

AIMS & BACKGROUND

Increasing waste generation is a global problem recognised by the UN in its Sustainable Development Goal 12: Responsible Production and Consumption. Compared with other developed countries Australia generates more waste per capita (e.g. double that of Norway or the UK) and recycles less, and waste volumes have increased over the 13 years that national waste data has been reported (National Waste report 2018: 10). Australia's waste crisis, brought to the fore by China's ban on imports of materials for recycling in 2018, highlights the significant environmental and public health challenges linked to increasing waste. The long-term solution is to transition to a **Circular Economy (CE) in which products and materials are retained in use through successive cycles of reuse and recycling, resulting in reduced resource use and less waste** (Worrell et al. 2016). This is particularly important in Australia where the majority of durable products and materials used by households and businesses are disposed of after their first use-life, regardless of their reuse potential. Reuse contributes to more sustainable resource use, but also green economic development, providing diverse, quality employment opportunities required to manufacture and extend the use life of products and materials. However, Circular Economy initiatives have so far focused primarily on incentivising end of life materials recycling. Other strategies, like product design for longevity and extending product lifespans through repair and reuse, are only beginning to receive attention (European Commission 2015).

As governments across Australia begin to develop circular economy policy, research is urgently needed to understand the benefits of reuse and how best to support it. The goal of a Circular Economy is endorsed by Australia's National Waste Policy (Australian Government 2018) and more detailed policy and reporting frameworks are being developed by State Governments. However, CE reporting has so far focused on categories of materials (e.g. metals, plastic, glass, paper etc.) collected for reprocessing and does not distinguish between destructive materials recycling and the reuse of products and materials (Pickin et al 2018: xiv). Evidence of the reuse of products and materials is not captured (Pickin et al. 2018: 14). While the volume of products and materials reused (e.g. through second hand trading, tip shops etc.) is likely to be small compared with bulk materials recycling, the number of jobs per thousand tonnes of material reused and the dollar value of materials sold is also much higher (Pickin et al. 2018: 14), and charitable and community organisations are key actors in employment and training. To support reuse within circular economy strategies and reporting targets, a deeper understanding is needed of what drives and enables circuits of reuse is now urgently needed, along with a systematic assessment of the full range of socio-economic benefits.

AIMS: The proposed research has two central aims:

- 1) to address the gaps in understanding what drives and upholds reuse and the socio-economic benefits it provides; and,
- 2) to develop a national reporting methodology able to inform government circular economy policy, strategic investment and targets.

Achieving these aims requires new approaches to conceptualising and measuring reuse, in terms of the quantities and value of goods involved, the activities of organisations that facilitate reuse, and the associated forms of employment and skills development. **The project will focus on reuse facilitated by charitable and community sector organisations for two important reasons. Firstly**, these organisations link social benefits, including employment and training, with environmental benefits of extending product lifespans through reuse. Consequently, they provide a valuable opportunity to explore social and labour aspects of the CE, which require more attention (Gregson et al. 2015, Moreau et al. 2017, Gibson-Graham et al. 2019). **Secondly**, these organisations have a strong physical presence in terms of existing facilities, infrastructure, and communities. They maintain extensive networks of collection, storage and sorting facilities for used goods and materials across urban and regional Australia, which provide sites for monitoring quantities of processed materials and understanding how these activities interact with other industries and economies. As we elaborate below, charitable and community sector organisations therefore may provide institutional models for more robust CE strategies.

The research will contribute new conceptual understanding of reuse as a social and institutional process (Figure 1). The idea of the CE proposes a radical change to the way that manufactured goods move through socio-economic systems so as to “decouple” economic activity from environmental degradation. Significant policy and regulatory measures have been implemented by governments internationally, especially in China and the EU (Murray et al. 2017), and the Ellen MacArthur Foundation promotes CE ideas within the corporate sector (Webster 2017). Yet there has been limited attention to its important social and institutional dimensions (Murray 2017, Moreau et al. 2017) and its relationship to broader ideas of sustainable development that include goals of social equality and economic opportunity (Stahel 2010, Murray et al 2017, Moreau et al. 2017, Korhonen et al. 2018).

The overarching question addressed by the proposed research is,

What motivates and enables reuse of products and materials and how can the benefits of reuse be characterised, measured and analysed?

The following three sub-questions inform the research design and methods:

- RQ1:** What are the main steps in reuse commodity chains facilitated by charitable and community sector organisations and what are the key factors that enable or hinder the passage of used goods into reuse circuits?
- RQ2:** What practical methods can be developed for accurate reporting of the quantities of reused goods that enter the circular economy through charitable and community sector organisations?
- RQ3:** What are the socio-economic relations and benefits related to reuse activities, particularly regarding labour and workforce dynamics as reuse organisations interact with local industries and urban planning processes?

