MONASH University

BehaviourWorks AUSTRALIA

BEHAVIOURAL ROADMAP TO CIRCULAR CONSUMPTION

Transforming Australia's systems of production and consumption to significantly reduce Australia's material footprint.

A way forward for Australia's policy-makers, industry leaders, entrepreneurs and advocates, produced through an innovative application of behavioural science and systems thinking.

Behaviourworksaustralia.org

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Executive Summary

The United Nations sustainable development goal (SDG) 12 promotes sustainable consumption and production by improving resource efficiency, reducing waste and pollution generation, and embracing the circular economy. This goal is driven by the negative environmental and social impacts of unsustainable consumption and production, which contribute to climate change, biodiversity loss, pollution, inequality and poor wellbeing. By adopting more sustainable and circular consumption practices, we can mitigate Australia's impact by reducing our material footprint.

As part of a three year program of work supported by our consortium partners*, BehaviourWorks Australia led critical research and stakeholder engagement to understand what 'circular consumption' behaviours are required to significantly reduce Australia's material footprint as part of transitioning to a circular economy. A vital outcome of the program of work is this **Behavioural Roadmap to Circular Consumption**, produced through an innovative application of behavioural science and systems thinking. The Behavioural Roadmap offers a clear way forward for Australia's policymakers, industry leaders, entrepreneurs and advocates.

Production of the Behavioural Roadmap involved working collaboratively with our consortium partners as well as key government, industry, civil society and academic stakeholders to **identify behaviours** that could contribute to circular consumption in Australia. A wide variety of stakeholders were engaged through two parallel programs of work, ensuring a comprehensive list of behaviours. Input from stakeholders was then analysed using **systems thinking** principles to determine the connections between the identified behaviours and to understand how changes in one behaviour affect others. The resulting **behavioural systems map** provides practical guidance on where and how to intervene to achieve circular consumption in Australia.

The work identified eight core behaviours by individual and organizational consumers that can reduce Australia's material consumption. Importantly, the work also revealed the role of actors beyond consumers whose behaviour affects circular consumption – ie. government, designers, produces, retailers, services, advocacy organisations, and community organisations.

Of the many actions required by various stakeholders across the system / economy, we have identified three key places for intervention to maximise the transformation potential of the whole system of production and consumption:

1) **Borrow / rent items** and 2) **Source items second-hand** contribute directly to reducing Australia's material footprint and challenge norms of 'linear' ownership. Thus, they offer valuable places to focus behaviour change efforts now to create direct impact and drive further systems change by transforming consumer perceptions of, and relationships with, circular products.

3) **Buy items 'built-to-last'** is a fundamental starting point for most of the core consumption behaviours. It is critical to the later 'use' and 'post-use' behaviours, which themselves enable avoidance and reduction behaviours. It is currently difficult, however, for consumers to do so due to a lack of available items 'built to last' in the market. At the same time, it's challenging for businesses to shift to producing and selling items 'built to last' - therefore Government intervention is needed.

This Behavioural Roadmap represents the first phase of research to map Australia's *behaviour* systems of production and consumption. More research is needed to validate and expand this work.

* Partners in the 2020-2023 BehaviourWorks Consortium included the Australian Government Department of Climate Change, Energy, the Environment and Water (formerly the Department of the Agriculture, Water and Environment); Victorian Government Department of Energy, Environment and Climate Action **(formerly** Department of Environment, Land, Water and Planning**)**, Sustainability Victoria and The Shannon Company, with contributions from the NSW Environment Protection Authority.

Recommendations

1 Focus new behaviour change efforts on enabling and encouraging both individual and organisational consumers to 'borrow or rent items' from existing options.

2 Continue and expand behaviour change efforts to mainstream 'buying second-hand *instead of new*' for individual consumers; and explore scalable practices for organisational consumers.

3 Work upstream to ensure retailed products are built to last, including through minimum design / import standards; then build 'built to last' into sustainable & circular procurement policies of organisations.

Focus **change** efforts

4 Validate the relationships between circular consumption behaviours and the activities of other actors in the system

5 Investigate the 'consumption' role of businesses and other organisations in greater detail

Future **research** efforts

Contents

OVERVIEW & RECOMMENDATIONS

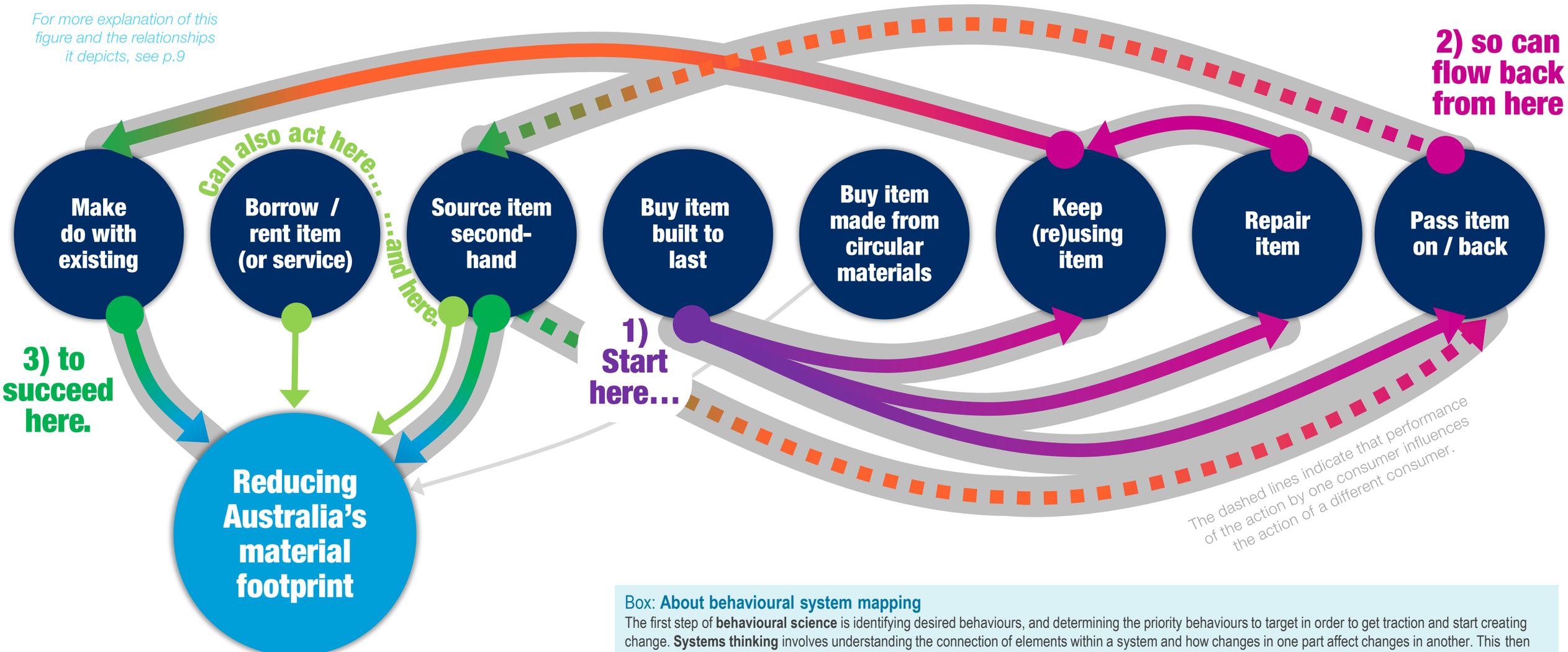
The core circular consumption behaviours

Over three years, BehaviourWorks undertook two major streams of research under the auspices of the Australian, Victorian and NSW Governments, which engaged over 100 expert stakeholders across Australia's public, private, civil and research sectors to understand what 'circular consumption' behaviours are required to significantly reduce Australia's material footprint as part of transitioning to a circular economy. Our experts also provided insights to how these circular consumption behaviours relate to each other and how they directly or indirectly reduce material footprint. The work revealed that **eight core circular behaviours can be adopted by consumers to help reduce Australia's material footprint**.

Most of these core behaviours are connected to, and reliant on, other consumer behaviours. Only half have direct impact on reducing material footprint, while the others only impact indirectly (see p.9). Critically, '**Buying items built to last' is a fundamental starting point** for most of these core consumption behaviours, as shown through the flows number (1), (2) and (3). This behaviour is critical to downstream value retention activities, which themselves enable upstream avoidance / reduction behaviours, ultimately contributing to a reduction in material footprint. The behaviour is, however, currently difficult for consumers to perform due to a lack of available items 'built to last' in the market (see p.7).

On the other hand, both **'Borrowing / renting items (or services)' and 'Sourcing items second-hand' currently have conventional avenues for certain product types** and do not depend on previous purchasing choices of the same consumer (as shown by the lack of unbroken connections), making them easier to target directly. Both actions contribute directly to reducing Australia's material footprint, while at the same time representing important shifts away from the current 'convenience culture' / 'ownership orthodoxy'. This means they are valuable places to focus current behaviour change efforts as they can have direct impact while also paving the way for broader system changes through the transformation of consumer perceptions of, and relationships with, more 'circular' products (see p.5-6).

For more explanation of this figure and the relationships it depicts, see p.9



Box: **About behavioural system mapping**

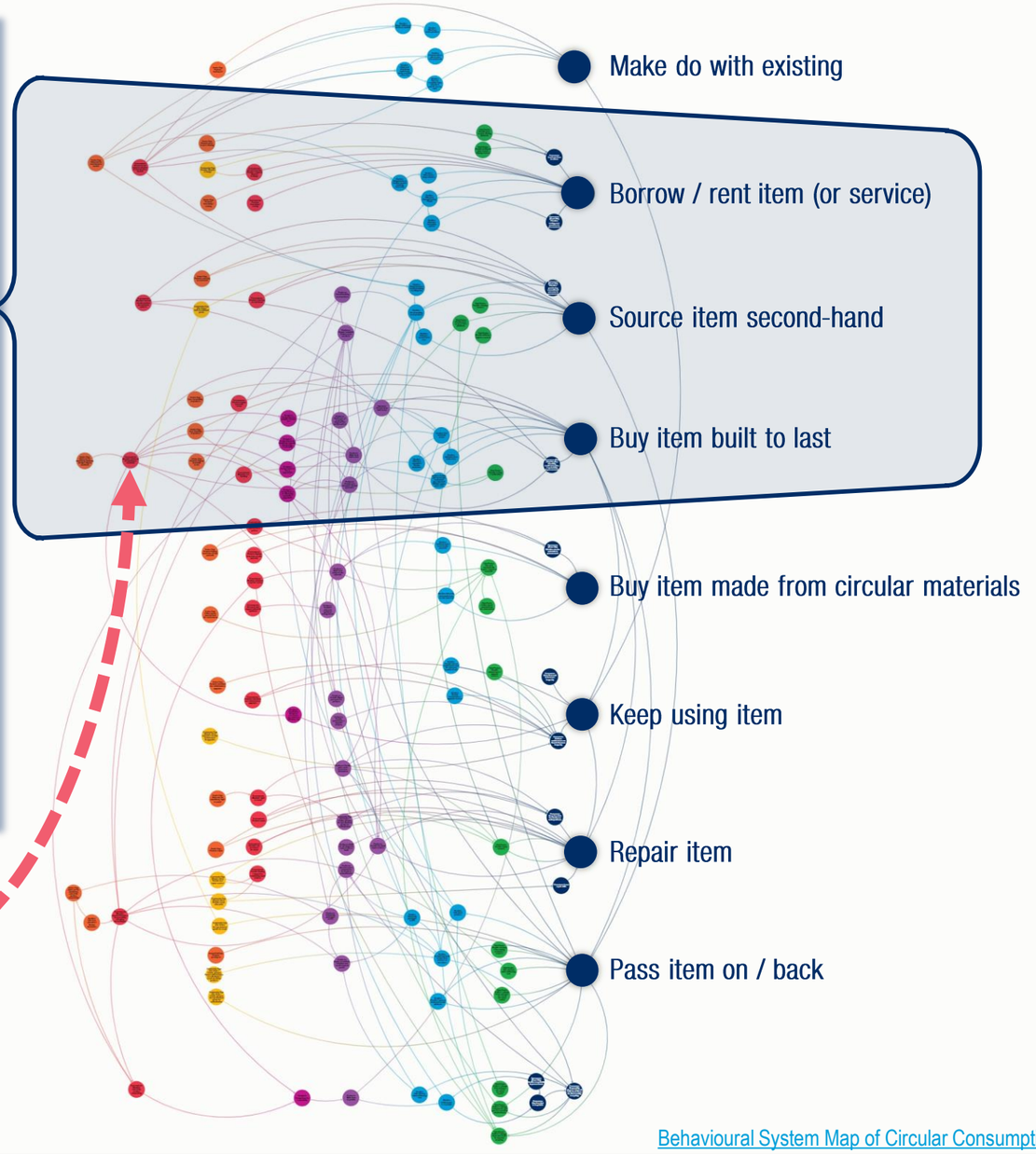
The first step of **behavioural science** is identifying desired behaviours, and determining the priority behaviours to target in order to get traction and start creating change. **Systems thinking** involves understanding the connection of elements within a system and how changes in one part affect changes in another. This then allows understanding of where to intervene in order to transform the system. **Behavioural system mapping** is an emerging technique[15] that combines the strengths of these two powerful approaches to produce practical guidance on where and how to intervene to address complex challenges.

The broader system of production and consumption behaviours

The connections between different circular consumer behaviours are not the only relationships that matter. As seen with 'Buying items built to last' consumer behaviours are also dependent on many 'upstream' behaviours by other actors in the market, such as designers, producers, retailers and service providers. The options available to consumers are also influenced by the activities of additional stakeholders such as governments and advocacy / community organisations.

Understanding the broader 'system' of production and consumption behaviours in Australia's economy is therefore critical for determining where best to intervene to create the ultimate change of reduced material footprint from consumption. Building on stakeholders insights provided through the two research projects, BehaviourWorks has produced a preliminary map of the connections between key actors and their behaviours, as shown below. The map demonstrates the complex interactions across and between all actors in the system.

Also available online, this Behavioural System Map allows anyone to explore the identified connections to better understand relationships and influences in the system. The mapping software also allows for quantitative analysis of the 'system influence' of each included behaviour, rated on a scale of 0 (no system influence) to 1 (maximum system influence). This analysis showed that **the single most influential behaviour was Governments 'Mandating minimum design / import standards'** (see p.12).



Governments mandate minimum design / import standards that extend product lifetimes

Legend

- Consumers (Individual & Organisational)
- Third party service providers
- Retailers
- Producers / Importers
- Designers
- Governments
- Advocacy organisations
- Community organisations

Behavioural System Map of Circular Consumption

Priority 1: Promote Borrowing instead of buying new

Borrowing behaviours involve a consumer obtaining temporary possession of, or access to an item without any transfer of ownership, and with the express intention of returning / releasing the item back to its owner at a (usually specified) point in the future. 'Commercial borrowing', such as hiring, renting or leasing includes an underlying monetary exchange.[7]

Individual consumers

For individual consumers, there are a number of current mainstream and emerging avenues to borrow or rent items. Aside from borrowing from family / friends, the most established individual forms identified include book libraries, car hire & leasing and laundromats, as well as hiring of equipment / tools and appliances / furniture for rentals. Emerging forms now include micro / membership rental such as commercial car sharing, fashion rental, returnable packaging and community 'libraries of things' (eg. tools, toys). Outsourcing, where the consumer gains the benefits from an item without actually taking possession of it, can also be considered 'borrowing'. This includes services like dry cleaners as well as home services like lawn mowing that prevent a consumer having to purchase and operate an item themselves.[14]

Despite the above, mainstream Borrowing is currently limited to certain product categories, or as an option when people are unable to afford to purchase the desired item. For products only used intermittently, there is significant potential to shift perceptions and practices of Borrowing to be a mainstream alternative to buying, countering the current dominant culture of individual ownership.

Key barriers for individual consumers to Borrow instead of buy particularly include lack of awareness and inertia of purchase habits, plus lack of local opportunities, bias in advertising of product purchase, cheap cost of purchasing, convenience of online purchase delivery, self-identity linked to ownership, and perceptions and social norms surrounding borrowing as second-class alternative to buying (see p.24). Further efforts are required to identify which Borrowing behaviours are currently most probable in the face of these barriers, plus which barriers could likely be mitigated through tailored intervention design.

Organisational consumers

For organisational consumers, leasing and outsourcing may be even more mainstream than for individual consumers. Common organisational forms identified include leasing of vehicle fleets, ICT equipment (eg. computers, printers and photocopiers), capital equipment (eg. medical technology) and industrial and construction machinery. Emerging forms of 'commercial' borrowing include product-as-a-service opportunities such as lighting-as-a-service, power purchasing agreements behind the meter, as well as leasing in new product ranges such as carpet.[14]

As with individual consumers, organisational Borrowing is currently limited to certain product categories and industries. The adoption of leasing and product-as-service have been identified as an important and viable transition pathway to a circular economy[26], which could be accelerated through focused organisational behaviour change efforts.

