usually, the focus is on clearing the litter from the local environment and it is quickest to 'black bag' all the litter for ease of collection by the LA. Some volunteers stated that, where possible, they would separate bottles and cans for recycling, but that the added effort to do so often deterred this from becoming a regular occurrence. Others stated that they do usually split out the waste for recycling where possible. This suggests that sorting and recycling of litter does occur but is not widespread. These practices will have implications for the environmental impacts of landfill and incineration compared to recycling, and the value of material lost to the circular economy.

Most stakeholders mentioned that their volunteering patterns changed during and following the COVID-19 pandemic. Though the initial 'lockdowns' led to a decrease in litter picking whilst movement was restricted, most reported that – once allowed – engagement with litter picking increased significantly. Several volunteer networks began in lockdown or have seen an increase in their membership, as more residents were staying locally whilst travel was limited. The Community Clean Hubs set up by KSB to form local networks for organising litter clearing began during the 2020 lockdowns and have since grown to 88 Hubs – the majority of these are within and surrounding Glasgow and Edinburgh, but there are also Hubs in Dumfries, Aberdeen, Fort William, the Outer Hebrides, Orkney and other locations.<sup>102</sup> Several groups also stated that the increase in domestic holidays led to increased waste in their area from tourists, which led to increased interest in volunteering to clear litter. During the pandemic KSB published guidance to enable individuals to litter pick safely throughout the COVID-19 restrictions.

Several stakeholders expressed their general thoughts on the issues of litter and flytipping. These included the need for coordinated education and campaigning, combined with:

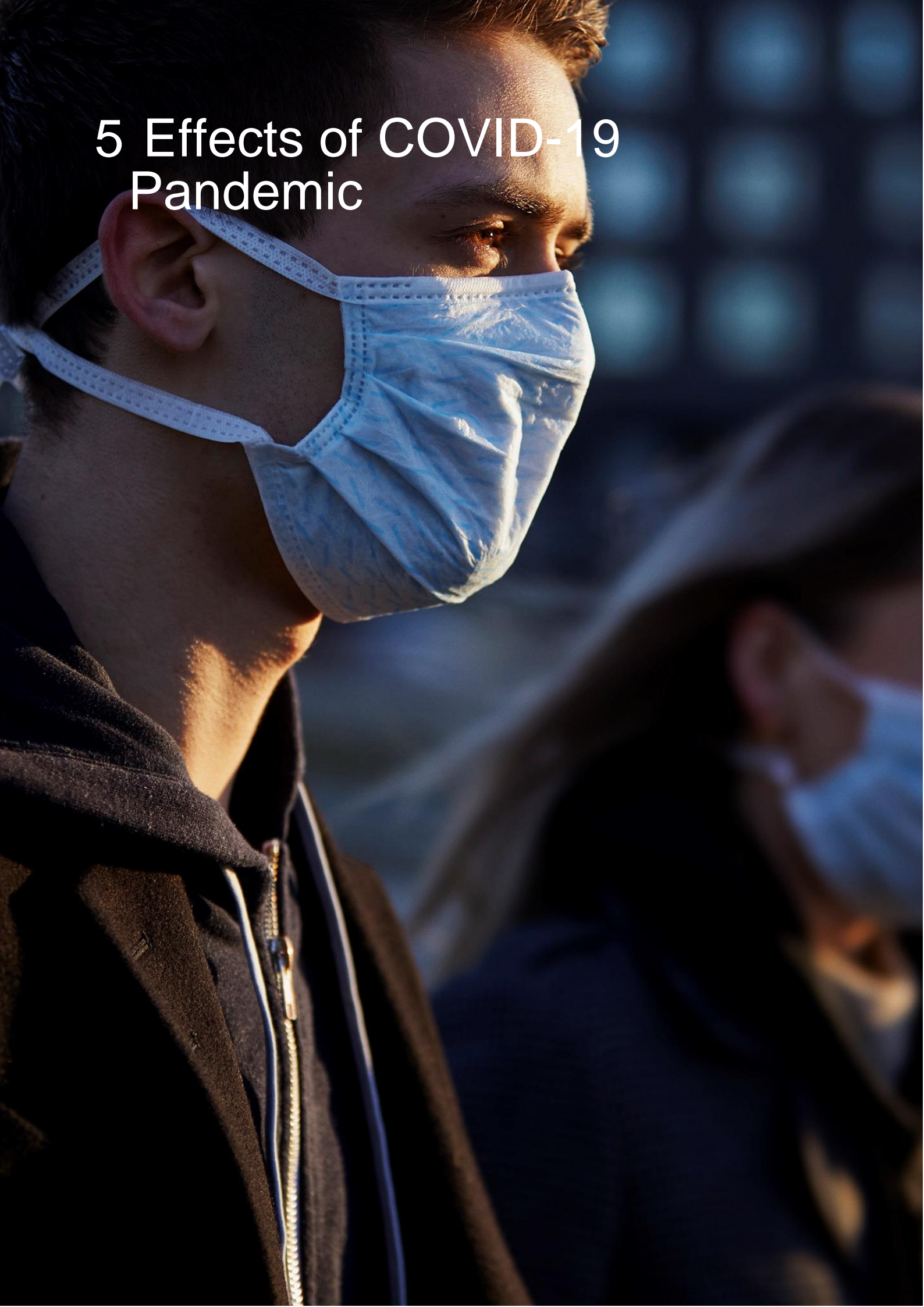
- Significant enforcement (including penalties);
- Greater coordination between SEPA and LAs to resolve flytipping sooner; and
- More proactive work to reduce the occurrence of littering, as opposed to reactionary clearing.

