Report

Scottish re-use mapping and sector analysis

Zero Waste Scotland works with businesses, individuals, communities and local authorities to help them reduce waste, recycle more and use resources sustainably.

Find out more at www.zerowastescotland.org.uk

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Executive summary

The revised Waste Framework Directive requires all EU Member States to produce a National Waste Prevention Plan by December 2013. The Scottish Government has shown a strong commitment in this area, committing itself to a strategy that seeks to prevent waste and to channel products into re-use where possible. The Scottish Government is supported by Zero Waste Scotland, which is seeking to provide support to encourage the growth of the re-use economy in Scotland.

Zero Waste Scotland commissioned Resource Futures to conduct a mapping study of re-use organisations across Scortland, with the aim of improving knowledge of the sector and establishing the baseline level of re-use activity. This will be used to inform any future programme of support.

The key elements of of the research were:

- A mapping exercise, identifying re-use organisations in Scotland by type and location.
- Conduct a questionnaire survey to improve understanding of the activities and support needs of re-use organisations.
- A series of in-depth interviews with re-use organisations to gather more qualitative information on market conditions and strategic issues affecting re-use.
- Interviews with council representatives to assess local authority attitudes towards re-use and explore options for local authority involvement and partnership working to divert items from the municipal waste stream for re-use.

In order to maintain focus and produce a manageable amount of data, the study excluded some sectors of the re-use economy with fully developed markets that are unlikely to require support (e.g. the second hand car industry) or one-off examples of re-use that do not lend themselves well to being scaled up and which thus have limited potential for support (e.g. decommissioning and redeployment of industrial plant). The scope of the project is discussed in detail in Chapter 1.

Major findings

The mapping exercise identified 1,527 organisations across Scotland, split by organisational type as follows (in order to prevent double counting, all organisations that were identified as registered charities have been recorded as charities; in the table below, social enterprises refers only to organisations that are not charities).

Re-use organisations identified, by type

Organisation type	Number identified
Charity	943
Private sector	533
Social enterprise	51
Combined	1,527

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The mapping shows that re-use organisations are dominated by charity shops, and are heavily concentrated in urban areas, particularly across the central belt. Outside of the central belt, organisations are most prevalent on the east coast, particularly around Dundee, Aberdeen and Inverness.

Despite fluctuations in the number of organisations in different local authority areas, analysis of the number of organisations per 100,000 people in each authority suggest that most authorities are reasonably well served relative to population size.

Combining the mapping outputs with information gained from the questionnaire and modelling from UK wide re-use studies suggests that the re-use economy in Scotland currently:

- Re-uses around 89,000 tonnes of material, including 12,000 tonnes of furniture, 9,500 tonnes of electrical items and 66,000 tonnes of textiles.
- Has a turnover of approximately £244 million.
- Employs over 6,000 people (full time equivalent).
- Provides around 3,000 full time equivalent volunteering positions, with more than 13,000 people involved in volunteering.

The research also suggests that there is around 150,000 tonnes of additional material that could potentially be re-used in the waste stream. If just 25% of this material could be targeted for re-use, the re-use economy in Scotland would:

- Re-use around 127,000 tonnes of material.
- Turn over approximately £348 million (with a Gross Value Added roughly equivalent to the Scottish textile industry).
- Provide around 9,000 full time jobs and 4,000 full-time equivalent volunteer positions.

A number of barriers stand in the way of realising this potential, and these, along with opportunities for growth, are discussed in Chapter 6. Priority issues that emerge from this analysis include:

- A consumer culture that values newness and encourages a negative public perception of re-use, which in turn limits demand for re-used products.
- Consumer concerns around product quality, reliability and safety.
- Competition from inexpensive new imported products.
- A lack of supply of high-quality items for re-use and a lack of refurbishment and repair capacity.
- The historically greater emphasis placed on recycling, which has limited the place of re-use in both the policy landscape and the public imagination.

The report considers these and other barriers and makes recommendations of how these might be addressed, before considering (in Chapter 7) how these might fit together to provide an approach to developing the re-use economy in Scotland. Key recommendations include:

- Communications and marketing to promote re-use to the public and provide information to make re-use easier.
- Expansion of the Revolve accreditation system to include the charity and private sectors in order to promote consumer confidence.
- Working with local authorities to push waste up the hierarchy through voluntary targets, re-use led procurement policies and increased partnership working.
- Provision of business support loans and training to SMEs in the re-use economy.
- A feasibility study to assess the business case for a central repair and refurbishment hub.

- Long-term engagement with the university sector to develop Scotland as a centre of excellence for research into sustainable design, remanufacturing and the circular economy.

The report concludes with suggestions for monitoring and evaluating progress and recommendations for further research.

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1 Introduction

1.1 Background

The revised European Waste Framework requires all EU Member States to put in place a National Waste Prevention Plan by December 2013, and the Scottish Government has committed itself to a plan that will place the waste hierarchy at the centre, prioritising waste prevention and preparation for re-use.

The Scottish Government is supported in this aim by Zero Waste Scotland; the Zero Waste Scotland Delivery Plan 2011-15 sets out its priorities as working in partnership to:

- design out waste;
- make more efficient use of resources; and
- maximise the economic benefit from unavoidable waste.

Supporting the growth of the re-use economy in Scotland will have a positive impact on all the actions listed above. In addition to its environmental benefits, re-use brings economic and social benefits, creating jobs and training opportunities, realising the full economic value of products and helping to provide a source of affordable goods and equipment to start-up businesses and households.

Zero Waste Scotland's aims for 2011-15 include the establishment of an accredited Repair and Re-use Network. The roll out of the Revolve national re-use standard aims to improve consumer confidence in re-used products through quality standards and accreditation, including measures to improve the consumer experience. There is also ongoing work to link accredited re-use services under a common re-use hotline number to make it easier for consumers to locate and utilise appropriate services. For more information visit: http://www.zerowastescotland.org.uk/content/re-use-and-repair.

In providing future support to encourage the growth of the re-use economy in Scotland, it is important to have an understanding of where the sector is currently, the types of businesses trading and the baseline levels of re-use being achieved. While there is a good level of understanding of some aspects of re-use (e.g. of community and third sector activity through CRNS's *State of the Sector 2011* report) there are still major gaps in knowledge around charity and private sector re-use activity.

This research was conducted with the aim of filling some of these data gaps and providing a comprehensive overview of re-use activity across Scotland.

1.2 Objective

The objective of the project was to undertake a mapping, consultation and strategic planning exercise to inform the strategic development of support for re-use in Scotland through cohesive engagement. This was carried out by gathering information on current business re-use activities and consulting with re-use organisations to gain an understanding of the issues affecting their business and the sector in general. The key outputs from this project are:

- A map showing the geographical location of businesses and the type of organisation (private sector, charity, social enterprise). In addition to showing physical location, the map allows analysis of the spatial distribution of re-use businesses, highlighting regional gaps in service.

- Responses to a questionnaire of re-use business activities (types of item re-used, turnover, employees etc) to assess the general level of business confidence among organisations involved with re-use.
- In-depth interviews to gather detailed information at a more strategic level discussing opportunities and barriers and what support might help to encourage the growth of the re-use economy.
- An overview, based on the primary data gathered and previously published work, of the re-use economy, including baseline levels of re-use, the potential supply of end-of-life items that might be diverted into re-use and the barriers and opportunities to increasing re-use in Scotland.
- Suggestions and recommendations on future engagement to encourage the growth of the re-use economy and the impact that this might have.
- Suggestions for future research to develop understanding of the re-use economy in Scotland.

1.3 Scope of the project

1.3.1 Business sectors included

The study focused primarily on the commercial and charity sectors, since these were seen as the areas where the data gaps were most significant. The 2011 CRNS *State of the sector* report provides a comprehensive overview of the activities of community and third sector organisations, and it was decided that this research would provide more value by concentrating on the less well understood sectors. Some elements of the CRNS report have been incorporated into this project, and the CRNS was interviewed as a project participant to ensure that the views and concerns of this sector were incorporated.

1.3.2 Types of activities included

While the project brief was originally defined in terms of mapping and characterising the re-use sector, the terms "re-use economy" or "re-use businesses" have generally been preferred throughout this report. Given the wide range of activities that involve re-using items, and the range of different businesses thus involved, the term sector may be misleading, suggesting that businesses may have more in common than is the case. Arguably, businesses engaged in re-use, when taken across the board, have no more in common than businesses in the new goods sector. In this context, the term sector has been retained for use when describing subsets of the re-use economy (e.g. the charity retail sector, or private sector second hand shops).

The range of activities that can be defined as re-use is very broad, and, as with any piece of research, it was necessary to define the scope of the work in terms of the types of organisation included, in order to identify a coherent object of research.

Since the stated aim of the report was to inform future Zero Waste Scotland support to encourage the growth of the re-use sector in Scotland, the focus was on re-use activity within the confines of the formal economy, since this is where support is liekly to be targeted. Sectors of economic activity that were excluded were:

- Well developed re-use sectors currently functioning without external support (e.g. the second-hand car market; re-use of industrial plant and machinery)
- Activities where re-use is a peripheral activity, to such an extent that it does not make sense to include the business as belonging to the re-use economy (e.g. a computer store specialising in new equipment that sells one or two reconditioned PCs each year).

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Table 1 below summarises the inclusions and exclusions followed by this study.

Table 1 Businesses included in and excluded from the study

In scope	Out of scope
Charity shops	Automotive re-use
Second hand shops	Repair services not connected to re-use
Auction houses handling non-antique items	Car boot sales
House clearance operations salvaging items for re-sale	Online exchange
Re-use of office furniture and commercial equipment (e.g. commercial refrigeration)	Informal re-use
Architectural reclamation and salvage yards	Pawnbrokers
Businesses combining the sale of new and refurbished products	Antique sales
Charitable furniture re-use organisations	Occasional or one-off re-use by businesses where re-use is not a general activity.

2 Methodology

The research programme included a literature review and three empirical data-gathering activities:

- Literature review
- Mapping the distribution of re-use organisations, based on geographical data
- A questionnaire survey of a sample of re-use organisations to gather data on the range of items re-used, economic performance etc
- In-depth interviews with re-use organisations and local authorities to supplement the questionnaire data with qualitative information and to explore issues at a more strategic level.

The following section outlines the methology for each of the three empirical data gathering stages; the results are outlined in the chapters that follow.

2.1 Mapping research

The following section describes the methodology used to map the re-use sector in Scotland. This includes detailed descriptions on where the data was sourced from and in what manner, the means of refining the data, and the GIS (Geographical Information System) tools used to map the data.

2.1.1 Identification of re-use organisations

The re-use organisations in Scotland were identified through a range of means, each intended to increase coverage. A web search was conducted using search engines and online business directories such as Yell and Thompson Local. Searches were also conducted using the websites of membership organisations, such as CRNS (Community Resources Network Scotland) and the Charity Retail Association, and use was made of previously published mapping information, such as the Edinburgh Charity Shop and Re-use Map produced by Changeworks in 2010.

The search aimed to collect as much information as possible for each organisation including name, address, city and region, phone number, postcode (in order to be geo-coded), type of organisation, web address, contact email address and a named contact.

Once a re-use organisation was identified the relevant information was downloaded into a spreadsheet. The organisation type and main re-use activity of each organisation was checked and added to the record if known, using the two tier system presented in Table 2. When classifying organisation type, cases where an organisation was both a charity and social enterprise were coded as a charity. The main activity of an organisation was specified in relation to the items being re-used. In cases where the main activity could not be clearly identified, the default classification categories were "commercial" and "second-hand shop", since the majority of organisations not classified in directories or identifiable by name were small second-hand goods dealers.

Table 2 Type and category of re-use organisation used in mapping

Organisation type	Main activity
Charity shop	Architectural salvage
Commercial	Auction house
Social enterprise	Bicycles
	Books
	Electrical
	Farm equipment
	Furniture
	House/office clearance
	Music
	Scrap store
	Second-hand shop
	Textiles
	Wood

2.1.2 Mapping the data

Once the data set was compiled, the postcode information for each organisation was converted to latitude and longitude for ease of use with GIS tools. Preliminary analysis was conducted using Quantum GIS software, in order to establish key variables such as the density of re-use organisations, or the number of organisations within a local authority area.

Following the preliminary analysis, data was exported to Google Maps format for production of the online mapping tools provided with this report.

2.2 Questionnaire

The purpose of the questionnaire was to characterise re-use activity as it occurs "on the ground", looking at the operation of individual business units rather than across a whole business group incorporating numerous individual operations. This approach was felt to be more suitable to a mapping exercise, and enables comparison of activities at a similar level of scale (for example, a single outlet small to medium-sized enterprise (SME) can be compared to a national charity by looking at the data for a single outlet).

The questionnaire was designed by Resource Futures and amended following discussion and feedback from the project steering group. Key areas that the questionnaire was designed to cover were:

- Organisation contact details
- Organisational form
- Range of items accepted for re-use
- Quantities of items re-used
- Typical condition and re-usability of items
- Whether the organisation conducts repair activities
- Economic turnover
- Number of employees
- Use of volunteers
- Membership of business networking or support organisations
- View of the current market environment
- Attitudes towards partnership working

The questionnaire script is reproduced in Appendix 1.

Sampling was conducted using the business list generated through preliminary outputs from the mapping research. The list was sorted using a random number generator and businesses called in order. Regular checkups were made on the proportion of private sector to charity premises responding to the questionnaire, and a tally was also made of the number of responses from each postcode area. This enabled the sampling approach to be adjusted in order to ensure a sufficiently broad coverage of geographical area and business type and to maintain a representative sample.

The survey was conducted using a telephone interview, and respondents refusing the telephone interview were offered the option of completing the survey online. Data was recorded using SNAP survey software and analysis was conducted using the R statistical programming language.

2.3 In-depth interviews

To supplement the output of the questionnaires, in-depth interviews were conducted with ten re-use organisations and representatives of three local authorities. The interviews covered the same subject areas as the questionnaires, but provided an opportunity for greater depth and discussion of strategic issues affecting re-use organisations. It also filled in the gaps that would have been left if the analysis had been conducted only at the individual outlet scale. Interviewees were selected through consultation with the Zero Waste Scotland steering group, and were chosen to give coverage of the private, charity and social enterprise sectors (the public sector was covered through three local authority interviews). Interviews were conducted by telephone, using an interview pro-forma designed to cover:

- Form of organisation and its major activities
- The types and numbers of items re-used
- Main sources of products for re-use
- Typical condition and re-usability of items
- Whether the organisation conducts repair activities
- How the organisation handles product liability and customer complaints
- Partnership working
- Accreditation and quality standards
- Business and marketing plans
- Professional memberships
- Waste licensing and exemptions

- Turnover and profitability
- Proportion of income from re-use activities
- Numbers of employees, volunteers and placements
- Plans for expanding the business
- Whether the market is growing or shrinking
- Is the market constrained more by demand or supply?
- Degree of competition
- Opportunities and barriers to increasing re-use
- Ideas for support for the re-use economy

The responses of interviewees were entered into the proforma and the results were gridded and analysed in order to identify emerging themes and areas where the results could inform future support.

2.3.1 Local authority interviews

In addition to the interviews with re-use organisations, representatives from three local authorities were also interviewed. The interviewees were suggested by the project steering group, and the interviews aimed to capture local authorities attitudes towards re-use and where they saw it fitting within their waste strategies. It also examined their experiences of and attitudes towards partnership working with waste producers (retailers, manufacturers etc.) and re-use organisations. As with the re-use operator interviews, the results were recorded on a proforma and gridded for analysis.

2.4 Limitations of the work

Information for the mapping exercise was gathered through online research and through telephone interviews. The project did not include physical on-the-ground mapping of second hand outlets, as this would have been very expensive and time consuming, requiring huge personnel resources. As such, the outputs have a number of limitations.

Some businesses may not have any internet presence, or online information about the businesses may be very sparse. For example, a business directory may have the name of a business, but lack any means of identifying that the business is engaged in any type of re-use. In such case, a business will not be included in the mapping outputs. While it may seem unusual for a business not to have a web presence, the questionnaire study showed that many re-use businesses are SMEs or sole traders, and many are likely to operate without any significant marketing budget.

Information may not always be completely up to date, especially for a sector dominated by small to medium sized enterprises (SMEs). While this is a limitation, the dynamic nature of the re-use economy is such that the impact of this source of inaccuracy is likely to be minimal over time – without ongoing maintenance, even a directory compiled through on the ground mapping will accrue inaccuracies as businesses form, move and dissolve.

Information on re-use activities by local authorities was gathered from three interviews, and in other cases is based on the local authority questionnaire administered by WRAP. It was specifically requested that the study did not directly approach other local authorities, and as a result there is limited coverage of local authority re-use donation points or outlets.

3 Mapping the re-use sector

The mapping exercise identified 1,527 re-use outlets across Scotland. Table 3 shows the number of organisations found in each local authority area, along with the split by organisational type.

Table 3 Re-use organisations identified, by type

Name	Total	Charitable	Commercial	Social enterprise (non charity)
Aberdeen City	76	52	24	0
Aberdeenshire	53	23	27	3
Angus	38	26	11	1
Argyll & Bute	42	28	11	3
Clackmannanshire	16	9	6	1
Dumfries & Galloway	54	25	24	5
Dundee City	62	29	30	3
East Ayrshire	27	18	8	1
East Dunbartonshire	17	13	4	0
East Lothian	27	23	3	1
East Renfrewshire	15	12	2	1
Edinburgh, City of	198	117	76	5
Eilean Siar	8	4	2	2
Falkirk	44	25	19	0
Fife	89	51	36	2
Glasgow City	202	113	84	5
Highland	93	65	24	4
Inverclyde	20	14	6	0
Midlothian	21	12	8	1
Moray	33	21	12	0
North Ayrshire	38	27	11	0
North Lanarkshire	53	35	15	3
Orkney Islands	3	2	1	0
Perth & Kinross	47	33	14	0
Renfrewshire	41	30	10	1
Scottish Borders	54	37	15	2
Shetland Islands	5	2	2	1
South Ayrshire	32	24	7	1
South Lanarkshire	45	29	15	1
Stirling	32	17	14	1
West Dunbartonshire	15	10	3	2
West Lothian	27	17	9	1
All Scotland	**1527**	**943**	**533**	**51**

The re-use economy, at least in terms of the number of outlets, is heavily dominated by the charity sector. However, bear in mind that the charity category includes some organisations that are also social enterprises.

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The following section presents the results from the mapping exercise using point and area data, and highlights the main findings. All of the maps in this report are available online, which provides zoom functionality down to the individual street level.