Key barriers to organisational adoption of Borrowing behaviours include institutional barriers (including barriers embedded in existing procurement policies / procedures), institutional inertia (including lack of internal drive and / or external pressure), low risk appetite (lack of precedent, perceived cost vs benefit), and staff skills gaps (including building business cases for new practices, updating / implementing procurement policies for new practices, fulfilling terms of hire / lease agreements). Behaviour change efforts could build on and leverage work by entities such as the Australian Product Stewardship Centre of Excellence and the Australian Circular Economy Hub (ACE Hub).

Box: **How Borrowing reduces material footprint**

To reduce material footprint, *Borrowing* and Renting an item must be performed *instead of* buying an item new (ie. it must displace the purchase of a new item[8]). By reducing the number of new items purchased, borrowing reduces the number of new items that retailers restock through purchase from wholesalers / manufacturers, which reduces the number of items manufactured, reducing (or 'narrowing') the number of new items entering the economy. If performed instead of *Making Do Without*, *Borrowing* only has minor impact on material footprint by adding some 'wear and tear' to borrowed item, slightly hastening its end-of-life. *Borrowing*, particularly under formal agreements, also provides incentives to both the retailer and the consumer to care for and prolong the life of the item, delaying (or 'slowing') the need to purchase a replacement item[26]. The longer that items remain in use, the less item replacements are needed over a lifetime. Shorter-term borrowing also enables consumers each time to choose to *Make Do Without* instead, with a similar narrowing impact and even further slowing effect on the item avoided, as no 'wear and tear' is created.

Recommendation 1: Focus behaviour change efforts on enabling and encouraging both individual and organisational consumers to borrow or rent items from existing options.

Specifically:

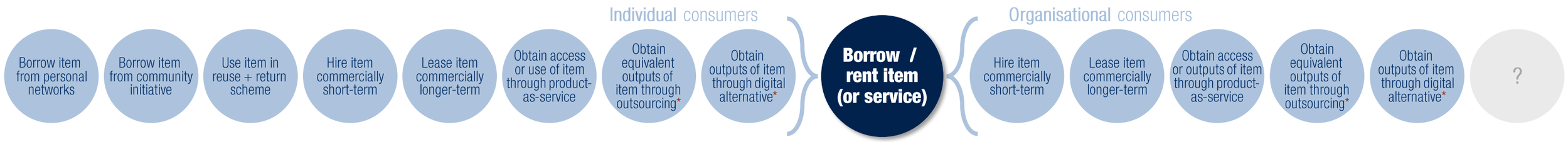
1.1. Understand which product categories in the personal and organisational spheres can have the greatest impact on material footprint if borrowed instead of bought new.

1.2. Define the key target *Borrowing* behaviours for both individual and organisational consumers respectively.

1.3. Extend current knowledge of general *Borrowing* barriers to the specific identified target behaviours.

1.4. Design and test tailored interventions to enable and encourage the key target behaviours, then implement as widescale behaviour change initiatives.

Borrowing and renting: range of specific behaviours



* These behaviours do not involve gaining possession of, or access to an item, but instead involve obtaining outputs equivalent to possession of the item.

Priority 2: Promote Sourcing Second-Hand instead of buying new

Sourcing second-hand involves a consumer purchasing or otherwise obtaining an item that has already been owned by at least one previous owner. The item can be obtained from the last owner (peer-to-peer transaction) or via an intermediary including the original brand or third-party retailer.[7]

Individual consumers

For individual consumers, there are currently a number of mainstream and emerging avenues to *Sourcing Second-Hand* in Australia. Aside from hand-me-downs via personal networks, the most established personal forms include third party retailers such as thrift stores / op shops, second-hand car dealers, junkyards, etc. Peer-to-peer second-hand purchase, initially commonplace through newspaper listings and garage sales, have now become mainstreamed online through third party platforms. Refurbished electronic items and appliances resold by original brands or third-party retailers are also common. Other emerging forms include community-based, free peer-to-peer exchange groups, etc.[14]

Despite the opportunities above, mainstream *Sourcing Second-Hand* is currently limited to certain product categories (eg. cars, electronics, clothing, household goods), often as a form of bargain-hunting. There is significant potential to shift perceptions and practices of *Sourcing Second-Hand* to be a mainstream alternative to buying products new.

Key barriers to *Sourcing Second-Hand* instead of buying new include the low cost of cheap 'new' goods, lack of awareness of second-hand options, concerns about hygiene / cleanliness of previously used products, concerns about quality / lack of warranty, perceptions and social norms surrounding buying second-hand as second-class alternative to buying new predominantly for those with constrained finances, inertia of purchase habits, convenience of online shopping / delivery and adoption of 'buying second-hand' as a bargain activity enabling the accumulation of more items (see p.26). Promoting the purchase of second-hand items from online peer-to-peer listings, thrift stores / op shops / second-hand dealers and refurbished from original brands or resellers are all viable behaviour change targets.

Organisational consumers

Established versions of organisational *Sourcing Second-Hand* are less well-known compared to the practices of individual consumers, even amongst our extensive range of stakeholders. Individual anecdotes of organisations buying refurbished items from brands / resellers, and second-hand goods advertised through traditional peer-to-peer listing were known (particularly for large equipment / machinery), and the existence of industry-specific business-to-business platforms was suspected. A narrow practice of purchasing second-hand furniture, crockery and knick-knacks to produce a certain aesthetic in retail businesses such as cafes was also identified.

Further work is therefore needed to understand and characterise the different ways that organisations currently do or can *Source Second-Hand*, particularly at scales beyond that of individual transactions that mimic individual sourcing of second-hand items. Once these behaviours are identified, research can clarify the key drivers and barriers to organisations *Sourcing Second-Hand* as a foundation for developing future behaviour change efforts targeting organisations.

Box: How second-hand reduces material footprint

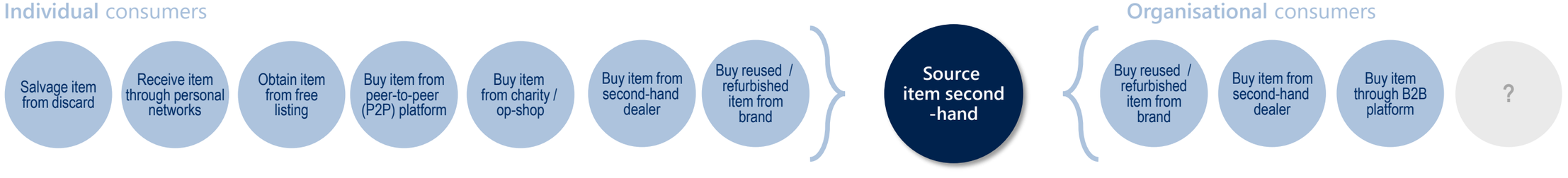
To reduce material footprint, *Sourcing Second-Hand* must be performed instead of buying an item new (ie. it must displace the purchase of a new item[8]). By reducing the number of new items purchased, *Sourcing Second-Hand* reduces the number of new items that retailers restock, eventually reducing (or 'narrowing') the number of items entering the economy. However *Sourcing Second-Hand* can also produce a rebound effect where common cost savings are used to purchase additional second-hand or new items[16]. Therefore, when performed instead of *Making Do Without*, *Sourcing Second-Hand* can lead to accumulation which can stabilise or increase the number of items required in the economy. It is therefore important that any behaviour change efforts emphasise the need to 'buy second-hand *instead of* buying new'.

Recommendation 2: **Continue and expand behaviour change efforts to mainstream 'buying second-hand instead of new' for individual consumers; and explore scalable practices for organisational consumers.**

Specifically:

- 2.1. Understand which product categories in the personal sphere can have greatest impact on material footprint if bought second-hand instead of new by individual consumers.
- 2.2. Extend current knowledge of barriers to buying second-hand *clothing and furniture* to other identified product categories.
- 2.3. Design and test tailored interventions to enable and encourage the key target behaviours amongst individual consumers, then implement as widescale behaviour change initiatives.
- 2.4. Identify existing and new viable practices through which organisational consumers can source second-hand at scale.
- 2.5. Extend current knowledge of general organisational change barriers to those hindering the specific identified target behaviours for organisations, to inform future efforts.

Sourcing second-hand: range of specific behaviours



Priority 3: Work upstream to ensure products are built to last

'Buying built to last' behaviours involve a consumer deliberately purchasing a particular item because of explicit characteristics that indicate the potential for a substantively greater number of uses, use-time or lifetime than conventional alternatives on the market. Such characteristics may be published expected lifetimes, longer included warranties, specific design for repair, functional upgrade, aesthetic upgrade, etc.

Buying 'built to last'

Previous research by BehaviourWorks[11] identified that technical durability (ie. longer expected lifetime) is one of the key 'circular' characteristics for which consumers indicate they are willing to pay additional for (but only to a certain extent).

Despite this willingness, stakeholders were clear that there are currently limited options for consumers (especially individual consumers) to purchase items explicitly built to last, particularly at affordable price points. While some household items / brands were known to have substantially longer product warranties than conventional items, these were usually at the top end of the price range and outside many individual consumers' grasp. Furthermore, in the absence of explicit expected lifetime / longer warranty, price was not considered a reliable proxy for quality / durability in making individual purchase decisions. More useful to consumers would be expected lifetimes at certain price ranges included in regulations.

Stakeholders considered that certain types of commercial / industrial goods for relevant organisational consumers were somewhat more likely to be built to last, or at least have some indication of expected lifetimes, to enable reliable calculations of return on investment. However outside large capital expenditures or long-term contracts, stakeholders did not believe that organisational consumers typically build in explicit expected lifetime considerations into their general purchasing and procurement policies / practices. Organisational procurement of items 'built to last' could reduce costs for individual consumers by providing economies of scale to producers / retailers.

Designing, making and selling 'built to last'

Designing / making items built to last has a number of facets ranging from technical durability to aesthetic / emotional durability, functional flexibility and upgradability, and repairability.

Making and selling items 'built to last' at an affordable price requires a significant shift in business models, as it is effectively a reverse from the traditional approach of maximising profit by maximising number of products sold, to a model centred around selling less physical items, usually by increasing the number of associated services, including lifetime extension services.

Previous research by BehaviourWorks[22] identified that a key barrier to businesses adopting circular business models such as making / selling products built to last, is a lack business confidence in current consumer demand for such products at the prices they would currently need to be retailed at. This creates a 'catch 22' dilemma where producers cannot make products built to last at affordable price because there is not enough consumer demand, and consumers can't buy products built to last because there is not enough affordable supply.

This suggests that direct intervention in the system is required. The system-level analysis revealed that 'Governments mandating minimum design / import standards for durability' was the single most influential behaviour, both for the whole system and specifically for this consumer behaviour.

Box: How 'Built to last' reduces material footprint

Buying an item built to last has an indirect impact on material footprint by enabling other circular consumption behaviours, particularly 'Keep (re)using item' and 'Repair item', both of which support 'Making do' (with existing). Buying an item built to last can also reduce material footprint by ensuring items retain value for longer, enabling 'Passing on' of items which itself enables 'Sourcing items second-hand'. Buying items built to last will have a greater impact on material footprint when it is performed explicitly as an alternative to buying a new item with conventional (shorter) lifespan, however it is likely to still have some impact on material footprint even if it an impulse buy as it may prevent future impulse purchases.

Recommendation 3: **Work upstream to ensure retailed products are built to last, including through minimum design / import standards; then include 'built to last' criteria in procurement policies of Governments.**

Specifically:

3.1. Understand which product categories in the personal (and organizational) spheres can have greatest impact on material footprint if built to last longer than conventional lifetimes.

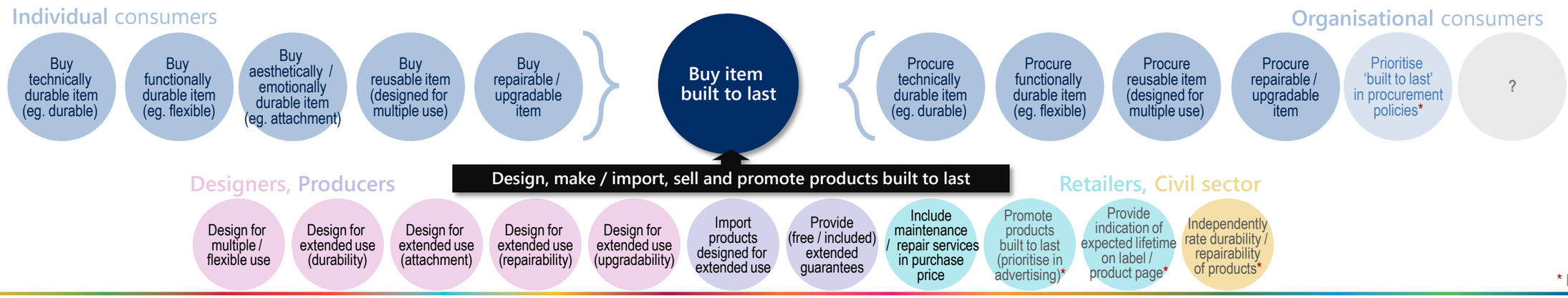
3.2. Consult on and publish expected lifetimes for key product categories identified under 3.1, in Australian Consumer Law.

3.3. Consult on and implement minimum design / import standards for durability and repairability of identified key product categories identified in 3.1.

3.4. Use expected lifetimes / standards to develop durability / repairability criteria in government procurement policies.

3.5. Support incorporation into organisational procurement policies.

Built to last: range of specific behaviours



* Indirect behaviour

DETAILED FINDINGS AND NEXT STEPS

Impacts and influences of circular consumption behaviours

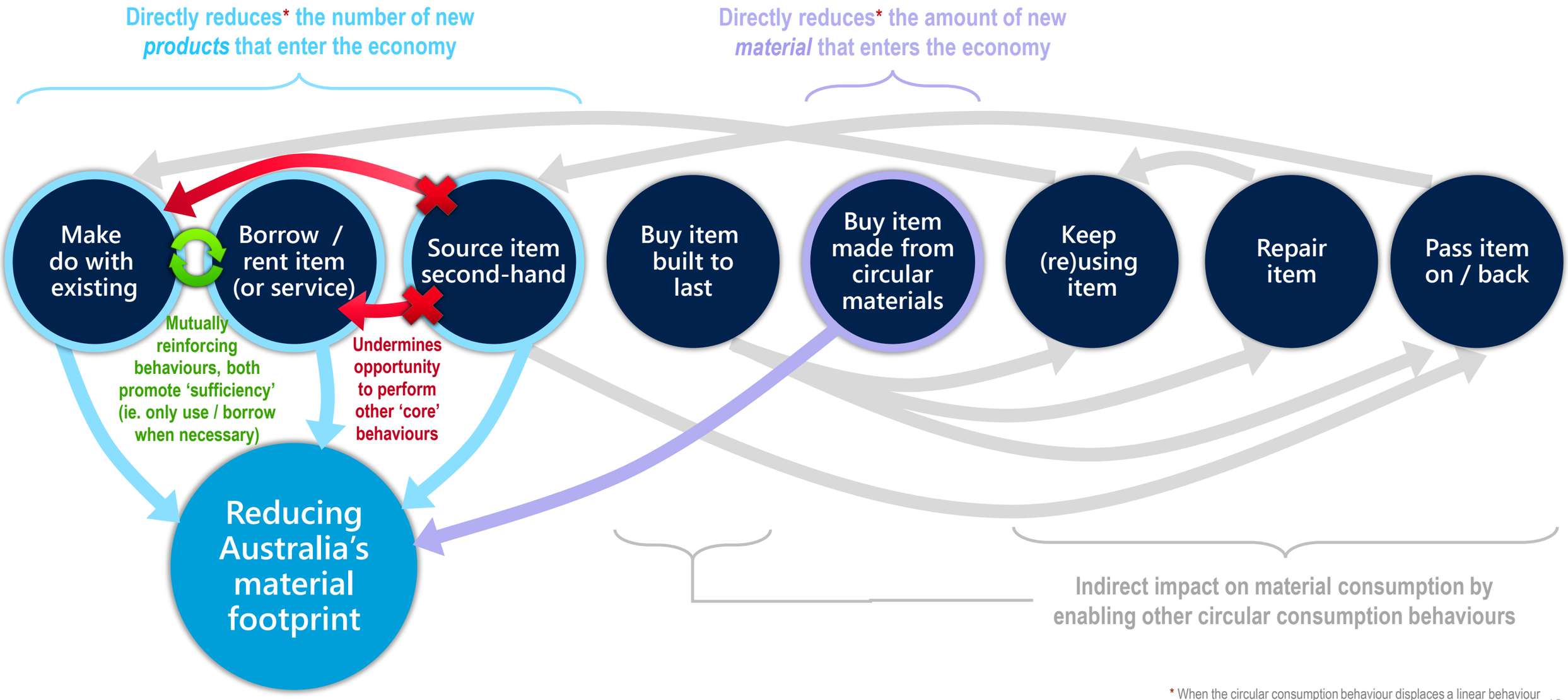
Four of the core circular consumption behaviours have a direct impact on reducing material footprint consumption, by directly reducing the amount of new / virgin products or materials brought into the economy. In order to have an impact on material footprint, they must be performed instead of (ie. 'displace') a linear behaviour:

- Make Do *instead of* buying
- Borrow / Rent *instead of* buying
- Source Second-hand *instead of* buying new
- Buy Item made from Circular Materials *instead of* buying item made from virgin materials.