<sup>102</sup> Keep Scotland Beautiful (2022), *Clean Up Scotland Map*, <https://www.keepsotlandbeautiful.org/community-and-place/clean-up-scotland/clean-up-scotland-map/>

## 4.3 Summary

The contribution of volunteers to clearing litter is immense. Though it is difficult to accurately quantify the hours spent clearing litter by volunteers, as it is an informal and mostly unrecorded activity, this research suggests that volunteers spend over 280,000 hours a year clearing litter from their local areas, which is equivalent to over £2.5 million of equivalent resource to LAs undertaking this clearing. Collectively this totals the clearing of approximately 420,000 bags of litter, or 2.8 million kg. This includes records from official clearing events organised by Keep Scotland Beautiful, Community Clean Up Hubs and schools, and an estimate of unofficial litter clearing events by other local groups. These groups varied significantly in their number of members, area covered, frequency of clearing and how they worked with their LA.

# 5 Effects of COVID-19 Pandemic



## 5.1 Background and Context

Throughout 2020 and 2021, the COVID-19 pandemic caused widespread disruption to economic activity. The way in which people used products and services changed drastically. There have been several reports, as well as anecdotal evidence describing how litter and flytipping has been affected by the pandemic and the variety of issues it has caused.

## 5.2 Results

### 5.2.1 New Types of Waste

Over the course of the pandemic, several new products related to health and sanitation have emerged as commonly littered items. Since the early start of COVID-19, and despite management efforts and announcements, there have been worldwide reports of improper disposal and littering of PPE by the public.<sup>103</sup> A recent estimate of the global mismanagement of PPE found that an average of 129 billion face masks and 65 billion gloves were littered each month.<sup>104</sup>

In the UK, the introduction of mandatory fitted face masks in indoor spaces resulted in a significant increase in single-use surgical face masks used by the general public, and consequently also the number of these products being littered. Indeed, a study by the University of Portsmouth found UK mask litter to have increased by 9,000%.<sup>105</sup>

A 2022 analysis published in *Nature Sustainability* used data crowdsourced on the citizen science application Litterati to explore worldwide changes in PPE litter as a result of the pandemic. For the UK over the period of August to October 2020, masks accounted for more than 5% of all recorded litter. Gloves and wipes accounted for an additional 1.5% each. Whilst this pattern is not repeated worldwide, inconsistencies in data collection, as well as differences in the rate at which national policies were introduced, leaves comparisons between countries difficult.

At the time of writing, there was no formally published data relating to the changes in litter composition in Scotland. However, anecdotal evidence from community litter pickers suggests that quantities of PPE found to have been incorrectly disposed of increased drastically. For instance, during an interview with Fife Street Champions, a representative stated that they counted 17,000 face masks that were collected since the beginning of the COVID-19 pandemic, compared to presumably zero or negligible quantities pre-pandemic.

<sup>103</sup> Y. Tesfaldet, et al. (2022) *Assessing face mask littering in urban environments and policy implications: The case of Bangkok*

<sup>104</sup> A. Forrest, et al. (2019) *Eliminating plastic pollution: how a voluntary contribution from industry will drive the circular plastics economy*

<sup>105</sup> BBC (2021) *University of Portsmouth study finds 9,000% increase in face mask litter*, <https://www.bbc.co.uk/news/uk-england-hampshire-59622307>

## 5.2.2 Change in Behaviours

As well as in the introduction of PPE, other government recommendations and rules caused behaviour changes. For a period during the pandemic, groups were only allowed to meet outside. This led to parks and open spaces being used with increasing frequency. Indoor socialising was restricted, and thus meeting outdoors was the norm. As a consequence, littering in these spaces also appeared to increase.<sup>106</sup>

In addition to changing socialising habits, concerns of hygiene and safety led to an increase in the number of people opting for disposable rather than reusable products (e.g., coffee cups).<sup>106</sup>

## 5.2.3 Closure of HWRCs

The decision to close Household Waste Recycling Centres (HWRCs) was taken on 24<sup>th</sup> March 2020. This was in line with the UK Government's guidance for people to stay at home and only travel, if necessary, to prevent the spread of COVID-19. From March 2020 to March 2021 in England, 1.13m fly-tipping incidents were dealt with by LAs, an increase of 16% on the 980,000 reported in the previous year.<sup>107</sup> In Scotland there have also been reports of increased incidents of flytipping, West Lothian reported 73 tonnes of flytipped waste was collected between October 2020 to December 2020<sup>108</sup>, unfortunately there are no figures from total number of incidents reported in Scotland.

During the pandemic, many households used the time to remodel or clear out houses, resulting in a lot of waste in need of disposal<sup>109</sup>. However, due to HWRCs being closed, some resorted to flytipping their waste or using unlicensed waste removals who in turn flytipped the waste. This information was validated by two LAs in Scotland.

## 5.2.4 Staffing Issues in Waste Collection

During the pandemic there were significant staff shortages due to staff illness or the need to isolate. As a result of these staff shortages, many waste, recycling, and cleansing rounds and services were not completed<sup>110</sup>. Prioritisation was given to clearing general waste bins, and less resources were allocated to litter picking and mechanical street sweeping. This led to a rise in the amount of street litter present, as the frequency

<sup>106</sup> BBC (2020) *Why litter is surging as lockdowns ease*, <https://www.bbc.com/worklife/article/20200610-why-are-parks-full-of-litter-as-lockdown-eases>

<sup>107</sup> The Guardian (2022) *Fly-tipping in England increases during Covid pandemic*, <https://www.theguardian.com/environment/2021/dec/08/fly-tipping-in-england-increases-during-covid-pandemic>

<sup>108</sup> The Herald (2021) *Call for action as fly-tipping surges in Scotland*, <https://www.heraldsotland.com/news/19124659.call-action-fly-tipping-surges-scotland/>

<sup>109</sup> Statista (2022) *Home improvements projects – statistics & facts*, <https://www.statista.com/topics/7899/home-improvement-projects/#dossierKeyfigures>

<sup>110</sup> Roadrunner (2021) *HOW COVID-19 HAS AFFECTED THE WASTE INDUSTRY'S WORKFORCE*, <https://www.roadrunnerwm.com/blog/covid-waste-industry-workforce>

of clearing streets was lower. Additionally, uncollected bins due to staff shortages may have led to residents flytipping their waste if their missed collection wasn't rectified.