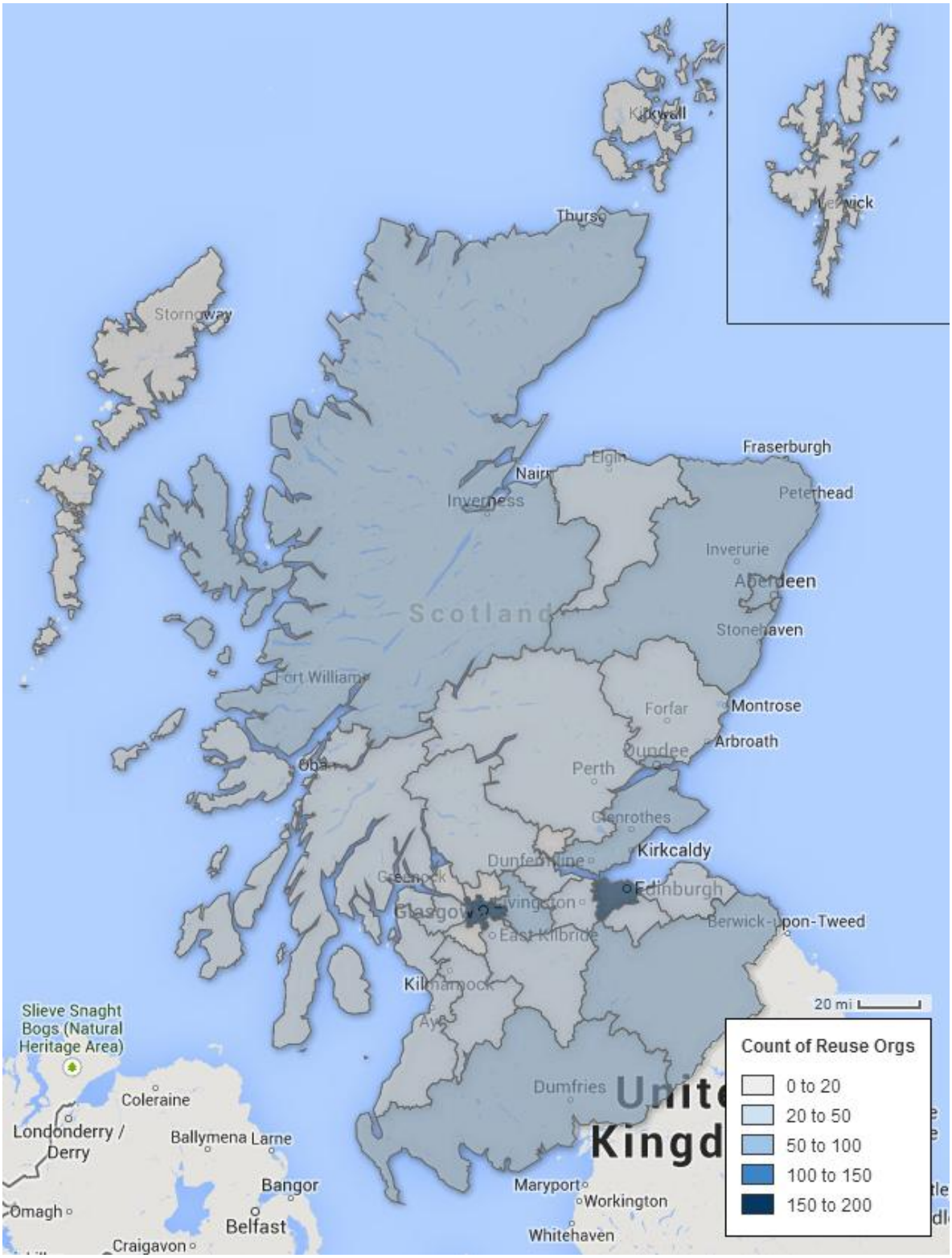
3.1 Local Authority Level

Figure 1 presents a count of all identified re-use organisations across Scotland broken down by local authority. High numbers of re-use organisations are seen in the major conurbations of Edinburgh and Glasgow but otherwise local authorities appear to be approximately equally served with the exception of the Outer Hebrides and the Orkney and Shetland Islands. Although a count of re-use organisations by local authority is potentially useful, it does not give much information on the density of locations by population or geographical area. This information is presented in Figures 2 and 3.

Figure 2 shows the density of re-use organisations relative to population (per 100,000 people) categorised by Local Authority. When corrected for population, the distribution of organisations appears somewhat more even than on the basis of a simple count. Local authority areas that appear in light shade (i.e. comparatively low number of re-use organisations) in Figure 1, such as Highland and Argyll and Bute, appear to have a reasonably high level of supply relative to the population (Figure 2).

With the exception of Edinburgh and Glasgow, the most densely populated authorities (between and around the two major cities) appear to be the most sparse in terms of the number of re-use organisations. This may be a result of the proximity of these regions to Edinburgh and Glasgow, where customers are willing to travel to shop for or sell/donate used items. Aberdeenshire also stands out as an area that has a relatively low level of re-use organisations relative to the population of the local authority.

Figure 1 Count of re-use organisations by local authority[1]



[1] Map link: https://www.google.com/fusiontables/embedviz?q=select+col3+from+1b4Cf25oheVS4nz6hvQPJubN87zaXXkFXa2tHkS4&viz=MAP&h=false&lat=56.27349093149836&lng=-3.406227046875074&t=1&z=7&l=col3&y=2&tmplt=2&hml=GEOCODABLE

Figure 2 Re-use organisations per 100,000 people by Local Authority[2]

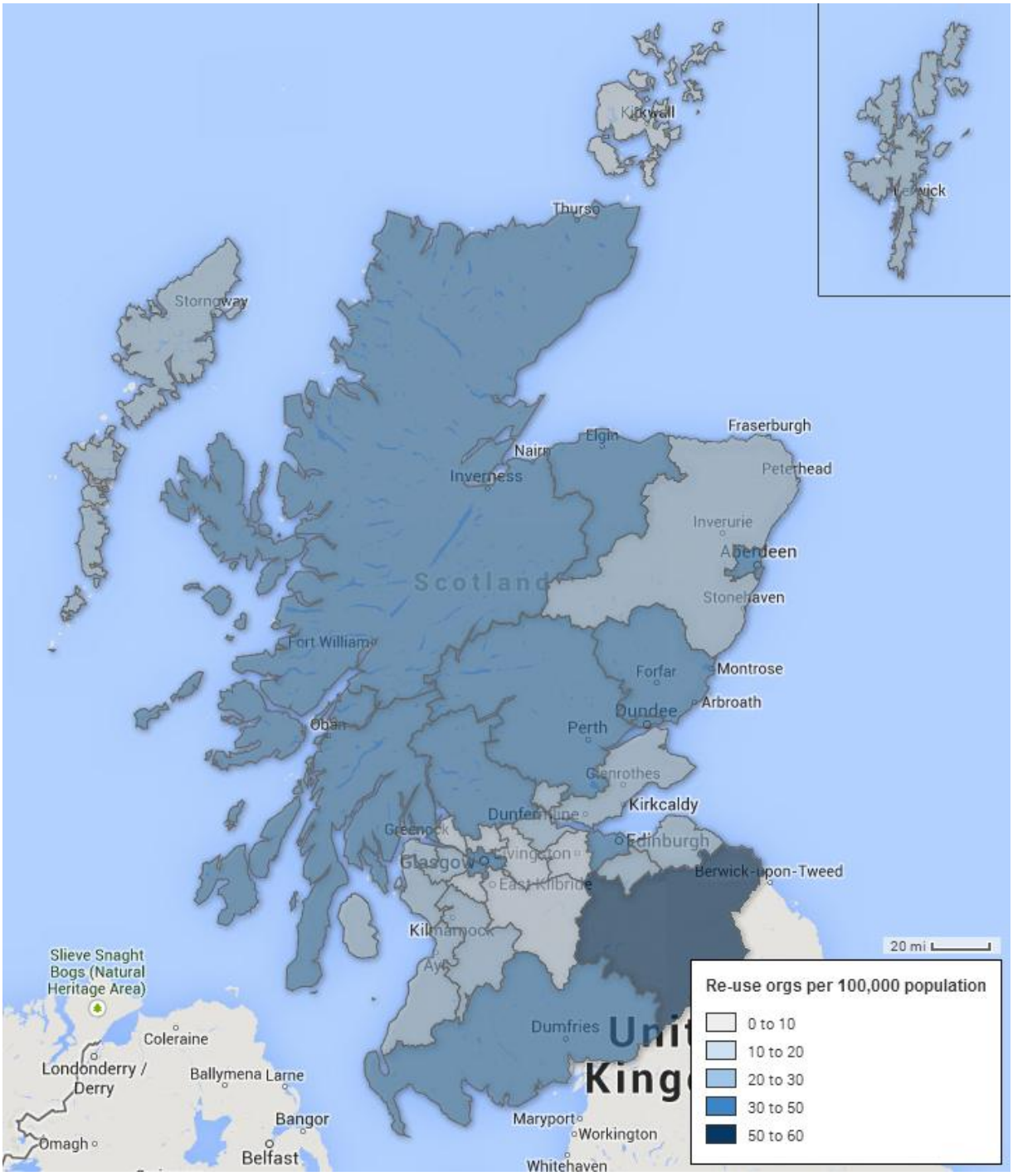


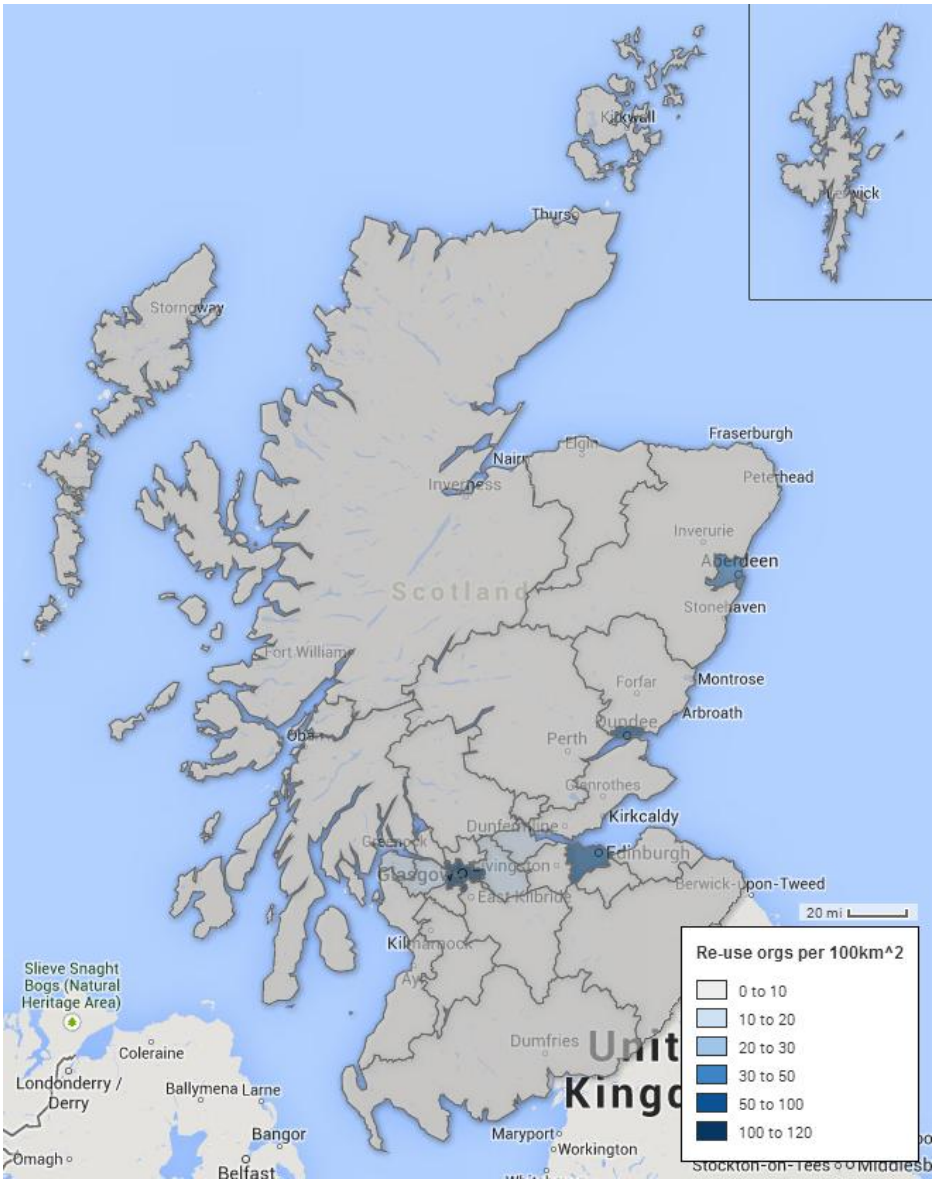
Figure 3 presents a map of the geographical density (per 100km^2) of re-use organisations by Local Authority. This is potentially important because we would not expect the population size alone to determine the number of re-use organisations – how evenly spread (rural) or clustered (urban) that population is is also likely to have an effect, given logistical issues, travel costs etc.

[2] Map link:
https://www.google.com/fusiontables/embedviz?q=select+col3+from+1b4Cf25oheVS4nz6hvQPJubN87zaXXkFXa2tHkS4&viz=MAP&h=false&lat=56.52580140652415&lng=-5.131080562500074&t=1&z=7&l=col3&y=3&tmplt=3&hml=GEOCODABLE

With the exception of Edinburgh, Glasgow, Dundee and Inverness, each of which show higher geographical densities of re-use organisations than the surrounding areas, the geographical density of organisations appears very even. This suggests that geographical size has a significant impact on the number of re-use organisations in a given area, independently of the population (at least outside of the very densely populated cities). This is perhaps not surprising, given logistical issues and the costs of travel, which limit the catchment area that a re-use organisation is likely to cover.

Another point that stands out from the maps is that the more densely populated authorities, with the exception of the major cities, are not more densely populated with re-use organisations. This may be a result of the major cities being close enough in proximity to satisfy demand for re-use in these areas.

Figure 3 Re-use organisations per 100km^2 by Local Authority[3]



[3] Map link: https://www.google.com/fusiontables/embedviz?q=select+col3+from+1b4Cf25oheVS4nz6hvQPJubN87zaXXkFXa2tHkS4&viz=MAP&h=false&lat=57.87361971157277&lng=-4.208229000000074&t=1&z=6&l=col3&y=5&tmplt=5&hml=GEOCODABLE

Table 4 shows the areas with the lowest number of re-use organisations by 100,000 population and by area (100km^2).

Table 4 Lowest provision by population and area

Population (per 100,000)	Area (per 100km^2)	Rank
South Lanarkshire	Eilean Siar	32
West Lothian	Highland	31
Orkney Islands	Orkney Islands	30
East Dunbartonshire	Shetland Islands	29
West Dunbartonshire	Argyll & Bute	28

Table 4 shows the local authorities with ther lowest provision of re-use organisations, by area and per head of population. The results suggest that areas with low supply relative to population are generally densely populated, mid mid-ranked levels of provision by area. As can be seen from maps above (and is illustrated in more depth in the intermediate geography maps below – see Figures 4–6) the limiting factor in such cases is likely to be proximity to other areas where provision is very high. An exception to this observation is the Orkney Islands, and it was also noted that the Shetlands have relatively low supply relative to population density. This is not likely to be a feature of their island geography *per se* (Eilean Sar, for example, has a higher than average supply by population, while Argyll and Bute and Highland, both of which have a large number of islands, are also well supplied in this regard) but may be related to their greater level of geographical isolation than the other islands.

Areas with low supply relative to area are typically rural areas, with mid-level supply relative to population. Supply in these areas is limited primarily by logistics and the relatively low population density.

3.2 Intermediate Zone Level

Figure 4 presents a map of the number of re-use organisations using the more detailed Scottish intermediate zone geography[4]. Each zone contains on average 4,000 residents and so the map also stands as an approximation of the density of re-use organisations per person. Using this principle it is possible to deduce that the lighter areas on the map (those with fewer organisations per person) may represent areas of undersupply. The lightest shade of blue on the map show the areas with no identified re-use organisations at all. These may be of interest in cases where they are not situated close to darker areas where there is a high concentration of supply.

[4] The intermediate zone geography is a key statistical geography for reporting government statistics in Scotland.

Figure 4 Number of re-use organisations by intermediate zone geography[5]