The other four core circular consumption behaviours indirectly impact on the goal by successively enabling other behaviours that eventually reduce material footprint, through two main chains:

- Buying items built to last enables the same user to Keep (Re)Using (and if necessary, Repairing) enabling them ultimately to Make Do with existing items.
- 'Buying Items Built to Last' means that items retain value, making it easier for a user to 'Pass on' to other users, both directly (eg. hand-me-downs or peer-to-peer sales) or indirectly (eg. by donating to thrift store or returning to retailer, to be onsold to a new customer), allowing another user to 'Source Second-hand'.

Behaviours can have other types of connections between them. For example, Borrowing an item and Making Do are mutually reinforcing. Once a decision is made *not* to purchase an item (but to instead Make Do or Borrow), then each time a desire for the item is experienced, the User can Make Do or Borrow *this time*, without undermining the opportunity to either Make Do or Borrow *next time*. On the other hand, Sourcing Second-hand undermines future opportunities to Make Do or Borrow, because once the item is sourced, there is no need / opportunity to do these behaviours until the item is passed on or discarded. Particularly, stakeholders noted that Sourcing Second-hand can actually lead to accumulation as a 'rebound' effect due to the often 'bargain' prices of second-hand items.



* When the circular consumption behaviour displaces a linear behaviour

Unpacking the core consumption behaviours

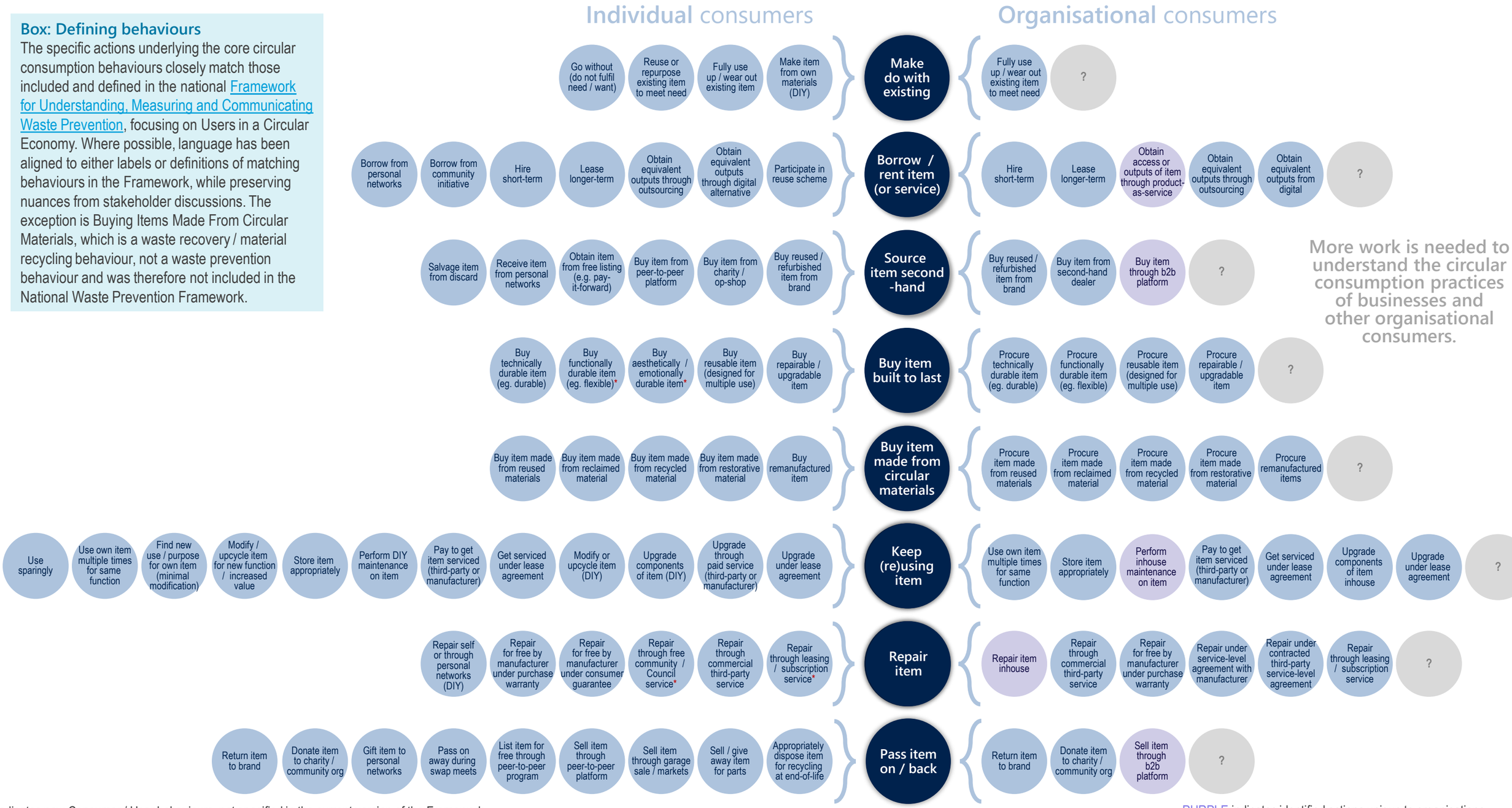
Each of the core circular consumption behaviours is made up of a range of individual actions. An important distinction that is often lost, is the difference between individual / personal and organisational consumption. Individual consumers only contribute 18% of Australia's overall waste generation. On the other hand, commercial / industrial organisational waste comprises about 27% of Australia's total waste[21].

Despite this, the focus of the majority of our public, private, civil and research expert stakeholders was on individual consumption behaviours. This focus on 'individual' consumption is reflected in broader conversations about circular economy, as evident in other research we reviewed, and the questions following presentation of preliminary findings from this Behavioural Roadmap research.

While some 'individual' actions may be adopted by smaller businesses, much fewer are appropriate for organisations operating at larger scales. Importantly, only a handful of specifically 'organisational' actions were identified. Gaps therefore exist in our current understanding of specific organisational circular consumption actions, and this is an important aspect for further investigation.

Box: Defining behaviours

The specific actions underlying the core circular consumption behaviours closely match those included and defined in the national Framework for Understanding, Measuring and Communicating Waste Prevention, focusing on Users in a Circular Economy. Where possible, language has been aligned to either labels or definitions of matching behaviours in the Framework, while preserving nuances from stakeholder discussions. The exception is Buying Items Made From Circular Materials, which is a waste recovery / material recycling behaviour, not a waste prevention behaviour and was therefore not included in the National Waste Prevention Framework.



* Indicates new Consumer / User behaviours, not specified in the current version of the Framework.

PURPLE indicates identified actions unique to organisations

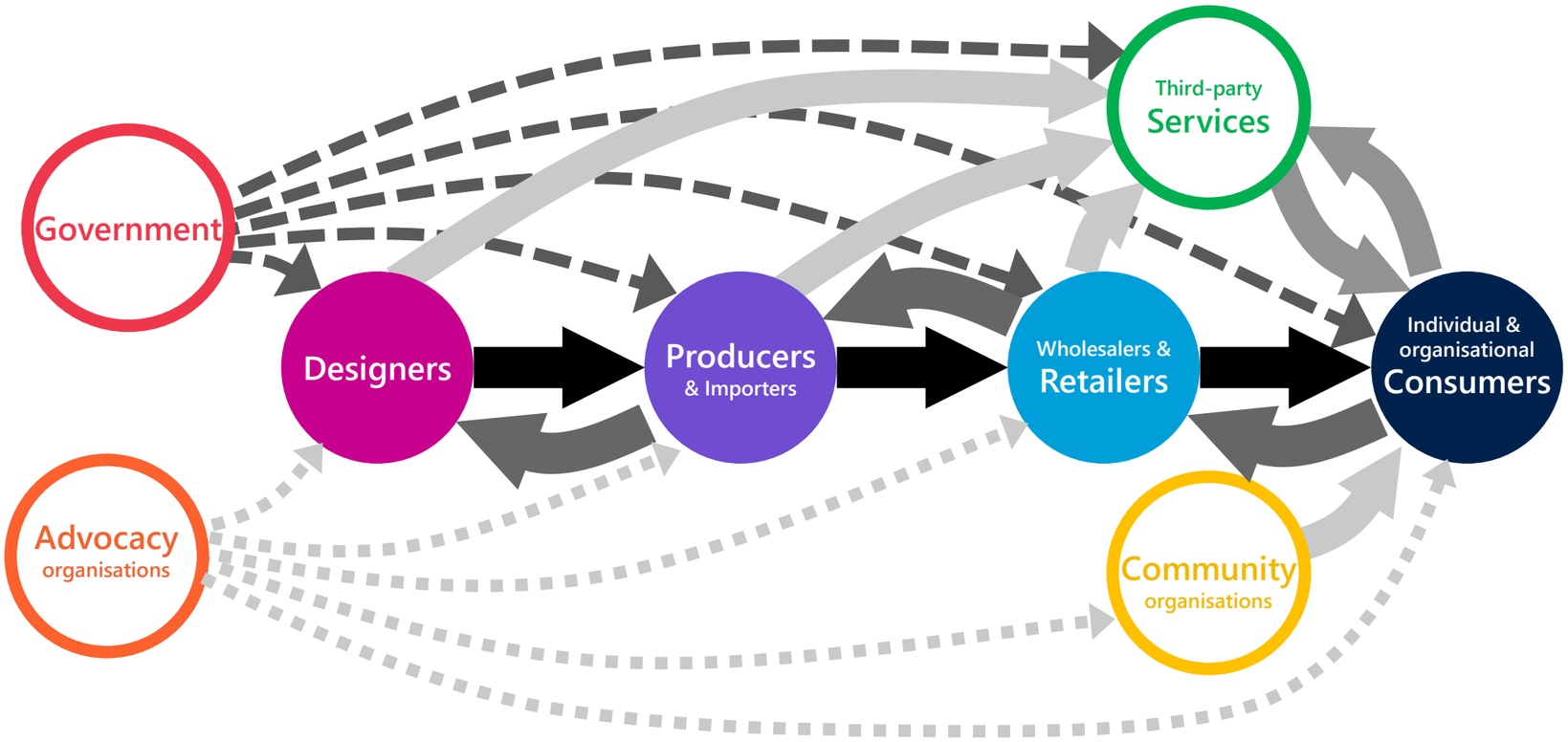
Impact and influences of the broader system

Consumer behaviours are deeply interconnected with, and often dependent on, the activities of other actors across the system. Many behaviours by other actors directly enable or constrain consumers, while others influence consumers indirectly. The direct impact of upstream supply chain activities on the opportunities available to consumers is well known. Also recognised is the opposite 'pull' force that consumers can exert upstream through demand. These two reciprocal relationships form the backbone of the broader behavioural system map of production and consumption.

However actors across and outside the supply chain can influence customer action in many ways beyond simply what products are placed on the market. Other actors, such as third-party service providers and community organisations can influence consumers through the enabling services they provide, while Government and Civil society can also have a direct, and indirect impact through policy / advocacy and public education and communication.

As one example, the consumer behaviour of 'buying built to last' is enabled by advocacy organisations that publicly rate the quality and reliability of products on the market. It is constrained by the current lack of producers / importers and retailers making available products that are explicitly built to last. At the same time, current demand for such products is not yet high enough to enable many businesses to adopt such a model. Were Organisational consumers to incorporate product durability into procurement policies, this might provide enough certainty of demand to encourage business to adopt such a model. Government intervention in the form of mandatory minimum design / import standards (or their smaller cousin, expected products lifetimes explicitly included in Australian Consumer Law) would compel or encourage (respectively) businesses to make such products available, providing greater visibility and choice to consumers. Allowing consumers to Buy Built To Last, would also enable them to Keep (Re)Using, Repair and Pass On items, ultimately enabling them to Make Do Without or Source Secondhand.

The interconnections in the behaviour system map go beyond that between different actors and consumers. This includes the potential for 'spillover' where one behaviour of an actor makes other behaviours by that same actor more likely. Take for example, Advocacy organisations advocating for 'mandatory inclusion and privileging of reuse & repair in EPR schemes' (the second most influential behaviour, see next page). Stakeholders suggest this not only influences those organisations to advocate for EPR more generally and Governments to consider such provisions, but also influences voluntary schemes to consider such options to either prepare for, or avert such mandatory rules. Where Producers and Retailers participate in such voluntary or mandated schemes, they are not only more likely to setup true 'take-back' schemes where the products return to the original brand or nominated intermediary for immediate or eventual resale, but also to design products to be more durable and repairable, and to salvage parts / components from unusable returned products before sending for material recycling. Stakeholders also think it likely that that would prompt Retailers to provide or sponsor peer-to-peer resale platforms, to enable consumers to more easily pass on items, reducing demand for brand take-back services.



Box: **Understanding the relationships**

The actions of consumers are in various ways dependent on, enabled or constrained by the actions of other stakeholders across the economy.[16] A direct dependency exists in that a consumer can only obtain goods that have been designed, produced and retailed, and so there is a strong downward influence on the consumer from higher up the supply chain. However consumers can also influence these actions through the choices they make to obtain or not obtain certain goods, sending demand signals. There is therefore an opposite influence up the supply chain. Both third-party service providers and community organisations can have a similar, reciprocal relationship with consumers in terms of available services. The types of services provided by third-parties are also influenced by the actions of designers, producers and retailers. Government can have a direct (through regulation) or indirect influence (through other policy levers) on the actions of designers, producers, retailers, service-providers and consumers, while broader civil society can indirectly influence through its advocacy and campaigning efforts.

Top 10 ‘influential’ behaviours

As noted on the previous page, across the 129 behaviours in the map, the four behaviours with the most influence across the system related directly to federal government policy, specifically mandating minimum design / import standards that extend product lifetimes, and ensuring that reuse and repair outcomes are not only required, but privileged in product stewardship / extended producer responsibility (EPR) schemes. The top 10 also included behaviours from other actors in the system, including Producers / Importers, Retailers and Organisational Consumers. All behaviours and their scores are listed on the following page.

Top 10 most ‘system influential’ behaviours

Influence score

1.000 **Governments** mandate minimum design / import standards that extend product lifetimes

0.723 **Advocacy organisations** advocate for reuse / repair in EPR

0.687 **Advocacy organisations** advocate for mandatory minimum design / import standards

0.635 **Governments** mandate EPR that privileges reuse / repair

0.461 **Org Consumers** prioritise durability / extended warranties / repairability in procurement

0.439 **Advocacy organisations** advocate for mandatory end-of-life product stewardship

0.391 **Governments** mandate internal circular product procurement policies

0.376 **Retailers** provide ‘true’ buy-back or take-back schemes or incentives

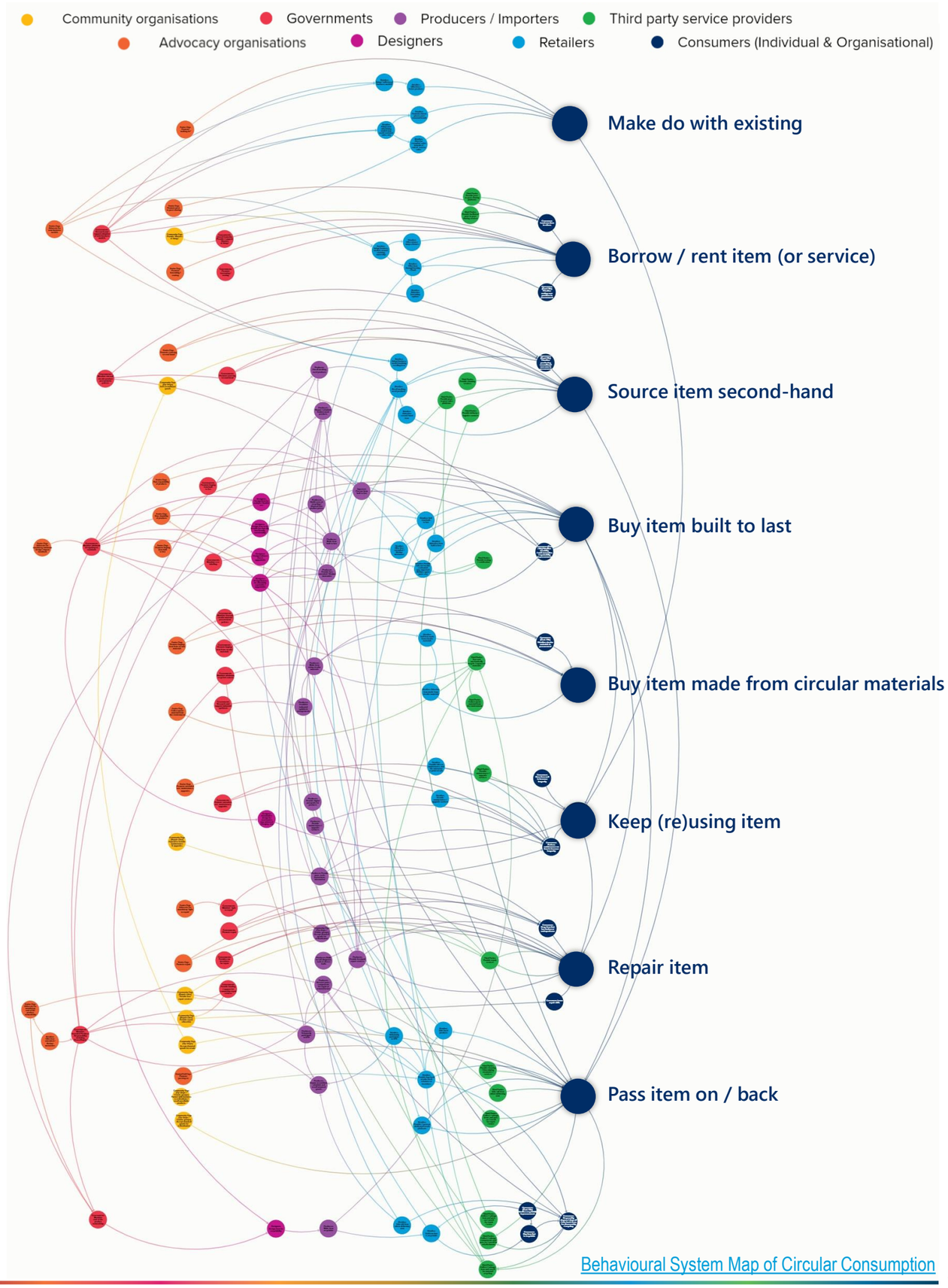
0.332 **Producers** & **Retailers** voluntarily participate in EPR

Other 119 behaviours

0

Box: System influence scores

‘System influence’ represents the ability of the behaviour to have flow on effects throughout the system. It is distinct to considerations of *impact*. A score of zero does not mean the behaviour has no impact / importance.