## 5.2.5 Commentary

During interviews with Scottish LAs, several stated that littering and flytipping appeared to have increased during the pandemic. In 2020/21, Keep Scotland Beautiful (KSB) saw the largest decline in streets that are classified 'acceptable' (according to LEAMS<sup>111</sup>) in high density residential areas (82.9%, a decline by 4.5% from 19/20).<sup>112</sup> Whilst less significant, a decline was also observed in low density residential areas (92.8%, a decline by 1.7% from 19/20). Overall, residential areas reached a level of 90.5% of sites with acceptable litter levels, whilst town centres reached 88.4%. KSB also stated that domestic waste issues (from poor presentation, over capacity, and under-resourcing) increased during the COVID-19 pandemic and are potentially linked to people spending more time at home, staff shortages in servicing, and changes in collection frequency.

Additionally, during interviews with public and private bodies, many saw an increase in littering and flytipping, again particularly an increase in PPE.

## 5.3 Summary

The pandemic has increased the amount of litter and flytipping through the introduction of new materials to the waste stream, policies and laws causing changes in behaviours and the closure of HWRCs and other amenities. This has had significant impacts on the authorities throughout Scotland.

Out of the new materials (masks, gloves, wipes), masks have been the most commonly littered item. This is likely due to the fact that masks were mandatory, and at the start of the pandemic most were disposable rather than reusable. The littering of other items was predominantly fuelled by restrictions for socialising and closure of amenities, causing people to spend more time outdoors and thus more likely to incorrectly dispose of their waste.

The closure of HWRC's and staff shortages in the waste industry is likely to have caused an increase in incidents of flytipping. Anecdotal evidence suggests that residents may have turned to flytipping (or contracting of unlicensed waste removal companies who then flytipped) to address their build-up of waste. This is likely either due to not being able to take waste to the HWRC or having multiple missed bin collections.

<sup>111</sup> Streets that are classified Grade A, B or B+ following on from LEAMS surveys are deemed 'acceptable' by KSB, according to the definitions found here: <https://www.keepsotlandbeautiful.org/environmental-services/leams/>

<sup>112</sup> Information provided by Keep Scotland Beautiful during an interview on 17<sup>th</sup> March 2022

# 6 Summary and Conclusions



Scottish Government is devising a new National Litter and Flytipping Strategy. The current strategy was published in 2014 and includes data from 2011. The purpose of this study was to update these figures with 2019 data (the most recent year unaffected by COVID-19) and expand the scope of the research to include both direct and indirect costs of litter and flytipping to LAs, other public bodies, and private organisations.

For 2019/2020, the cost of addressing instances of litter and flytipping in Scotland was calculated to be at least £280.8m. This includes direct costs (£81.2m), indirect costs (£196.7.8m), the value of materials lost (£416k at current recycling rates), and the value of volunteering (£2.5m). It is very important to note that due to lack of data, this calculation was based on adjusting the 2012/2013 figures upwards for inflation and population growth, and therefore there is a large amount of uncertainty with these figures, until further data becomes available. Table 6-1 provides an overview of these costs.

**Table 6-1: Breakdown of costs incurred when addressing instances of litter and flytipping in Scotland**

<b>Cost Category</b>	<b>Cost</b>
Local Authority Litter Costs	£48.0m
Local Authority Flytipping Costs	£12.7m
Direct Costs to Other Public and Private Bodies	£20.5m
Indirect Costs	£196.7m
Value of Materials Lost	£416k
Value of Volunteering	£2.5m
<b>TOTAL</b>	<b>£280.8m</b>

When considering the costs incurred by LAs, special consideration was given to Highland and Island Authorities and the differences they experienced when compared with other Authorities. Research revealed that the scale and costs associated with addressing litter in these regions varied significantly when compared with other locales in Scotland. Whilst the available data was limited, some quantitative input as well as anecdotal evidence suggests that litter and flytipping are less of an issue, but that clearing them up comparatively costs more.

In addition to costs incurred, the study also compiled evidence regarding the most commonly littered and flytipping items. Amongst the most commonly littered items were food and drinks packaging, cigarette butts, and dog fouling. Frequently flytipped items



included bulky household waste, electrical items, and construction and demolition waste.

Finally, the study considered the likely impacts of the COVID-19 pandemic. The intention of this research was not to ascertain quantitative differences. Moreover, the objective was to provide qualitative commentary on the effects experienced by LAs, other public and private bodies, and volunteers. Perhaps the key conclusion here was that the types of waste have changed. Numerous stakeholders reported that PPE had increased drastically in proliferation (particularly disposable face masks). It was also noted that closures of HWRCs and staffing issues within waste collection operations had a significant impact on the scale and distribution of littered and flytipped waste.

## 6.1 Recommendations to Improve Data Collection

The research relied upon receiving data from both LAs, and other public and private organisations. The area where Scottish Government is likely to be able to have the greatest impact in influencing reporting practices is within LAs and therefore these recommendations focus primarily on the improvement of the quality and volume of data received from LAs. It is unlikely that the government could implement a widespread mechanism to improve the quality of data received from private organisations without long-term policy change and/or financial incentives.