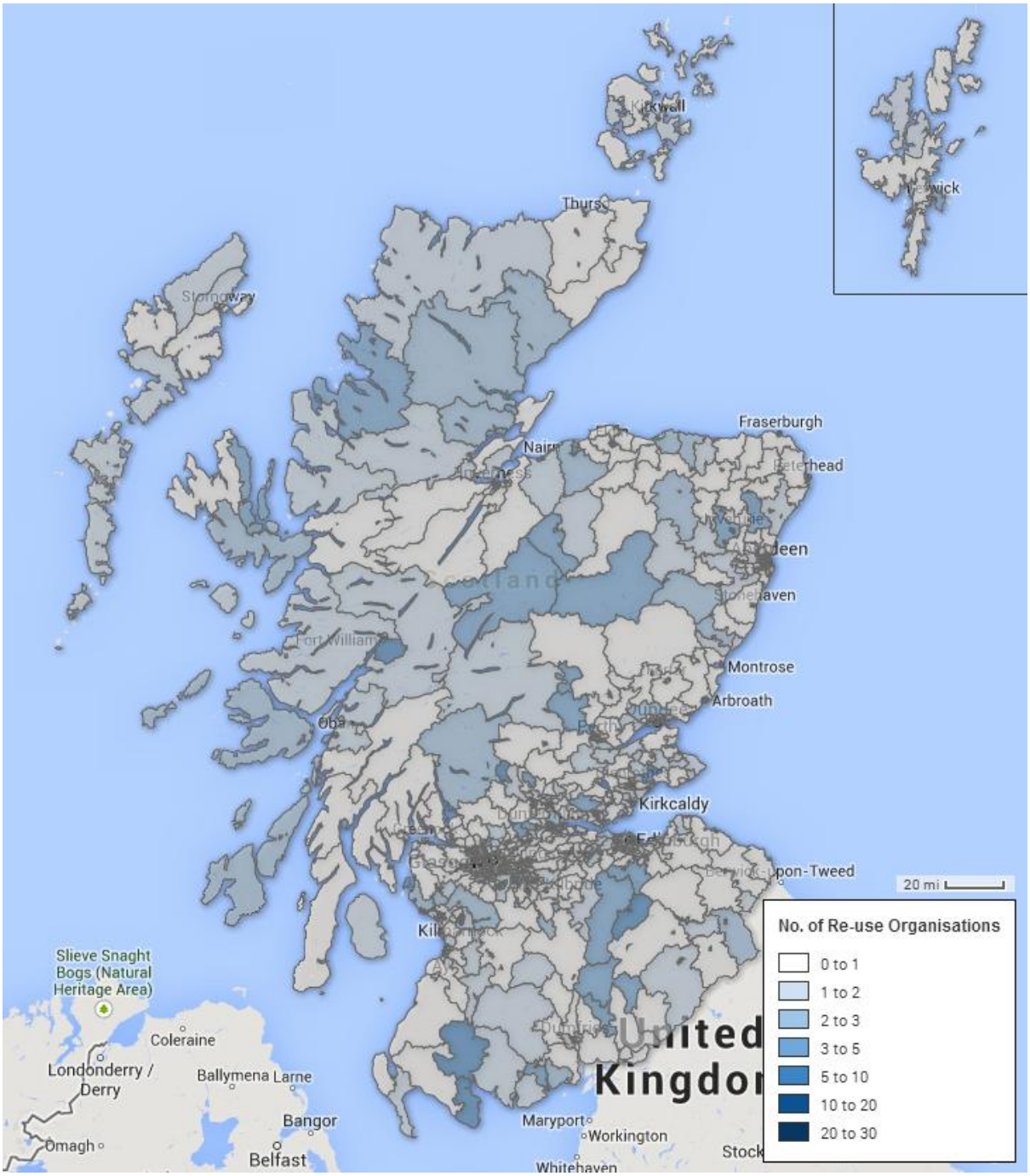
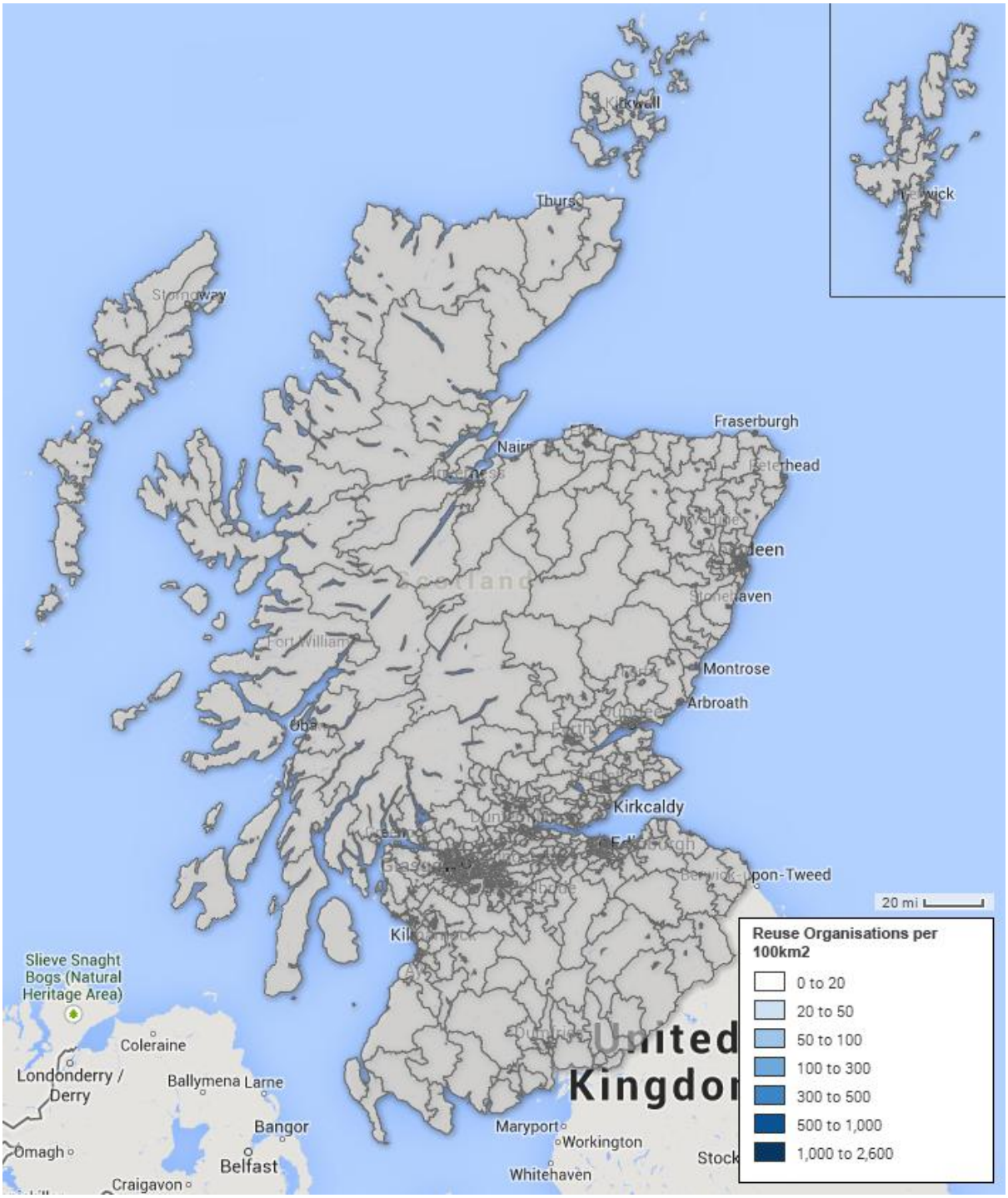


Figure 5 presents the re-use organisation density per 100km^2. The scale on the legend forbids any substantive information to be extracted from this map with the exception that the vast majority of rural intermediate zones are sparsely populated with re-use organisations (more detail is available online by varying the scale). It is more interesting to re-examine this map in the central urbanised belt containing Glasgow, Edinburgh, Stirling, Falkirk and Motherwell where dense pockets of re-use

[5] Map link:
https://www.google.com/fusiontables/embedviz?q=select+col7+from+1SI8oSJZNJzTyPBbp5g9JdWaxabyHXmBNQnbKNqY&viz=MAP&h=false&lat=56.86742115170628&lng=-4.6838448181190415&t=1&z=7&l=col7&y=3&tmplt=2&hml=GEOCODABLE

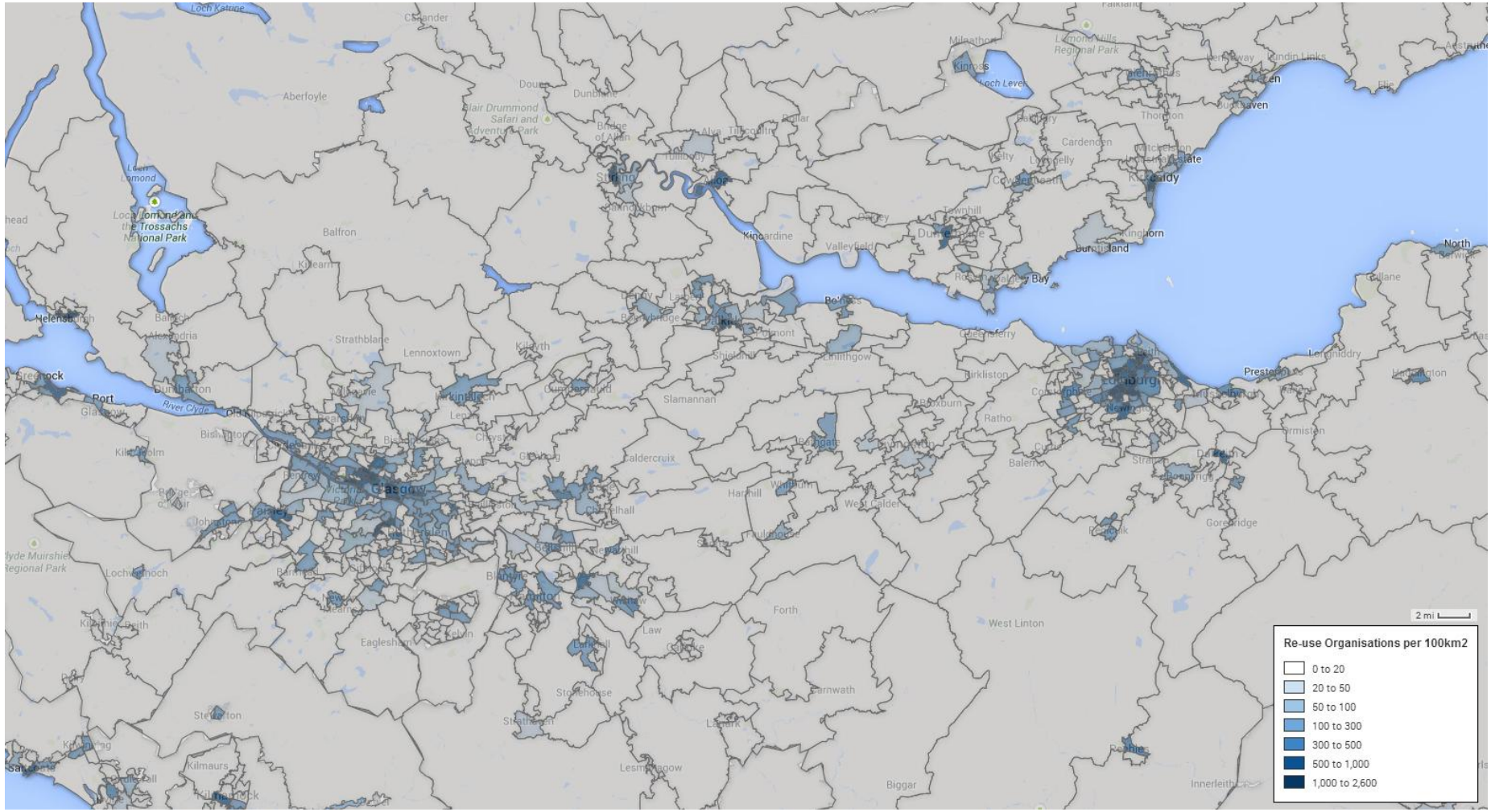
organisations exist. Figure 6 shows this area in landscape orientation – it is notable that, even here, there are many areas with little or no provision, the high density of the overall area being the result of extremely high densities in a number of (generally small) urban areas.

Figure 5 Re-use organisation density per 100km^2, intermediate zone geography [6]



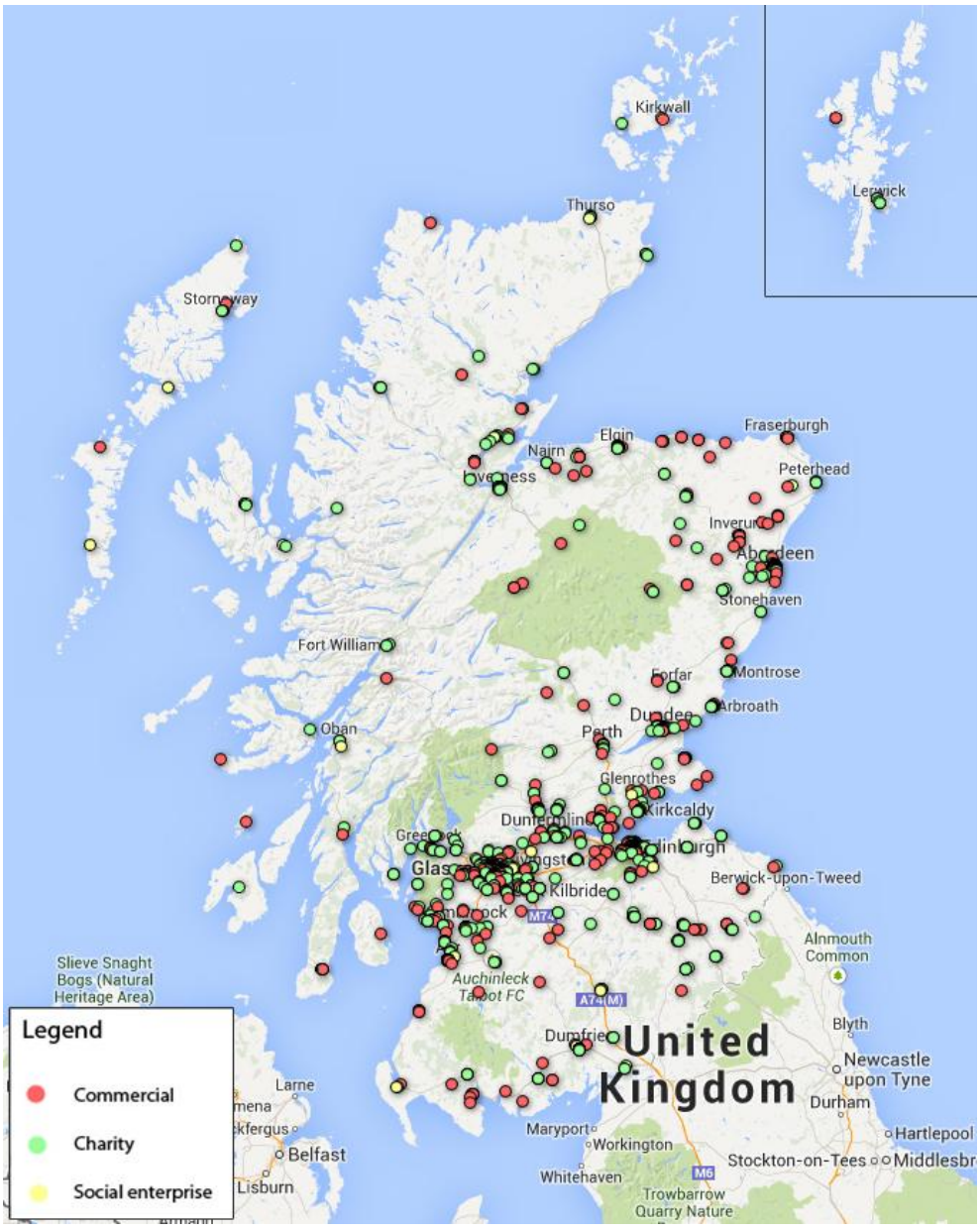
[6] Map link: https://www.google.com/fusiontables/embedviz?q=select+col7+from+1SI8oSJZNJzTyPBbp5g9JdWaxabyHXmBNQnbKNqY&viz=MAP&h=false&lat=56.43882837222833&lng=-4.6563789978065415&t=1&z=8&l=col7&y=4&tmplt=4&hml=GEOCODABLE

Figure 6 Re-use organisations per 100km^2, intermediate zone geography



The point data in Figure 7 presents the locations of all the identified re-use organisations in Scotland categorised by type of organisation (commercial, charity and social enterprise); location data is accurate to postcode level. The map consolidates the previous charts by revealing the higher density of re-use organisations in densely populated areas. Of the 1,529 re-use organisations, 943 are charity based, 534 are private companies and 51 are social enterprises. At the national level the organisations appear to be quite uniformly distributed by type (again, more detail can be observed using the online maps).

Figure 7 Re-use organisations across Scotland by type[7]



[7] Map link: https://www.google.com/fusiontables/embedviz?q=select+col7+from+19LRA9_Cw__B7zoCu9zAfQTvNhovitPikRccOV3s&viz=MAP&h=false&lat=56.34251982972081&lng=-4.835825953979565&t=1&z=7&l=col7&y=3&tmplt=2&hml=TWO_COL_LAT_LNG

The scale of the above graph makes it difficult to obtain any real insight into the distribution of re-use organisations in the central belt, in particular the two largest urban conurbations, Edinburgh and Glasgow. The maps below help to examine the location and distribution of re-use organisations in these two cities by focussing on each in turn.

Figure 8 shows the identified re-use organisations in Glasgow by type. At this scale it is possible to discern the exact streets where the re-use organisations are located. For example, Dumbarton Road in the Partick area, Kilmarnock Road in Shawlands and Duke Street in Dennistoun have high concentrations of charity re-use organisations.

In total, Glasgow and its surrounding area has 242 identified re-use organisations, 40% of which are commercial, 57% charity sector and 3% social enterprise. In comparison to the national composition of identified re-use organisations (35% commercial, 62% charity, 3% social enterprise), Glasgow has a higher proportion of commercial re-use organisations and a similar proportion of social enterprises.

Figure 8 Re-use organisations across Glasgow by type

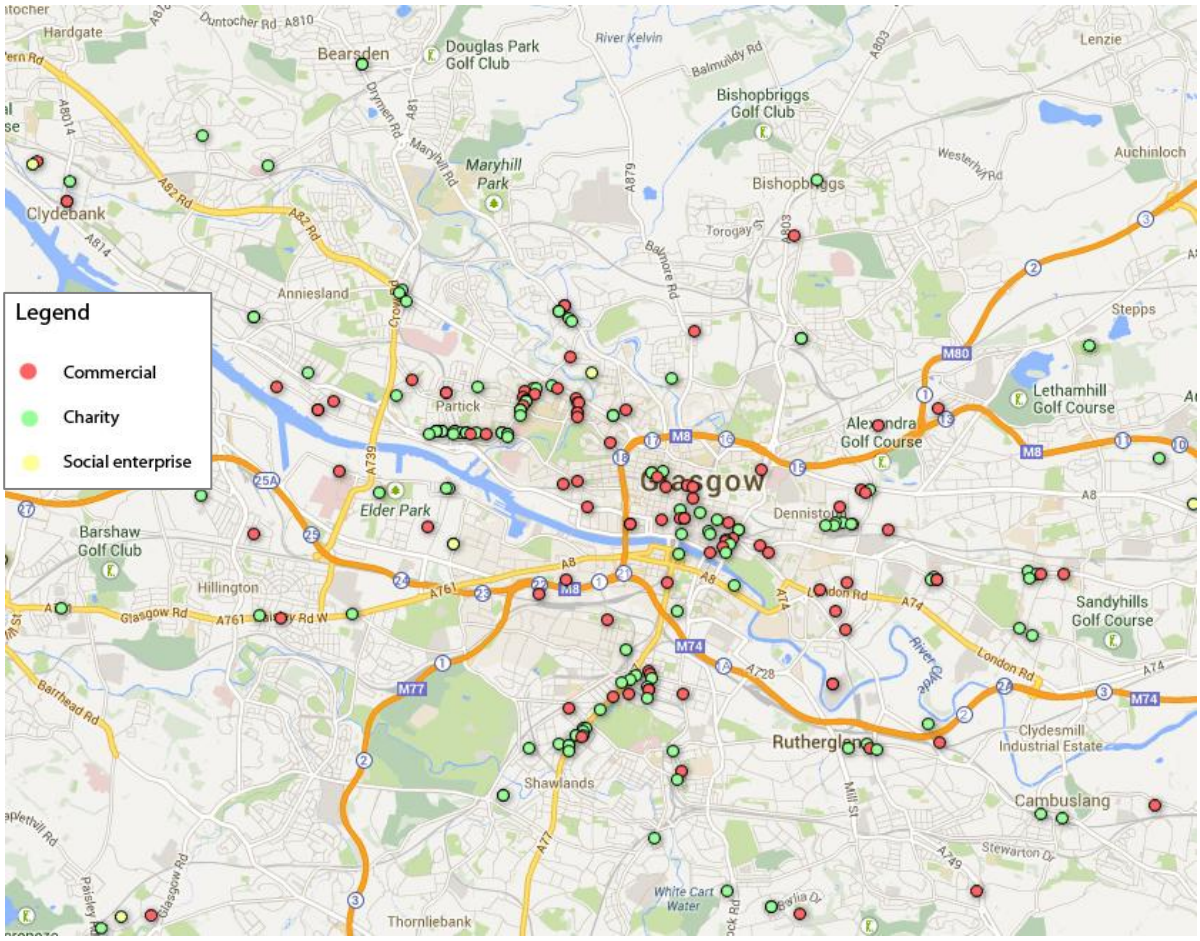
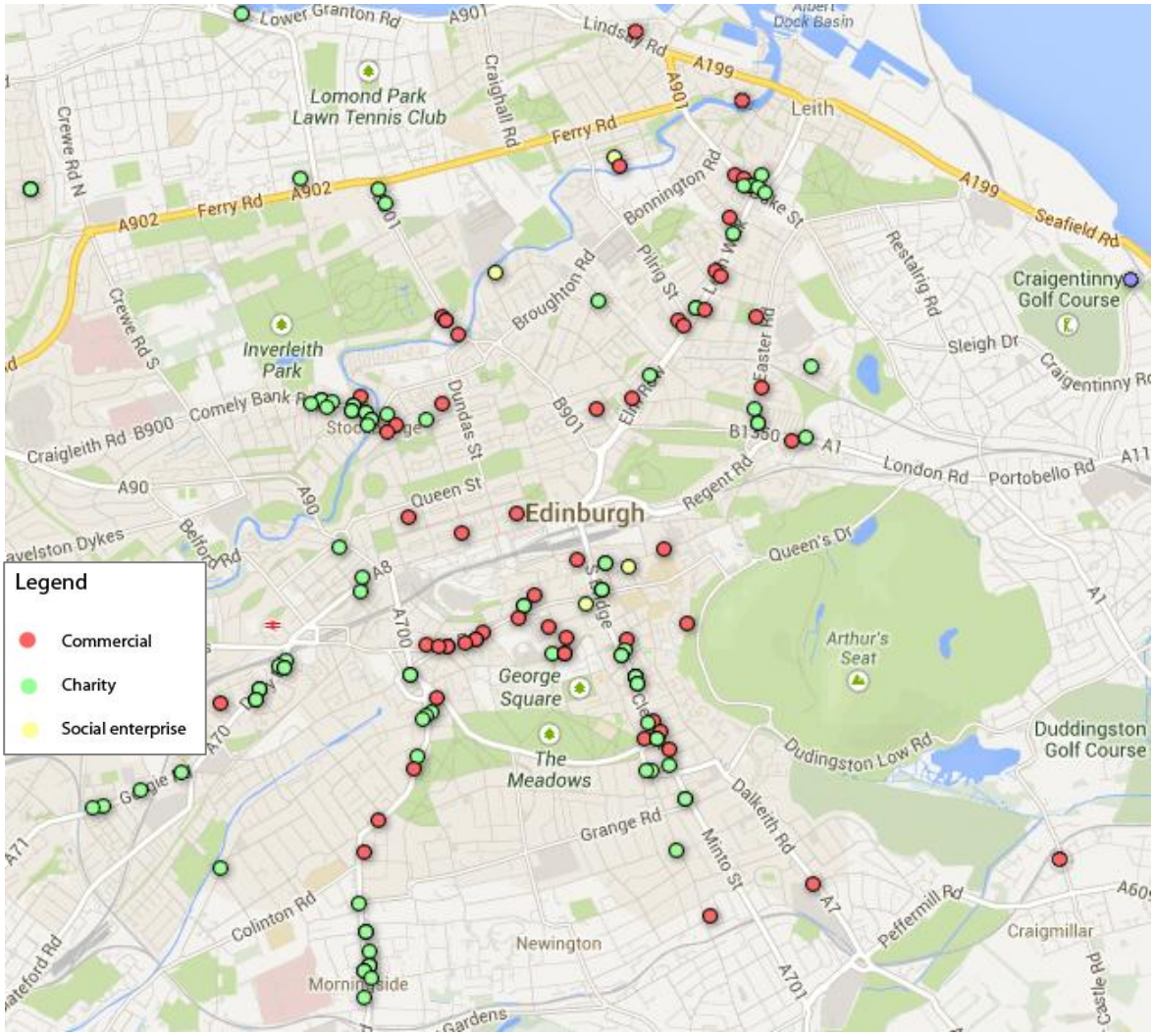