Behavioural System Map of Circular Consumption

Behaviours that contribute to circular consumption, and their system influence

A total of 129 behaviours were identified and included in the online Behaviour System Map. These behaviours are presented here according to actor, ordered by their relative 'system influence' score (in brackets). The 20 with the highest system influence are in purple. Those without measurable system influence are shown in grey. (An influence score of zero does not mean the behaviour has no impact on material footprint.)

Consumers

Pass products on or back for next use when no longer wanted (0.238)
Responsibly dispose / drop off / take back items for disassembly / recycling (0.203)
Buy item built to last (0.176)
Buy item that is recyclable (0.138)
Repair item that has broken or underperforms (0.031)
Learn repair skills (0.013)
Make do with existing / without acquiring an(other) item (-)
Borrow / rent item (or access through service) instead of acquiring an(other) item (-)
Source item second-hand instead of buying new (-)
Buy item made from circular materials (-)
Continue using item (as is, or with changes) for extended time (-)
Lend own item to others (-)
Perform maintenance on item to increase longevity (-)
Store item well to increase longevity (-)

Organisational consumers
Prioritise durability / extd warranties / repairability in procurement (0.461)
Prioritise recyclability in procurement (0.288)
Prioritise renting over purchase in procurement (-)
Prioritise purchasing secondhand over new in procurement (-)
Prioritise circular materials in procurement (-)

Designers

Design item to be affordably repairable / upgradable (0.292)
Design item to be durable (technically, functionally, emotionally) (0.257)
Design item for multiple / flexible use (0.191)
Design software that is upgradable (0.191)
Design item for recyclability (0.134)
Standardise design for accessories (eg. universal charging, etc) (-)

Producers

Voluntarily participate in EPR (0.332)
Build costs of recycling / disposal into product prices (0.317)
Make item built to last (Producers) (0.274)
Provide digital passports for products (0.221)
Import items built to last (Importers) (0.208)
Make item recyclable (Producers) (0.193)
Recover parts / components for repair or remanufacture (0.111)
Repair / refurbish broken used products (0.111)
Provide free extended / lifetime warranties (0.098)
Provide parts, tools, instructions, information (0.047)
Honour warranties for products repaired by third parties (0.031)
Build in self-diagnosis tools to detect faults (Producers) (0.013)
Provide free / paid repair services (0.013)
Establish industrial symbiosis arrangements (-)
Make item using circular materials (Producers) (-)
Onsell working used products (-)
Provide maintenance / upgrade services (-)
Repair, recondition, refurbish and resell returned goods (-)

Retailers

Provide 'true' buy-back or take-back schemes or incentives (0.376)
Voluntarily participate in EPR (0.332)
Sell item built to last (0.306)
Sell item that is recyclable (0.285)
Take old item when delivering new (0.214)
Provide / sponsor dedicated resale platforms (0.162)
Advertise item built to last (0.126)
Offer free extended / lifetime warranties (0.126)
Provide info on circular credentials (eg. expected lifetime, spare parts, etc) (0.126)
Adopt business model involving reselling item (-)
Adopt business models around retaining ownership (-)
Adopt new advertising models (eg. avoid seasonal, sales, etc) (-)
Adopt 'sufficiency' business models (-)
Advertise borrowing options (-)
Advertise item made from circular materials (-)
Advertise second-hand item (-)
Offer item through leasing / PaaS (-)
Offer less / better products (-)
Offer return / swap schemes (-)
Price for 'everyday' value instead of end-of- season sales (-)
Promote classic pieces over seasonal trends (-)
Provide info on maintenance and life extension at point of sale (-)
Provide maintenance / upgrade services (-)
Resell working used products (-)
Sell item made from circular materials (-)
Take back products (-)

Third party service providers

Provide testing / certification (0.164)
Collect / salvage items and pass on / onsell for repair / reuse (0.162)
Provide cleaning / data wiping assurance / services (0.162)
Provide delivery + logistics services (0.162)
Provide peer-to-peer sales platforms (0.162)
Take old item when delivering new (0.162)
Collect / salvage components and pass on / onsell for refurbishment (0.076)
Provide repair services (0.013)
Collect / salvage item and onsell for material recycling (-)
Collect / salvage item and pass on / onsell for repair / reuse (-)
Collect waste material from the environment (-)
Provide cleaning services (-)
Provide facilitated peer-to-peer sharing services (-)
Provide maintenance / upgrade services (-)
Provide peer-to-peer sharing platforms (-)
Sort and mechanically recycle / reprocess materials (-)

Community sector

Partner with business to accept unsold items (Op shops / Community groups) (0.257)
Accept donations of goods from businesses (Op shops / Community groups) (0.162)
Accept donated goods from households for resale (Op shops) (0.162)
Provide repair education (Repair cafes) (0.016)
Provide free repair services (Repair cafes) (0.013)
Expand to include maintenance & upgrades (Repair cafes) (-)
Sell secondhand goods (Op shops) (-)
Provide 'libraries of things' (-)

Environment / Civil society organisations

Advocate for privileging Reuse / Repair in Extended Producer Responsibility (0.723)
Advocate for mandatory minimum design / import standards (0.687)
Advocate for mandatory end-of-life product stewardship (0.439)
Rate repairability of products (0.208)
Promote passing on (0.162)
Promote buying item built to last (0.126)
Rate durability of products (0.126)
Advocate for mandatory 'right to repair' (0.039)
Promote repair (0.029)
Advocate for new circular business models (-)
Promote "making do" (-)
Promote borrowing / renting (-)
Promote buying item from circular materials (-)
Promote extended use, maintenance, upgrades (-)
Promote peer-to-peer sharing (-)
Promote sourcing second-hand (-)
Collect waste material from the environment (-)

Government

Governments mandate minimum design / import standards that extend / maximise product lifetimes (1.000)
Mandate Extended Producer Responsibility that privileges Reuse / Repair (0.635)
Mandate internal circular product procurement policies across Government (0.391)
Mandate end-of-life product stewardship (0.302)
Promote buying item built to last (0.126)
Mandate minimum recycled content (0.091)
Mandate eco-labelling (0.082)
Mandate 'right to repair' (0.034)
Promote repair (0.029)
Provides tax incentives for repair (0.029)
Provide funding / support for community repair services (0.022)
Promote borrowing / renting (-)
Promote buying item from circular materials (-)
Promote extended use, maintenance, upgrades (-)
Promote sourcing second-hand (-)
Research and support adoption of new business models (-)
Research and support industrial symbiosis (-)
Mandate internal circular material procurement policies (-)
Provide / support 'libraries of things' (Councils) (-)

Next steps

Recommendation 4: Validating and extending existing behavioural system map
Recommendation 5: Further research on organisational consumption

Validating and extending existing behavioural system map

The current work provides a comprehensive picture of the relationships between various actors in involved in Australia's systems of production and consumption. It has both great *breadth*, covering most aspects of a consumer's interaction (ie. acquisition, use and divestment) with "stuff", and *depth*, making subtle distinctions between similar behaviours.

It does however, represent only a preliminary effort at understanding the relationships between the various actors and their behaviours, as the connections were made by the BehaviourWorks team based on outputs and recollections from previous stakeholder engagement exercises. However one of the key principles and affordances of system mapping is its participatory nature[19].

An important first step is therefore to **engage a variety of stakeholders in reviewing, refining and expanding the connections** to enhance its representation of reality. This should explicitly include identifying 'feedback loops', where actions could reciprocally reinforce each other to speed up change in the system, as well as any potential negative influences where some behaviours may have unintended consequences for other behaviours. The system influence of behaviours in the enhanced map can be explored to identify what other leverage points may exist. At this point the map could also be used to directly compare the system influence, pathway to change and potential for unintended consequences of various Government policy options or industry changes.

A number of further possibilities exist to **extend the value of the behavioural system map** once the connections have been validated. These include:

- 'zooming in' on core circular consumption behaviours to incorporate the nuanced, specific actions of consumers (see p.13) to undertand the relationships between actors in more detail
- adding quantitative or qualitative ratings of the strength of influences to refine the ratings of system influence
- incorporating identified drivers and enablers of the core circular consumption behaviours and refining the connections to understand which behaviours of consumers and other actors can help overcome existing barriers.

Research into organisational consumption

Both streams of underlying research recognised and attempted to include organisations as consumers in the concept of 'consumption'. However to a large extent, discussions and outputs related more to individual consumers in their personal sphere. Observations of the conversations suggest this was driven by both unconscious association of the term 'consumer' with individuals, and a lack of specific insights into organisations as consumers (as distinct from much greater knowledge of the role of organisations as producers).

This work therefore attempted to explicitly separate out consumption behaviours relevant to individuals and organisations, and to some extent, represent these distinctions in the behavioural system map where relevant. (Presently, this is limited to recognising the 'buying power' of larger organisational consumers and explicitly incorporating behaviours directly related to organisational procurement.) Further research on circular 'consumption' should **maintain this deliberate attention to organisation consumption** to ensure that focus is not centered too squarely on individual consumers, who collectively produce less than 25% of Australia's waste.[21]

An obvious, and critical extension of the work commenced here is to more deeply investigate organisational practices from a consumption perspective, to understand the range of 'scalable' consumption behaviours that are open to and / or required of larger organisational consumers in reducing Australia's material footprint.

The 'buying power' of organisational consumers is well known and explicitly incorporated in the present work. However organisations can have other important roles in the economy beyond 'producer' and 'consumer'. For example, **understanding the role of business as 'investor'** is starting to be recognised as an important focus in achieving widescale system change.[24] Building on this work and adding the finance sector as a key actor in the Circular Consumption behavioural system map will open up further avenues to understand where changes are needed in the behaviour of actors across the economy.

Recommendation 4: **Partner with BehaviourWorks to validate and extend the behaviour system map, and conduct further analysis.**

Specifically this includes:

4.1. Participatory mapping exercise to validate and extend the behaviours and connections in the current map

4.2. Adding layers to the map that allow 'zooming in' on the core consumption behaviours at the next degree of detail

4.3. Rating the strength of connections quantitatively through existing data or qualitatively by experts.

4.4. Adding drivers and enablers of the core consumption behaviours (and those of other actors) to enable greater understanding of potential mechanisms of change.

4.5 Make use of Kumu's* 'presentation' functionality to better present the insights and conclusions from the current or extended map to enable greater use and impact.

Recommendation 5: **Investigate the 'consumption' role of businesses / other organisations in greater detail.**

Specifically:

5.1. Build into future waste data collection, analysis and reporting efforts methods to distinguish between waste generated from organizational consumption activities and waste generated from organizational production activities in the Commercial and Industrial sector.

5.2. Develop a framework to understand and categorise the different types of organisational consumers (or organisational consumption), and their main forms of material resource consumption.

5.3 Conduct research into the range of circular consumption behaviours that are currently, or could be, scalable for large organisational consumers.

5.4 Investigate the other important roles that organisations play, beyond producer and consumer, that can enable the transition to a circular economy, and specifically, add finance sector as an actor to the behavioural system map.

* Kumu is an online system mapping software that was used to create the behavioural system map. It allows overlaying the map with a presentation that can walk through different aspects of the map

APPROACH AND METHODS

Behavioural system mapping An introduction

Behavioural system mapping is an emerging technique[15] that can provide practical guidance on where and how to intervene to address complex challenges. It combines the strengths of two powerful approaches: behavioural science and systems thinking. The following provides an overview of these two approaches and the benefits of combining. The specific methods adopted for this research are outlined on the following page.

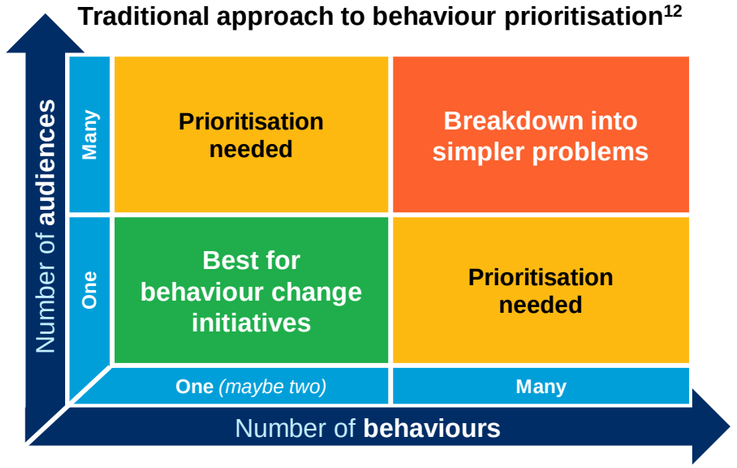
Behavioural science

Traditional behavioural science adopts a structured approach to research and decision-making in order to: understand problems, make educated choices about which behaviours to change, generate informed ideas of how to intervene to influence them, and systematically test and evaluate intervention ideas to ensure effectiveness.[5,25]

A key early step in the behavioural science process is determining which behaviour to target. Often there will be many options, which requires prioritising one single action from a specific audience to focus change efforts on.[12,17,25] Typically this involves taking a powerful analytical approach that is 'reductionist' in nature, breaking down a complex problem into specific issues and focusing narrowly on solvable aspects of these.[5,15] Multiple behaviours and audiences can be targeted, but they must generally be done sequentially, or in parallel through different and distinct efforts.

Common criteria for prioritising include the direct impact that each behaviour could have on the problem, and the likelihood it would be adopted by the audience.[12,17] However, focusing on a single behaviour and its direct impact on an outcome within a small slice of the system risks excluding broader perspectives and evidence, downplaying interactions with contextual factors, and potentially re-enforcing or exacerbating the underlying problem. It can also lead to unexpected, unintended and undesired outcomes, solving one problem by creating others as bad or worse.[10]

Traditional approach to behaviour prioritisation[12]



Systems thinking

Systems thinking is an approach to understanding a situation or problem by identifying, and often mapping, all of the various 'parts', and how they interact or conflict with each other and change over time to produce desirable or undesirable outcomes. Systems thinking retains and engages directly with complexity, and so is particularly valuable for 'wicked' problems that are persistent / recurring and whose multifaceted root causes defy narrow problem definitions and simplistic responses.[10] It can help to more explicitly understand relationships between different factors and demonstrates how broader contextual and structural factors influence and constrain human behaviour.

Recognising this complexity early in the design of a behaviour change initiative is important because it prevents us from focusing too quickly on a specific target behaviour (or leverage point for interventions) without understanding its interaction within the system. Instead, systems thinking and mapping allows us to us to select the most appropriate target behaviour(s) by considering upstream and downstream influences as well as any existing feedback loops.

System mapping also often lets us understand why certain interventions, which have been tried in the past, have failed to result in a broader systems shift to responsible consumption. It might even let us foresee possible unintended consequences any proposed interventions might lead to.