In light of the above identification of limitations on current reporting practices, it is recommended that a **standardised Local Authority reporting mechanism** should be developed and implemented. This would guarantee that data on LA expenditure and operations is collected and available for future research, thereby creating a more robust evidence base for upcoming policy decisions. The data included should encompass expenditure across services in addition to operational data such as litter tonnages collected. Local Environmental Audit and Management System (LEAMS), Litter Management System (LMS) and Flymapper are examples of Scotland-wide datasets that have successfully collated comparable and comprehensive datasets on litter and flytipping for several years. It is evident that an equivalent tracker of disaggregated data, including on expenditure, would be of significant benefit.

For LAs, the benefits of a standardised reporting mechanism are numerous. The provision of consistent data would leave Scottish Government with a more accurate understanding of the significant costs associated with managing litter and flytipping. This could, in turn, feed into policy development in related areas (e.g., the implementation of EPR in Scotland) that could subsequently result in improvements to the resources available to support LAs to address litter and flytipping. It could also form an evidence base for organisations that do not have a defined route for influencing

policy development (for example, farms and rural estates that suffer from flytipping) to track the adverse impacts that they experience.

For Scottish Government, a standardised reporting mechanism would enable a more strategic (and efficient) method of using data to inform policy. Any proposed mechanism should address the lack of formalised structure in current LA reporting. There appears to be limited tracking and apportionment of spend into different services, which restricts an LA's ability to identify trends in expenditure through time and across regions.

Moreover, most LAs did not appear to have a responsible individual or body that could provide data on expenditure, and instead on-the-ground officials were collating spend. A more efficient approach might track spend on a macro-level by service, which could then be provided and analysed per service as required. This process may also be improved by having an individual in each LA who is ultimately responsible for gathering, cleansing, and distributing data in the standardised format when required.

The development of this platform or mechanism should be iterative, and collaboration between LAs and the Scottish Government is essential. Taking such an approach will ensure that the system's efficacy is optimised and that it fulfils the needs of both parties. Additionally, identifying the correct level of data to request is essential. Asking for too much or too detailed data leads to confusion and a lack of engagement in providing what is required. Moreover, in recognition that many LAs are stretched for resource whilst providing a multitude of important services, the platform used to track data must be intuitive and improve upon existing data reporting practices, rather than creating additional work by introducing an entirely new system.

By implementing a standardised approach for tracking LA financial and operational data, Scottish Government could create a multi-year, multi-department, and multi-LA dataset. Though there would be an initial upfront cost and time implication, deploying such a system would payback, both in terms of reporting efficiencies (for research) and by enabling the identification of opportunities for spend and services to be apportioned more effectively. This would improve future research into LA expenditure and enable the development of tailored and evidence-based policy, which would improve future apportionment of resources to tackling problems such as litter and flytipping.

# 7 Annex



## 7.1 Indirect Costs Comparison

Indirect Cause of Litter	Previous cost	Updated cost
<b>Litter as a Casual Factor in Crime</b>	Between £225,000 and £22.5 million	Between £393,392 and £39,339,200
<b>The impacts of Litter on Mental Wellbeing</b>	Cost of Antidepressants: £1.57 million Poor Mental Health: £53 million	Cost of Antidepressants: £2.1 million Poor Mental Health: £56.7 million
<b>Indirect Costs of Drug-related Litter</b>	NA	NA
<b>Cost of Litter-related Injuries</b>	NA	NA
<b>Cost of Injuries to Duty Body Staff</b>	NA	NA
<b>Costs of Litter-related Road Traffic Accidents</b>	Between £1.03m to £4.8 million	Between £646,400 to £5.3 million
<b>Costs to Repair Punctures Caused by Litter</b>	£1 million	£1 million
<b>Indirect Costs of Litter to the Rail Networks</b>	Between £156 and £54,100.	Unable to replicate
<b>Litter-related Costs of Vermin: Rats</b>	Cost of Damage: £1 million Cost of Control: Between £2,900 and £340,000	Cost of Damage: £5.2 million Cost of Control: Between £5,000 and £500,000.
<b>Litter-related Costs of Vermin: Pigeons</b>	Between £1,680 and £168,000	Between £1,880 and £188,000
<b>Indirect Costs to Business</b>	£500,000	Unable to replicate

<b>Litter as a Cause of Wildfires</b>	Between £66,000 and £6.6million	Between £84,349 and £8,434,854
<b>Cost of Dealing with Impacts of Litter on Wildlife and Livestock</b>	£315,000	£92,400
<b>Costs of Litter-related Flooding</b>	NA	NA
<b>Effects of Litter on House Prices</b>	£100 million	£110 million
<b>Impacts of Litter on Tourism</b>	NA	NA

## 7.2 Primary Data Availability across Local Authorities, Public and Private Bodies

The following table shows the primary data availability across LAs, Public and Private Bodies for the cost, scale and composition of litter. A red-amber-green scale has been used as follows:

- Red / “Not Available”: No primary data collected (or unknown)
- Amber / “Limited”: At least one qualitative data point, or anecdotal evidence, collected through primary research for this category
- Green / “Available”: At least one quantitative data point collected through primary research for this category

**Table 7-1: Primary data availability across local authorities, public and private bodies**

		Litter		
		Cost	Scale	Composition
<b>Local authorities</b>				
<b>Urban</b>		Available	Available	Not Available
<b>Mixed</b>		Limited	Available	Not Available
<b>Rural</b>		Limited	Available	Not Available
<b>Private and other public bodies</b>				
<b>Food</b>	Take away and fast food	Available	Not Available	Not Available
<b>Nature based attractions</b>	National parks	Available	Available	Limited
	Holiday parks	Available	Not Available	Not Available
	Country parks	Available	Not Available	Not Available
	Woodlands	Available	Not Available	Not Available
	Farmlands	Not Available	Not Available	Not Available
	The Crown Estate	Not Available	Available	Available
<b>Night-time economy</b>	Nightclubs	Available	Not Available	Not Available
	Pubs and bars	Available	Not Available	Not Available