Figure 9 shows the equivalent map of re-use organisations for Edinburgh, categorised by type of organisation. Similarly to Glasgow, there appears to be a higher concentration of commercial sector organisations in the city centre and charity re-use organisation exist along the major routes into the centre. In particular, Comely Bank Road in Stockbridge, Gorgie and Dairy Road South West of the centre and Morningside Road appear to be areas of high charity sector offerings. As in the case of

Glasgow, this observation may not mean that demand for charity sector re-use is higher in these areas, but that rents are more affordable outside of the city centre.

In comparison to the national composition, there is a similar proportion of social enterprises (3%) but a higher proportion of commercial sector re-use organisations (38% compared to 35%) and a slightly lower proportion of charity sector organisations (59% compared to 62%) reflecting the situation in Glasgow. This may be due to higher rents in city centre areas.

Figure 9 Re-use organisations across Edinburgh by type



3.3 Accuracy and Completeness

The above data represents the most accurate, complete and up-to-date information within the time and budget constraints. With this in mind, the above information should be treated as a robust estimate on the size and make-up of the Scottish re-use economy. There are a number of channels of research that may be able to increase coverage of the sector but with diminishing returns:

1. **Town centre surveys** are a first-hand way of monitoring the number of organisations in a particular market sector; however conducting a nation-wide survey would be very expensive.
2. **Regional and city/town-wide chambers of commerce** usually hold information on the composition of businesses in their respective areas. These organisations could be consulted

to increase coverage at the local and regional level. Attempts to do this during the current exercise, however, revealed that this approach is likely to involve a considerable fee.

3. **Local Authority Planning departments** often hold information on the retail uses of town centre buildings which could be studied to improve coverage or confirm the existing composition.

3.4 Mapping conclusions

Rural areas, as expected, tend to have a low geographical density of re-use organisations. However, the number of re-use organisations relative to the population was high in a number of rural areas, including Highland. This suggests that these areas are not generally undersupplied with re-use organisations.

Areas with low density of re-use organisations relative to population tend to be urban areas (though not the major cities) within commutable distance of areas with a very high concentration of re-use organisations, suggesting that people may be travelling to shop.

Within urban areas with a very high concentration of re-use organisations (e.g. Glasgow and Eninburgh) analysis at the intermediate geography level shows a patchwork of areas of extremely high density, interspersed with areas where there is little or no re-use activity. This accords with the separation of residential areas from retail zones and the concentration of re-use organisations in particular areas and streets.

Large scale analysis of the mapping outputs do not suggest that there are significant geographical areas of undersupply. Large areas with sparse populations – even when they have comparatively few re-use organisations – typically have a reasonaly large density of re-use organisations when corrected for population, while areas with a low number of re-use organisations relative to the population tend to be in close proximity to retail centres with high supply.

4 Profiling the sector

Consultation with re-use organisations was primarily conducted through a questionnaire survey and a series of more in-depth interviews. While the questionnaire was designed more to capture operational data, and the interviews to capture more qualitative data including strategic issues such as market opportunities and threats and opportunities for support, there was significant overlap in the questions so as to enable the results to be compared. The interview and questionnaire results are discussed in the following sections.

4.1 Questionnaire

Overall, 591 calls were made to 406 businesses, generating 108 questionnaire responses. The geographical distribution of these is shown in Table 5 below, using postcode areas.

Table 5 Geographical distribution of questionnaire responses

Postcode	Postcode area	Mapping	Questionnaire Sample
AB	Aberdeen	136 (9%)	8 (7%)
DD	Dundee	103 (6%)	13 (12%)
DG	Dumfries and Galloway	54 (3%)	5 (5%)
EH	Edinburgh	292 (19%)	22 (21%)
FK	Falkirk	88 (6%)	5 (5%)
G	Glasgow	295 (19%)	6* (5%)
HS	Outer Hebrides	8 (1%)	0 (0%)
IV	Inverness	90 (6%)	6 (6%)
KA	Kilmarnock	97 (6%)	7 (7%)
KW	Kirkwall	12 (1%)	0 (0%)
KY	Kircaldy	92 (6%)	8 (7%)
ML	Motherwell	65 (4%)	7 (7%)
PA	Paisley	90 (6%)	9 (8%)
PH	Perth	61 (4%)	5 (5%)
TD	Galashiels	39 (3%)	7 (7%)
ZE	Lerwick	5 (0%)	0 (0%)
Total	All areas	1,527	108

* The 6 answers from Glasgow covered 21 separate premises.

There is some overrepresentation of the Galashiels (TD), and Dundee (DD) postcode areas, though this is not surprising given the relatively small sample size (the Galashiels overrepresentation, for

example, amounts to only three responses). There is also a noticeable under representation of responses from Glasgow. This is because one response was provided by the Prince and Princess of Wales Hospice for their 16 Glasgow shops. In the results that follow, the Prince and Princess of Wales results are marked with an asterisk to indicate that one of the responses represents 16 individual premises rather than a single shop.

4.1.1 Profile of businesses

The breakdown of the businesses contacted was as follows.

Table 6 Breakdown of questionnaire responses by business type

Business type	Responses
Private sector	44 (41%)
Charitable organisation	59 (55%)
Social enterprise	5 (5%)
Total	**108**

This compares with a Scottish population distribution of 35% private sector and 62% charity sector (derived from the re-use mapping exercise). This higher representation of private sector businesses was intentional, as this is the least understood sector within re-use and it was felt to be important to gather as much information as possible in this area. In addition, many of the charity shops were members of large Scotland or UK-wide charities, and these tended to give similar answers to one another. As such, it was determined that focusing additional resources on private sector re-use businesses would maximise the learning produced by the questionnaire.

The majority (75%) of outlets in all sectors had been trading for more than five years, and this proportion did not vary significantly between business types, suggesting that most organisations in the field are reasonably well established.

4.1.2 Re-use impacts

Businesses were asked what items they accepted for re-use. The following data shows the items taken, at headline level, by business type.

Table 7 Items accepted for re-use by business type (headline level, multiple answers allowed)

	Furniture	Electrical	Textiles	Building	Other
Charity	25*	28*	55*	0	55*
Private sector	22	24	20	1	32
Social enterprise	5	2	2	0	1
Combined	52	54	77	1	88

This shows approximately equal numbers of organisations re-using furniture and electrical goods. The majority of organisations dealing in furniture or electrical goods handle both (of the 52 organisations handline furniture and 54 handling electrical, 34 handled both product streams). Textiles are the most commonly re-used product, primarily accounted for through charity shops, which have traditionally dominated the UK second-hand clothing market.

Where available, a more detailed breakdown of items re-used was recorded, and this is shown in Table 8.

Table 8 Items accepted for re-use (detailed breakdown)

Type	Count
Domestic furniture	37*
Office furniture	16
Large electrical	14
White goods (excluding refrigeration)	17*
Small electrical goods	39*
Computers and peripherals	19*
Mobile phones	17*
Clothing	57*
Household linen	55*
Mattresses	15*
Carpet & flooring	8
Books	65*
Media (e.g. DVDs)	65*
Toys	58*
Nursery and baby equipment	14*
Sporting goods	51*
Bicycles	28
Power tools	17
Hand tools	20

Key points that emerge from this table are:

- There are around twice as many organisations re-using domestic furniture than re-use office furniture.
- Small electrical items are the most commonly re-used electrical goods, followed by computers.

- Household linen is accepted for re-use by almost as many businesses as accept clothing. Other non-clothing textiles (mattresses and carpets) are less commonly accepted.
- Of the "other" category, the most common items were books, media (CDs and DVDs), toys and sporting goods.
- The least commonly re-used items were large electrical items, nursery items and carpet and flooring.

Respondents were asked what proportion of items received were typically suitable for re-use in their current condition (i.e. without repair). The results are shown in Table 9 below.

Table 9 Proportion of items suitable for use in condition in which they are donated / received

Organisation type	Number of responses	Mean
Charitable organisation	56	67%
Private sector	43	65%
Social enterprise	5	84%
Average	**104**	**67%**

Both charities and private sector organisations gave very similar answers, with around 2/3 on average being suitable for re-use. Although higher, the social enterprise figure should not be regarded as significant given the very small sample size. Across all organisations, the central 50% of responses across all organisations fell in the range 50-90%.

Questionnaire respondents were asked if their organisation conducted any repairs on items that were not suitable for re-use in the condition in which they were received. The results are shown in table 10 below.

Table 10 Do organisations conduct repair activities?

Organisation type	Yes	No
Charitable organisation	29	30*
Private sector	27	17
Social enterprise	4	1
Combined	**61**	**47**

The majority of businesses conducted repair activities of some sort, although repair was less common among charities than other types of organisations. This may be due to the high street location of many charity shops (which increases the cost of storage), the large-scale use of volunteer labour (which is likely to affect the availability of specialist skills) and the types of goods they typically receive as donations.

Respondents were asked which types of repairs they carried out, and the results are shown in Table 11.

Table 11 Types of repair conducted by re-use organisations

Repair	Count
Reupholstery	5
Carpentry repairs	21
PAT testing and minor repair (e.g. changing a fuse)	33
Larger electrical repairs / replacing components	6
Clothing alterations	17
Mechanical repair (e.g. bicycle repair)	19
Other repair activities	17

The most commonly cited repair activity was PAT testing and minor electrical repair (such as replacing a fuse or changing a plug), followed by carpentry repairs to furniture. The least common repairs were furniture reupholstery and larger electrical appliance repairs. Activities cited under other repair included bookbinding and repair and repair of musical instruments (these were also counted under mechanical repair), stripping of furniture and cleaning activities.

Businesses were asked to estimate how many tonnes of material they re-used in a year, and were also asked a range of supplementary questions around the quantities of furniture, electrical goods and textiles that they re-used. Unfortunately, these questions produced a very limited response, with the majority of respondents unable to supply an answer.

Table 12 Estimated re-use tonnage

Estimated tonnes re-used per year	Number of responses
0–5	5
6–50	8
51–100	4
101–500	4
501–1000	1
Don't know	85

Given the very large number of "don't know" answers, the results of this question should not be used as a guide to the typical quantities re-used, even at an indicative level. The primary conclusion is that that the vast majority of businesses involved in re-use simply do not know how much material they re-use, at least not in tonnage terms.

A range of other questions were asked about furniture, WEEE and textiles, specifically:

- The tonnage re-used per year
- The number of items re-used
- The value of items re-used

In all cases, however, the number of responses was extremely low. Ultimately, we would conclude that questions of this nature are not addressed effectively using a telephone questionnaire. This is significantly different to the third sector, where organisations are more accustomed to maintaining records and producing tonnage based re-use figures due to a history of working with local authorities and other organisations (CRNS, WRAP and Zero Waste Scotland) that measure success in tonnage terms.

4.1.3 Economic impacts

In addition to re-use activities, respondents were also asked questions that aimed to understand their economic and employment impacts. The questions asked related to turnover, number of employees and use of volunteers.

4.1.3.1 Turnover

Table 13 below shows the annual turnover of the respondents' operations.

Table 13 Annual turnover of respondents

Turnover	Charity	Private sector	Social enterprise
£0 – 50k	13	12	1
£51 – 100k	18	10	2
£101 – 250k	7	7	0
£251 – 500k	1	5	0
£501 – 1 million	2	3	0
More than £1 million	1	1	0
Don't know / rather not say	18	6	2

For all business types, the median turnover was in the range £51-100k. If we attempt to calculate a mean based on range midpoints, with the maximum value (over £1m) counted as £1 million, we arrive at the following mean turnover figures (though again, this is likely to be an underestimate based on the treatment of the highest range).

Table 14 Estimated mean annual turnover of respondents

Organisation type	Estimated mean turnover
Charity	£138,000
Private sector	£195,000
Social enterprise	£59,000

4.1.3.2 Number of employees

Re-use organisations were asked how many people they employed, as full-time equivalents. The answers are shown in Table 15.

Table 15 Number of organisations by full time equivalent employees

No. FTE employees	Charity	Private sector	Social enterprise
0	2	0	0
1	17	11	0
2-5	35	24	5
6-10	2	7	0
11-20	1	2	0
21-50	1	0	0
More than 50	0	0	0

The median number of employees for all organisation types was 2–5. Calculating a mean based on range midpoints (as for turnover, above) yields the following:

Table 16 Mean number of employees (as FTE) by organisation type

Organisation type	Mean no. employees (FTE)
Charitable organisation	3.58
Private sector	4.18
Social enterprise	3.5

4.1.3.3 Use of volunteers

When asked whether they used volunteers, organisations responded as shown in Table 17.

Table 17 Use of volunteers

Organisation type	Yes	No
Charitable organisation	58*	1
Private sector	1	43
Social enterprise	3	2

Not surprisingly, the use of volunteers is concentrated in the charity sector, with all but one of 57 charity sector respondents using volunteers. There is insufficient data to determine the extent of volunteer use in the social enterprise sector, but the CRNS *State of the Sector* report suggests that

many social enterprises rely on volunteer labour, with the sector employing 2,854 volunteers in 2011, compared with 739 full-time equivalent staff (the average organisation had 38 volunteers).

The number of volunteers used by each organisation is shown in Table 18.

Table 18 Numbers of volunteers

Number of volunteers	No. organisations
1–2	3
3–5	7
6–10	16
11–20	16
>20	20

The median response was in the range 11-20, while calculating a mean based on range midpoints (and taking >20 to be 21) produces a mean volunteer number of 13.4. Note, however, that this is likely to be an underestimate, due to the assumptions made regarding the "more than 20" range and the high number of responses in this category. Interviews with the Charity Retail Association suggest that the average charity shop could employ as many as 20 volunteers.

Table 19 Average hours worked by a typical volunteer in a week

Average volunteer hours	No. organisations
1–5	27
6–10	21
11–15	5
16–20	5
>20	3

The median number of hours worked by a volunteer was in the range 6-10, while the mean (based on range midpoints, as for turnover above) was 7.7.

4.1.4 Business networking and view of the market

Respondents were asked if they were members of any business support networks or other support organisations. Table 20 shows the responses.

Table 20 Respondents membership of business support organisations

	Charity	Private sector	Social
Yes	8	20	3
No	41*	23	1
Don't know	10	1	1

Almost 50% of private sector businesses were members of a network organisation of some kind, with the most common being the Federation of Small Businesses (14), a local Chamber of Commerce (5) and the Revolve accreditation scheme (3).

While the rate of membership appears low among charities, this is likely due to the fact that the questionnaire was conducted at the level of individual stores – the majority of charities in Scotland are members of the Charity Retail Association, even if this was not reflected in the results.

Perceptions of the market environment were generally more positive than negative. Businesses were asked if they envisaged their re-use activities growing or shrinking over the next 12 – 18 months. Their replies are presented in Table 21.

Table 21 View of market activities over the next 12–18 months

	Charity	Private	Social	Combined
Growing	28	15	4	47
Staying the same	25	23	0	48
Shrinking	5*	6	1	11
Don't know	1	0	0	1

In all cases, more businesses were expecting their re-use activities to expand in the next 12-18 months than were expecting contraction. While it might appear from the table that private sector businesses were more optimistic than charities, this difference is not statistically significant at even a 90% level. Similarly, there was no relationship between membership of a business support network and respondent view on whether the business would grow, shrink or stay the same in the next 12–18 months. Businesses expecting their situation to change were asked to comment on the perceived reasons. Responses included the following:

- *More people buying second hand due to current economic climate, outweighing any increase in competition*
- *Lack of individual wealth in current economic environment*
- *Partnership with Zero Waste Scotland, organisations have increased ... furniture pick up*
- *Being pro-active with marketing strategy - meetings with the local council*
- *Competition from eBay, other retailers, charity shops*
- *46% of readers choose electronic versions and competition (affects bookshops)*
- *Cost of sorting, recycling and charges for waste disposal in this area (and very low value of household clearance items)*

- *Shopping Mall in which shop is situated is in decline & for sale. Very quiet.*
- *There has been so much competition in the past three years.*

4.1.5 Attitudes to partnership working

Partnership working between waste producers (whether retailers, manufacturers of local authorities) and organisations working in the field of re-use represents a potential opportunity for growth that WRAP and Zero Waste Scotland have been keen to encourage. Questionnaire respondents were asked if their business was involved in any partnership working; answers are shown in Table 22 below.