With 'wicked' problems, it is common that multiple actors may contribute to parts of the problem, and to the solutions. Systems thinking can therefore highlight where integrated solutions are required that involve making changes at different levels in the system.[10]

Applying a whole-of system approach to a problem generates a rich understanding of the issues, composed of interrelated parts and subsystems that organically evolve and interact. However the level of detail can be overwhelming, and it is not always clear from this picture where or how rapid, substantial, intentional change can be 'made' to happen, leading to 'analysis paralysis' / inertia.[15]

Behavioural system mapping

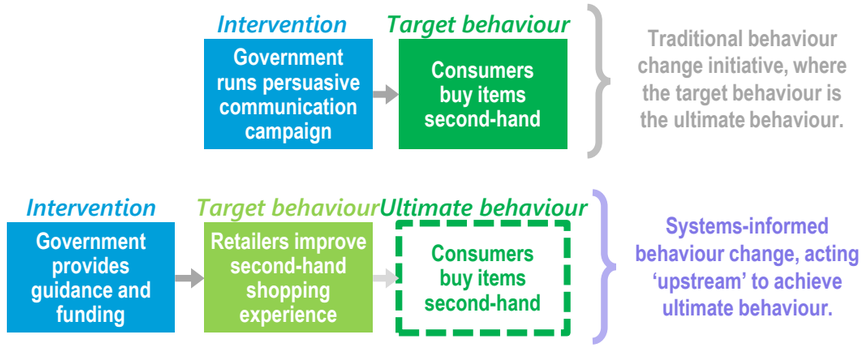
The contrasts between focused behavioural science and broader systems thinking suggests that both are needed at various stages of behavioural public policy to balance the advantages and risks of both. Behavioural system mapping is one emerging way to do so.

Behavioural system mapping is a specific form of system mapping where the main entities mapped are individual behaviours or actions of different actors that either contribute to ('present-state') or help solve ('ideal-state') a particular problem. The specific barriers to those behaviours can also be included in the map.[6,9,18] Connections are drawn between behaviours (and barriers) to understand relationships and influence. It is a form of system mapping that makes the role of human behaviour more visible, and explicit.[15]

Systems thinking principles can then be applied interpretively (qualitatively) or statistically (quantitatively) to understand the potential benefits and consequences of intervening at different points in the system. Such insights can be combined with traditional prioritisation criteria such as impact and likelihood of adoption for immediate impact, or used to understand the systems transformation potential of different options for longer term impact. A key outcome of this process is that the 'target' behaviour selected may be several steps removed from the ultimate behaviour or goal.

Once an intervention point has been identified, the focus of the map on behaviours makes it easier to know *how* to proceed to create change, by using behavioural science methods to identify effective interventions to bring about the change needed.

Traditional approach vs Systems approach to identify behaviour



Behavioural system mapping Underlying research and method of analysis

The Behavioural Roadmap to Circular Consumption is the culmination of over three years of research across two parallel programs of work: the Responsible Consumption Mission, a major collaborative research program supported and co-steered by BehaviourWorks' consortium partners, and research under the auspices of the Victorian and Australian governments into the range and measurement of waste prevention behaviours of all actors in a circular economy.

Responsible Consumption Mission

The Responsible Consumption Mission was a continuation of BehaviourWorks Consortium efforts to leverage the combined reach, resources and expertise of the Consortium partners (Australian Government Department of Climate Change, Energy, the Environment and Water, the Victorian Government Department of Energy, Environment and Climate Action, Sustainability Victoria, and The Shannon Company) by identifying shared policy challenges between partners and tackling them with behavioural approaches.

The Responsible Consumption Mission explored how systemic behavioural public policy experiments, that support 'responsible consumption', could have a substantial impact on reducing Australia's material-footprint (the amount of raw material extraction used to meet the final demand of the economy).

Commencing in April 2021 after initial scoping of potential meeting topics, the Responsible Consumption Mission involved the full application of the BehaviourWorks Method. After confirming the problem focus areas of household textiles, furniture and electronics / electrical items, the first phase was an extensive *Behaviour Identification and Prioritisation* exercise. This involved significant stakeholder engagement with over 75 stakeholders from Australia's public, private, civil and research sectors which identified over 470 specific behaviours by 7 types of actors that contribute to responsible consumption. These were collated down to 84 different types of behaviours to consider. A shortlist of these were selected to take through to the next phase of Co-design, centered around buying clothing and furniture second-hand or built-to-last, then passing on when no longer wanted. The *Codesign* phase involved a series of workshops with a subset of engaged stakeholders to understand the shortlisted behaviours in more detail, identify their core barriers, and devise a range of potential intervention ideas to increase the adoption and prevalence of these behaviours.

The Behavioural Roadmap drew on the long list of identified behaviours, discussions held when prioritising these behaviours, and the research and stakeholder insights into the barriers of the short-listed behaviours.

→ Read the Final Mission Report.

National Waste Prevention Framework

The Australian Government Department of Climate Change, Energy, the Environment and Water commissioned this work from BehaviourWorks to support the National Waste Policy & Action Plan, particularly *Target 2: Reduce total waste generated in Australia by 10% per person by 2030*. The work was conducted in 2021-2022 and built on and extended work by BehaviourWorks for the Victorian government from 2020 to 2022 to measure waste avoidance as part of implementing and evaluating Victoria's circular economy policy.

The ultimate aim was to investigate methods for measuring waste prevention at national, state / territory and more local scales, in order to increase measurement and reporting of waste prevention across Australia's public, private and civil sectors. It began with a similar behavioural identification piece as the Responsible Consumption Mission with approximately 40 of Australia's leading circular economy stakeholders, but focused more on documenting the various waste prevention activities of different stakeholders, and how these related to each other (that is where activities of one stakeholder either enabled, or were contingent on, the activities of other stakeholders.

The National Framework for Understanding, Measuring & Communicating Waste Prevention in a Circular Economy sets out a very similar set of 'core' activities of Users (both individual and organizational) to those identified in the Responsible Consumption Mission, underpinned by a detailed 'glossary' clearly defining each behaviour. The labels and definitions included in the Framework were discussed and agreed through extensive stakeholder collaboration. Drivers and barriers to the core waste prevention activities were identified by stakeholders, and measured as part of establishing a National Baseline of household waste prevention behaviour. A scan of existing waste prevention activity and opportunities was also conducted to underpin the National Waste Report 2023.

The Behavioural Roadmap drew on the work to identify some additional behaviours to incorporate. Where appropriate, it adopted the language from the Framework to maximise consistency. It drew heavily on the connections between actors identified by stakeholders in constructing the behavioural system map, and the current adoption levels and waste prevention opportunities from the Baseline & National Waste Report.

→ See the Final Framework and Supporting research

Behavioural Roadmap

As noted the Behavioural Roadmap drew on research and stakeholder conversations from these two parallel streams of work. It commenced by refining the initial list of 470 behaviours from the Responsible Consumption Mission, and separating out by actor, resulting in 129 'ideal' behaviours. Eight 'core' circular consumption behaviours were identified based on insights from stakeholder conversations, and the core waste prevention activities identified in the National Framework.

The relationships between these eight core behaviours were then mapped based on knowledge of the research team, and insights from stakeholders. Next, systems thinking and behavioural science principles were qualitatively applied to understand potential priorities amongst the eight core behaviours in terms of either 1) behaviours where change would have a flow on or 'ripple' effect throughout the other behaviours (also known as 'leverage points'[19]), or 2) behaviours which would be relatively easy to adopt as they did not depend on changes in other parts of the system.

These eight behaviour, along with the other 121 behaviours by other actors in the system where then input into the online Kumu platform to create an 'ideal-state' behaviour system map. A range of connections were then drawn between the behaviours made based on the workshop outputs from initial National Framework stakeholder engagement activities, and the resulting analysis of connections published by BehaviourWorks.[16]

Subsequently, the analysis capabilities of the Kumu platform were used to calculate MICMAC* scores for all behaviours to determine which
had the greatest system influence. Finally, Results from the interpretive and quantitative analysis were then synthesised with stakeholder insights to develop the final set of recommendations.

→ See the Behavioural System Map of Circular Consumption

* MICMAC (Cross-Impact Matrix Multiplication Applied to Classification) is a system analysis that explores element exposure (how much a given element is affected by other elements) and influence (how much a given element affects other elements).[13]

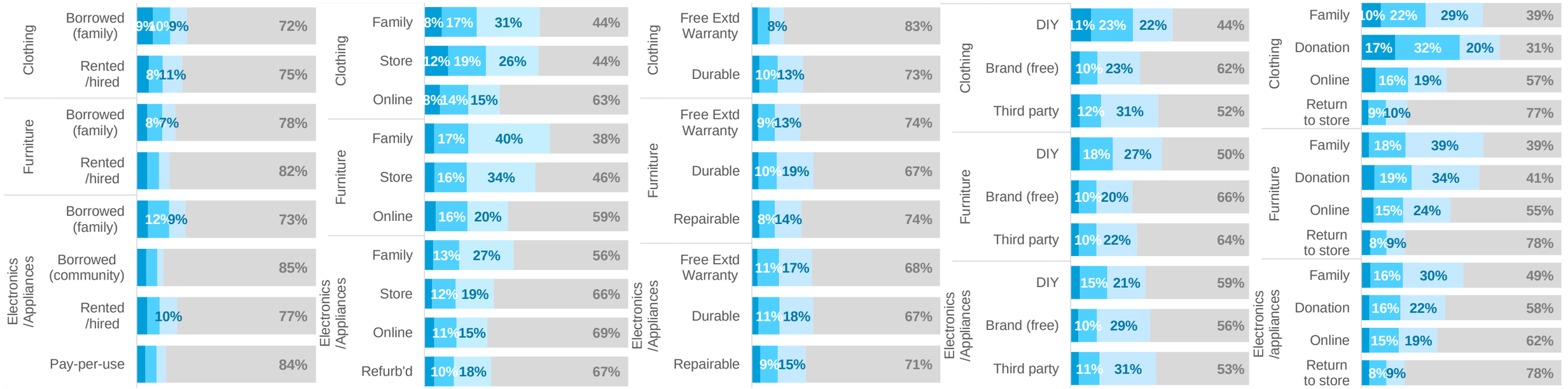
RESOURCES

Data & insights for developing behaviour change campaigns

RESOURCES

Baseline of household adoption and barriers

Level of adoption of circular consumption behaviours among Australian households (June 2022)



Action list

Rented / hired *from a store or brand,*
Obtained through a ***'pay-per-use'*** *or other 'product-as-a-service' model.*

Borrowed from ***family*** *or personal networks,*
Borrowed from a ***community*** *sharing scheme,*

Item included a free extended or lifetime ***warranty***

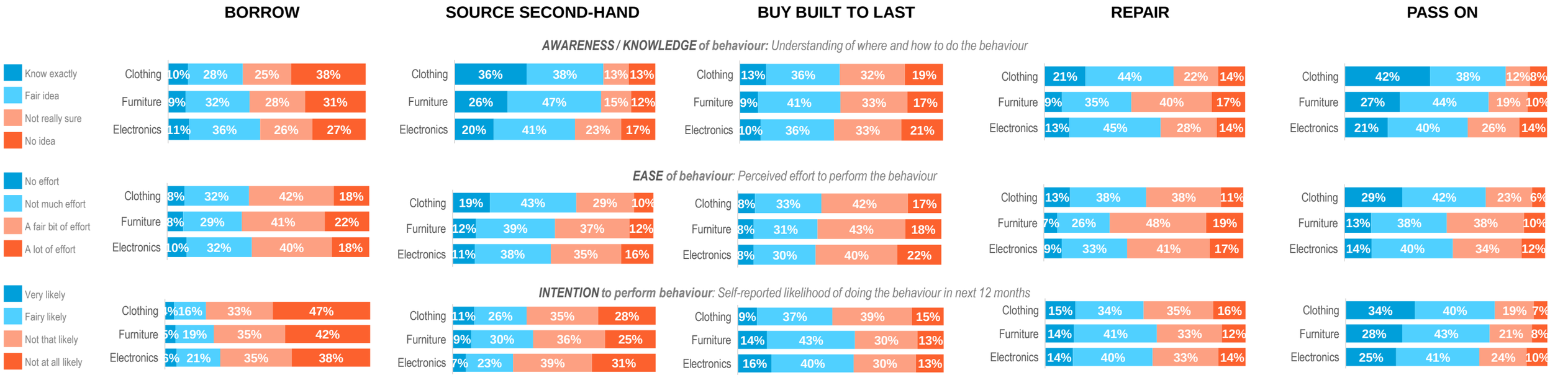
Item marketed as ***durable*** */ long lasting*
Item marketed as ***repairable***

Hand-me-downs from ***family*** */ personal networks*
*Bought from a second-hand thrift / charity shop, \tip shop, etc or garage sale [****store****]*
Bought (or got free) secondhand ***online***
Bought ***refurbished*** */ reconditioned from retailer*

Doing repairs yourself
Having repairs done for ***free*** *by the brand (****retailer or manufacturer****)*
Paying for repairs by a ***third party***

Donating *to a second-hand charity / thrift store, etc*
Listing for sale or for free ***online*** */ in classifieds*
Returning *to store / brand reuse or resale program*

Level of key drivers of activity among Australian households (June 2022)



RESOURCES

Priority ‘core’ circular consumption behaviours

Insights to support behaviour change efforts

Basic approach to behavioural science

There are four basic steps to developing a behaviour change initiative using behavioural science.

1. Select behaviour — Define your target behaviour

Select just one behaviour that you want households to perform after receiving your communication. It can help to specify it as who needs to do what, when.

2. Understand barriers — Understand key barriers to your target behaviour

Explore your target behaviour to understand what is making the behaviour harder or less likely to happen, and what might make it easier or more likely to happen. It can help to think about aspects related to the *individual* person, the *social* context and *physical* environment.

3. Develop solutions — Develop relevant strategies to overcome barriers

Select behavioural insights and other targeted strategies matched to what you know about your target behaviour and its barriers. You will likely need persuasive messages to maximise motivation, and supportive and enabling messages to overcome other barriers.

4. Test and refine — Check before, during and after implementation

Success can never be guaranteed, and messages can sometimes have unexpected effects, so it is important to check messages and communication before delivery, monitor during delivery and evaluate effectiveness afterwards.

Overview

This section collates a range of supporting information from the spectrum of BehaviourWorks research, for the eight core circular consumption behaviours.

We begin with the **two priority circular consumption behaviours** recommended to address through direct behaviour change approaches, walking through the various resources provided:

1. Borrow
2. Source second-hand

Following this, we present some supporting information for the **remaining core circular consumption behaviours**:

3. Make do
4. Buy built to last
5. Buy from circular materials
6. Keep using
7. Repair
8. Pass on

For **all** circular consumption behaviours we provide a list of the relevant individual and organisational consumer behaviours along with a 'Behavioural System Map' figure illustrating the broader system behaviours and their relationships (some relationships include links with other core behaviours – these are indicated in the figures). Each page also includes the consumer and non-consumer behaviours presented in a table.

For the two **priority** behaviours, 'Borrow' and 'Second hand', additional information is provided on identified barriers to adoption of the behaviours by individual consumers. Where a barrier applies only to a specific sub-behaviour, it is presented alongside the specific sub-behaviour. Otherwise, it is presented along the top of the figure. The barriers are coded as:

- *internal:* barriers relating to characteristics of the individual
- *social:* barriers relating to the broader social context
- *physical / system:* barriers relating to the physical environment in which a behaviour occurs, or the underlying technical system

Box: **Relevant research**

The Behavioural Roadmap to Circular Consumption draws on two key streams of research, as described in the Method (p.18) to undertake the behavioural system mapping exercise, the Responsible Consumption Mission and National Framework for Waste Prevention. The work is also informed by a wider range of BehaviourWorks research that provides insights into not just where, but also how to intervene, particularly including research conducted under BehaviourWorks' 2020-2022 Waste and Circular Economy Collaboration. Specifically, the following underlying research has been referenced may be valuable resources for change makers.

Behaviour Prioritisation

Codesign supporting research

National W.P. Framework

Framework & Baseline

Underlying research

Circular Business Models

Rapid Review

Trial report

Circular Purchasing & EcoLabels

Rapid Review

Trial report

1. Borrow / rent

1. Identifying and prioritising target behaviour(s)

The first step in developing a behaviour change initiative to promote borrowing is to determine which particular behaviour you ultimately wish to achieve. *Borrowing* includes a combination of personal and commercial *individual* behaviours and commercial *organisational* behaviours (see the table below). Any of these could be selected as a target behaviour.

Additional research undertaken by BehaviourWorks[8] (see p.21) reveals that individual Borrowing is relatively uncommon (~15% to 30% adoption), and that adoption varies marginally depending on the type of behaviour (ie. borrowing from family vs renting / hiring) and the product / item (ie. clothing, furniture, electronics). Therefore all have scope to increase adoption levels.

The consumer Borrowing behaviours are influenced (eg. enabled, encouraged) by a range of behaviours by other actors in the system (see table further below). These behaviours and their relationships are presented in the behaviour system map (see bottom right). Once a target behaviour has been selected, the next step is determine whether to engage directly with the consumer, or with another actor in the system.