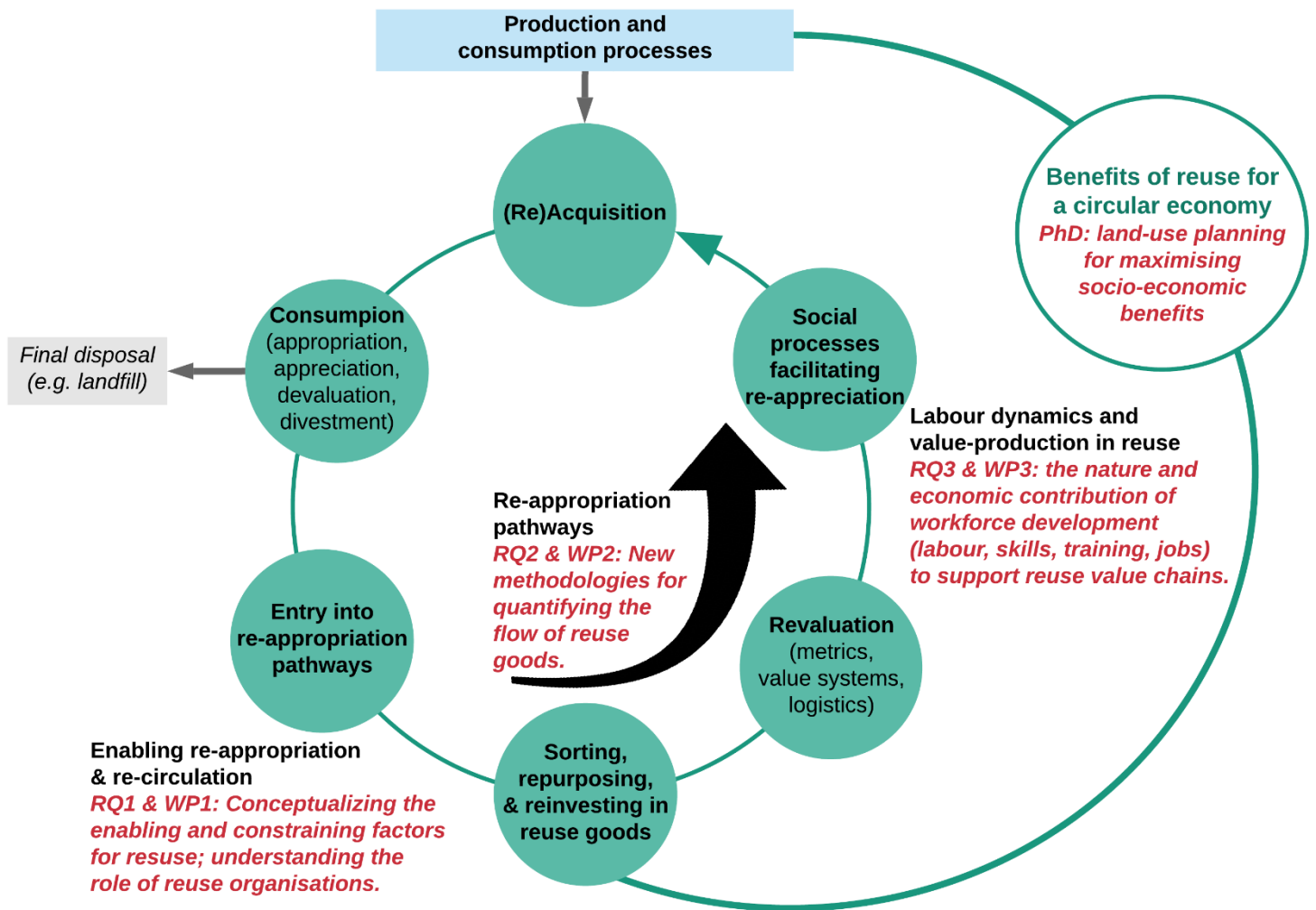


Figure 1. Proposed heuristic to guide research into processes, pathways, functions, and benefits in a circular economy (WP = Work Package; see section on Approach & Training)

BACKGROUND:

The approach and outcomes of the European Union’s circular economy initiative (European Commission 2015), strongly framed around economic incentives for managing waste streams, have been critiqued. There has been limited uptake of producer-led models, and the primary focus is on capturing waste streams that were previously being exported to global recycling networks for processing within the EU (Gregson et al. 2015). The selection of performance targets and metrics influences the character and destination of material flows. Gregson et al. (2015) argue that the use of weight and volume as the primary measures for waste diversion targets, incentivised by cap and trade schemes linked to a landfill tax, has favoured waste diversion over reuse resulting in the production of low value recycled materials within the EU that are then sold into global export markets. A range of unintended consequences of market-led approaches to CE transitions have been observed (Murray et al. 2017). For example, Australia’s National Television and Computer Recovery Scheme promoted destruction of collected material over repair and reuse and bypassed non-profit organisations in favour of contracts with large commercial e-waste recyclers (Lane and Gumley 2018).

The emphasis on profit-motives evident in the EU CE policy may ultimately work against a societal scale CE transition because the capture of products and materials for reuse or recycling necessarily involves non-profitable activities (Moreau et al. 2017). The large majority of these reuse organisations in Australia are members of the National Association of Charitable Recycling Organisations (NACRO) and, each year, over 588,000 tonnes of material is diverted from landfill by NACRO members (NACRO 2017). This includes material sold in second-hand shops, recycled, or processed and sold to international export markets.

Alternative not-for-profit incentives found in charitable and community sector organisations, such as job creation and training (Barraket and Yousefpour 2013), could provide institutional models for more robust CE strategies that include used goods and materials that do not figure in commercial value chains yet make significant economic contributions. Imperatives for more sustainable manufacturing in the CE also align with the role of charitable and community organisations in facilitating repair and reuse and their potential to link such activities with the long-term viability of neighbourhoods and communities (Carr and Gibson 2016, Gibson-Graham et al. 2019). New sustainable production techniques or environmental regulations, for example, can spur new jobs and business creation (D’Amato et al. 2017). Because charitable and community organisations work at the local or regional level, they avoid the kind of cost shifting in time and place evidenced in the EU (Gregson et al 2015), and align CE activities with community economic development. Due to their grass roots connections with local households and businesses, they are strategically positioned to influence decisions about the disposal of unwanted goods.