Table 22 Respondents engaged in partnership working

	Yes	No	Don't know
Charity	14	44*	1
Private sector	5	38	1
Social enterprise	2	3	0
Total	21	85	1

Overall, around 20% of organisations were involved in partnership working (23% of charities, 11% of private companies and 40% of social enterprises surveyed). The partner organisations were predominantly retailers that donate end of line stock, warranty returns etc., though four surveyed organisations did have local authority partnerships (involving Dundee, Paisley, Edinburgh and Glasgow Councils).

Those organisations that were not currently engaged in partnership working were also asked if they would consider working in partnership if the opportunity arose. The responses are shown in Table 23.

Table 23 Willingness to consider partnership working (of those not currently involved)

	Yes	No	Don't know
Charity	29*	5	10
Private sector	24	10	4
Social enterprise	3	0	0
Total	57	15	14

Among those companies not working in partnership, most were prepared to consider the idea. The proportion prepared to consider partnership was similar between charities (66%) and the private sector (63%).

Among those not interested in partnership working, the following reasons were given:

- premises too small
- already overstocked
- would need to take on more help if any busier
- quality of items and cost of trade waste is prohibitive
- suitability of items
- specialist stock few and far between
- prefer to be stand alone organisation without affiliation

Apart from one respondent, who was concerned with maintaining the independence of the business, the other reasons given all concerned either the quality and suitability of items or a lack of capacity to handle significant amounts of extra material.

4.2 Interviews

To supplement the output of the questionnaires and provide qualitative detail on more strategic issues, in-depth interviews were conducted with ten re-use organisations and representatives of three local authorities. The interviewees are listed in Table 24 below.

Table 24 Interviewees

Organisation	Details
CRNS	Umbrella organisation for Scottish third sector organisations
Charity Retail Association	UK umbrella organisation for charity shops
British Heart Foundation	National charity
Salvation Army	National charity
Sue Ryder	National charity
Cunninghame Housing Association Furniture Recycling Project	Third sector furniture project established and operated by a housing association
Recycle Scotland	Private sector provider of clearance to public and private sectors. Refurbishment and sale of furniture.
Independent Catering Equipment Ltd	Private sector refurbishment and sale of catering equipment
Junk Ants	Private sector home and commercial clearance company
Haven Recycle (not yet completed)	Social enterprise IT re-use and recycling
Perth and Kinross Council	Local authority
Argyll and Bute Council	Local authority
North Ayrshire Council	Local authority

Interviews results were recorded in a proforma spreadsheet, and then gridded for analysis by theme. The results are shown in Table 25 below.

Table 25 Re-use operator interview results

Theme	Discussion
Repair	The private and social enterprises interviewed all engaged in minor repair activities, such as replacing missing parts, minor modification, etc. The exception was one clearance company that did not carry out repairs; the reasons given for this were that income came mostly from collection costs, and the need for a quick turnover to minimise storage requirements. The charities interviewed generally conducted less repair activity, with activities limited to steam cleaning and PAT/function testing. This may, as above, relate to storage costs, as charity shops occupy retail premises, which are typically expensive. The high cost of premises was raised by one charity interviewee.
Warranties and management of product liability	While some of organisations said that they would replace items that were faulty, none offered a substantial warranty. While some offered a 3-month warranty, this does not represent an extension of the minimum statutory rights established under the Sale of Goods Act and EU regulation on minimum product life, which states that goods (including goods sold second-hand) should have a minimum expected durability of six months. (EU Directive on the Sale of Consumer Goods and Associated Guarantees). One of the clearance companies interviewed managed liability by selling through auction houses on a "sold as seen" basis.
Standards and accreditation	Interviewees generally did not hold accredited standards. One interviewee's company did hold ISO9001 and was working towards ISO14001, while another was working towards Revolve accreditation.
Proportion of material suitable for re-use	The figure on the proportion on material received suitable for re-use in its current condition varied hugely depending on the materials collected and the business model. The lowest figure given (from the clearance company that did not conduct repairs and relied primarily on collection fees for revenue) was around 5 – 10%, while the highest (from a company that inspects goods prior to collection and collects only what is deemed re-usable) was 95%. The three other interviewees that provided an answer to this question gave answers in the range 50% (furniture from office clearances) to 88% (charity shop donations). These results are broadly in line with the results of the questionnaire survey.
Partnership working	Organisations had a range of experience with working in partnership. For example, the Salvation Army works in partnership with Perth and Kinross Council to operate an HWRC re-use container, while the Cunninghame Housing Association Furniture Project holds the voids clearance contract with the Housing Association. Charities also had experience of operating textile collections banks on behalf of local authorities. Private sector companies were less involved in partnerships, relying more on commercial contracts, but one interviewee did donate WEEE items collected during office clearances to a social enterprise for refurbishment, while another was examining a partnership that would see the company donate re-useable goods to charities in exchange for a referral to carry out any residual waste collection and disposal from the charity's house clearance work.
Business and marketing planning	Of the ten businesses interviewed, seven had a current business plan, while the other two expressed an intention to produce an updated plan in the near future. Three of the nine organisations had a current marketing plan, with most others expressing an intention to produce one – though one business expressed the view that a marketing plan was unnecessary, as sufficient business was being generated by word of mouth and referrals.

Theme	Discussion
Business support and networking	Most interviewees were members of a business network. Organisations used for business support included Chambers of Commerce, the Federation of Small Businesses, CRNS, FRN and the Charity Retail Association. One interviewee expressed some scepticism about the value of the networking opportunities provided by some organisations, noting the need for such events to provide access to "movers and shakers" if they are to be useful. Another noted attendance at Zero Waste Scotland events as a useful networking activity.
Licensing and exemptions	The organisations interviewed had all relevant licenses and exemptions in place, with one exception (a business carrying out occasional commercial clearance work that said they had never contacted or informed SEPA). In general, organisations collecting items tended to have a carrier's license, while storage and preparation for re-use activities were carried out under exemption. Organisations holding licenses or exemptions did not express concerns about the process, with one collector explicitly welcoming SEPA's influence in maintaining a well-regulated sector.
Profitability	Of the businesses that provided an answer, three were profitable, two were breaking even and one made a loss in the previous year.
Other activities	The most common additional activities carried out by the organisations interviewed were clearance, repair activities, sale of new goods and modification / remanufacture.
Percentage of income generated by re-use	The four answers given in response to this question were very variable. One – a clearance organisation with no repair activities – stated that the revenue from re-use accounted for at most 5% of the company's income, but that re-use was probably a net cost once storage and transport costs had been accounted for. The other three organisations gave answers in the range 40% (office furniture clearance and resale) to 75% (a commercial re-user of catering equipment).
Plans for expansion	All businesses were planning expansion or investment. All the charities interviewed were looking to expand the number of shop premises, while the social enterprise was looking to bid for local authority bulky uplift waste contracts. Growth plans among the private sector interviewees included rebranding, moving the operation to larger premises and expanding the range of services provided by taking work currently contracted out in-house.
View of market conditions and competition	There was unanimous agreement among interviewees that the market has grown and demand has increased, as incomes are squeezed and consumers look for bargains. Two of the private sector operators also mentioned demand from start up businesses looking to acquire furniture and equipment at a lower price than new. All organisations raised issue with the lack of (quality) supply. Reasons included cheap imports, people holding onto things because of recession and competition (eBay, cash for clothes, charity shops). The CRNS account noted increased awareness around donation, but unwillingness to buy (i.e. shortage of demand). Two of the organisations interviewed stated that quality of items is an issue, and that people do not want to buy tatty, unfashionable furniture. One of these (a private sector operator) also stated that, in their view, some third sector re-use organisations have a lower quality of donations than the best high-street charity shops, and that this may be affecting the viability of third sector furniture re-use organisations.

Theme	Discussion
	Whether or not this is the case, a potential lesson should be drawn concerning the importance of ensuring that items targeted for re-use are of a suitable quality, since a large increase in the re-use of low-value items is unlikely to be economically sustainable. The majority of interviewees also stated that the market is very competitive, and increasingly so. Charities are especially exposed to this increased competition, given the boom in the textile market, though they have also been significant beneficiaries of the price rise. The charitable sector were generally keen to defend their market position, by discouraging public use of cash-for-clothes type textiles dealers and partnerships between local authorities and the private sector.
Barriers	The most commonly identified barrier was poor public perception of second hand products and re-use, and a lack of public trust in product quality. It was felt that effective communication and promotion of re-use was needed to help overcome this barrier. Also affecting demand, several interviewees noted that low price imported new goods compete with re-use. Another major issue was a lack of suitable stock and poor quality items (charities reported falling quality in donations). For charities, this is complicated by the fact that rejection of items can also discourage further donations. Not all interviewees struggled with a lack of supply, with one WEEE operator (a refurbisher and retailer of catering equipment) stating that, while he had access to plenty of stock, the difficulty was in the price of space to store it. This issue around the cost of space for storage, repair or retail was reiterated by several interviewees. One charity noted that retail premises were generally more expensive than in the rest of the UK, while private sector operators noted that the cost of premises lessened their capacity for repair or expansion of re-use operations. Logistics was also raised as an issue; re-use businesses need to minimise collection and transport costs, and to have enough people in their catchment area to both supply and purchase stock. Very rural areas with low population density therefore may not lend themselves to cost effective re-use. One interview also noted that many start-up SMEs are not experienced in business, and may not understand the importance of business planning, cash flow etc. The same interviewee also noted that businesses cost money to set up, and access to loan funding has been extremely difficult since the financial crisis.
Opportunities	Interviewees generally suggested fewer opportunities than barriers. The most commonly cited opportunity was partnership working, with local authorities to conduct HWRC re-use and re-use led bulky waste services and with private enterprises to divert unwanted end-of-line stock for re-use. Other opportunities, such as increased education and marketing around re-use, are discussed below under support.
Ideas for future support	The most commonly cited support need was for marketing and promotion to encourage re-use as a consumption activity and to allay consumer concerns about product quality. While marketing and promotion was mentioned in this regard, use of standards and accreditation to improve consumer confidence was not raised by any interviewees. One interviewee stated that all local authorities should allow charities to dispose of collected household waste for free, since this would be entering

Theme	Discussion
	the domestic waste stream were it not for the charity collection, and re-use represents a financial saving for councils. It was also suggested that local authorities should offer re-use credits to re-use organisations to reflect the savings made on landfill costs. Another interviewee (from the private sector) suggested a programme of support to build capacity among re-use businesses. Specific examples included provision of training in business management and planning skills and the provision of government-backed loans to environmental businesses to encourage investment and growth.

4.3 The role of local authorities

While no questionnaire was administered to the local authorities, examination of the 2013 WRAP Local Authority Survey produced the following summary information.

Table 26 Summary information for Scottish local authorities from WRAP Local Authority Survey (2013)

Question	Result
Number of local councils	32
Number of councils with a formal re-use target	1
Number of councils running a re-use promotional campaign in the past 12 months	3 (from 2011-12 data)
Number of councils offering re-use credits	1 (at £72 per tonne)
Number of authorities re-using items collected through bulky uplifts	5
Type of items re-used through bulky uplifts	Furniture, large and small WEEE, bicycles, mattresses, paint and bric-a-brac
Cost of bulky uplifts	A "standard" uplift (typically 3 or 5 items) ranged from free to £53.05. The median price was £19.12, and the inter-quartile range (i.e. the central 50% of values) was £11.74 to £22.25.
Number of councils with re-use provision at (at least) one HWRC	8
Items re-used through HWRC containers	Furniture, large and small WEEE, paint, bicycles, bric-a-brac

Overall, around one in six councils have re-use associated with bulky uplifts, while a quarter have some level of re-use provision (e.g. re-use containers) at HWRCs. Based on the questionnaire responses, all of the re-use takes place off site. The figures suggest that there is very significant potential to expand the provision of re-use facilities, particularly at HRWC, which tend to have a higher proportion of items suitable for re-use than bulky uplifts (Clarke and Bridgwater 2012).

It should be noted that some of the questions had gaps in the data (e.g. the question about formal re-use targets had 9 non-responses, so it is possible that some figures are underestimated.

4.3.1 Local authority interviews

Interviews were conducted with representatives from three councils: Perth and Kinross, Argyll and Bute and North Ayrshire. As with the re-use operator interviews, the results were recorded on a proforma and gridded for analysis. The results are shown below.

Table 27 Results of local authority interviews

Theme	Discussion
Formal re-use strategies or targets	Of the three councils interviewees, only one had a formal re-use target in its waste strategy, aiming to re-use 0.81% of municipal waste by 2014/15. Another had no formal target but expressed a commitment to re-use in their waste strategy; this council also had a well developed commitment to re-use embedded in its procurement system, with all procurement requests fed through a central office that aims first to transfer items within the organisation and then, if this fails, to procure items second hand, before a new purchase can be authorised. The third interviewee stated that the local authority, while supporting re-use, did not have a formal re-use strategy.
HWRC re-use operations	All three councils had at least one HWRC re-use cabin in operation, in all cases run by third sector partners. Items collected included bicycles, furniture, white goods and paint. In the past year, one local authority had re-used approximately 26.4 tonnes by this route, another 50 tonnes and the third 250 tonnes (this final figure includes uplifts from textile banks, which are not included in the other two figures). One of the authorities was in the process of tendering for a third sector partner to operate (additional) re-use facilities at HRWCs and to open a Revolve-accredited re-use shop.
Bulky uplifts re-use	None of the local authorities had a re-use element to their bulky uplift service. One authority had considered this, but had rejected the idea because of the logistical difficulties associated with working in a very rural area. This same authority had a bulky uplift booking script that asked residents if items were potentially re-usable, with the aim of referring the resident to a re-use organisation if appropriate. The authority in the process of tendering was planning to introduce a formal referral system, using a Service Level Agreement. The third authority had no plans in this area, but did promote re-use organisations on the council website, and hoped to be able to promote the national re-use line on the bulky uplifts page once a sufficient number of local organisations were on board. This interviewee noted that the bulky uplift contract was in the hands of the waste management contractor has control of the bulky waste material collected. The price of bulky uplifts varied, with minimum fees ranging from £12 to £53.
Attitudes to partnership working	All three interviewees were positive towards partnership working with third sector organisations, though one noted that the council did not work directly with a TSO but through its waste contractor. When asked about potential disadvantages, one interviewee recognised that partnership working could bring about delivery risks, but was positive about the council's experiences, noting that risks were generally small scale and that procurement systems exist to manage these risks.
View of the main benefits of re-use	When asked about the benefits of re-use, two interviewees replied that it diverted waste from landfill, while the third emphasised the value of driving material further up the waste hierarchy. Two mentioned additional benefits, in terms of building links with local projects and the social benefits of re-use (one interviewee voiced the opinion that the council's homelessness unit could benefit significantly through closer working with re-use organisations to provide housing starter packs etc).

Theme	Discussion
Local authority role in provision of re-use and level of priority	Two of the authorities interviewed stated that they had a strong commitment to re-use; one of these noted that the tonnages involved were relatively small, but brought additional social benefits and could bring in external funding and help regenerate the local economy. The third interviewee, while supportive of re-use, expressed the view that the primary responsibility of the council was to deliver services in compliance with the Zero Waste Regulations, and that these were recycling driven. In the interviewee's opinion, local authorities, while encouraging residents to re-use, should not be involved in service provision, which should ideally be a matter between the householder and the re-use organisation, since it is these organisations that have the necessary skills and experience.
Views on support for re-use	In terms of support to Scottish authorities to promote re-use, suggestions from interviewees included: communications and information to make the public more aware of the opportunities for re-use and to signpost re-use operations; funding to help local authorities implement re-use initiatives; and publication of case studies to highlight the opportunities and provide examples of successful implementation.

4.4 Discussion

Overall, in areas where they overlap, the interviews and re-use organisation questionnaire present a coherent picture, albeit one of a wide ranging and highly varied sector of the economy. However the responses are broadly similar for the proportion of material suitable for re-use (50-75% in the interviews and 50-90% in the questionnaires) and the generally positive view of the re-use economy as expanding and offering opportunities for growth.

It was also clear from both interviews and the questionnaire (though more accented in the latter) that most people are not able to readily quantify the extent of their activity in tonnage terms. This is not surprising, since this is an unusual way of measuring activity outside of the waste or raw materials industries and re-use businesses are dealing primarily with finished products.

The re-use economy appears to be dominated by small to medium sized enterprises and by the charity sector, operating in a marketplace that is becoming increasingly competitive as businesses compete for a stable (or perhaps dwindling) supply of items for re-sale.

There is already considerable partnership working in the re-use economy, with around 20% of operations actively involved in a partnership of some kind. Further, the majority of re-use businesses are open to the idea of partnership working, while local authority experiences in this regard are positive.

Most organisations highlighted a lack of consumer understanding and a negative perception of re-use as the major barrier to increased re-use, while lack of capital and business support and lack of premises were also cited. The questionnaire in particular also highlighted a lack of suitable high quality donations as a barrier.

Regarding potential support for the re-use economy, interviewees and questionnaire respondents all highlighted the need for better promotion and communication with residents around the opportunities for re-use and where services can be found. Other popular ideas were financial support (local authority implementation grants, loans to re-use businesses, free refuse disposal for charities) and dissemination of information around existing best practice.

5 Baseline and potential material supply

5.1 Re-use baseline tonnages

Table 28 shows the estimated baseline levels of re-use being achieved in Scotland, with the source iof each figure discussed below.

Table 28 Baseline levels of re-use in Scotland

Product type	Estimated tonnes re-used
Furniture	12,000
WEEE	9,500
Textiles	66,000
Bicycles	57
Books	1,600
Paint	7.5

In 2012, WRAP published a series of reports exploring the stock and flow of products through distinct sectors of the UK economy. In particular, the reports focussed on furniture, WEEE and textiles, each helping to expand the knowledge of just how much material is re-used in the UK each year.

WRAP's *Furniture Mass and Product Flow and Market Development Opportunities in the UK* (Parker *et al.* 2012) estimates the total annual tonnage of furniture re-used in Scotland to be 12,000 tonnes, accounting for approximately 17% of the annual furniture demand in Scotland. Domestic soft (41%) and hard (45%) furniture comprise the bulk of the annual re-use tonnage with commercial hard furnishings (14%) making up the remainder. The report draws upon data that is on the whole of acceptable quality but there are some product categories where the report, by its own admission, accepts that the data quality is low and may have a significant impact on the accuracy of the final figures. It is estimated that the report represents approximately 80% of the re-use sector in the UK and a similar proportion in Scotland.