<b>Retail/ commercial</b>	Supermarkets	Available	Not Available	Not Available
	Shopping malls/ retail parks	Available	Available	Available
	Business parks	Available	Not Available	Not Available
<b>Transport hubs</b>	Ports	Available	Not Available	Not Available
	Train and coach stations	Not Available	Not Available	Not Available
	Airport	Available	Not Available	Not Available
<b>Transport infrastructure</b>	Railways	Not Available	Not Available	Not Available
	Roads	Not Available	Not Available	Not Available
	Waterways	Available	Available	Available
<b>Education facilities</b>	Universities	Available	Not Available	Not Available
	Primary Schools	Available	Not Available	Limited
	Secondary Schools	Available	Not Available	Limited
<b>Indoor recreation</b>	Cinemas	Available	Available	Available
	Theatres	Available	Not Available	Not Available
	Aquariums & zoos	Available	Not Available	Not Available
	Museums & historical sites	Available	Not Available	Not Available
<b>Outdoor recreation</b>	Stadium	Not Available	Not Available	Not Available
	Sports grounds	Available	Not Available	Not Available
	Golf courses	Available	Not Available	Not Available
	Car parks	Available	Not Available	Not Available
	Theme parks	Available	Not Available	Not Available
	Music Festivals	Not Available	Not Available	Not Available

## 7.3 Public and Private Bodies - Categories, Sub-categories and Specific Types of Organisations

**Table 7-2: Public and private bodies - categories, sub-categories and specific types of organisations**

Category (9)	Sub-category (31)	Specific type (56)
<b>Food</b>	Take away and fast food	High footfall
		Rural setting
		Outdoor seating
		Drive through/collection
<b>Nature based attractions</b>	National parks	Near city
		Further away
	Country parks	Facilities
		No facilities
		Charges
		No charge
	Woodlands	Near city
		Further away
	Farmlands	National Farmers Union
		Scottish Land and Estates
	The Crown Estate	The Crown Estate
	Tourist attractions	One urban
One not		
<b>Night-time economy</b>	Nightclubs	Smoking area
		Not smoking area
	Pubs	Bar
		Pub
<b>Retail/commercial</b>	Supermarkets	Urban
		rural setting
	Shopping malls/retail	Mall
		Retail Park
	Business parks	Urban
		Rural
<b>Transport hubs</b>	Ports	Urban
		Rural



	Train stations	Urban
		Rural
	Airport	Glasgow
		Highland and Island Airports
		Edinburgh
<b>Transport infrastructure</b>	Railways	One company
	Roads	One company
	Waterways	One company
<b>Education facilities</b>	Universities	Campus university
		City university
	Schools	Primary state
		Primary private
		Secondary state
		Secondary private
		Nursery
<b>Indoor recreation</b>	Cinemas	Landlord - leisure park
		Non-landlord
	Theatres	Independent
		Chain
	Tourist sites	Urban
		Rural
<b>Outdoor recreation</b>	Stadium	One
	Sports grounds	One
	Golf clubs	One
	Car parks	One
	Theme parks	One
	Festivals	One

# 7.4 Public and Private Bodies – Survey Questionnaire

The full questionnaire was sent in Excel format. The file contained the following sheets:

- **Introduction:** Containing a description of the study and the survey and contact details of the research team.
- **Contact Information:** To allow respondents to provide their contact details.
- **Scale & Cost of Lit. & Flytip.:** Containing questions related to the scale and cost of the services associated with litter and flytipping, as well as composition. Structured by data, people, education, enforcement, equipment, disposal and other.
- **Impact of COVID-19:** Containing questions relating to changes in littering and flytipping as a result of the COVID-19 pandemic.

## Scale & Cost of Litter & Flytipping Questions

**Q1** Does your organisation face issues with litter and/or flytipped waste on your premises?  
Please provide as much information and detail as possible.

---

**Q2** Do you spend resources to clean up this litter and/or flytipped waste?  
Please provide as much information and detail as possible.

---

**Q3** Does your organisation collect data (e.g the cost of cleaning, the tonnages of waste collected etc.) on the litter and/or flytipped items you collect?  
If you don't have an exact figure, even an estimate would be really helpful.

Alternatively please provide the following figures (which can be used to calculate this cost):

Description	Answer
How many hours are spent clearing litter and flytipping per week?	
What is your hourly rate?	
What is the cost of your equipment (e.g. uniforms, sweeping vehicles, pavement cleaners etc.)?	
Do you have any running costs associated with cleaning litter and/or flytipping (e.g. fuel, maintenance, insurance)?	
Any other relevant costs?	

## The Scale and Cost of Litter and Flytipping

**Q4** What do you do with the litter you collect? Do you throw it all into residual waste? Do you separate and recycle any? Do you separate and send any to compost (food and garden waste). Please provide an indication of ratios if you can.

*For example 80% mixed waste disposed of as residual, 20% recyclable waste separated and set for recycling.*

**Q5** Can you think of any other issues caused by litter that you have to address? Please provide details where you can.

Problem	Comments
Drains	<i>e.g. magnitude, cost, severity, examples</i>
Crew injuries	

**Q6a** Please give us an approximate total tonnage of litter and flytipped items collected by your organisation in FY2019/20?

**Q6b** As a rough percentage, what % was litter, what % was flytipping and what % are you not sure about?

**Q7** Please provide a list of the most commonly littered items, categories of items, and an estimate of the percentage of littering they account for. This can be based on general experience and can be a rough estimate.