The broader contribution of charitable and community reuse to state and local economic development, particularly in regional Australia, is poorly understood, yet of the nearly 3000 charitable and community reuse sites around Australia, over half are located in rural or regional centres. Most of what they collect comes in the form of donations of goods and materials from households and small businesses, motivated by both the convenient proximity of collection facilities and services as well as altruistic motives for helping the needy. In this respect they dominate a critical stage in the commodity chain for reuse and recycling (Figure 1). Other key roles played by charitable sector organisations are the operation of recycling centres connected with local government waste management facilities (e.g. Outlook Environmental, Eaglehawk Eco Centre and Recycle Shop) and innovative niche recycling activities based on specific products or materials in urban precincts (e.g. Green Collect focuses on goods and materials from offices in Melbourne’s CBD). Many of these reuse organisations depend on industrial land for storage, transport and processing of goods and materials. However, there is no systematic understanding of their land use needs and how their facilities may be affected by pressures for rezoning of industrial lands in Australia’s rapidly growing cities and regional centres.

INVESTIGATORS

The research team brings together highly relevant expertise in geographies of waste and recycling (CIs Lane and Yates), community development and planning (CI Grodach) and qualitative and quantitative methodological approaches. All have previously collaborated with non-profit organisations. The three CIs currently co-supervise research students and co-authored a submission on the 2019 Victorian Circular Economy Discussion Paper. Each CI will lead one of the three work packages (WPs) that aligns most closely with their expertise and PI Soker will broker and manage relationships with member organisations hosting the research. The cultivation of research skills within the industry sector is fundamental to the research design, and underlies the recruitment of a Research Associate Industry.

CI Lane (0.3 FTE), as team leader, will maximise synergies between the work packages, oversee the work of the Research Associate and Research Assistant, and chair the Advisory Committee. She will lead WP1, guide and support the Research Associate Industry (RAI) on WP2 and contribute to the policy assessment in WP3. She will manage the research personnel for maximum effectiveness. CI Lane’s expertise in geographies of waste, reuse and recycling, and recent team leader experience in the “Wealth from Waste” CSIRO cluster research program equip her well for this role.

CI Yates (0.2 FTE) will co-lead the research on WP3 with CI Grodach and co-supervise the PhD student. He will build on past experience researching the labour dynamics in transforming waste into a resource in urban environments; and of exploring adult training and skills development for employability among marginalised populations. He will apply highly developed skills in qualitative analysis to explore what kinds of labour are being cultivated by reuse organisations, focusing on skills development, capacity-building, training in logistical and value systems, and the nature of employment opportunities. He will also support CI Lane in YR 1 of the project, particularly in the design of WP1 to ensure that the data generated feeds into the design and implementation of WP3.

CI Grodach (0.1 FTE) will co-lead the research on WP3 with CI Yates and mentor CI Yates, an ECR, in the specific research methods employed. This work package focuses on understanding the types of labour and skills entailed in upholding reuse commodity chains and the overall contribution that charitable reuse organisations make towards urban and regional economic development. His work will encompass an audit of the contributions, interconnections and workforce challenges of reuse organisations and result in concrete action steps for supportive policy.

PI Soker (0.2 FTE) is CEO of NACRO and contributes strategic planning, network engagement, collaboration and implementation experience, and will ensure that all developed programs are strategically aligned for NACRO members. He brings expert knowledge of the sector and industry networks and will liaise with the NACRO board and members to provide a high profile for the project within the charitable and community reuse sector and secure stakeholder support. He will be a member of the Advisory Committee.

Research Associate Industry (RAI) (HEW 8 @ 0.25 FTE, YR 1 & 2) will focus primarily on WP 2 and be responsible for the development of the manual for measuring and reporting on reuse facilitated by community and charitable organisations (WP2) in collaboration with CI Lane and PI Soker. The RAI will also collaborate with CI Lane and PI Soker on WP1 and for the preparation of publications for academic and industry journals. We will recruit Matt Allen from the community and charitable reuse sector for this role, who has detailed practical knowledge of reuse organisations, and he will be mentored to further develop research capacity.

Research Assistant (RA) – (HEW 6 @ 0.6 FTE, YR1 & 2 & 0.3FTE, YR3) will assist the data gathering activities of the CIs and Research Associate (industry), organise, code and manage the research materials in NVivo software, and assist with other administrative tasks.

SIGNIFICANCE & INNOVATION

Science and Research Priority: 8 - Environmental Change; *Practical research challenge:* Resilient urban, rural and regional infrastructure.

The project will develop research capacity within the charitable and community reuse sector as well as addressing knowledge gaps. It will be conducted through a collaboration between Monash University, the National Association of Charitable Recycling Organisations (NACRO) and state government agencies responsible for developing CE policy and reporting frameworks in South Australia - Green Industries SA (GISA), Queensland - Department of Environment and Science (DES), and Victoria - Sustainability Victoria (SV). NACRO has initiated work in this area and is strongly motivated to develop standard approaches to measuring reuse and its socio-economic benefits that can be used by all member organisations. State government policy-makers appreciate the importance of including reuse in CE policy and targets but require clear evidence of its benefits and standardised measurement approaches that can be related to those for materials recycling.