With regard to electricals, *Market flows of WEEE materials* (Haig *et al* 2011) estimates that 1,613,581 tonnes of WEEE arise in the UK each year. As the average re-use rate for WEEE is 7%, around 112,950 tonnes are thought to be re-used in the UK each year (not including hoarding of used electrical goods). Assuming that Scotland accounts for 8.4% of the UK population (based on a Scottish population on 5.3 million and a UK population of 62.74 million) and that each UK citizen re-uses on average a similar proportion of electricals, around 9,487 tonnes are estimated to be re-used in Scotland each year. By applying WEEE composition data we can deduce that this annual re-use tonnage comprises 887 tonnes of small household appliances, 3,528 tonnes of large household appliances, including refrigeration units, 1,475 tonnes of IT and telecoms equipment, 696 tonnes of consumer equipment, 1,114 tonnes of display equipment and 1,790 tonnes of other WEEE. An estimated 35% of WEEE is sold though charity shops whilst the remaining 65% is re-used mostly through informal donations, online exchange and car boot sales.

WRAP's *Textiles flow and market development opportunities in the UK* (Bartlett *et al.* 2012) estimates that the combined clothing, shoes, and household linens recycling and re-use rate in Scotland is 43%.

Around 66,000 tonnes of textiles are re-used each year, either within Scotland (47%) or exported for re-use (53%). Re-use of clothing through charity shops is more prevalent in Scotland than the UK average, with 50% of items collected being re-used through this route. At least 11 tonnes of carpets and 25 tonnes of carpet tiles were also re-used in Scotland last year, according to data supplied by Spruce Carpets. Overall re-use of carpets and carpet tiles is estimated to be less than 50 tonnes. The research has not identified any organisations carrying out mattress re-use as a primary activity (although some furniture re-use organisations will re-use mattresses provided they are in good condition); overall mattress re-use in Scotland is estimated to be less than 5 tonnes.

In addition to the three key categories explored in the above reports, the research sought to gather information on the levels of re-use in three further sectors: bicycles, books and paint. Using data from the two Revolve-accredited bicycle re-use organisations (the Bike Sheds and Recyke-a-bike) and accounting for other small scale schemes, it is estimated that around 15,000 bicycles are collected or donated for re-use in Scotland each year by cycle re-use organisations. Current re-use is thought to be around 31% of this figure (based on Recyke-a-bike data on re-use relative to bicycles received) equating to 4,650 bicycles or around 57 tonnes.

It is estimated that approximately 1,600 tonnes of books are currently re-used in Scotland through charity shops, estimated through extrapolating data from charity shop interviews to the population of charity shops in Scotland. It was not possible to quantify any private or third sector re-use, or informal re-use pathways, due to a lack of baseline data.

Community RePaint re-use schemes in Scotland have collected more than 59 tonnes of re-usable paint, though low demand has meant that re-use achieved has been lower, at around 7.5 tonnes.

5.1.1 Baseline re-use using a bottom-up approach

Using a variety of data sources in combination with the directory of Scottish re-use organisations, an attempt was made to develop a bottom-up model to calculate the total size by weight of the re-use economy in Scotland. The model was constructed to reflect the categories and sectors used in the majority of the research but instead of using a mass-flow approach to estimate the re-use tonnages, anecdotal data on the re-use throughput collected in the questionnaire and interviews was scaled up depending on the amount of organisations in that particular sector.

Although the methodology undertaken to develop the model was sound, the coverage and quality of the tonnage data gathered during the interviews and questionnaires was very limited and not strong enough to build a model of this kind (see discussion in Chapter 4). As a result, the model had to make unrealistic assumptions in order to provide estimates of the total national re-use tonnage and as such was abandoned. The recommendations section provides a possible solution to improving the data quality and availability to the extent that a reliable bottom-up quantitative model of re-use in Scotland could be developed.

5.2 Turnover baseline

Average turnover of re-use organisations in each sector were estimated using data collected through the questionnaire, as discussed in section 4. It found that social enterprises had an average turnover of £59,000, whilst charities had an average turnover of £138,000 and private sector re-use organisations had an average turnover of £195,000. Extrapolating these figures to the organisations identified in the re-use mapping exercise produces an estimate of Scottish re-use turnover. This was calculated by removing all CRNS members from the database of re-use organisations, multiplying the number of organisations by the average turnover for each organisation type, and then reintroducing

the CRNS estimates (based on the 2011 State of the sector report). The results are shown in Table 29 below.

Table 29 Extrapolation of combined annual turnover in re-use economy

Organisation type	Number of organisations (minus CRNS members)	Average turnover	Combined turnover
Charity (non-CRNS)	859	£138,000	£119 million
Private sector	533	£195,000	£104 million
Social enterprise (non-CRNS)	16	£59,000	£1 million
CRNS members			£20 million
Total			£244 million

These results should be taken as being conservative, since:

- There may be gaps in the mapping data
- Certain industry types (e.g. second hand cars, re-use of industrial equipment) have not been included
- The treatment of the upper range (treating all turnovers of over £1 million as £1 million) will tend to deflate the value (though only a little due to the small number of organisations of that size)

The results suggest that the re-use sector in Scotland accounts for approximately £¼ billion in turnover per year (about 0.16% of Scottish GDP). Gross Value Added (which includes VAT) of the sector would be approximately £292 million. By way of comparison, the GVA of the Scottish textiles, clothing and leather industries is estimated to be around £372 million (Scottish Government 2013).

5.3 Baseline job and volunteering opportunities

5.3.1 Jobs

The CRNS State of the Sector report estimates that CRNS members provided 739 full-time equivalent jobs in 2011. Figures on the average number of employees per premises for non-CRNS members were derived from the questionnaire (see section 4). Extrapolating these average figures to the non-CRNS members identified during the mapping exercise, and then adding in the CRNS State of the Sector data, provides the following employment estimates.

Table 30 Extrapolation of total employment in the re-use economy

Organisation type	Number of organisations (minus CRNS members)	Average employees	Combined employees
Charity (non-CRNS)	859	3.58	3,075
Private sector	533	4.18	2,228
Social enterprise (non-CRNS)	16	3.5	56
CRNS members (*State of the sector*)			739
Total			6,098

As noted above, these results should be seen as conservative, given potential gaps in the data set and the exclusion of certain types of re-use from the project scope.

5.3.2 Volunteering opportunities

As noted in section 4, the median number of hours worked by a volunteer was in the range 6-10, while the mean (based on srange midpoints, as for turnover above) was 7.7. The mapping exercise identified 937 charity operations, 859 of which were not CRNS members.

If we assume, based on the questionnaire results (see Table 18) that each of these employs a mean 13.4 volunteers, this equates to 11,511 volunteers in the charity sector, and at 7.7 hours a week this represents 2,364 full time equivalents. If we accept the Charity Retail Association's figure that a typical charity shop benefits from around 20 volunteers, the estimate of full time equivalent employees could be considerably higher (around 3,500 if the average number of hours is assumed correct). In addition, the CRNS State of the Sector report estimates that around 2,854 volunteers work with CRNS members, implying that the re-use sector provides at least 13,875 volunteering opportunities across Scotland.

5.4 Arisings of material and potential suitability for re-use

Table 31 shows the estimated average re-usability of waste by product type, and the estimated waste arising from these products in Scotland, in order to calculate how much material currently in the waste stream is potentially suitable for re-use. Since this material is all in the waste stream (except for the furniture data, which is based on total end-of-life arising), it represents additional potential for re-use on top of the current basline. The figures are based on waste composition and arisings data (discussed for each product type following the table).

Table 31 Re-use potential and arising of domestic re-usable materials in Scotland

Category	Subcategory	Re-use potential (%)	Waste arising (tonnes)	Re-useable material (tonnes)
Textiles	Clothing	65%	118,000	77,000
	Shoes, belts and bags	40%	25,000	10,000
	Household linens	15%	26,000	3,900
	Mattresses	5%	14,000	700
	Carpet and Underlay	20%	48,000	9,600
Furniture*	Soft furniture	27%	38,000	10,000
	Small hard furniture	43%	8,000	3,000
	Large hard furniture	24%	33,000	8,000
	Commercial furniture	50%	14,000	7,000
WEEE	Large household appliances	26%	50,000	13,000
	Small household appliances	9%	13,000	1,000
	IT and telecommunications equipment	9%	21,000	2,000
	Consumer equipment	9%	10,000	900
	Display equipment	9%	16,000	1,500
	Other WEEE	9%	25,500	2,500
Bicycles	Bicycles and parts	23%	700	200
Books	Books	50%	20,000	10,000
Paint	Paint & paint related products	38%	5,000	1,900
Total	**All re-usable material**			**162,000** (150,000 when corrected for furniture)

** Data based on end-of-life arising, and so includes current re-use. Estimated re-usable material in the waste stream is 16,000 tonnes (see discussion below).*

The figures in Table 31 are derived as follows.

5.4.1 Textiles

Bartlett *et al* (2012) estimate that 231,000 tonnes of textiles are purchased each year in Scotland. This figure includes 118,000 tonnes of clothing, 25,000 tonnes of shoes and accessories, 26,000 tonnes of household linens, 48,000 tonnes of carpets and 14,000 tonnes of mattresses. It is thought that consumption is broadly equivalent to waste arisings as the majority of items bought displace currently owned items, though Scotland's population growth rate of 0.54% must also be taken into account.

Clothing textiles and non-clothing textiles have very different re-use characteristics. Clothing achieves high re-use rates of 42%-89% (Ripper and Morrish 2012) depending on the feedstock source and collection method used. As well as being readily re-usable, clothing benefits from a good market price, high demand and well established re-use infrastructure. Footwear and accessories share similar characteristics to clothing as they are dealt with using the same infrastructure, though re-use rates are lower at 40% (Harris *et al* 2012). The re-use rate for household linens is estimated to be around 15% (Bartlett *et al* 2012). As with footwear and accessories, infrastructure with clothing is shared but demand is significantly lower.

Non-clothing textiles such as mattresses or carpets are much less re-usable. Whilst the technical re-usability of mattresses on disposal has been estimated to be 14% (Clarke and Bridgwater 2012), the observed re-usability is significantly lower. The main Scottish mattress recycler FEAT, which ceased operations in late 2011, had reported 5% re-use rates. Carpet has a technical re-usability rate of 20%, though carpet tiles are much more re-usable with a re-usability rate of 70%.

5.4.2 Furniture

Parker *et al* (2012) estimate that 74,000 tonnes of new furniture arises each year in Scotland, though the figure only covers approximately 80% of items. It is therefore possible to estimate that the total arising of furniture in Scotland is approximately 92,500 tonnes. Harris et al (2012) based on analysis of data from Clarke and Bridgwater (2012) estimated that 27% of soft furniture, 24% of large hard furniture and 43% of all hard furniture were suitable for re-use in their current state. While figures for the re-usability of commercial furniture was not available, interviews conducted for the same research suggested that a figure of 50% was a conservative estimate. Combined with figures on the estimated composition of the furniture waste stream of 41% soft domestic, 36% large hard domestic, 8% small hard domestic and 15% commercial (Harris *et al* 2012) it is possible to produced an estimate of re-usable end-of-life furniture arising in Scotland of 28,000 tonnes each year. Since this figure is based on end-of-life arising (rather than waste arising) it is necessary to subtract re-use (estimated at 12,000 tonnes per annum) from the total figure, suggesting that around 16,000 tonnes of re-usable furniture remains in the waste stream.

5.4.3 Electrical

According to Haig *et al* (2012) the UK produces 1,613,581 tonnes of WEEE each year. Allocated by population (Scotland accounts for 8.4% of the UK population) this suggests that around 135,540 tonnes of domestic WEEE arise in Scotland each year. This includes 12,800 tonnes of small household appliances, 51,000 tonnes of large household appliances, 21,300 tonnes of IT and telecoms equipment, 10,000 tonnes of consumer equipment, 16,000 tonnes of display equipment and 25,000 tonnes of other WEEE. Re-usability is higher for fridges and freezers (34%) than for other large household appliances (18%) and other subcategories have an estimated 9% re-usability if disposed of at HWRCs (Harris *et al* 2012). Higher re-usability rates of 20%-50% are possible when the material is sourced from takeback or warranty schemes.

The fate of commercial WEEE is less documented. Over 25,000 tonnes of business to business WEEE was placed on the market in 2012, of which only around 600 tonnes were recorded as collected through WEEE system (Peagram *et al* 2013). A large amount is thought to have been re-used through informal routes, or disposed of though the domestic waste stream. Small domestic appliances and consumer equipment collected through takeback or warranty schemes have re-usability rates of around 20%. The re-usability of commercial IT and telecoms equipment and display equipment collected in this manner is higher, at 50% (Harris *et al* 2012).

5.4.4 Bicycles

Using the national figure apportioned by Scottish population, it was calculated that 687 tonnes of bicycles were disposed of at HWRCs in Scotland in 2011, with a further 143 tonnes being collected through bulky waste collections (Clarke and Bridgwater 2012). Scottish cycle re-use organisation Recyke-a-bike achieved a 31% re-use rate for bicycles in 2012 (based on case study interviews), including re-use of spare parts. This suggest that approximately 213 tonnes of bicycles or bicycle parts currently being disposed of could be re-used.

5.4.5 Books

It was estimated using national composition data and waste analysis data that 19,700 tonnes of books arise in the Scottish waste stream each year. As the re-usability of books on disposal is not known, a conservative figure of 50% was applied. Using this estimate, approximately 9,850 tonnes of potentially re-usable books are thought to be disposed of each year.

5.4.6 Paint

Figures from Community RePaint estimate that around 50 million litres of paint are unused in the UK each year. Weighting by population (assuming Scotland to account for 8.4% of the UK population) we arrive at an estimated 4,200,000 litres wasted per year. Assuming that paint weighs around 1.2kg/litre (figure from Community Repaint) this equates to 5,040 tonnes of material.

The case study conducted with Castle RePaint suggests that, under current conditions, around 38% of paint is suitable for re-use (though this figure is based on paint collected fromn HWRC paint containers and could be either an over or under estimate). If the figure is correct, this means that Scotland wastes around 1,900 tonnes of re-usable paint each year.

Table 32 below presents the amount of material in each of the categories currently being re-used alongside the potential amount of re-usable material entering the waste stream. The third column identifies the proportion of total re-usable material actually being re-used. The highest levels of re-use are evident in the 'clothing, shoes, accessories and linen' category and all WEEE categories with the exception of large household appliances. Lowest performing categories are carpets and underlay and mattresses.

Table 32 Current re-use levels and proportion of potentially re-usable material re-used

Category	Subcategory	Currently re-used	Re-usable in waste stream	% of re-usable material being re-used
Textiles	Clothing, shoes, accessories and linens	66,000	90,600	42%
	Mattresses	25	700	3%
	Carpet and Underlay	50	9,600	0.5%
Furniture	Domestic soft furniture	5,000	5,000	50%
	Domestic hard furniture	5,500	5,500	50%
	Commercial furniture	1,500	5,500	21%
WEEE	Large household appliances	3,528	13,106	21%
	Small household appliances	887	1,139	44%
	IT and telecoms	1,475	1,897	44%
	Consumer equipment	696	895	44%
	Display equipment	1,114	1,432	44%
	Other WEEE	1,790	2,301	44%
Bicycles	Bicyles and parts	57	200	22%
Books	Books	1,617	9,850	14%
Paint	Paint & paint related products	7.5	1,900	0.4%
Total	**All re-usable material**	**89,000**	**150,000**	**37%**

6 Opportunities and barriers affecting the market for re-use

At an abstract level, any market can be represented as an interaction between supply and demand. As demand increases, consumers are willing to pay more for a product, while falling demand reduces the price a product can command. Similarly, as supply increases, competition among sellers drives prices down, while restricted supply pushes prices up as items become scarcer. The market works to ensure equilibrium between supply and demand. If demand rises and prices rise, more suppliers enter the market to take advantage of the increased margins, bringing the price back down; the converse applies when demand falls.

If the functioning of the market is determined by this interaction between supply and demand, then anything that increases the demand for second-hand products or increases the supply should work to increase the level of activity.

An understanding of some of the barriers and opportunities affecting the re-use market is useful in determining the options for future support. Barriers and opportunities were identified in the literature review part of the research, through questionnaire responses and through interviews with actors in the re-use economy in Scotland.

6.1 Barriers to re-use

Table 33 shows market barriers identified through this work. A market barrier is here defined as:

- Anything that prevents or discourages re-usable product from being brought to market. These supply side barriers increase the price of bringing goods to market, increasing the price at which they must be sold in order for the sale to be financially sustainable.
- Anything that works to deflate market demand for re-usable goods. These demand-side barriers reduce the desirability of second-hand goods and lower the price that consumers are willing to pay.

Table 33 Market barriers to re-use

Barrier	Affects	Discussion
Negative public view of re-use	Public. Demand for re-use products.	We live in a consumer society that positively values new products and having the latest, most up to date consumer goods. In contrast, second hand products have been seen as something of a poor relation, often associated with being unable to afford new purchases. While by no means universal, it would be fair to say that second-hand purchase is generally seen as an inferior option to buying new.

Barrier	Affects	Discussion
Concern about quality, safety, cleanliness and reliability of re-used products	Public. Demand for re-use products.	In tandem with a general negative evaluation of second-hand purchasing, concerns over product quality, safety, cleanliness and reliability / longevity of re-use product have a depressing effect on demand. The perceived risk around second-hand purchase results in an expectation of a significant price differential between a new and re-used product that may not always be possible to deliver. This barrier affects some product types more than others. Hard wooden furniture, for example, is minimally affected, while soft furniture such as sofas and mattresses is affected strongly due to concerns around hygiene (DEFRA 2011). Electrical goods are also affected strongly, due to concerns about reliability and safety.
Growth in the sale of inexpensive imported items	Public. Demand for re-use products.	Reinforcing the above point, the price of many new products has fallen significantly (several interviewees alluded to competition from inexpensive imported goods as a significant factor). This makes it increasingly difficult to defend the price differential needed to generate sales. In addition, when these less expensive products reach the end of their first lives they may not be in a suitable condition for re-use, due to reduced material and build quality. Even if they are fit for re-use, the fact that the product was extremely inexpensive when new exerts a further downward influence on the price that consumers will be willing to pay.
Lack of consumer information and knowledge of the options available.	Public. Demand for re-use products.	In addition to factors affecting demand and the price consumers are willing to pay, there is evidence of a lack of consumer knowledge of the options available for buying re-used products (and donating or selling items for re-use). Lee-Woolf et al (2012) noted the difficulty in locating re-use businesses, particularly small private sector companies that were unlikely to be a member of any umbrella organisation and may lack an online presence. While consumer interviews noted high awareness of high street re-use options (primarily charity shops) there was much less awareness of off-high-street re-use activity, especially of organisations re-using bulky items.
Lack of supply of quality items for re-use	Re-use organisations. Supply of re-use products	Several interviewees raised concerns about the falling quality of items available for re-use, noting that consumers do not want to buy tatty or unfashionable items. It was suggested that the economic downturn has had an impact in this regard, with people holding onto things longer and disposing of them only when they are no longer fit for purpose. The rise of cheap imported goods was also blamed, with some interviewees saying that these goods do not have the longevity of higher quality alternatives.