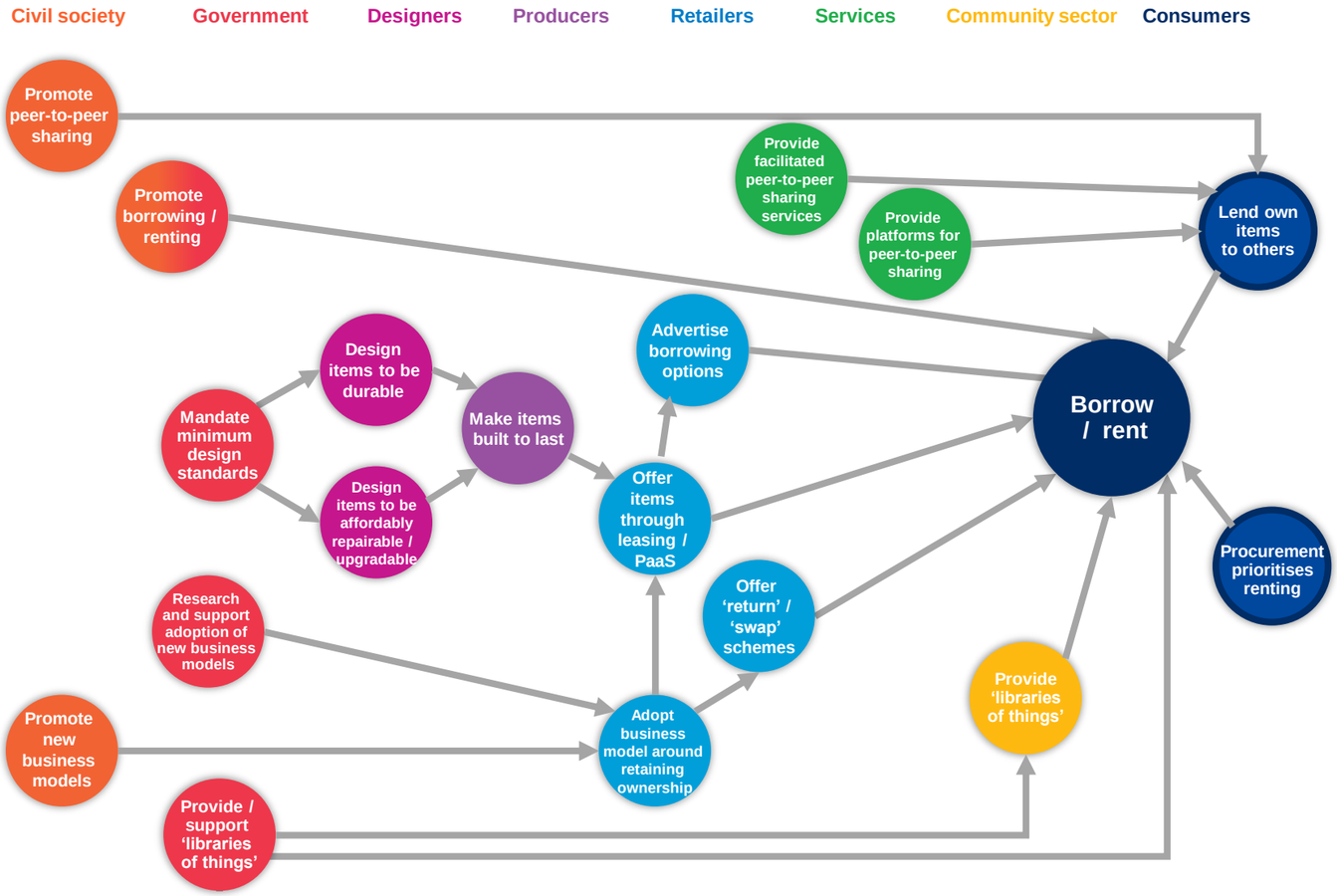
Borrowing behaviours of consumers

Personal behaviours	Organisational behaviours
Individuals, households	**Business, Govt, Civil / Community organisations**
• Borrow item from personal networks • Borrow item from community initiative • Use item in reuse + return scheme • Hire item commercially short-term • Lease item commercially longer-term • Obtain access or use of item through product-as-service • Obtain equivalent outputs of item through outsourcing* • Obtain outputs of item through digital alternative*	• Hire item commercially short-term • Lease item commercially longer-term • Obtain access or outputs of item through product-as-service* • Obtain outputs of item through digital alternative*

Behaviours of other actors in the system influencing borrowing

Civil society	Designers	Services
• Promote borrowing / renting • Promote peer-to-peer sharing • Promote new circular business models	• Design items to be durable • Design items to be affordably repairable / upgradable	• Provide facilitated peer-to-peer sharing services • Provide peer-to-peer sharing platforms
Government	**Producers**	**Community sector**
• Promote borrowing / renting • Mandate minimum design standards • Research and support adoption of new business models • Promote new circular business models • Provide / support 'libraries of things'	• Make items built to last **Retailers** • Advertise borrowing options • Offer items through leasing / Product-as-a-Service (PaaS) • Offer 'return' / 'swap' schemes • Adopt business model around retaining ownership	• Provide 'libraries of things'

Behavioural system map of borrowing



1. Borrow / rent

2. Understanding barriers

Once a target behaviour has been selected, the second step in developing a behaviour change initiative to is to understand the key drivers and barriers of the target behaviour. Stakeholder insights into barriers to individual borrowing behaviours were captured as part of the National Waste Prevention Framework research.

The table (below left) provides a dot-point list of known barriers. The figure maps these barriers either 1) generically to the ultimate behaviour ('Borrow / rent') or to specific borrowing behaviours (eg. 'Participate in reuse scheme').

These can act as a starting point for brainstorming potential solutions to increased adoption of a particular Borrow / Rent behaviour. It is recommended that these are verified as pertinent to the particular community being targeted, or otherwise that solutions are tested before being implemented.

BARRIERS TO INDIVIDUAL BORROWING

Physical / System

- Location: Not convenient / no delivery
- Location: Options not available / accessible in local area
- Location: High shipping costs for a low cost item
- Tech / infrastructure: Existence of physical centres
- Object: Availability of products / items
- Object: Only certain types of items are available to borrow from community scheme
- Object: Depends a lot on local initiatives / community
- Object: Not many types of items are available for rent
- Service: Lack of promotion
- Laws / rules: Need for reliable industry standards
- Service: Cheaper to buy (low quality) than lease / borrow better quality
- Service: Lack of promotion
- Object: Better suited to certain types of items
- Laws / rules: Voluntary product stewardship schemes with no penalties or offences

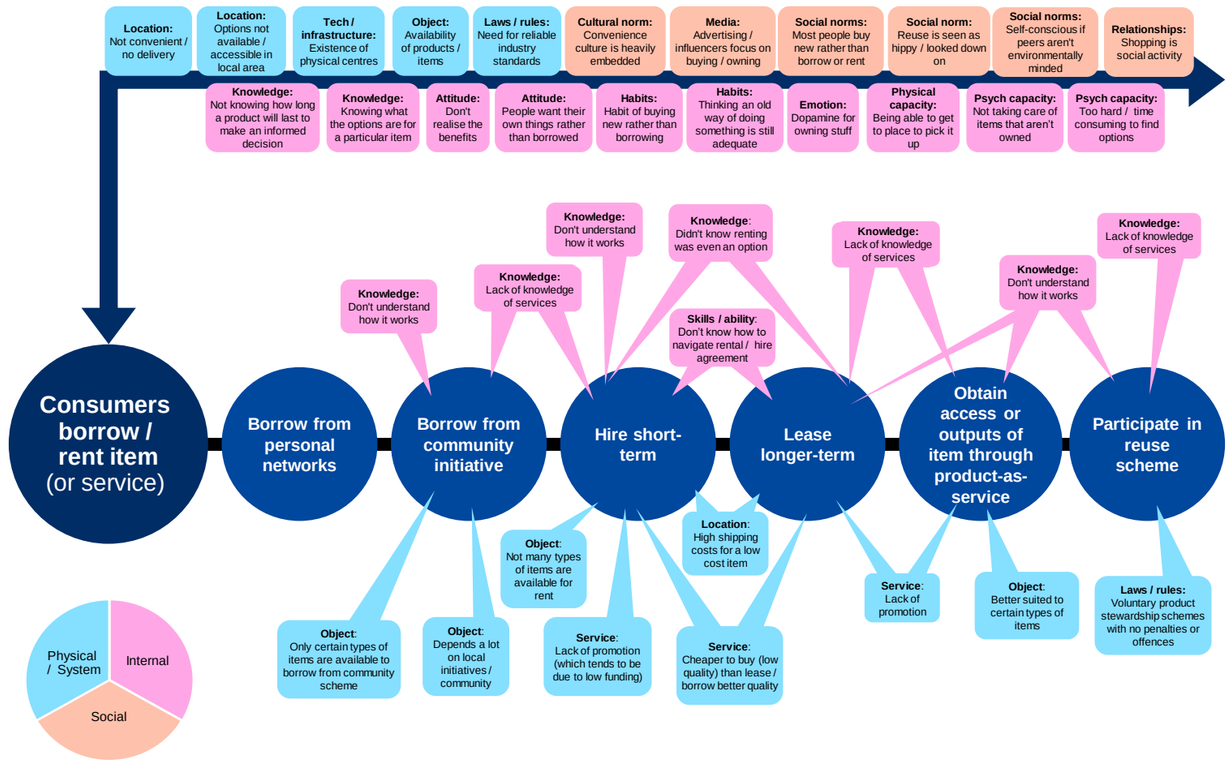
Internal

- Knowledge: Not knowing how long a product will last to make an informed decision
- Knowledge: Knowing what the options are for a particular item
- Knowledge: Don't understand how it works
- Knowledge: Lack of knowledge of services
- Knowledge: Didn't know renting was even an option
- Skills / ability: Don't know how to navigate rental / hire agreement
- Knowledge: Lack of knowledge of services
- Attitude: Don't realise the benefits
- Attitude: People want their own things rather than borrowed
- Habits: Habit of buying new rather than borrowing
- Habits: Thinking an old way of doing something is still adequate
- Emotion: Dopamine for owning stuff
- Physical capacity: Being able to get to place to pick it up
- Psych capacity: Not taking care of items that aren't owned
- Psych capacity:
- Too hard / time consuming to find options

Social

- Cultural norm: Convenience culture is heavily embedded
- Media: Advertising / influencers focus on buying / owning
- Relationships: Shopping is social activity
- Social norms: Most people buy new rather than borrow or rent
- Social norm: Reuse is seen as hippy / looked down on
- Social norms: Self-conscious if peers aren't environmentally minded

Mapping of barriers to specific behaviours



2. Sourcing second-hand

1. Identifying and prioritising target behaviour(s)

The first step in developing a behaviour change initiative to promote Sourcing Second-Hand is to determine which particular behaviour you ultimately wish to achieve. *Sourcing Second-hand* includes a combination of individual and organisational consumer behaviours (see table below).

Additional research undertaken by BehaviourWorks[8] (see page 20) reveals that Sourcing second-hand is not uncommon (~20% to 50% adoption). However, adoption varies depending on the type of behaviour (ie. purchasing vs acquiring for free), the product / item (ie. clothing, furniture, electronics), and the target audience (ie. women vs men, renters vs owners, income level). For example, women are more likely to purchase second-hand clothing (particularly mothers buying baby and children's clothes), whereas renters are more likely to buy second-hand furniture than home-owners, while high income earners are more likely to purchase (durable) new furniture[1,2,3]. This presents two options: targeting an already common(ish) behaviour to try to maximise adoption for potentially less investment, or targeting a relatively uncommon behaviour with greatest potential for impact if significant adoption achieved.

The consumer Borrowing behaviours are influenced (eg. enabled, encouraged) by a range of behaviours by other actors in the system (see table further below). These behaviours and their relationships are presented in the behaviour system map (see bottom right). Once a target behaviour has been selected, the next step is determine whether to engage directly with the consumer, or with another actor in the system.

A separate traditional system mapping activity was also undertaken by BehaviourWorks and stakeholders[4] to identify influential actors to Sourcing Second-hand. In addition to those identified in the behavioural system map to the right, other potentially influential actors include: personal networks, informal and paid influencers, other consumers, design students, media / pop culture.

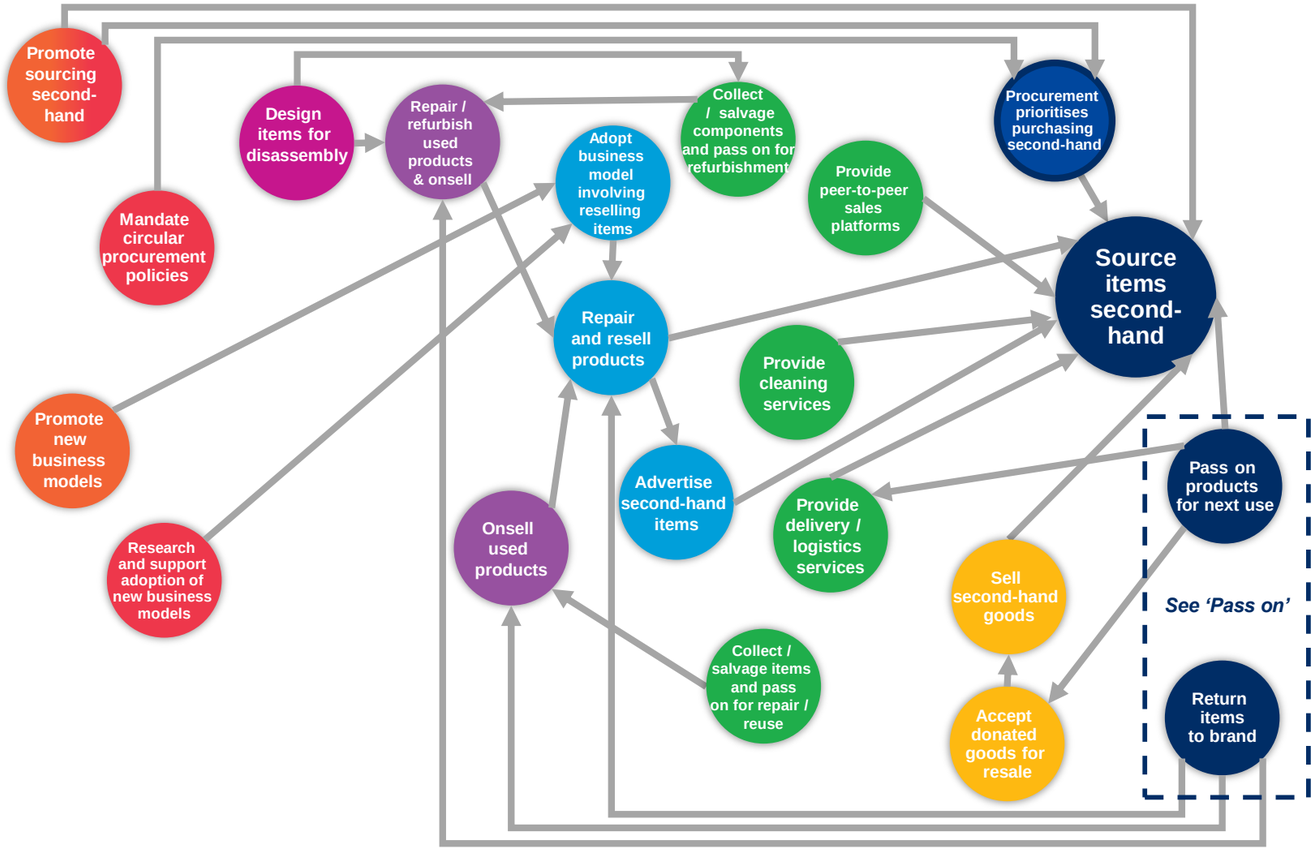
Sourcing Second-Hand behaviours of consumers

Personal behaviours	Organisational behaviours
Individuals, households	**Business, Govt / civil organisations**
• Salvage item from discard • Receive item through personal networks • Obtain item from free listing • Buy item from peer-to-peer (P2P) platform • Buy item from charity / op-shop • Buy item from second-hand dealer • Buy reused / refurbished item from brand	• Buy reused / refurbished item from brand • Buy item from second-hand dealer • Buy item through B2B platform

Behaviours of other actors in the system influencing

Civil society	Designers	Services
• Promote sourcing second-hand • Promote new circular business models	• Design items for disassembly	• Collect / salvage / harvest components and pass on for refurbishment • Provide peer-to-peer sales platforms • Provide cleaning services • Provide delivery / logistics services • Collect / salvage items and pass on for repair / reuse
Government	**Producers**	
• Promote sourcing second-hand • Mandate circular procurement policies • Promote new circular business models • Research and support adoption of new business models	• Repair / refurbish used products & onsell • Onsell used products	
	Retailers	**Community sector**
	• Adopt business model involving reselling items • Repair and resell products • Advertise second-hand items	• Sell second-hand goods • Accept donated goods for resale

Behavioural system map of borrowing



2. Sourcing second-hand

2. Understanding barriers

An additional table and figure are provided for Sourcing Second-hand which present some of the known barriers to adoption. The table (top) provides a dot-point list of known barriers, grouped by physical / system, social, or internal. The figure maps these barriers either to the ultimate behaviour (Source Second-hand) or to specific sub-behaviours (eg. Buy from charity / op-shop). As with the barriers for Borrow / Rent, these can act as a starting point for developing solutions.