The project presents a major *conceptual innovation* to characterise and measure reuse commodity chains. This will be informed by mapping and assessing reuse circuits through re-appropriation and re-valuation pathways linked with specific sites and charitable organisations (Figure 1). Logistically, re-appropriation and re-valuation depends on the collection, processing, and provision of goods for re-sale, all of which entail labour, facilities, skills, and investments. However, little is known about the socio-economic processes that support these logistical links, particularly relating to how discarded goods are *re-valued* (in terms of both use value and exchange value) for the purpose of re-sale in a CE. The social processes involved in consumption have been conceptualized as consisting of: (i) acquisition (the act of accessing, goods, services or experiences that are then consumed), (ii) appropriation (the assumption of meaning or the incorporation of goods, serves or experiences into everyday life), and (iii) appreciation (the derivation of pleasure and satisfaction), (iv) devaluation (the loss of cultural meaning or economic value), (v) divestment (the undoing of attachments to goods, services and experiences), and (vi) disposal (the counterpart of acquisition which may occur through multiple conduits of which some may result in re-appropriation into secondary cycles of consumption) (Warde 2014, Evans 2019: 9). We will develop an equivalent schema for understanding commodity chains that start with disposal and end in reuse. The project will therefore contribute new knowledge and approaches that characterise and measure *reuse commodity chains* and their value *using qualitative and quantitative methods*, and it will *conceptualize and assess reuse processes and their benefits* to better understand how these activities interact with local and regional economies (Figure 1). The research will produce theoretical insights into the labour dynamics and socio-economic relations of reuse and how they may uphold a circular economy.

Conventional, linear production and consumption chains result in final disposal of commodities, such as in landfill. In contrast, reuse builds on disposal for re-appropriation into secondary cycles of consumption. Figure 1 schematically depicts re-appropriation circuits, focusing on the socio-economic processes for facilitating re-investment in and re-valuation of reused goods, along with re-appropriation, re-acquisition and re-appreciation. The proposed research focuses on such *re-appropriation and re-valuation pathways*, which so far lack thorough conceptual and empirical understanding. Figure 1 therefore elaborates some conceptual tools needed for elaborating such pathways: (i) the factors that enable or constrain individuals and social collectives to engage in reuse; (ii) processes of sorting, repurposing, and reinvesting in goods, and the kinds of labour required to support this; (iii) re-valuation processes that accompany the material transformations of goods, such as the calculative measures that are used to understand and quantify the value of reused goods; (iv) social processes for re-appropriation, which enable the socio-economic movement of reusable goods; (v) the functions, benefits, and economic contribution of charitable and community reuse organisations, brought about through the connection of the above processes and practices.

Collaborating with reuse organisations, the project will focus on a few but key examples of reuse chains, such as clothing or office furniture, and will define appropriate questions, related to that chain according to the conceptual processes outlined in Figure 1. These questions will focus on the tangible and practical aspects that help to add an empirical basis to the conceptualization in Figure 1. For example, they may focus on the collection and transport

processes and infrastructural requirements; on the labour time, space, equipment, and skills required for processing and refurbishing goods; and/or on the economic, infrastructural, and planning aspects needed to support reuse organisations. In addressing these questions, the research project will also place reuse circuits and pathways of re-appropriation/re-valuation into the broader context of social/community economies and regional economic development, thereby contributing to discussions on green economies and sustainable development. For example, there is labour entailed in refurbishing, sorting, and transporting reusable goods for potential re-acquisition, and the project will explore how these jobs and re-manufacturing processes contribute to cultural-economic production (e.g. through value-added re-production). The project will also address the implications, such as the kinds of planning processes (e.g. rezoning) that are required to support urban and regional development based on circular economy principles.

The *methodological innovations* will be significant in addressing the limitations of current approaches to measuring circular economy activities, which are focused **either** on reporting to relevant government authorities on the capture of materials from the waste stream, as in the EU Action Plan for the Circular Economy (e.g. European Commission 2015) and Australia’s National Waste Report (Pickin et al 2016), **or** on circularity indicators that can be used to assess business models (Pauliuk 2018). While both include measures of the use of recycled materials as input for manufacturing processes, they do not address reuse. This project will break new ground by developing a meaningful yet practical measure of reuse that includes item level records (e.g. number of items sent for reuse by product type).

APPROACH & TRAINING

The research will employ a multiple case study design to ensure that a representative range of organisation types and site locations is involved and their diverse challenges are responded to. The objective of building applied research and evaluation skills within the sector informs the research methods and the recruitment of research personal. The project revolves around three Work Packages (WPs), which align with the three research questions; WP activities are staged across the three project years so outputs from WP 1 and 2 provide inputs to WP3. Work in progress will be presented at NACRO annual conferences in YR 1 and 2 for feedback and validation from member organisations.

WP 1: Characterise the types of reuse organisations, the key factors and conditions that facilitate their activities, and develop a conceptual model of the reuse commodity chains they support (led by CI Lane, PI Soker and RAI (addresses RQ1)

Objective (1): Develop a typology of reuse organisations that captures the breadth of NACRO member organisations.