Barrier	Affects	Discussion
Cost of dealing with low quality donations	Re-use organisations. Supply of re-use products	Related to the lack of quality items is the increase in the number of poor quality donations to charity shops and furniture projects. Several interviewees raised the costs of sorting and then disposing of unsuitable goods as a significant burden and a barrier to growth. Organisations collecting bulky items from the doorstep typically manage this issue by screening items at the point of collections, but this means that a proportion of items (estimated to be around 20-30%) is rejected (Lee-Woolf *et al* 2012). Rejection of donations can have the effect of undermining future donations, further reducing the supply of items for re-use. This is a potential barrier to any campaign that would seek to promote a blanket message of donation for re-use; such a campaign could easily do more harm than good.
Lack of storage space in domestic properties and the high cost of commercial space.	Public. Re-use organisations. Supply of re-use products.	This affects both the willingness and ability of the public to donate items and the ability of businesses to maintain a stock of items for sale. Lack of household storage space can be a serious barrier to a householder using a charity or third sector pick-up to dispose of bulky items. Re-use collections can sometimes take longer than a local authority bulky waste collection, but even where a free re-use collection can collect faster than a charged bulky waste collection, the need to store bulky items indoors until collection may render the re-use option impractical. The high price of land and storage space means that organisations find it expensive to store items for resale and are forced to seek a quick turnover. This was cited by one interviewee as a major barrier to repair activities, as this requires space to store items, spare parts and equipment.
Damage to items in handling, transit or during storage	Local authorities. Re-use organisations. Supply of re-use products.	Local authority bulky uplifts are typically optimised to transport waste items as cost-effectively as possible, usually by bulking in a tipper vehicle or similar. Items loaded, transported and tipped in this way are likely to be damaged in transit (if not already damaged by the weather) and hence unsuitable for re-use.
High logistical costs in areas of low population density	Re-use organisations. Supply of re-use products.	Scotland has the lowest population density in the UK, with the Highland area in particular being very sparsely populated, and has a significant number of populated islands. This poses logistical difficulties, making the costs of transport in these areas significantly more expensive. This can pose serious problems for low return business such as re-use, and is one reason why businesses tend to cluster in urban areas.

Barrier	Affects	Discussion
Lack of product specialisation and heterogeneous supply	Re-use organisations. Supply of re-use products.	Repair activities depend hugely on economies of scale that do not exist at the level of small organisations. Re-use operations handle heterogeneous products, and most organisations handle small amounts of any particular item. This has implications for skills and experience and affects the ability to build the bank of spare parts that is essential to running an effective repair and refurbishment operation.
Rising cost of disposal impacts some re-use pathways	Re-use organisations. Supply of re-use products.	Increases in landfill tax have had a huge impact in encouraging the sustainable management of waste. However, one consequence has been to put pressure on house clearance businesses – a route by which household furniture has traditionally entered re-use – as operators face increasing waste management costs that are not offset by increasing revenues from the sale of re-uasble items. As a result, house clearance costs have risen, leading to a decrease in demand. The conclusion of this process is that residents are more likely to dispose of items through other routes, and more material will enter the municipal waste stream through HWRCs and bulky uplift. These collection routes are currently poorly configured for re-use.
Lack of incentive for waste managers to re-use	Local authorities. Supply of re-use products.	The current regulatory framework does not enforce adherence to the waste hierarchy. While companies and local authorities are obliged to "consider" re-use and waste prevention, there is no fiscal or regulatory incentive to do so. In an environment where local authorities face tonnage based recycling targets, with established systems for measuring performance and penalties for non-compliance, there is strong incentive to regard re-use more as a desirable afterthought than a core aim.
Competition with recycling	Local authorities. Supply of re-use products.	In some product areas (especially WEEE) an efficient infrastructure has grown up around recycling services, spurred on by the need to meet statutory recycling obligations. This infrastructure provides a convenient, audited and (for WEEE) revenue-generating approach to managing waste. Given the compliance-led focus of local authority waste management, this route may be seen by many waste managers as preferable to re-use, or in any event not inferior to it, and this can act as a disincentive to re-use.

Barrier	Affects	Discussion
Difficulty in monitoring progress	Support bodies. Regulators. Monitoring and evaluation.	A difficulty in providing support to re-use is the difficulty in establishing a baseline re-use level and monitoring progress. There is no statutory requirement to report re-use activity (other than preparation for re-use) and this makes it very difficult to gather reliable data. Gathering this information in a comprehensive way is likely to be a time consuming and expensive undertaking, and would need to be updated regularly to remain current.

6.2 Opportunities for re-use

The research also identified a range of opportunities for re-use. Opportunities in many cases follow from barriers, since identifying a barrier enables action to overcome it, while others follow from developments in the economy more generally.

Market opportunities are here defined as:

- Anything that could enable or encourage re-usable product being brought to market.
- Anything that increases market demand for re-usable goods and through this the price consumers are willing to pay.

Table 34 shows market barriers identified through this work.

Table 34 Opportunities for re-use

Opportunity	Discussion
Communications and promotion of re-use. Consumer and business education	The most consistently cited opportunity in the interviews and questionnaire responses concerned communications and education of the public and businesses. This is an area recently examined by WRAP through a series of re-use communications pilots (Kerrell 2012), which suggest that such campaigns do have the potential to make a difference. Whether this difference is sustained is not clear; nevertheless, the study does suggest that a re-use communications campaign run along lines similar to Recycle Now or Love Food Hate Waste has the potential to stimulate behavioural change, while new ways of promoting re-use and sustainable living are emerging (see, for example, http://festivalofthrift.co.uk/). In addition to raising awareness, such a campaign would be useful in disseminating information about what donations are acceptable, raising donor confidence that their donations will be valued and reducing the problems faced by organisations in handling unsuitable items.
Provision of information to consumers	As noted under barriers, it can be difficult to find information on the options for re-use. This creates an opportunity for a directory of re-use operators, spanning the public, private and charity sectors, which would enable the

Opportunity	Discussion
	public to find the information they need. Any directory would need to ensure that businesses listed met certain standards of service and product quality; one option would be to tie a listing to standards and accreditation (e.g. Revolve members, ISO accredited organisations and those holding PAS141 accreditation). Such a database would also require continual investment and revision in order to ensure that it was kept up to date.
Introduction of targets and incentives that focus on the waste hierarchy	Targets and fiscal incentives have more potential to increase re-use than any other measure. For example, material condition estimates from this report suggest that a 10% target for re-use of HWRC bulky items is within the bounds of what is practically achievable, and would result in the re-use of more than 10,000 tonnes of material (based on estimated HWRC bulky waste arising for Scotland in Clarke and Bridgwater, 2012). Similarly, introduction of mandatory re-use credits could provide a significant injection of funding into re-use, increasing financial sustainability and encouraging the growth of capacity. The use of targets and incentives for an activity as widespread and as difficult to measure as re-use, however, is not straightforward. To use the example of re-use credits, there would be issues to resolve around who is eligible to receive credits and how re-use should be measured. Measures would also need to be put in place to prevent fraud.
Clarify local authority responsibilities with regard to re-use.	At present, it is not clear exactly what the responsibilities of local authorities regarding re-use are. Clear guidance, with a stated expectation for councils to uphold the waste hierarchy including re-use where practicable, would provide significant impetus to local authority re-use programs.
Encourage local authorities to reduce disposal costs for waste of domestic origin	Provision of free or discounted waste disposal to commercial collectors of domestic waste, such as charities and house clearance contractors, would enable such businesses to offer clearances at reduced rates to customers, potentially resulting in an increase in domestic re-use. A permit system would help prevent abuse for example, by ensuring that the discount was only available to organisations who were certified to a re-use trade body.
Expansion of quality standards and accreditation	Standards such as Revolve can have a twofold effect, by both reassuring the public about the quality of the items and improving the professional image of organisations and businesses involved in re-use. Revolve returns suggest that the programme has had a positive impact on accredited groups. Between the January-June and July-December 2012 reporting periods, the turnover of Revolve accredited organisations grew by 69% on average, while the tonnage of material sold more than doubled. It is not possible to tell how much of this increase is new re-use, and how much is due to increased competitiveness relative to other re-use organisations. Revolve is currently restricted to the third sector. There may be a significant opportunity in extending the scope to include charity and private sector organisations. From the perspective of consumer recognition, this would be

Opportunity	Discussion
	preferable to introduction of a separate standard. Consideration could also be given to harmonising Revolve with other standards (e.g. require accreditation to PAS141 if engaged in WEEE re-use).
Encouragement of partnership working	The research suggests that there is considerable potential to develop further partnership working between Scottish local authorities and external organisations (businesses, charities and third-sector organisations) to increase re-use at HWRCs and through bulky uplifts. This is a major opportunity for growth, and could be encouraged through the publication and dissemination of best-practice case studies that highlight the significant results that can be generated with a minimum of investment. Examples of best-practice are readily available, with authorities such as Buckinghamshire,Warwickshire and Shropshire achieving meaningful diversion from waste disposal to re-use.
Engagement with small business sector	Historically, the small business sector appears to have been under-engaged in attempts to build re-use infrastructure, despite the critical role that small businesses have played in the re-use economy. This has changed in recent years, and many of the businesses contacted in connection with this study were aware of the work of Zero Waste Scotland. Further engagement with small businesses on issues of relevance to the sector (business skills and support, funding or standards and accreditation) is essential, and may be best pursued through business support organisations, such as local Chambers of Commerce. The questionnaire suggested that the Federation of Small Businesses is the single most subscribed to organisation among private sector re-use companies, and this may represent an opportunity for engagement.
Establishing a central repair and refurbishment hub	One opportunity to address the barriers around repair would be to establish a repair and refurbishment hub with the specific aim of refurbishing items for the re-use sector. Collected or donated items requiring repair beyond the level of the collecting organisation could then be sent to this hub for repair as an alternative to disposal. The repair hub could, in turn, remarket these refurbished items to the re-use organisations as a source of additional, high quality stock. For such a system to work, it would be necessary to ensure that collection fees were lower than disposal or recycling costs (for WEEE items, which generate a recycling revenue, it may be necessary for the collector to pay for the material). A hub will have more success if it retains control over its operations, rather than being controlled by the network of organisations supplying it, since the alternative model is likely to undermine its ability to function as an effective business (for an example of the failure of the alternative model, see Hinchion 2011).
Rising material and overseas labour costs	Literature around the circular economy (e.g. Ellen MacArthur Foundation 2012) has noted reversal in the trend of falling raw material prices. Coupled with a projected rise in overseas labour costs associated with the growth of consumerism in China and India, many are predicting an end to the era of cheap consumer goods that have been outcompeting re-use. In addition, the

Opportunity	Discussion
	developed world is likely to experience reduced labour costs as the world economy re-aligns itself, making the labour needed to refurbish items for re-use more affordable.
Promote design for re-use	Most products are not designed with disassembly and remanufacture in mind, and this reduces the quantity of products that can be viably re-used. While not directly supporting the growth of the re-use economy in Scotland in the short term, support for more sustainable product design could have a very significant impact on the future supply of re-useable goods. Supporting design for re-use, through publications, working with the National Design Council or supporting students and researchers in Design departments at University level, has the potential to bring about a long term shift in the re-usability of products at the end of their first use lives.
Gathering information	In light of the information barriers noted earlier, any potential to gather more accurate and comprehensive data on re-use should be seen as an opportunity. The mapping work begun by this project could – if augmented and supported by local input – form a powerful benchmarking and analysis tool. In addition, if such a mapping database were to be combined with an increased-scope revision of Revolve, it would help to overcome many of the public information market barriers.

7 Recommendations and conclusions

7.1 Introduction

This research has involved mapping the re-use economy in Scotland, along with a review of relevant literature and questionnaire and survey research. By examining this data, and developing an understanding of the opportunities and barriers affecting the economy, we are able to offer a number of recommendations that we believe should inform Zero Waste Scotland and the Scottish Government's strategic approach to re-use. This broad outline is developed, before examining specific interventions that might help to promote re-use. This is followed by a discussion of how progress in developing the Scottish re-use economy might be monitored, and the potential material and economic impacts of the levels of increased re-use that might be achieved.

7.2 Strategic overview

The requirement set out in the Waste Framework Directive for each Member State to develop a national waste prevention strategy by December 2013 represents a historic opportunity for government to put waste prevention and preparation for re-use at the heart of waste policy through support for re-use organisations, policy targets and monitoring and evaluation research. Any such strategy, and any support programme that seeks to realise its objectives, needs to consider the opportunities and barriers around re-use, as outlined in the previous chapter. Examining these, a number of priority issues can be seen:

- Public perception of re-use is generally poor, limiting demand, and this is reinforced by the economic logic of a consumer society.
- There are concerns around product quality, safety and reliability, especially concerning complex goods such as electrical and electronic equipment. Given the wide disparity of practices and the relatively unregulated nature of the re-use industry, it is likely that much of this suspicion is grounded in real consumer experience.
- The increase in inexpensive imported products, including furniture, textiles and electrical goods, means that re-use items face stiff competition from new items.
- A lack of supply of high-quality items for re-use, and the relatively high cost of bringing goods to market in an industry that has a low rate of return.
- A historic lack of government and local authority emphasis on re-use. Policy over the past decade has succeeded in raising public awareness around recycling and promoting large-scale investment in waste and recycling infrastructure, but this has not been mirrored in the field of re-use. While this is changing, it would be fair to say that re-use historically has played second fiddle to the development of waste treatment and recycling, and that infrastructure / capacity and public awareness are in need of development.

We would argue that these barriers are the primary constraints on the further development of re-use, and that other barriers are secondary. For example, lack of public knowledge of where to buy re-used items – while a genuine barrier – is limited in its relative importance by the lack of public demand for re-use. While steps to address this barrier would themselves likely stimulate public interest, it may be more advantageous to address first, or in tandem, concerns around product quality, reliability, longevity and safety. Similarly, the issue of transit damage reducing the supply of items is secondary because the technology and the understanding to solve the problem already exist; what is missing is investment and a sense that this is a political priority.

In this context, a number of interventions may have the capacity to produce change in the short term. Such interventions are most likely to be structured around:

- Communications and standards to promote interest in re-use and confidence in re-use products
- Local authority intervention to divert items from the waste stream into re-use
- Direct investment and support for re-use organisations, whether private sector, charities or social enterprises.

It is likely that such interventions (potential examples of which are discussed below) could serve to increase re-use rates. However, their potential to divert significant tonnages into re-use may be limited. Given the reduced expected lifespan of repaired (as opposed to completely remanufactured) products, and the influx of cheap new products on the market, re-use has to contend with the harsh reality that it may not always offer best value to the consumer. Regardless of policy aims, the levels of re-use currently being achieved reflect, for the most part, the rational economic decisions of market actors, and significant change is likely to require significant change in the context in which those decisions are made. In the current environment of cheap imports and high domestic labour costs, the reality is that any action on re-use needs to be well informed (using empirical data on supply and demand wherever possible), carefully planned and well supported in its delivery and marketing. In this context, the most important long-term opportunities identified by this research are:

- The re-emergence of resource scarcity and rising material costs, coupled with the rising cost of labour in developing countries
- Design for re-use, remanufacture and the circular economy.

Any strategy seeking to bring about a radical increase in re-use in the longer term needs to engage with these structural changes to ensure that Scotland is well placed to address the opportunities, and challenges, as they emerge. There is no large-scale "quick win" to be found in a high-value, high demand product that is not currently being re-used. Such a silver bullet does not exist, and to imagine it could implies a misunderstanding of markets.

7.2.1 Areas of focus

7.2.1.1 Geographical spread

The mapping exercise suggests that there is no strong evidence of a geographical undersupply of re-use services.

- City centre areas generally have a high number of re-use organisation, relative to both population and land area and are thus well supplied with re-use organisations.
- Rural areas of the country seem to be reasonably well supplied with re-use services in terms of the number of organisations per 100,000 population. The geographical sparsity of these organisations, which potentially increases their logistical costs and limits customer numbers, does not seem to have had a particularly strong negative effect on re-use.
- Areas that do have lower supply relative to population size tend to be relatively close to areas with large numbers of re-use organisations – a pattern common to most economic activity, where residential and shopping areas are often geographically distinct. However, one possibility that should be considered is that less well off households in these areas (potentially a large part of the market for re-use organisations) may not be able to afford to travel. In this sense, there may be indications of a supply issue in those central belt areas identified in Chapter 3.

7.2.1.2 Priority products

There is insufficient evidence to suggest that there are specifc product areas that are "under re-used". In general, products are being re-used more or less in tune with their economic potential. The second-hand clothing market is, if anything, in danger of overheating, and may experience a slowdown over the next few years, especially if consumption habits in Eastern Europe change. Existing work on consumer attitudes (DEFRA 2011) does suggest that some areas (especially soft

furniture and mattresses) have a relatively *low* potential for further expansion, since concerns over hygiene and the tendency for soft furniture to deteriorate with use makes this option very much second-best for most people. Nevertheless, the large number of households in social need means that Scottish furniture projects continue to do a significant trade in soft furniture items.

If Zero Waste Scotland does wish to select priority product areas to focus on, the single most important consideration should be that re-use is most economically viable when the original item has a high intrinsic value that is not subject to rapid depreciation (e.g. through obsolescence). Items that fulfil this description include:

- Wooden furniture (not MDF or particleboard). These items withstand movement, are built to last and can be modified by a carpenter to meet a customer's requirements.

- High end white goods and refrigeration equipment. Especially commercial equipment, which is typically well supplied with a market in spare parts.

- Computers and IT equipment. The slowdown in the release of faster processors in recent years means that obsolescence, once a major barrier to the re-use of desktop PCs, is becoming less of an issue; it remains to be seen whether this will in turn impact procurement decisions and the number of PCs suitable for re-use coming onto the market.

7.3 Interventions

The section below covers examples of specific interventions. These have been sorted according to the sector that they seek primarily to engage, with discussion of the relative priority of each measure and a discussion of the issues and critical success factors to be addressed.

7.3.1 Public facing interventions

7.3.1.1 Publicity and marketing to encourage re-use

Publicity and marketing to raise awareness of re-use as a consumer activity was the issue most raised by interviewees, and should not be overlooked. Low consumer interest in re-use is a significant barrier to further growth that needs to be addressed. However, the barriers to re-use suggest that any campaign would need to be carefully considered, for a range of reasons.

- Most organisations reported high levels of demand and difficulty in sourcing stock of sufficient quality.
- Given the cost of premises and general shortage of capital, businesses may struggle to increase their capacity to meet rising demand.
- Increasing demand under conditions of restricted supply could have the effect of bringing poorer quality items into the re-use market, undermining its long-term viability.
- A blanket campaign to increase donations could have the consequence of lowering donation quality, at a time when organisations are already struggling to cope with the number of poor quality donations they receive.
- In some cases (e.g. where items are of low quality and cheap replacements are available) purchasing re-used may not be sensible from the consumer perspective. Attempting to give consumers bad advice is unlikely to produce positive results.

With this in mind, we would recommend that a consumer facing communications campaign to promote re-use needs to concentrate on specific messages around not just the benefits of re-use but the opportunities for donation and consumption, what types of item are and are not suitable for

donation and where items can actually be purchased and donated. Instead of issuing general reassurances about the high quality of second hand products – which would not be warranted – any campaign should seek to promote a quality standard label or to advise consumers on how to ensure that they get a good deal (for example, noting that they have the same statutory rights as the purchaser of a new item).