Additional insights

Drawing again from additional research undertaken by BehaviourWorks[1], when it comes to *buying second-hand furniture*, the primary drivers identified were:

- Value / bargain hunting (as distinct from affordability / low income)
- Anti-consumption / originality
- Environmental (mixed results)

And the primary barriers identified were:

- Hygiene *(depending on audience)*
- Status / desire for new products *(depending on audience)*
- Ease (poor display in store, time to find right piece)
- Knowledge *(depending on audience)*
- More barriers to 'soft' furnishings compared to 'hard' furniture
- Low supply of 'quality', 'desirable' furniture in second-hand stores.

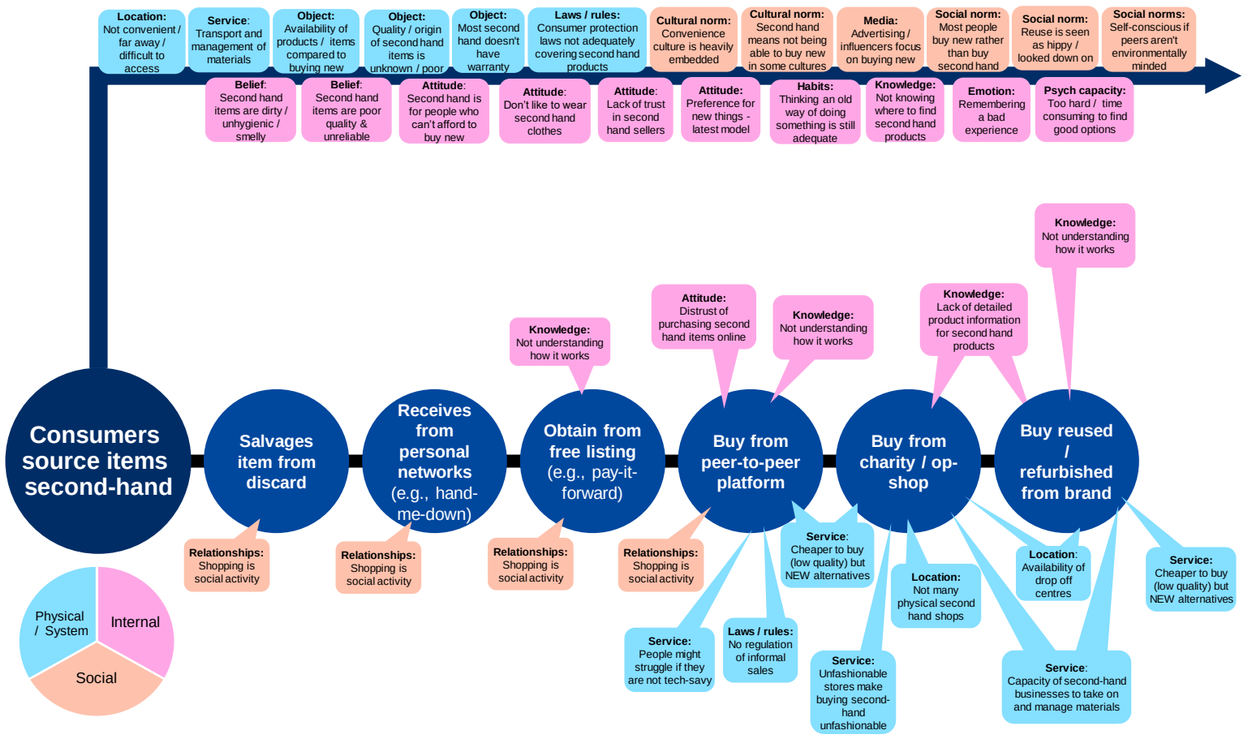
For *buying second-hand clothing*[3], the primary drivers were:

- Affordability
- Bargain / treasure hunting
- Distance from the mainstream
- Social interactions (social media; friends; word of mouth)
- Attractive visual displays.

And the primary barriers were:

- Hygiene
- Unknown past
- Stigma of second hand
- Not on trend
- Poor shop displays / layouts
- Inconvenient store locations
- Time investment to find the right item / size
- Poor quality
- Too much product
- Cost difference not as great compared to fast fashion.

BARRIERS TO INDIVIDUAL BEHAVIOURS	
Physical / System • Location: Not convenient / far away / difficult to access • Location: Not many physical second hand shops • Location: Availability of drop off centres • Service: Transport and management of materials • Service: People might struggle if they are not tech-savy • Laws / rules: No regulation of informal sales • Service: Cheaper to buy (low quality) but NEW alternatives • Service: Unfashionable stores make buying second-hand unfashionable • Service: Capacity of second-hand businesses to take on and manage materials • Service: Cheaper to buy (low quality) but NEW alternatives • Object: Availability of products / items compared to buying new • Object: Quality / origin of second hand items is unknown / poor • Object: Most second hand doesn't have warranty • Laws / rules: Consumer protection laws not adequately covering second hand products	**Internal** • Belief: Second hand items are dirty / unhygienic / smelly • Belief: Second hand items are poor quality & unreliable • Attitude: Second hand is for people who can't afford to buy new • Attitude: Don't like to wear second hand clothes • Attitude: Lack of trust in second hand sellers • Attitude: Preference for new things - latest model • Attitude: Distrust of purchasing second hand items online • Habits: Thinking an old way of doing something is still adequate • Knowledge: Not knowing where to find second hand products • Knowledge: Lack of detailed product information for second hand products • Knowledge: Not understanding how it works • Knowledge: Not understanding how it works • Emotion: Remembering a bad experience • Psych capacity: Too hard / time consuming to find good options
Social • Cultural norm: Convenience culture is heavily embedded • Cultural norm: Second hand means not being able to buy new in some cultures • Media: Advertising / influencers focus on buying / owning	• Social norm: Most people buy new rather than buy second hand • Social norm: Reuse is seen as hippy / looked down on • Social norms: Self-conscious if peers aren't environmentally minded • Relationships: Shopping is social activity



[Responsible Consumption Codesign supporting research]

RESOURCES

Other ‘core’ circular consumption behaviours

3. Make do

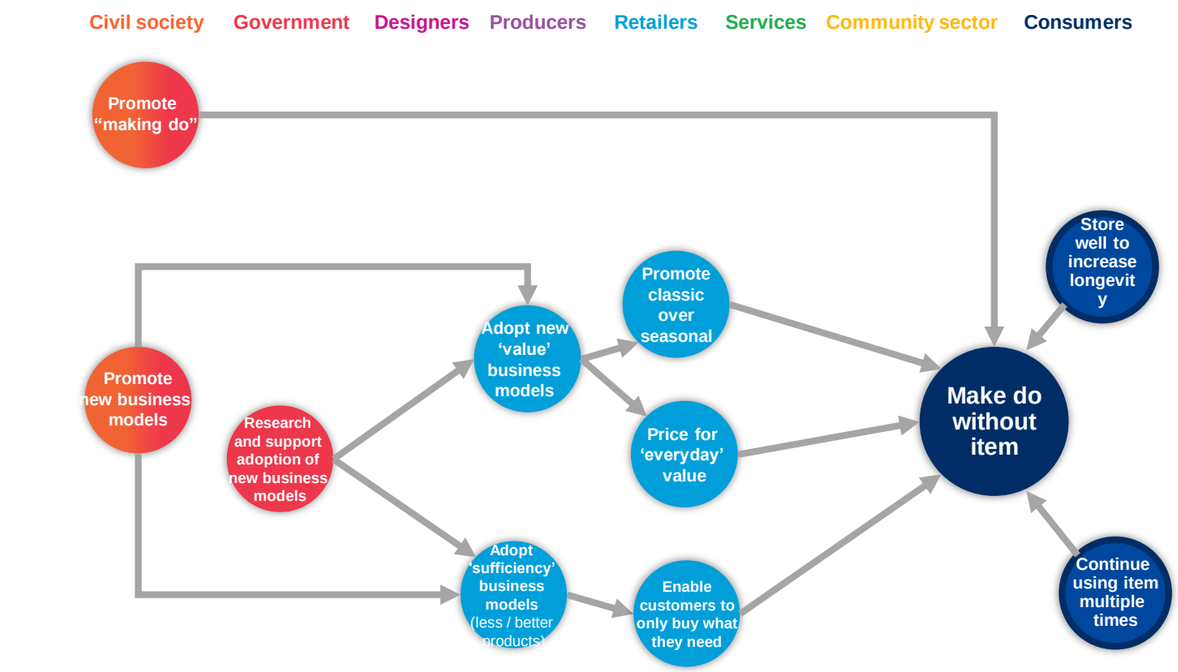
BEHAVIOURS OF CONSUMERS

Personal behaviours	Organisational behaviours
Individuals, households	**Business, Govt / civil organisations**
• Go without (do not fulfil need / want) • Reuse or repurpose existing item • Fully use up / wear out existing item • Make item (DIY)	?

BEHAVIOURS OF OTHER ACTORS IN THE SYSTEM

Civil society	Retailers
• Promote “making do” • Promote new circular business models\	• Adopt new ‘value’ business models • Adopt 'sufficiency’ business models (less / better products) • Promote classic over seasonal • Price for ‘everyday’ value • Enable customers to only buy what they need
Government	
• Promote “making do” • Promote new circular business models • Research and support adoption of new business models	
Designers	**Services**
-	-
Producers	**Community sector**
-	-

Behavioural system map



4. Buy built to last

BEHAVIOURS OF CONSUMERS

Personal behaviours

Individuals, households

- Buy technically durable item (eg. durable)
- Buy functionally durable item (eg. flexible)
- Buy aesthetically / emotionally durable item (eg. attachment)
- Buy reusable item (designed for multiple use)
- Buy repairable / upgradable item

Organisational behaviours

Business, Govt / civil organisations

- Procure technically durable item (eg. durable)
- Procure functionally durable item (eg. flexible)
- Procure reusable item (designed for multiple use)
- Procure repairable / upgradable item

BEHAVIOURS OF OTHER ACTORS IN THE SYSTEM

Civil society

- Promote buying items built to last
- Promote mandatory EPR
- Rate durability of products

Producers

- Build recycling / disposal costs into product prices
- Make items built to last
- Offer free extended / lifetime warranties

Government

- Promote buying items built to last
- Mandate EPR
- Mandate minimum design standards
- Mandate eco-labelling
- Mandate circular procurement policies

Retailers

- Advertise items built to last
- Sell items built to last
- Provide info on circular credentials

Designers

- Design upgradable software
- Design items to be durable
- Design items to be affordably repairable / upgradable
- Design items for multiple / flexible use

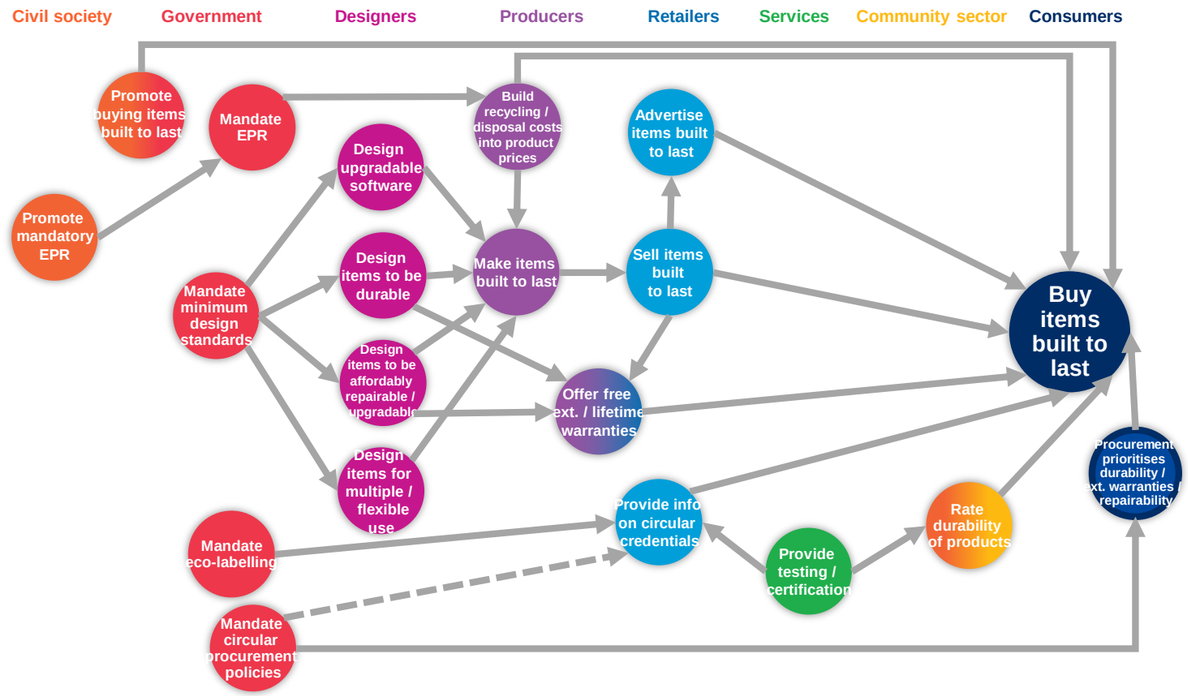
Services

- Provide testing / certification

Community sector

- Rate durability of products

Behavioural system map



5. Buy from circular materials

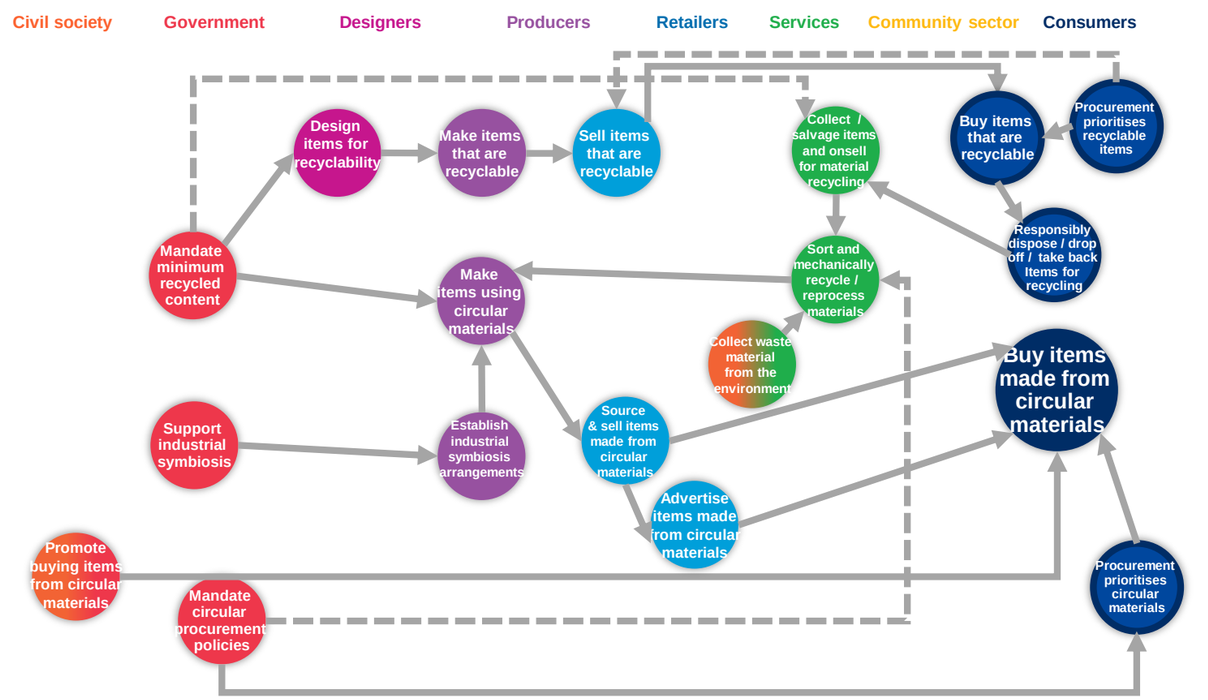
BEHAVIOURS OF CONSUMERS

Personal behaviours	Organisational behaviours
Individuals, households	**Business, Govt / civil organisations**
• Buy item made from reused materials • Buy item made from reclaimed material • Buy item made from recycled material • Buy item made from restorative material • Buy remanufactured item	• Procure item made from reused materials • Procure item made from reclaimed material • Procure item made from recycled material • Procure item made from restorative material • Procure remanufactured items