Objective (2): Develop a conceptual model of the main steps involved in reuse commodity chains along with key factors or conditions that facilitate them.

Approach: We will first develop a typology of NACRO member organisations, then identify a set of organisations that are representative of the four main types of organisations, including at least two large organisations that manage multiple sites. From these, we will select nine sites in urban and regional locations in Victoria, SA and Qld. These will include traditional charity-based opportunity shops (e.g. St Vincent de Paul), waste transfer stations with tip shops (e.g. Outlook Environmental), repair cafes (e.g. Adelaide Repair Café) and inner urban business-focused sites (e.g. Green Collect) (Table 1). Field research will be conducted at each of the nine sites aimed at understanding their activities and the dynamics of the reuse commodity chains they facilitate to inform development of a conceptual model of reuse commodity chains and their dynamics (WP1) and the measurement approach (WP2). In-depth research and observations will subsequently be undertaken to understand their labour dynamics and broader social benefits (WP3).

Table 1. Example of matrix used to select nine sites that are (a) indicative of the main organisation types, and (b) provide examples* from Queensland, Victoria and South Australia, the three states of focus, showing research activities linked to the three work packages.

ORGANISATION TYPE	INNER URBAN SUBURBS	OUTER URBAN SUBURBS	REGIONAL CENTRES
Opportunity shop	e.g. Salvos Stores, Red Hill, Brisbane	e.g. St Vincent de Paul, Redbank Plains, Brisbane	e.g. St Vincent de Paul, Victor Harbour, SA
WP1	4 intv’s with managers and operational staff +30 face-to-face surveys with donors and shoppers (2 days)	4 intv’s with managers and operational staff +30 face-to-face surveys with donors and shoppers (2 days)	4 intv’s with managers and operational staff +30 face-to-face surveys with donors and shoppers (2 days)
WP2	On-site measurement trials assisted by managerial and operational staff (2 days)	On-site measurement trials assisted by managerial and operational staff (2 days)	On-site measurement trials assisted by managerial and operational staff (2 days)

WP3	8 intv's for sites managed by one organisation (3 days)	8 intv's for sites managed by one organisation (3 days)	8 intv's for sites managed by one organisation (3 days)
Waste transfer station with tip shop WP1 WP2 WP3	No NACRO member org's in these locations	e.g. Outlook Environmental, Pakenham, Melbourne 4 intv's with managers and operational staff +30 face-to-face surveys with donors and shoppers (2 days) On-site measurement trials assisted by managerial and operational staff (2 days) 8 intv's + in-depth observation (3 days)	e.g. Incredible Tip Shop, Mackay, QLD 4 intv's with managers and operational staff +30 face-to-face surveys with donors and shoppers (2 days) On-site measurement trials assisted by managerial and operational staff (2 days) 8 intv's + in-depth observation (3 days)
Repair café WP1 WP2 WP3	e.g. Adelaide Repair Cafe 4 intv's with managers and operational staff +30 face-to-face surveys with donors and shoppers (2 days) On-site measurement trials assisted by managerial and operational staff (approx. 2days) 4 intv's + in-depth observation (2 days)	No NACRO member org's in these locations	e.g. Repair Café Castlemaine, VIC 4 intv's with managers and operational staff +30 face-to-face surveys with donors and shoppers (2 days) On-site measurement trials assisted by managerial and operational staff (2 days) 4 intv's + in-depth observation (2 days)
Business focused social enterprises WP1 WP2 WP3	e.g. Green Collect, Melbourne 4 intv's with managers and operational staff +30 face-to-face surveys with donors and shoppers (2 days) On-site measurement trials assisted by managerial and operational staff (2 days) 4 intv's + in-depth observation (2 days)	No NACRO member org's in these locations	e.g. Aware Industries, Wodonga, VIC 4 intv's with managers and operational staff +30 face-to-face surveys with donors and shoppers (2 days) On-site measurement trials assisted by managerial and operational staff (2 days) 4 intv's + in-depth observation (2 days)

* The precise organisations and the specific sites of those organisations to be included will be determined in phase 1 of the research, during which research agreements with organisations will be established. More interviews and field work days will be required for the larger sites and organisations.

Methods:

- (i) Based on NACRO records, organisation websites and follow-up phone calls, characterise NACRO member organisations using a matrix to capture summary details of organisation mission/values, functions (i.e. material types, collection, sorting, storage, repair, production, retail, infrastructure and locations, numbers of employees and volunteers, etc.)
- (ii) Select nine representative sites (see Table 1) and conduct semi-structured interviews with at least one manager and 2-3 operational staff in each organisation (approx. 4 interviews/site) to:
 - Identify range of activities performed, and personnel involved
 - identify main suppliers and main buyers of items for reuse and assess the drivers of change over time.
 - Characterise aspects of the sites and infrastructure important for reuse activities
- (ii) Conduct brief in person surveys with donors depositing items and shoppers acquiring items (n=30) to explore the motivations of suppliers and buyers (e.g. social values, economic values, use values)

Deliverables: **D1** a typology of reuse organisations that provides a sectoral overview of organisations and their activities that provides a basis for extrapolating case study research findings to the sector as a whole; **D2** selection of nine representative sites; **D3** a conceptual model of steps in the reuse commodity chain and the key factors and conditions that affect the dynamics at each step. This will be captured in diagrammatic form along the lines of Figure 1 and provide a structure for the assessment of quantities and value of goods in WP 2 and of socio-economic benefits in WP 3 and will underpin an academic contribution (target journal: *Geoforum*).