Details of the look and feel and the messages to be conveyed around the benefits of re-use should be developed through consultation with the public and local trials. Kerrell (2012) has already conducted significant work in this area, which suggests campaigns of this type can make a real difference.

7.3.1.2 Expansion of Revolve into a nationwide quality standard that covers all sectors of the re-use industry

This intervention would require extensive engagement with all sectors of the re-use industry, and so could easily be catetgorised under that section. It has been listed here, however, to highlight its importance in changing consumer opinions and attitudes around re-use and product quality.

Examination of the Revolve returns suggests that accreditation has had a significant effect on members, with average turnover up 69% and the weight of products re-used more than doubling between April and December 2012. This suggests that there may be considerable value in widening the scope of Revolve accreditation to include charity and private sector organisations. As noted in the section on opportunities, this would likely be most effective if combined with a harmonisation of re-use standards (PAS 141, Fit for Re-use etc) to produce a single quality label for re-use across Scotland.

Such a system may initially struggle to engage the private sector, which is less integrated than the social enterprise sector (due to the efforts of CRNS and Zero Waste Scotland). A solid emphasis on the commercial benefits of accreditation, combined with promotion through business organisations such as Chambers of Commerce or the Federation of Small Businesses, is likely to be an effective method of attracting applications. Further communications and promotion of Revolve to the public will also serve to make the standard more attractive to the full range of businesses, by increasing recognition and the financial value of accreditation.

7.3.1.3 Production of a consumer directory of Scottish re-use businesses

Creation and promotion of a national re-use directory that consumers can use to locate suitable places to buy and to sell or donate second-hand goods could provide consumers with better market information on their re-use options. There are existing examples of such directories (e.g. Recycle Scotland), but a well-publicised portal that gives consumers the opportunity to search online by item type and geographical area would have significant potential to improve the availability of market information. However, two factors should be taken into account before any scheme is established.

- Such a directory will require significant and ongoing, investment to ensure that it remains up to date. With more than 1,500 re-use businesses in Scotland, many of which are SMEs, the re-use economy is extremely dynamic and changeable, and any directory will need to be updated at least annually.
- Consideration should also be given to whether inclusion in the directory ought to be conditional upon businesses meeting some level of minimum standard. Publicising services that offer poor value or generate complaints could be counterproductive. One option would be to tie directory listing to some form of accreditation in order to ensure that minimum standards are met. Alternatively, an opportunity for consumers to leave reviews (using functionality such as that

included in Google Maps) could be considered, although this could lead to issues with false or unfair reviews and would require moderation.

As noted earlier, while potentially worthwhile, construction of a directory should be seen as a lower priority than activities to address the key issues of low consumer interest in re-use and concerns around product quality.

7.3.2 Engagement with local authorities

Local authorities already play an important role in the re-use economy, and this role has the potential to expand dramatically. Councils hold the key to thousands of tonnes of material disposed of each year through HWRCs and bulky uplifts, while their ongoing engagement with the public around service provision puts them in an excellent position to communicate the re-use message. They also have significant purchasing power, and local authority procurement policies have the potential to invigorate demand for re-use while saving public money and sending a message to other organisations about the benefits of re-use.

7.3.2.1 Encourage local authorities to move waste further up the hierarchy

The interviews, and the generally low level of re-use service provision, suggest that some local authorities may not treat re-use as having the same level of priority as refuse collection or the provision of dry recycling. This is not to suggest that local authorities are not supportive of re-use (all of those interviewed were working in partnership with re-use organisations to divert items into re-use). Nevertheless, the historic and current concentration on refuse and recycling, and the lack of any statutory re-use requirements, mean that re-use is not accorded the same level of importance as activities lower on the hierarchy.

In order to help overcome this perception, without imposing costs on local authorities, we would recommend that Zero Waste Scotland explores the possibility of a local authority voluntary agreement around re-use and waste prevention, with a joint target – held by Zero Waste Scotland – along lines similar to the Courtauld Commitment or Zero Waste Scotland's Resource Sector Commitment. Such an initiative could help promote innovation in service delivery and reorient local authority thinking around the waste hierarchy without imposing undue financial burdens.

7.3.2.2 Encourage local authorities to include re-use in their procurement policies

One local authority interviewee noted that the council had adopted a re-use led strategy for internal procurement; all requests for items such as office furniture etc. are dealt with through relocation of existing unused stock wherever possible, and external procurement, where necessary, is always attempted through re-use channels before a new purchase is authorised.

Scottish local authority procurement spending amounts to more than £9 billion per year (Source: Scottish Government) and innovation such as this has the potential to inject a significant quality of investment into the re-use economy, increasing the demand for re-use products while saving local authorities money.

7.3.2.3 Provide funding for re-use trials and demonstrator projects

One local authority interviewee highlighted the need for case studies of successful implementation of re-use programmes that would encourage further take up. A number of WRAP case studies of English

authorities (e.g. Warwickshire) already exist, and these should be promoted to Scottish Councils as examples of best practice, since many of the lessons are directly applicable.

Going further, Zero Waste Scotland may wish to consider a series of funded demonstrator projects in Scotland itself. This would create local examples of best practice, and allow detailed access to financial and operational information that might otherwise not be accessible.

7.3.2.4 Establishment of re-use outlets at HWRCs

Evidence from the WRAP Local Authority Survey and the local authority interviews shows clearly that there is significant capacity for enhancing re-use facilities at HWRCs. In particular, on-site re-use shops provide access to a steady supply of re-useable items and the footfall needed to market those items successfully, while also working to change users' views of the HWRC away from "the dump" towards sites for sustainable management of resources (Harris *et al* 2012).

Establishing re-use outlets at HWRCs also represents an extremely cost-effective method of diverting items for re-use. The cost of collecting and quality checking goods for re-use at an HWRC is minimal, while examination of charity shop and furniture charity sales prices suggests that the sales value of a tonne of re-used bulky items (furniture and WEEE) is typically in the range £1,500 - £2,000.

Previous case studies (Harris et al 2012) have shown that an HWRC re-use outlet will divert around 1% of total site throughput, bringing in a potentially significant income for minimum outlay. For example, the on-site re-use shop at Burton Farm HWRC in Warwickshire, operated by the Shakespeare Hospice, cost approximately £26,000 to establish and re-uses around 1.25% of site throughput (80 tonnes per annum), bringing in an annual income of £200,000 for the charity. Shakespeare Hospice pays Warwickshire County Council rent of £5,000 or 5% of shop income per year (whichever is greater). Taking into account landfill tax savings of over £5,000, the shop currently brings the local authority a net benefit of around £15,000 per year.

With a Scottish HWRC throughput of around 585,000 tonnes per year (Based on 2010-11 Waste Data Flow figures), re-using 1% of material in this way would account for 5,850 tonnes of material, generating approximately £5-10 million in income per year.

7.3.2.5 Encourage partnership working between local authorities and external organisations to provide a re-use led bulky waste service

Currently, there is little re-use of material from bulky uplifts in Scotland, and this represents an opportunity to divert a significant quantity of material. The main barriers to re-use from bulky uplifts are damage from items being stored outside and transport damage associated with handling items as waste. One option for increasing bulky re-use is to work with a partner organisation to collect items that are suitable for re-use. Uptake of this alternative, re-use led service can be encouraged by ensuring that the cost of a council bulky uplift is significantly higher than the referral option. For example, Highland Council charges £15 for uplift of up to three items, but refers residents with re-usable items to a third-sector collection that is able to pick up for free, as the collection fee is covered by the council.

The costs of such a service are variable. In areas of dense population, where bulky-uplift charges are high enough for the re-use partner to charge a (lower) collection fee, it is possible to operate a bulky referral service for minimal costs. The cost in rural areas is considerably higher; for example, in 2009/10, Highland Council funded its re-use partners at £250 per tonne (WRAP case study, undated). While this is considerably more expensive than collection for disposal or recycling, the resale value of

a tonne of WEEE or furniture items is such that succesful re-use of even 25% of this material will more than offset the price of collection (see above).

Case study research based in Lancashire and Shropshire shows that diversion rates of up to 55% of bulky uplift material are already being achieved through referral to third sector organisations for bulky uplifts (Harris *et al* 2012).

Assuming a Scottish bulky uplifts total of 65,000 tonnes per year (Clarke and Bridgwater 2012), achieving even a 10% re-use rate could divert 6,500 tonnes per year, with a sales value of £6.5-13 million.

7.3.2.6 Encourage local authorities to offer re-use credits

Payment of re-use credits (currently limited to one council in Scotland according to the WRAP local authority database) would clearly signal the local authority's support for re-use, while providing a small subsidy to increase the financial viability of re-use operations.

7.3.3 Engagement with re-use organisations and small businesses

7.3.3.1 Establish a loan fund for businesses engaged in waste prevention or re-use

Small businesses and start ups require capital in order to grow. The current financial situation has made access to affordable credit extremely difficult for small businesses, and this constitutes a significant barrier to growth. As one interviewee noted, much of the environmental business support currently available takes the form of match funding, which does not address the fundamental problem of a lack of start-up capital. Zero Waste Scotland should consider the options for a loan fund to provide support to businesses in the re-use and waste prevention sectors. Such a fund would increase capital availability and help to develop re-use capacity, while allowing Zero Waste Scotland or the Scottish Government to influence the development of the sector.

7.3.3.2 Establish a training support body for re-use businesses

Start-up businesses are also hampered by a lack of business skills and understanding, with many failing due to poor management of cash flow or a failure to understand the tax system. In addition, businesses entering the re-use sector will face a learning curve in dealing with the second-hand market for the products they deal in.

Promotion of basic business management skills should not be underestimated as a means of encouraging capacity growth, and re-use businesses could be signposted to organisations that provide such information and training (for example, Scottish Enterprise, the business support pages at Gov.uk and support provided through local Chambers of Commerce). Other opportunities where Zero Waste Scotland could look to partner with business organisatioisn include networking events for re-use businesses and workshops on the fundamentals the re-use market (including opportunities for partnership working, which are not always immediately obvious to small businesses).

7.3.3.3 Develop a feasibility study for a centralised repair hub

Many organisations are unable to conduct significant repairs due to space or skill constraints, or due to handling insufficient stock to generate significant economies of scale. Establishing a centralised hub for the repair of items not suitable for re-use in their current condition could significantly increase the proportion of material that can be re-used. The details of how such an organisation would be

established, its organisational form and its mode of operation (e.g. collecting items from organisations and selling them back) would need to be subject to consultation, in order to ensure that there is demand for the services it offers. The first step would be to develop an outline cost model to assess whether the proposition is viable. Nevertheless, a number of suggestions can be made at this stage:

- Such an organisation should ideally be centrally located, so as to be as accessible to as wide a range of organisations as possible.
- It should function independently of the organisations submitting items to be repaired and be able to make its own business decisions.
- In order to maximise tonnages of items, the organisation should be equipped to repair both WEEE items and furniture, since these are the most significant markets where there is a need for market development.

7.3.4 Long-term strategic intervention

7.3.4.1 Establish Scotland as a centre of excellence in design for disassembly and re-use

In the long term, maximising re-use will require greater awareness among product designers of the importance of designing items with their second or third lives in mind. Zero Waste Scotland is in a strong position to encourage this process, through working with Scottish companies, design organisations and Universities to promote the centrality of sustainable design. Working with Universities to form special interest groups and promote research agendas around sustainability, coupled with funding of postgraduate research in the area, could help to influence the culture of Design departments and of the industry. Engagement with the Scottish Design Awards, through sponsorship of a Circular Economy award would help to promote the design of items for re-use and encourage creative re-use of items already on the market.

While this objective is framed with longer term outcomes in mind, this intervention has a potentially large long-term impact, and should be considered a priority if the desired aim is to achieve a large-scale increase in re-use and remanufacture. Developing an internationally recognised skill base in what is likely to be a major growth area over the coming decade could have a significant impact in catalysing economic growth and attracting the large-scale inward investment that would be needed to make re-use and remanufacture a major sector of the Scottish economy.

7.4 What is achievable?

The baseline element of this research estimated that the re-use businesses considered within the scope of this project currently:

- Re-use around 89,000 tonnes of items per year
- Employ approximately 6,000 people
- Create about 14,000 volunteering opportunities
- Turnover approximately £244 million per year

Each tonne of re-use creates:

- 0.07 jobs
- 0.16 volunteering opportunities (0.03FTE)
- £2,740 in economic value

The baseline research also suggested that the waste stream contains around 154,500 tonnes of material that is potentially suitable for re-use. This provides an upper limit on what could theoretically

be diverted for re-use. In practice, the relatively low profitability of re-use as a business model and the need to grow capacity are such that the following table examines four scenarios based on more conservative assumptions:

- A 10% increase in re-use relative to the current baseline
- A 25% increase in re-use relative to the current baseline
- Expansion of current re-use to include 10% of the potentially re-usable material in the waste stream
- Expansion of current re-use to include 25% of the potentially re-usable material in the waste stream

Table 35 Potential environmental and economic contribution growth in the re-use economy

	Total amount re-used (t)	Jobs created	Volunteer FTE	Turnover (£m)
Baseline	89,000	6,000	3,000	£244
10% increase in current re-use	98,000	7,000	3,000	£269
25% increase in current re-use	111,000	8,000	3,000	£304
10% of additional re-use potential	104,000	7,000	3,000	£285
25% of additional re-use potential	127,000	9,000	4,000	£348

All of the scenarios outlined above would represent challenging targets. While the lower targets could potentially be met through expanded support to re-use organisations and increased partnership working to divert items for re-use from HWRCs and bulky uplifts, it is likely that the more ambitious results would require significant intervention to increase the demand for re-use products and to improve the repair and refurbishment infrastructure to ensure that the items being channeled into re-use are of a sufficiently high quality to have widespread consumer appeal.

7.5 Monitoring and evaluation

It is crucial that any programme of support should have a means of monitoring its impacts and evaluating success. It will be important to establish a number of simple and unambiguous metrics against which progress can be evaluated. We would suggest the following:

- Total tonnage of goods re-used. A single headline re-use figure that represents the combined weight of all re-use accounted for below.
- Tonnage of goods re-used by item type. Choice of item categories will depend on how much data is available and how much resource is available to collate this data. We would recommend that, at least initially, the subdivision into types is kept as simple as possible, for example:
    - Furniture
    - Electrical
    - Textiles
    - Other
- Total turnover or Gross Value Added. Gross Value Added (GVA) is the most common approach to reporting on the value of an economic sector, and is calculated by multiplying the combined value

of sales by sales tax (expressed as a decimal) plus one. With VAT currently at 20%, this would mean multiplying the value of sales by 1.2.

- Jobs created (Full time equivalent). The number of people currently employed in the re-use economy assuming a standard working week (252 days per annum at 7.5 hours per day).

It would also be possible to examine the number of volunteers engaged in re-use, either as full time equivalent or as number of individuals.

At present, the state of knowledge around re-use is much less developed than for waste and recycling, since re-use is not generally covered by the same regulatory regime (there are no transfer notes recording the date, item type and weight of every sale). Data gathering to monitor progress is likely to present a significant challenge, and to be subject to a relatively wide margin of error. Nevertheless, by collecting information annually or bi-annually, it will be possible to identify trends in re-use over time.

We would recommend that each monitoring exercise is conducted using three stages:

1 A business search, to quantify the number of businesses in the Scottish re-use economy by business type. This exercise would be similar to the mapping exercise conducted for this study, and would aim to classify businesses, so far as possible, by business type and main items traded (see chapter 3 for more information).
2 A questionnaire survey of a sample of businesses to gather data on items accepted, turnover and employee numbers. Experience suggests that a questionnaire is not an effective method of gauging re-use tonnages, and we would recommend that the questionnaire should restrict itself to the range of items accepted for re-use.
3 Direct engagement with a range of businesses in the re-use economy to establish the weight of re-use that they achieve, either through fieldwork or by application of average weight data to records of items sold. Turnover of each business should also be recorded, and the re-use tonnage for each business type normalised by turnover. In the longer term, working to develop a national accreditation system which requires members to report on their re-use activities (building on the current Revolve system) could fulfil this role, providing robust information on the performance of the re-use economy.

From this data, it will be possible to estimate the turnover of the re-use economy as a whole by extrapolating turnover data from the questionnaire to the business search results. The output of this exercise, combined with the results from stage 3, could then be used to produce an estimate of tonnage re-used.

7.6 Recommendations for further research

Given the intrinsic difficulties of measuring re-use activity, and the lack of reliable, publically available data on the costs and impacts of specific measures, there is an ongoing need for research in this area. Two areas of particular priority have already been addressed above, specifically:

- Conducting trials and demonstration programmes to measure the costs and impacts of specific interventions
- Ongoing measurement and updating of re-use activity associated with monitoring and evaluation of progress.

In addition, we would recommend that further research is conducted in two principal areas.

7.6.1 Assessment of the re-usability of items in the waste stream

WRAP's (2012) Composition of kerbside and HWRC bulky waste is currently the best source of information on re-usability. Nevertheless, it has a number of limitations:

- The assessment of re-usability was conducted on purely technical ground, without consideration of the potential market for the items being assessed. It may be that the viable re-use market for the items assessed has been overestimated as a result.
- Conversely, the study only looked at items in the HWRC and kerbside bulky waste streams, which could have led to an underestimation of re-usability of items more generally (e.g. end-of-life office furniture or warranty return electrical goods).
- The report focused only on bulky waste.
- The data is UK wide; the situation in Scotland may be different.
- Anecdotal evidence suggests that we are undergoing a period where people are holding onto re-usable items longer and the quality of end-of-life goods is falling as consequence. Despite being relatively recent, there may have been further changes in the quality of end-of life goods.

In light of the above points, there is likely to be significant value in conducting additional research to assess the condition and re-usability of goods at end of life through a variety of streams, in order to improve our understanding of the potential for increased re-use. Such a study, to be most effcetive, should consider:

- The potential market for items, in addition to their technical re-usability
- Estimated cost of repair
- Estimated resale value

7.6.2 Further research on the impacts of re-use

Research into the environmental impacts of re-use would enable application of the Scottish carbon metric (James *et al* 2010), allowing for more accurate comparison of re-use activity with waste management options. Comparatively little is understood about the environmental impacts of re-use relative to disposal and recycling. WRAP's work on the benefits of re-use (see James 2011) represents the most thorough study to date, but there is much work still to be done in this area. Key to the benefits of re-use work was the recognition that the environmental benefits of re-use stem from the displacement of new purchases, and the incorporation of this displacement into a lifecyle assessment approach.

Areas that would benefit from additional reseacrh include:

- Consumption behaviours around re-use. What proportion of re-use purchases are additional purchases and what proportion displace new purchases?
- Typical second-life lifespans of a range of re-use products. If a re-use purchase does displace a new purchase, the typical re-use lifetime is needed to calculate what proportion of a new purchase it offsets.
- Impacts of re-use and preparation for re-use activities (transport, cleaning, repair etc) themselves.

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