*If you are unsure whether an item is litter or flytipping please put it in either table.*

Littered Items	% of total littering
Packaging (e.g. crisp packets)	
Smoking related litter	
Beverage bottles	
Fast-food related	
Vehicle parts	
Discarded food and drink	
Other (please specify below)	

**Q8** Please provide a list of the most commonly flytipped items or categories of items, and an estimate of the percentage of flytipping they account for. This can be based on general experience and can be a rough estimate.

*If you are unsure whether an item is litter or flytipping please put it in either table.*

Flytipped Items	% of total flytipping
Bulky household waste	
Tyres	
C&D waste	
ELVs	
Electrical waste	
Hazardous waste	
Other (please specify below)	

## Impact of COVID-19

**Q1** Have you experienced a change in the littered and flytipped waste found on your premises since the COVID-19 pandemic? Please provide an estimate of the percentage change in the total tonnage of littered and flytipped material as a result of the COVID-19

Type	% change
Littered	
Flytipped	

**Q2** Please provide a list of the littered items or categories of items that have seen a significant increase/decrease as a result of the COVID-19 pandemic.

Items or categories with increased tonnage		
Littered Item	Tonnage pre-pandemic	Tonnage post-pandemic

Items or categories with decreased tonnage		
Littered Item	Tonnage pre-pandemic	Tonnage post-pandemic

**Q3** Please provide a list of the flytipped items or categories of items that have seen a significant increase/decrease as a result of the COVID-19 pandemic.

Items or categories with increased tonnage		
Flytipped Item	Tonnage pre-pandemic	Tonnage post-pandemic

Items or categories with decreased tonnage		
Flytipped Item	Tonnage pre-pandemic	Tonnage post-pandemic

**Q4** Have you observed a change in the distribution (geographic, composition or other) of litter and flytipped materials?

Comment	
---------	--

## 7.5 Public and Private Bodies - Interview Guide

### Question 1:

**Does your organisation experience any issues with litter around your premises/the premises that you are responsible for?**

*For note, the definition of litter to be used here is any rubbish (including, but not limited to, packaging, cigarette butts, food, chewing gum, etc.) found in any outside place that is not designed or intended to specifically gather rubbish (i.e., not a bin). This excludes any waste products left within the bounds of an organisation's outdoor premises that can be reasonably expected to be gathered as part of said organisation's daily operations. For example, food packaging left on a table in the seating area of a café would not count as litter.*

Expected responses and suggested approach:

- Yes – please move on to question 2
- No – ask them if there is any reason for this (e.g., the Council cleans any potential litter regularly enough to mitigate any issues experienced by the organisation). End conversation

### Question 2:

**Does your organisation clean up this litter? Either directly using employee time or through an additional, purchased service?**

Expected responses and suggested approach:

- Yes, employees – please move on to question 3
- Yes, paid service – please move on to question 5
- No – Thank them and end the call

### Question 3:

**Do you know how much time your employees spend, per week or per day, cleaning up this litter?**

Expected responses and suggested approach:

- Yes, quantitative description of number of hours (e.g., “about 15 minutes a day”) spent cleaning up litter – please move on to question 7
- Yes, percentage of a shift (e.g., “about 5% per shift”) – please move on to question 4
- No – please move on to question 6

### Question 4:

**How long is a typical shift?**

Expected responses:

- Qualitative figure for length of a shift (e.g., “8 hours”) – please move on to question 6

**Question 5:**

**How much does this service cost you? Does this service perform any other tasks (e.g., other cleaning) for you? As a percentage, what proportion of the time this service spends with you each week do you think is spent cleaning up litter?**

Expected responses and suggested approach:

- Qualitative responses to the above questions – please move on to question 6

**Question 6:**

**Are you able to provide any further details regarding the litter that you clean up? For example, what sort of litter it is or how much of it there is?**

Expected responses and suggested approach:

- Yes – please ask for an email address to send follow on questions
- No – Thank them and end the call

## 7.6 Public and Private Bodies – Data Points Collected from Stakeholder Sub-groups on the Direct Cost of Littering

### 7.6.1 Food

**Table 7-3: Data point(s) collected from take away restaurants and fast-food chains on the time spent clearing litter**

	<b>Response</b>	<b>Hrs/day cleaning</b>	<b>Annual cost (£/yr)</b>
<b>1</b>	None	0	0
<b>2</b>	1 person, 5 minutes per day	0.08	£250
<b>3</b>	1 person, 5 minutes per day	0.08	£250
<b>4</b>	1 person, 2-3 hours per day	2.50	£7,492

### 7.6.2 Nature Based Attractions

**Table 7-4: Data point(s) collected from National Parks on the time spent clearing litter**

	<b>Response</b>	<b>Hrs/day cleaning</b>	<b>Annual cost (£/yr)</b>
<b>1</b>	In summer, 3 staff spend 21 hours a week litter picking. In the winter, this falls to 1 member of staff	6	£17,980

**Table 7-5: Data point(s) collected from holiday parks on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	1 person, 30 minutes per day	0.5	£1,498

**Table 7-6: Data point(s) collected from country parks on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	1.5 people, 8 hours per day	12	£35,960

**Table 7-7: Data point(s) collected from entity responsible for woodlands on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	We would spend around £50-60K pa for our estate in Scotland for contractor costs. This does not account for staff time in managing those contracts or any volunteer time	N/A	£60,000

**Table 7-8: Data point(s) collected for the Crown Estate on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	Cleared while passing on route to other works within the Estates	N/A	N/A



	<b>Response</b>	<b>Hrs/day cleaning</b>	<b>Annual cost (£/yr)</b>
<b>2</b>	Litter is generally collected while on other duties e.g., patrolling trails. However, we have a list of named sites that get further checked annually specifically for litter/flytipping	N/A	N/A
<b>3</b>	Crown Estate Scotland work with other stakeholders to manage the clear up, including Police Scotland, the Local Authorities and the tenant farmers	N/A	N/A

Data point(s) collected: When contacted, Crown Estate Scotland could not provide any quantitative data on the cost of clearing litter on the four landed estates they are responsible for, as it is not data they collect. However, they did provide the following qualitative responses for three of their estates on clearing litter from their premises shown in Table 7-8.