WP 2: Quantifying material flows in the reuse chain (Led by CI Lane and RAI, RQ2)

Objective (3): Develop a practical methodological framework for assessing the quantity and values of goods currently moving through identified reuse stages (identified in WP1).

Objective (4): Assess the quantity and value of goods entering reuse circuits for each participating organisation and extrapolate an estimate for the charitable and community sector.

Approach: In collaboration with organisations responsible for each of the nine sites, (i) develop and trial approaches to the quantification at each site in order to propose new standards, (ii) assess the range of issues that arise when this is implemented and confirm reliability for delivering valid data. The measurement approach will be based on an item-weight system. The average weights and material compositions of commonly reused items are recorded, and individual item sales tallied (through a Point of Sale or other counting system) to arrive at total weight of items diverted from landfill (which can also be expressed in terms of weights of different materials diverted). We will record the source of items where possible (i.e. donation point, direct donation, collection, commercial/ industrial). We will also investigate existing measurement practices at participating sites (e.g. some sites may record weights of incoming items, others may have record more detailed information).

Methods: On-site trials of measurement approaches in collaboration with managerial and operational staff. Review of records of donations and sales of goods and materials for each site. (approx. 2 days/site)

Deliverables: **D4** A draft manual for measuring and reporting on reuse by organisations; **D5** A final published version of the manual that incorporates revisions following testing in stage (ii); **D6** An estimate of the quantity and value of goods processed by NACRO member organisations submitted for publication in *WME* and *The Conversation*.

WP 3: Labour dynamics & social benefits of reuse organisations (Led by CI Grodach, CI Yates, RQ3)

Objective (5): Improve understanding of the types of labour and skills entailed in upholding reuse chains.

Objective (6): Develop a detailed, qualitative assessment and analysis of labour, employment, and skills development at reuse organisations across the four main organisation types.

Approach: The research will identify the contributions, interconnections and workforce challenges amongst the four types of reuse organisations identified in WP1, resulting in concrete action steps for supportive policy and improved theoretical understanding of the intersecting components that uphold circular economies. This will help to build understanding of the opportunities and constraints for the repurposing and direct reuse of goods at the community scale. These aspects are underexplored in the CE literature and conceptualisations, which tend to focus on material and energy efficiency guided by industrial ecology perspectives (Lane 2014, Korhonen et al. 2018).

Drawing on in-depth interviews and site observation, the research will examine how organisations make goods available for re-use by focusing on the types of labour (voluntary and paid), skills, and material practices involved. The role of value systems and logistical systems in supporting the reuse chain at each step will be assessed, considering the goods themselves and the activities of different actors in deploying those systems. The qualitative analysis of labour and workforce dynamics will generate understanding of how reuse organisations help to uphold the social aspects of a circular economy, such as training and employment of marginalised and vulnerable populations, or by building connections among organisations in line with a social economy model. Reuse organisations also face specific challenges around supporting a CE, such as dealing with illegal dumping, which places strain on limited budgets, space, and technical and labour-related capacities. This work package will therefore document these often-hidden costs of supporting reuse, building them into an analysis of reuse land use dynamics. This work will align closely with the proposed PhD project analysing the land use requirements and challenges across the reuse chain.

Methods: The sector-wide typology and the characterization of labour tasks at the 9 sites generated by WP1 will be used as inputs into WP3. This information will enable identification of the types of labour employed across the four types of reuse organisation, and will be used to set-up in-depth interviews and detailed site observations for WP3 (as indicated in Table 1). Interviews will be conducted with managers, volunteers, and paid workers at the sites to identify the qualitative contributions to employment through aspects such as demographic and skills profiles, training approaches, capacity-building opportunities, and the socio-economic opportunities that working at a reuse organisation brings, particularly for underemployed groups. Observation will be conducted to generate understanding of how labour/workforce attributes and certain work tasks (e.g. sorting of reusable and dumped goods; repair of goods; etc.)

fit within the functions of the reuse organisation. Observation of social interactions among labourers, such as between paid managers and volunteers will also enable us to document and analyse aspects such as mentoring, skills development, and managerial approaches.

The numbers of workers to be interviewed and observed at each site will vary, due to the differing dynamics and scales of the reuse organisations. For example, Salvation Army is a large organisation with multiple locations and a large pool of paid and voluntary labourers; Outlook Environmental and Community Resources each have a social remit of employing disadvantaged members of society; reuse cafes are small but are home to labourers with very specific skill sets. To provide methodological balance, interviews will be prioritised at large organisations, while research at smaller organisations will include more in-depth observation (also allowing for an ongoing conversational interview style). Given that repair cafes and business-focused reuse organisations only operate in urban areas, opportunity shop and waste transfer stations will be included from outer urban and regional areas.

Deliverables: **D7** A report summarising the socio-economic benefits of the charitable and community reuse sector and recommending policy strategies to support reuse; **D8** A stakeholder (government & industry) workshop on policy implications; **D9** An academic contribution focused on the nature of labour and workforce development supported by the reuse organisations included in the research (target journal: *Environment and Planning A*). **D10** An academic contribution on reuse organisations and land use planning (targeted to an urban planning or geography journal).

