

Expanding reuse opportunities for recycled construction materials- SURVEY FINDINGS

11 June 2020



A project funded by the state government
and administered by the Waste Authority

Foundations
Research

Since 2015

This project is funded by the State Government through the Waste Avoidance and Resource Recovery Account, and administered by the Waste Authority.

Executive Summary

- An industry survey has found that 3 in 5 construction industry practitioners have no, limited, or only some understanding of recovered or recycled materials available in WA.
- 2 in 5 respondents were not able to identify any projects where they were aware of recycled products construction being used.
- Awareness of recycling of sand, soil, bricks, tiles and pavers is higher than less frequently recycled materials such as plastics, metal, timber, and rock and stone. Some respondents reported knowledge of 'other' recycled materials in construction including glass, rubber, furniture, and tyres.
- A majority of respondents wanted more information on the more commonly recycled materials.
- The survey found that the main perceived barriers to recycling are environmental specifications, structural specifications, cost and availability.
- More positively, the survey found that 71% of respondents were very likely or definitely to use recycled construction materials in future projects.
- The survey was circulated between April and June 2020 to industry and government participants by key associations and institutes:
 - Australian Institute of Landscape Architects,
 - Civil Contractors Federation
 - Housing Industry Association
 - Landscape Industries Association of WA
 - Urban Development Institute Association (WA)
 - WA Construction & Demolition Waste Recycling Working Group
 - WA Local Government Association
- 68 responses were received from developers, builders, engineers, landscape architects, environmental consultants, and civil contractors.
- The results will be used to assist to prepare the content of a new guide to assist in the procurement of recycled waste in Western Australia. It will be freely available to engineers, government decisionmakers and other stakeholders in July.
- *This project was part funded by the State Government through the Waste Avoidance and Resource Recovery Account, and administered by the Waste Authority.*

Background and objectives

Construction and demolition materials are the largest volume of waste resources diverted from landfill in WA. They are also the largest volumes of waste generated of any material type. However, there is a lack of acceptance and demand for these recycled construction products. There are currently growing stockpiles of recovered construction and demolition materials available for reuse in WA.

Active Sustainability and Foundation Research received funding and support from the Waste Authority through the Community and Industry Engagement program (CIE) for a research project to tackle perceived impediments to recycling of construction materials in WA. It aims to reduce stockpiles and to encourage construction industry recycling to achieve the WA Government's Waste Strategy 2030 'Recover' objective target to increase material recovery and reuse to 75% by 2025.

The survey was conducted as part of the project to better understand industry concerns and impediments, and to identify opportunities for the use of recycled construction materials in future development projects.

Critically, the survey sought to identify:

- (a) general awareness of recycling options in the construction industry;
- (b) awareness of specific recycled products available in Western Australia;
- (c) projects where recycling has occurred;
- (d) suppliers active in recycling;
- (e) key perceived barriers to recycling;
- (f) procurement policy changes sought by industry; and
- (g) interest in using recycled products in future products.

The results will be used to help identify opportunities for further development of C&D waste markets in WA by informing the content of a new guide to assist in the procurement of recycled waste in Western Australia. It will be freely available to engineers, government decisionmakers and other stakeholders.

SURVEY METHOD

The survey was open between Friday 10 April and Wednesday 10 June.

It was distributed by a significant number of supportive project partners – primarily via email and also via social media (LinkedIn):

- Australian Institute of Landscape Architects,
- Civil Contractors Federation
- Housing Industry Association
- Landscape Industries Association of WA
- Urban Development Institute Association (WA)
- WA Construction & Demolition Waste Recycling Working Group
- WA Local Government Association
- Department of Communities
- DevelopmentWA

These organisations cover representatives from all the key target groups of decision makers in the construction industry who are involved in the procurement of construction materials – namely developers, builders, engineers, local and state government, and landscapers.

The survey was kept short and promoted as a 5-minute survey to encourage a higher response rate.

The survey was first trialled with industry association representatives and some minor changes were made following feedback.

The deadline was extended at the request of several stakeholders, again to facilitate time to allow for more responses.