### 7.6.3 Night-time Economy

**Table 7-9: Data point(s) collected for pubs on the time spent clearing litter**

	<b>Response</b>	<b>Hrs/day cleaning</b>	<b>Annual cost (£/yr)</b>
<b>1</b>	1 person, 5-10 minutes a day	0.13	£375

**Table 7-10: Data point(s) collected for night clubs on the time spent clearing litter**

	<b>Response</b>	<b>Hrs/day cleaning</b>	<b>Annual cost (£/yr)</b>
<b>1</b>	10-20 minutes per day when open. Open 3 times a week, and 2 times a month have extra days	0.25	£370

### 7.6.4 Retail/Commercial

Data points were collected for supermarkets located in both rural (four responses) and urban areas (two responses). Of the rural supermarkets, three said litter was not an issue and that they do not spend time clearing it. One said that litter is an issue and that their cleaners spend around 20 minutes a day. Of the urban supermarkets, one said there was a lot of litter but that they were well-served by the council and so did not spend any time clearing litter. The other said litter is an issue and that they spend 20 minutes every day picking. The central estimate used for the time spent clearing litter was 10 minutes a day.

**Table 7-11: Data point(s) collected for supermarkets on the time spent clearing litter**

	<b>Response</b>	<b>Hrs/day cleaning</b>	<b>Annual cost (£/yr)</b>
1	Litter is not an issue, don't spend any time clearing	0	£0
2	Litter is not an issue, don't spend any time clearing	0	£0
3	Litter is not an issue, don't spend any time clearing	0	£0
4	Litter is an issue – they have schools nearby and lots of litter, their cleaners do some clearing when they have time, maybe 20 minutes every morning	0.33	£999
5	Litter is a big issue – spend 20 minutes a day picking it up	0.33	£999
6	There is a lot of litter, but they are central and well-served by the council, council litter pickers cover the area so they don't do any clearing	0	£0

When contacting shopping malls and retail parks, most of these responded that they had their own dedicated cleaning service to deal with litter. One data point was collected for a shopping mall in Glasgow, who said that their whole cleaning contract,

which included all cleaning duties, amounted to £400,000 and that approximately 45% of this was for litter clearing.

**Table 7-12: Data point(s) collected for shopping malls and retail parks on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	Whole cleaning contract is £400,000, approx. 45% of that is for litter clearing	N/A	£180,000

**Table 7-13: Data point(s) collected for business parks on the time spent clearing litter (From a business park in Aberdeen)**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	Litter is a massive issue, winds blow in litter, and due to bins not secured, lots of litter gets blown into the general area. Facility manager spends approximately 3 hours a week clearing	0.43	£1,284

### 7.6.5 Transport Hubs

Data points were collected for two urban ports and two rural ports. Two of the responses contained quantitative data – one urban port said they spend approximately £200 annually to clear up litter, and one rural port said internal staff spend around 30 minutes a day collecting waste and litter blown in.

**Table 7-14: Data point(s) collected for ports on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	£200 annually	N/A	£200
2	30 minutes a day	0.5	£1,498

An average was then calculated based on the two quantitative responses, equating to £849 annually.

No quantitative data was able to be collected from train and coach stations. However, two qualitative responses were received from a train station and a coach station.

**Table 7-15: Data point(s) collected for train and coach stations on the time spent clearing litter**

	<b>Response</b>	<b>Hrs/day cleaning</b>	<b>Annual cost (£/yr)</b>
<b>Train station</b>	All waste generated on site was from retailers, train operators and is managed according to its type, and therefore no data was available	N/A	N/A
<b>Coach station</b>	Do not collect information on litter in isolation. The litter picked up by cleaning staff who patrol the bus station is not usually significant	N/A	N/A

No reliable secondary data was found.

One data point was collected for one of the major commercial airports in Scotland, who reported that they had two members of staff who would spend 2 days a week litter picking.

**Table 7-16: Data point(s) collected for airports on the time spent clearing litter**

	<b>Response</b>	<b>Hrs/day cleaning</b>	<b>Annual cost (£/yr)</b>
<b>1</b>	Two members of staff, 2 days a week litter picking	4.6	£13,699

## 7.6.6 Transport Infrastructure

Cost data was collected from Scottish Canals through their survey response, who reported the following:

**Table 7-17: Data point(s) collected for waterways on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	150 hours a week spent clearing litter and flytipped items. Hourly rate of £20. Equipment = £5,000 per annum, other relevant costs equal to £26,331.14 per annum	21.4	£187,760

Data point(s) collected: No primary data was able to be collected on the cost of littering on roads. However, secondary data was collected – though the data found is from 10 years ago. In 2012, Zero Waste Scotland reported that Amey spend over 14,000 hours collecting rubbish each year from potentially dangerous, high speed motorway verges, through their Scottish Trunk Roads Unit (STRU) contract.<sup>113</sup> This amounts to £114,940 in the cost of labour time.

Data point(s) collected: No primary data was able to be collected on the cost of littering on railways. However, secondary data was collected. Network Rail Scotland report that they remove over 1,000 tonnes of rubbish from Scotland's Railways each year.<sup>114</sup>

## 7.6.7 Education Facilities

Data points were collected for two primary schools – one primary state school and one primary private school. The data is shown in Table 7-18.