PhD Project: Reuse Organisations and Land Use Planning

The PhD project is closely aligned with WP 3 and builds knowledge of specific workplace and space requirements of reuse organisations that enable conditions for collection, repair and processing and redistribution. Reuse organisations of various types comprise a potentially important yet overlooked component of the urban industrial base in Australian cities that contributes to addressing fundamental problems of climate instability and rising inequality (Gibson-Graham, et al., 2019). However, like other labour-intensive, “low-tech” industries they face the challenge of recognition in an economic development policy context that continues to overemphasise knowledge-intensity and advanced production technologies (Grodach and Gibson, 2019). Moreover, they face pressures similar to small manufacturers under postindustrial land use regimes that prioritize real estate value over other social and economic benefits including economic diversity, quality job opportunities, and contributions to social cohesion and solidarity (Grodach, et al., 2017).

Deliverables: **D11** Submission of PhD thesis.

Figure 2. Research schedule

	YR1: Q1-2	YR1: Q3-4	YR2: Q1-2	YR2: Q3-4	YR3: Q1-2	YR3: Q3-4
WP1	Typology Selection of 9 sites	Data collection at 9 sites Analyse data	Develop conceptual model	Prepare of publication linked to D3		
WP2	Develop methods	Trial methods at 9 sites Collect relevant data for 9 sites	Assess implementation issues and reliability Develop draft manual	Finalise manual Estimate quantity and value of goods for sector Prepare industry publications		
WP3	Recruit PhD		Field work interviews and observations	Field work interviews and observations Analyse data	Analysis of labour dynamics, socio-economic benefits of reuse, and supportive policy	Prepare publication linked to D9 Prepare publication linked to D10

Adv' C'tee	Meeting #1		Meeting # 2		Meeting # 3 Stakeholder workshop	
	D1, D2		D3, D4	D5, D6	D7, D8	D9, D10, D11

Deliverables

D1: Typology of reuse organisations

D2: Selection of six representative sites for field work studies

D3: Conceptual model of reuse and submission of *Geoforum* journal article presenting the development of the model

D4: A draft manual for measuring and reporting on reuse facilitated by charitable organisations.

D5: A final published version of the manual that incorporates revisions following testing in stage (ii).

D6: An estimate of the quantity and value of goods processed by NACRO member organisations and submission of articles to *WME* and *The Conservation* reporting on methods and findings

D7: Report summarising socio-economic benefits of the sector and recommending policy strategies to support reuse

D8: Stakeholder workshop

D9: Submission of *Environment and Planning A* journal article on labour and workforce development

D10: Submission of journal article on reuse activities and land use planning to an urban planning or geography journal

D11: Submission of PhD thesis

FEASIBILITY

The project leader, CI Lane, is an experienced and successful project manager, with recent relevant experience as leader of Monash University's interdisciplinary CSIRO Wealth from Waste research team which included a significant international collaboration. To ensure collaboration and integration each component of the research will be co-led by two researchers with relevant expertise. As outlined in part D, the CIs have the required research expertise, time and institutional capacity and support to conduct the key tasks they are responsible for, and will be supported by a Research Associate Industry with practical knowledge of the types of organisations involved, and an appropriately skilled RA who will undertake the more time intensive aspects of data gathering and management. The proposed research aligns strongly with Monash University core research strengths in Environment and Sustainability and Social Governance.

NACRO, now incorporating Zero Waste Network, has a strong track record of building strategic research alliances with Australian higher education institutions, including a successful ARC Linkage Projects. The project scope is realistic due to its focus on charitable and community sector reuse organisations and specific industry needs for standardised reporting on reuse that can be included in broader governmental circular economy reporting frameworks. The empirical work conducted at each site will be carefully coordinated so as to gather research materials to support more than one WP, wherever possible, and minimise the impact on participating organisations and sites.

BENEFIT

As the peak body representing charitable and community reuse enterprises nationally, NACRO is in an ideal position to maximise positive outcomes for Australia through this project. Currently, limited data is available regarding the social, economic and environmental contributions made by this sector, meaning that it is difficult to model the potential impact of further investment and support for the sector. Many community organisations currently record information about their activities but this is not done in a standardised manner that could be included in formal reporting to government agencies. The proposed research project is the outcome of six years of scoping, preparatory work and research conducted by NACRO and Zero Waste Network, including two research projects in partnership with the Queensland University of Technology and Centre for Social Impact Swinburne. As such, NACRO is confident that the project will be of direct benefit to the sector that NACRO represents. Specifically, NACRO and its members will benefit from the project in the following ways:

- The availability of data to drive advocacy, planning and collaboration among NACRO members
- Increased visibility and recognition of the social, environmental and economic contributions made by charitable reuse enterprises
- Improved understanding of the challenges faced by NACRO members, leading to development of improved member services and support structures across country
- Build the capacity of the charitable reuse and recycling sector for academic research collaboration

We anticipate that the research project will further develop the working relationship between Monash University and NACRO, particularly through the opening up of potential new lines of enquiry into the theoretical and practical dimensions of the charitable reuse sector, and through new relationships with key government agencies and policy makers in Victoria, Queensland and South Australia.

COMMUNICATION OF RESULTS

Planned publications: Each CI will be responsible for one key publication (open access) that forms a deliverable within the funding period. However, overall, we anticipate minimum of 6 co-authored journal articles targeting leading geography and planning journals, e.g. *Geoforum*, *Envt. & Planning A*, *Internat. J. Urban & Regional Res.*, *Antipode*, interdisciplinary journals focused on circular economy, e.g. *J. of Cleaner Production*, and industry sector publications (e.g. *WME*).