BEHAVIOURS OF OTHER ACTORS IN THE SYSTEM

Civil society	Producers
• Promote buying items from circular materials • Collect waste material from the environment	• Make items that are recyclable • Make items using circular materials • Establish industrial symbiosis arrangements
Government	**Retailers**
• Mandate minimum recycled content • Support industrial symbiosis • Promote buying items from circular materials • Mandate circular procurement policies	• Sell items that are recyclable • Source & sell items made from circular materials • Advertise items made from circular materials
Designers	**Services**
• Design items for recyclability	• Collect / salvage items and onsell for material recycling • Sort and mechanically recycle / reprocess materials • Collect waste material from the environment
	Community sector

Behavioural system map



6. Keep using

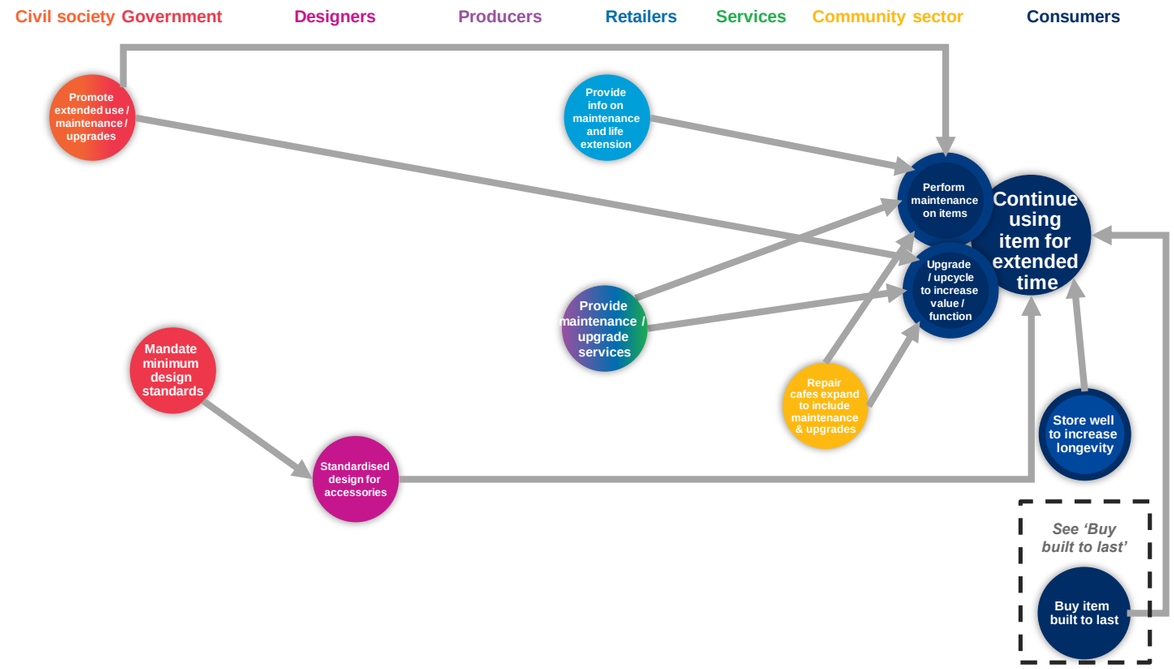
BEHAVIOURS OF CONSUMERS

Personal behaviours	Organisational behaviours
Individuals, households	**Business, Govt / civil organisations**
• Use own item multiple times for same function • Find new use / purpose for own item (minimal modification) • Store item appropriately • Perform DIY maintenance on item • Pay to get item serviced (third-party or manufacturer) • Get serviced under lease agreement • Modify or upcycle item (DIY) • Upgrade components of item (DIY) • Upgrade through paid service (third-party or manufacturer) • Upgrade under lease agreement	• Store item appropriately • Perform inhouse maintenance on item • Pay to get item serviced (third-party or manufacturer) • Get serviced under lease agreement • Upgrade components of item inhouse • Upgrade under lease agreement

BEHAVIOURS OF OTHER ACTORS IN THE SYSTEM

Civil society	Producers
• Promote extended use / maintenance / upgrades	• Provide maintenance / upgrade services
Government	**Retailers**
• Promote extended use / maintenance / upgrades • Mandate minimum design standards	• Provide info on maintenance and life extension • Provide maintenance / upgrade services
Designers	**Services**
• Standardised design for accessories	• Provide maintenance / upgrade services
	Community sector
	• Repair cafes expand to include maintenance & upgrades

Behavioural system map



7. Repair

BEHAVIOURS OF CONSUMERS

Personal behaviours	Organisational behaviours
Individuals, households	**Business, Govt / civil organisations**
• Repair themself / through personal contacts • Repair for free by manufacturer under purchase warranty • Repair for free by manufacturer under consumer guarantee • Repair through free community / Council service • Repair through commercial third-party service • Repair through leasing / subscription service	• Conduct repair in-house (employ repairers) • Repair under service level agreement with retailers (negotiated during purchase) • Repair under service level agreement with contracted third-party service (negotiated post-purchase) • Repair under rental / leasing agreement • Repair through paid service provider • Repair under purchase warranty

BEHAVIOURS OF OTHER ACTORS IN THE SYSTEM

Civil society
- Deliver education & persuasion campaigns
- Rate repair-ability

Government
- Deliver education & persuasion campaigns
- Provide financial support
- Provide tax incentives
- Mandate minimum standards
- Mandate Right to Repair
- Fund / support repair courses

Designers
- Design item built to last (repairable)

Producers
- Honour warranties for repaired items
- Make item built to last (repairable)
- Include free lifetime warranty
- Make parts / tools available

Retailers
- Sell item built to last (repairable)

Services
- Provide (affordable) repair services
- Teach repair skills

Community sector
- Rate repair-ability
- Teach repair skills
- Provide free repair

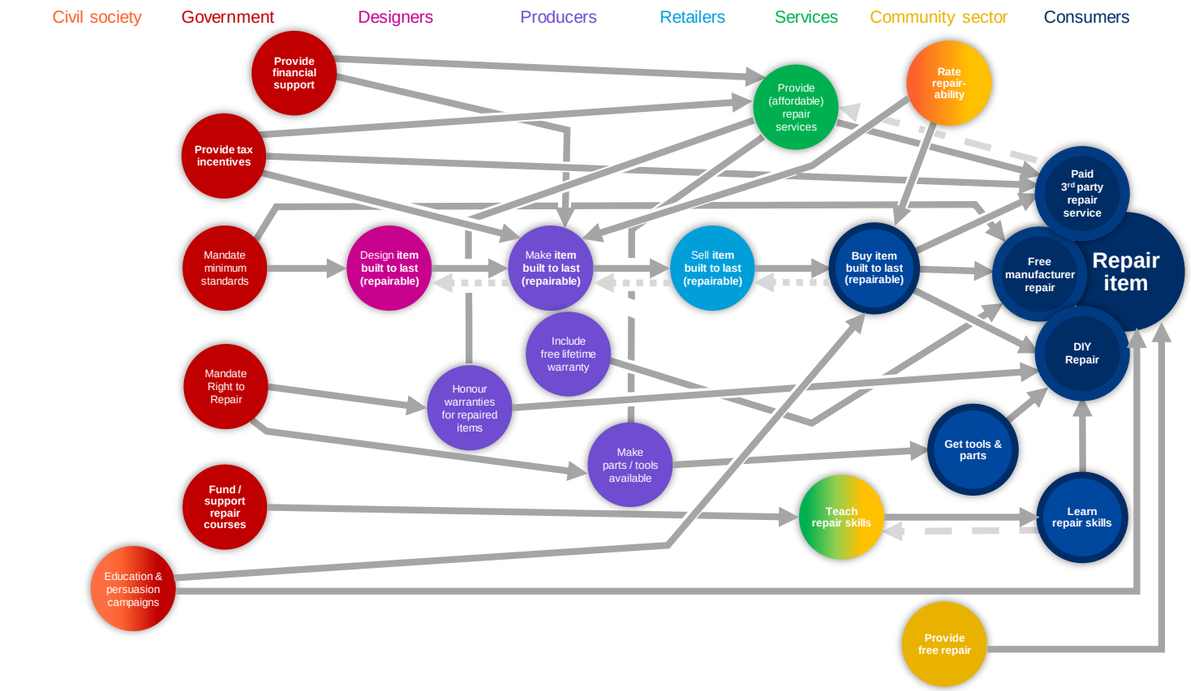
BARRIERS TO INDIVIDUAL BEHAVIOURS

Physical / System
- Policy / service: Lack of / reduced warranty for repair
- Policy: No clear guidelines on acceptable lifespans
- Service: No accessible service nearby
- Service: Paying for right they already have
- Service: Subscription cost high
- Service: Not common business model
- Technology: Speed of tech improvements means existing items obsolete
- Object: Broken item is not designed to be repairable
- Object: Access to tools / instructions
- Object: Parts / instructions not made available by provider
- Object: Parts / instructions not made available by provider
- Physical capacity / transport: Able to get item to provider
- Object: Collection / return delivery not part of service
- Physical capacity / transport: Able to get item to provider

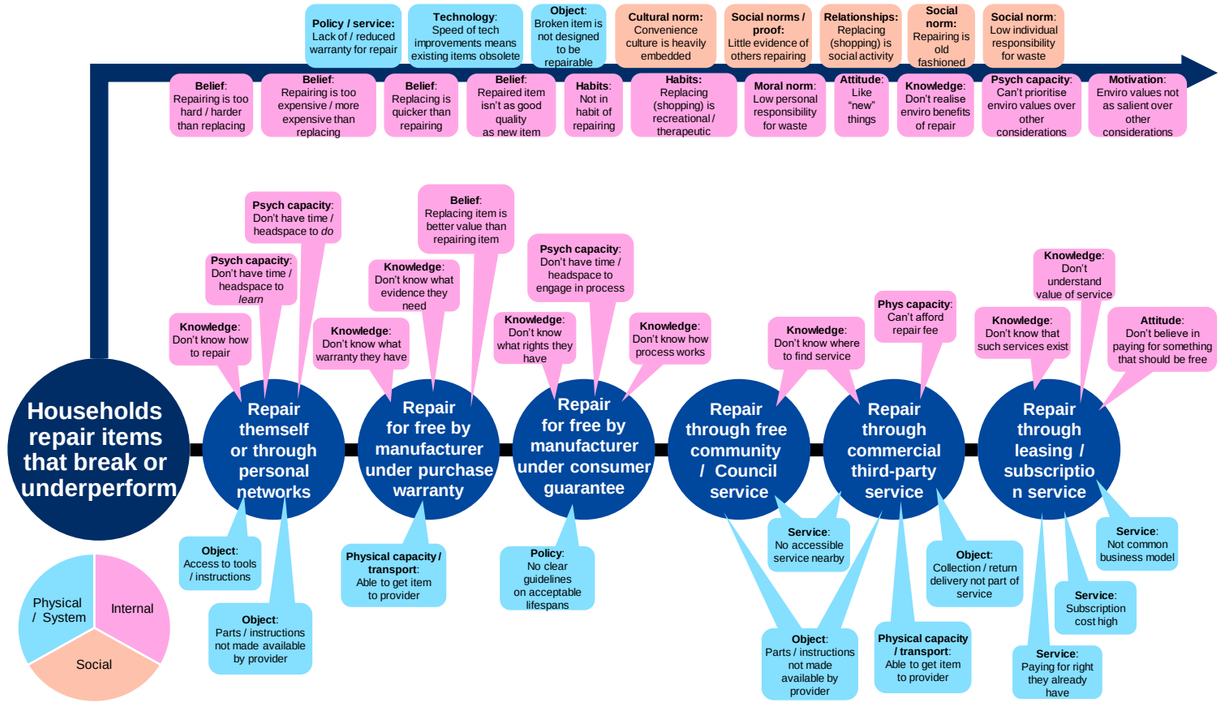
Social
- Cultural norm: Convenience culture is heavily embedded
- Social norms / proof: Little evidence of others repairing
- Relationships: Replacing (shopping) is social activity
- Social norm: Repairing is old fashioned
- Social norm: Low individual responsibility for waste

Internal
- Belief: Repairing is too hard / harder than replacing
- Belief: Repairing is too expensive / more expensive than replacing
- Belief: Replacing is quicker than repairing
- Belief: Repaired item isn't as good quality as new item
- Belief: Replacing item is better value than repairing item
- Habits: Not in habit of repairing
- Habits: Replacing (shopping) is recreational / therapeutic
- Moral norm: Low personal responsibility for waste
- Attitude: Like "new" things
- Knowledge: Don't realise enviro benefits of repair
- Knowledge: Don't know how to repair
- Knowledge: Don't know what warranty they have
- Knowledge: Don't know what evidence they need
- Knowledge: Don't know what rights they have
- Knowledge: Don't know how process works
- Knowledge: Don't know where to find service
- Knowledge: Don't know that such services exist
- Knowledge: Don't understand value of service
- Motivation: Enviro values not as salient over other considerations
- Psych capacity: Can't prioritise enviro values over other considerations
- Psych capacity: Don't have time / headspace to *learn / do*
- Psych capacity: Don't have time / headspace to engage in process
- Phys capacity: Can't afford repair fee
- Attitude: Don't believe in paying for something that should be free

Behavioural system map



Barriers



8. Pass on

BEHAVIOURS OF CONSUMERS

Personal behaviours

Individuals, households

- Return item to brand
- Donate item to charity / community org
- Gift item to personal networks
- Give item away during swap meets
- List item for free through peer-to-peer program
- Sell item through peer-to-peer platform
- Sell / give away item for parts
- Appropriate dispose item at end-of-life

Organisational behaviours

Business, Govt / civil organisations

- Return item to brand
- Donate item to charity / community org
- Sell item through b2b platform

BEHAVIOURS OF OTHER ACTORS IN THE SYSTEM

Civil society

- Promote passing on

Government

- Mandate minimum design standards
- Mandate product stewardship / EPR
- Promote passing on

Designers

- Design items for disassembly

Producers

- Provide digital passports for products
- Repair / recondition / refurbish and resell returned goods
- Recover parts / components for repair or remanufacture
- Voluntarily participate in EPR / product stewardship

Retailers

- Provide / sponsor dedicated resale platforms
- Provide buy-back or take-back schemes or incentives
- (Repair and) resell returned goods
- Take old items when delivering new

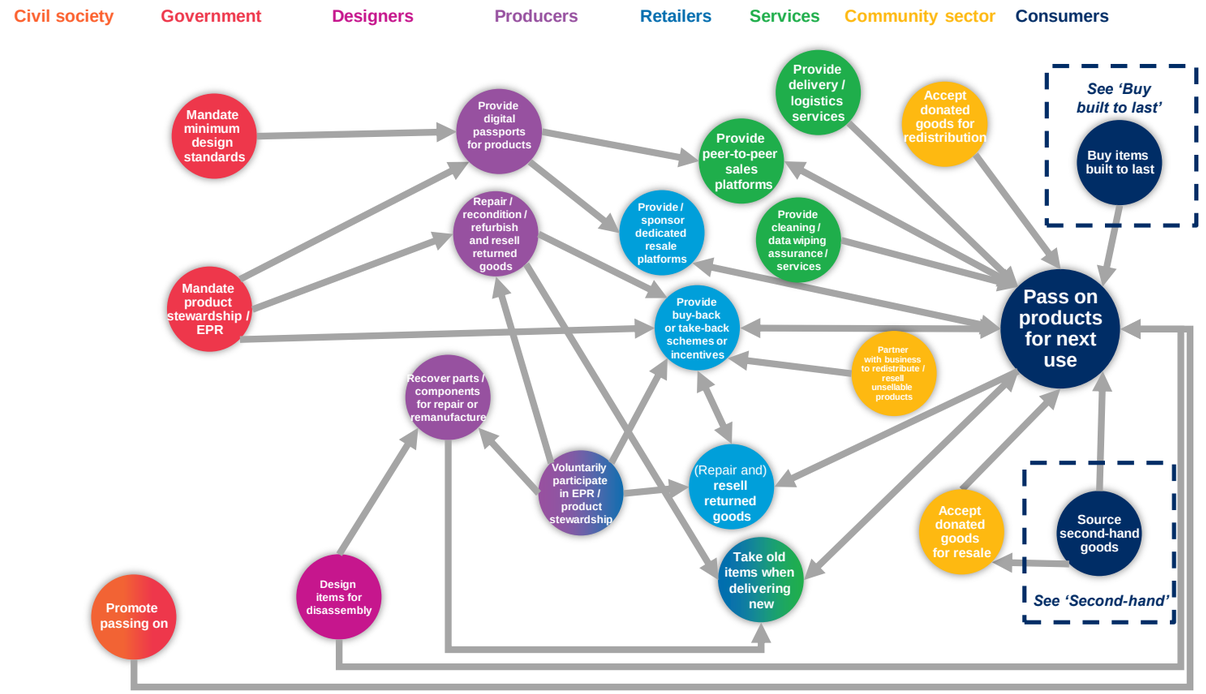
Services

- Provide delivery / logistics services
- Provide peer-to-peer sales platforms
- Provide cleaning / data wiping assurance / services
- Take old items when delivering new

Community sector

- Accept donated goods for redistribution
- Partner with business to redistribute / resell unsellable products
- Accept donated goods for resale

Behavioural system map



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