**Table 7-18: Data point(s) collected for primary schools on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	Spend an average of 20 to 30 minutes per day to pick up litter and to empty bins	0.4	£1,249

<sup>113</sup> Zero Waste Scotland (2012) *Scotland takes action to rid roads and rail stations of litter*, <https://www.zerowastescotland.org.uk/content/scotland-takes-action-rid-roads-and-rail-stations-litter>

<sup>114</sup> Network Rail (2020) *Fly-tipping risk for Scotland's Railway*, <https://www.networkrailmediacentre.co.uk/news/fly-tipping-risk-for-scotlands-railway>

	Response	Hrs/day cleaning	Annual cost (£/yr)
2	No litter problem as no packaged food or drinks	0	£0

The first response was used as it was deemed more representative of most primary schools. This was chosen as it was reported by a state school, and the majority of primary schools are state schools rather than private schools (94% of school students in Scotland go to state schools<sup>115</sup>). Furthermore, the second response was from a private school who serve their students all food, hence the lack of litter – this is likely to be the case for a minority of schools.

One data point was collected for one secondary state school, show in Table 7-19.

**Table 7-19: Data point(s) collected for secondary schools on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	Experience litter and spend 2 to 3 hours a day collecting it	2.50	£7,492

Data points were collected for two major Scottish universities and are shown in Table 7-20.

**Table 7-20: Data point(s) collected for universities on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	For littering, 3.5 FTE Outside Cleaners are employed who each work 35 hours a week (plus 0.5 FTE at a subsidiary campus). Includes sweeping of streets and roads owned by University, emptying of all litter bins. For flytipping, employ the service of an outside contractor to clear this waste. A very rough total figure is £100k per annum, with most of this staff time to clear litter	N/A	£100,000 (then adjusted downwards by 50% to £50,000 - see below)
2	Estimates time 15 hours per week per campus, 2 campuses total	4.3	£12,843

<sup>115</sup> Calculation based on: Scottish Council of Independent Schools (2021) *Facts & Figures*, <https://www.scis.org.uk/facts-and-figures/>

## 7.6.8 Indoor Recreation

Data points were collected for two cinemas, one located in a leisure park with a property owner, who takes on cleaning responsibilities, and one with no property owner. The data for the cinema with no property owner is shown in Table 7-21.

**Table 7-21: Data point(s) collected for cinemas on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	Spend a maximum of 20 minutes a day sweeping – very little litter outside, most people leave their litter in the cinema screens	0.33	£1,209

Data points were collected for two theatres – one independent theatre and one chain theatre (which gave data for the 3 theatres they managed, two of which are large). We were informed by the independent theatre they hold two to three shows every two weeks, whilst it was assumed the chain theatre runs a show almost every day. Data collected is shown in Table 7-22.

**Table 7-22: Data point(s) collected for theatres on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	Staff spend 5 to 10 minutes after every show to clear litter	0.13	£67
2	260hrs per week cleaning two theatres, approximately 5% of which is to clean litter outside	1.86	£5,565 for two theatres £2,782.50 for one

One data point was collected from an aquarium who provided the response shown in Table 7-23 on the time spent clearing litter.

**Table 7-23: Data point(s) collected for aquariums and zoos on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	1 person, 2 hours per day (7 days/week)	2	£5,993

One data point was collected from a museum whose response is shown in Table 7-24.

**Table 7-24: Data point(s) collected for museums and historical sites on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	Spend 5 minutes a day collecting litter	0.08	£250

## 7.6.9 Outdoor Recreation

Data point(s) collected: No primary data was able to be collected on the cost of littering at stadiums. However, secondary data was collected. Online Gambling submitted an FOI request to the UK government to find out about wastage at football stadiums. In their study, they found that Premier League clubs spend a combined £599,518 on cleaning up over the course of one full season (per year).<sup>116</sup>

One data point was collected from a sports ground on the cost of clearing litter, shown in Table 7-25.

**Table 7-25: Data point(s) collected for sports grounds on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	Spending includes £270 a week on staff, £500 on equipment and £800 a year on skips	N/A	£15,379

Data point(s) collected: Data was collected for three different golf courses, all said they had no issues with litter and spent no time clearing it. As a result, it was assumed that golf courses do not spend money clearing up litter.

One data point was collected from a car park in Edinburgh on the cost of clearing litter. Their response is shown in Table 7-26.

**Table 7-26: Data point(s) collected for car parks on the time spent clearing litter**

	Response	Hrs/day cleaning	Annual cost (£/yr)
1	One hour per week	0.14	£428

One data point was collected from a Scottish theme park on the cost of clearing litter. This can be seen in Table 7-27.

<sup>116</sup> onlinegambling.ca (2022) *Football stadium's wastage*, <https://www.onlinegambling.ca/content-hub/football-stadiums-highest-wastage.php>



**Table 7-27: Data point(s) collected for theme parks on the time spent clearing litter**

	<b>Response</b>	<b>Hrs/day cleaning</b>	<b>Annual cost (£/yr)</b>
<b>1</b>	£3,000 per year	N/A	£3,000

Data point(s) collected: It was not possible to obtain data on the cost of addressing litter at music festivals through primary research (calls or emails). As a result, the figure that has been used is scaled from estimates gathered through secondary research.

It has been reported that in 2017, it cost Glastonbury Festival £785,000 to clean-up and remove rubbish from the site.<sup>117</sup>

<sup>117</sup> The Sun (2017) *Glastonbury clean-up costing £785,000 and lasting six weeks begins as 200,000 festival-goers head home leaving behind mounds of rubbish*, <https://www.thesun.co.uk/news/3883718/glastonbury-2017-clean-up-pictures-rubbish-after-festival/>





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