Presentations at industry forums: All CIs will present at NACRO annual conferences in YR 1 & 2 to communicate research approaches and findings and engage with Industry stakeholders. The Stakeholder Workshop in YR 3 will be used to engage government and industry stakeholders from across Australia in the policy implications of the research.

Academic conferences: We will target relevant disciplinary and interdisciplinary conferences nationally and internationally: i.e. Institute of Australian Geographers, Sustainable Consumption Research and Action Initiative, Association of Collegiate Schools of Planning.

Public dissemination: Publication of reports on NACRO website, article for *The Conversation*, press releases etc.

MANAGEMENT OF DATA

All data collection and management will be governed by national and institutional ethical research guidelines and management of the digital interfaces and data will follow national ethical guidelines on digital research. Data will be shared among members of the research team using closed and secure Google Drive folder provided by Monash University. In terms of data organisation and analysis, the project will code qualitative data using standard NVivo software to facilitate collaboration among CIs and across Work Packages. All data will be permanently destroyed five years after the final publication from the research in accordance with university ethics requirements.

REFERENCES

- Australian Government. (2018). *National Waste Policy: Less Waste, More Resources*. Canberra: Commonwealth of Australia.
- Barraket, J., Yousefpour, N., 2013. Evaluation and Social Impact Measurement Amongst Small to Medium Social Enterprises: Process, Purpose and Value. *Australian Journal of Public Administration* 72 (4), 447-458.
- Carr, C., & Gibson, C. (2016). Geographies of making: Rethinking materials and skills for volatile futures. *Progress in Human Geography*, 40(3): 297-315.
- D'Amato, D., Droste, N., Allen, B., Kettunen, M., Lähtinen, K., Korhonen, J., . . . Toppinen, A. (2017). Green, circular, bio economy: A comparative analysis of sustainability avenues. *Journal of Cleaner Production*, 168, 716-734.
- European Commission. (2015). *COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS*. (COM (2015) 614). Brussels: European Commission Retrieved from https://ec.europa.eu/growth/industry/sustainability/circular-economy_en
- Evans, D. M. (2019). What is consumption, where has it been going, and does it still matter? *The Sociological Review*, 67(3), 499-517.
- Gibson-Graham, J. K., Cameron, J., Healy, S., & McNeill, J. (2019). Roepke Lecture in Economic Geography—Economic Geography, Manufacturing, and Ethical Action in the Anthropocene. *Economic Geography*, 95(1), 1-21.
- Gregson, N., Crang, M., Fuller, S., & Holmes, H. (2015). Interrogating the circular economy: the moral economy of resource recovery in the EU. *Economy and Society*, 44(2), 218-243.
- Grodach, C., & Gibson, C. (2019). Advancing Manufacturing?: Blinkered Visions in U.S. and Australian Urban Policy. *Urban Policy and Research*, 37(3), 279-293.
- Grodach, C., C. Gibson, and J. O'Connor. (2017). Manufacturing and cultural production: Towards a progressive policy agenda for the cultural economy. *City, Culture, and Society*, 10: 17-25.
- Korhonen, J., Nuur, C., Feldmann, A., & Birkie, S. E. (2018). Circular economy as an essentially contested concept. *Journal of Cleaner Production*, 175, 544-552.
- Lane, R. (2014). Understanding the Dynamic Character of Value in Recycling Metals from Australia. *Resources*, 3(2), 416.
- Lane, R., & Gumley, W. (2018). What Role for the Social Enterprises in the Circular Economy? In R. Crocker (Ed.), *Unmaking Waste in Production and Consumption: Towards the Circular Economy* (pp. 133–147): Emerald Publishing Limited.
- Moreau, V., Sahakian, M., van Griethuysen, P., & Vuille, F. (2017). Coming Full Circle: Why Social and Institutional Dimensions Matter for the Circular Economy. *Journal of Industrial Ecology*, 21(3), 497-506.
- Murray, A., Skene, K., & Haynes, K. (2017). The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context. *Journal of Business Ethics*, 140(3), 369-380.
- NACRO, (2017) Fast Facts – heaps of them. Retrieved from www.nacro.org.au/fast-facts/
- Pauliuk, S. (2018). Critical appraisal of the circular economy standard BS 8001:2017 and a dashboard of quantitative system indicators for its implementation in organisations. *Resources, Conservation and Recycling*, 129, 81-92.
- Pickin, J., Randell, P., Trihn, J., & Grant, B. (2018). *National Waste Report 2018*. Retrieved from <https://www.environment.gov.au/protection/waste-resource-recovery/national-waste-reports/national-waste-report-2018>:
- Stahel, W. R. (2010). *The Performance Economy* (2nd ed.). New York: Palgrave Macmillan.
- Warde, A. (2014). After taste: Culture, consumption and theories of practice. *Journal of Consumer Culture*, 14(3), 279-303.
- Webster, K. (2017). *The Circular Economy: A Wealth of Flows* (2nd ed.): Ellen MacArthur Foundation.
- Worrell, E., Allwood, J., & Gutowski, T. (2016). The Role of Material Efficiency in Environmental Stewardship. *Annual Review of Environment and Resources*, 41(1), 575-598.