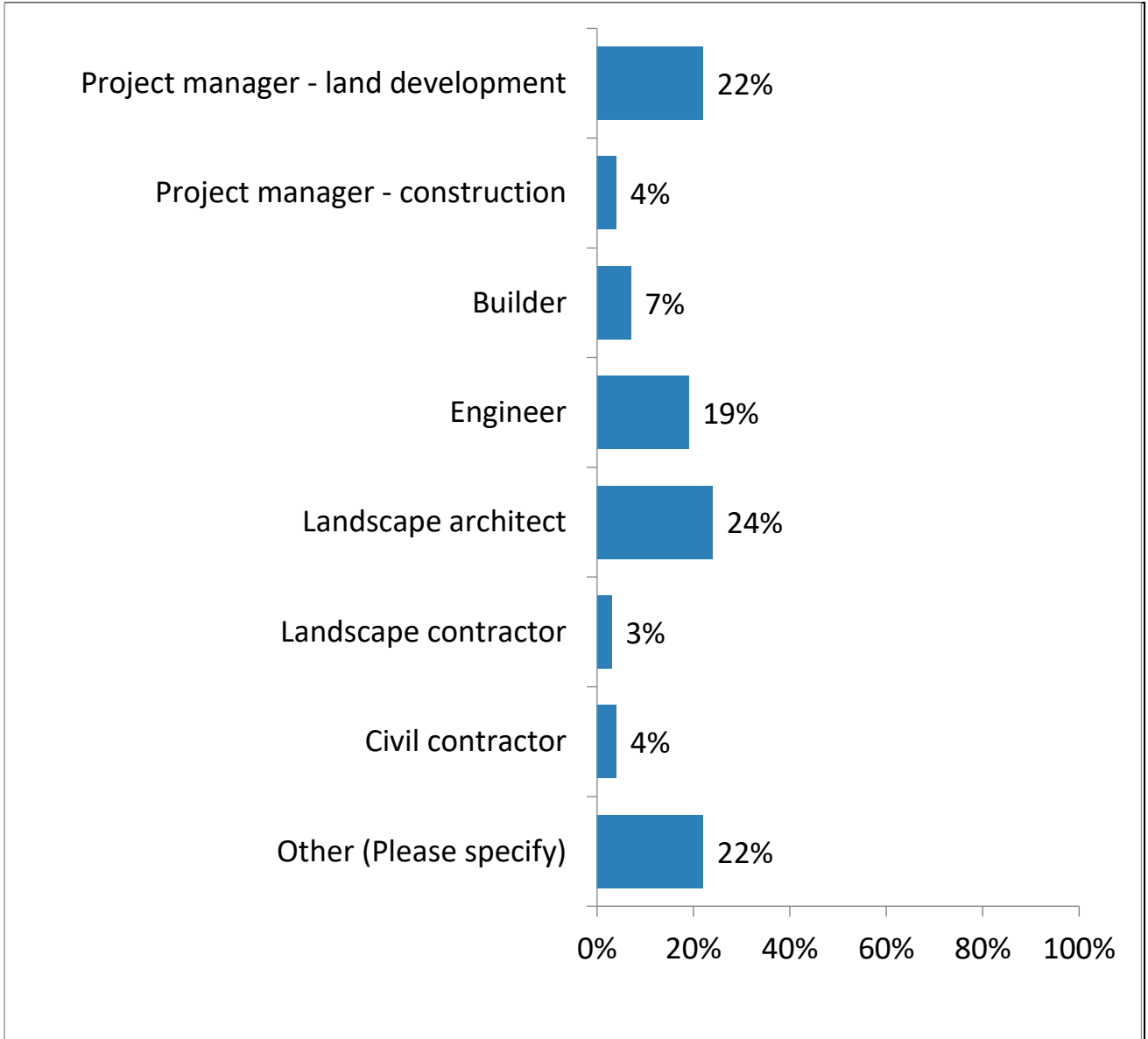
After a review of online survey providers, SoGoSurvey was chosen for its user-friendly systems and access to results. The online platform allowed for users to click on an email link to a well-presented webpage with an introduction and simple question format to elicit additional responses.

A copy of the survey questions is attached in Appendix 1.

SURVEY RESULTS

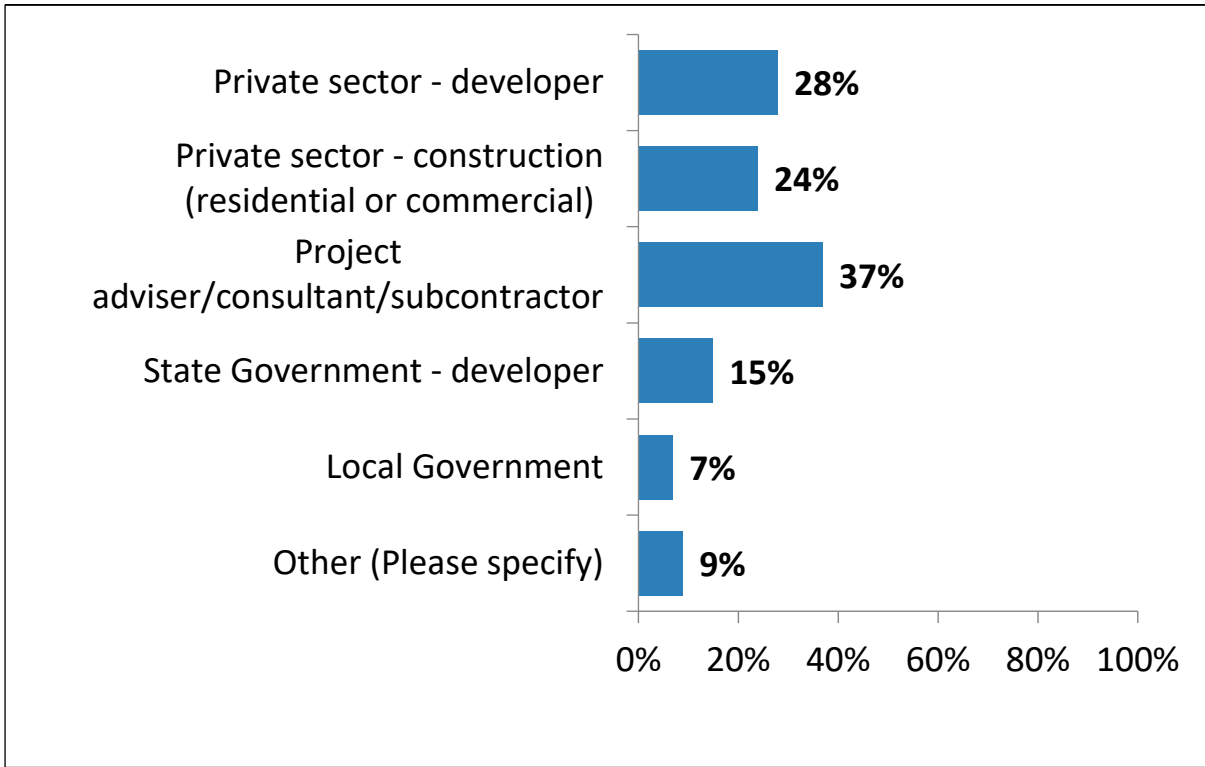
A total of **68 responses** were received to provide a strong sample size.

Question 1 confirmed that results were received a cross section of industry participants.



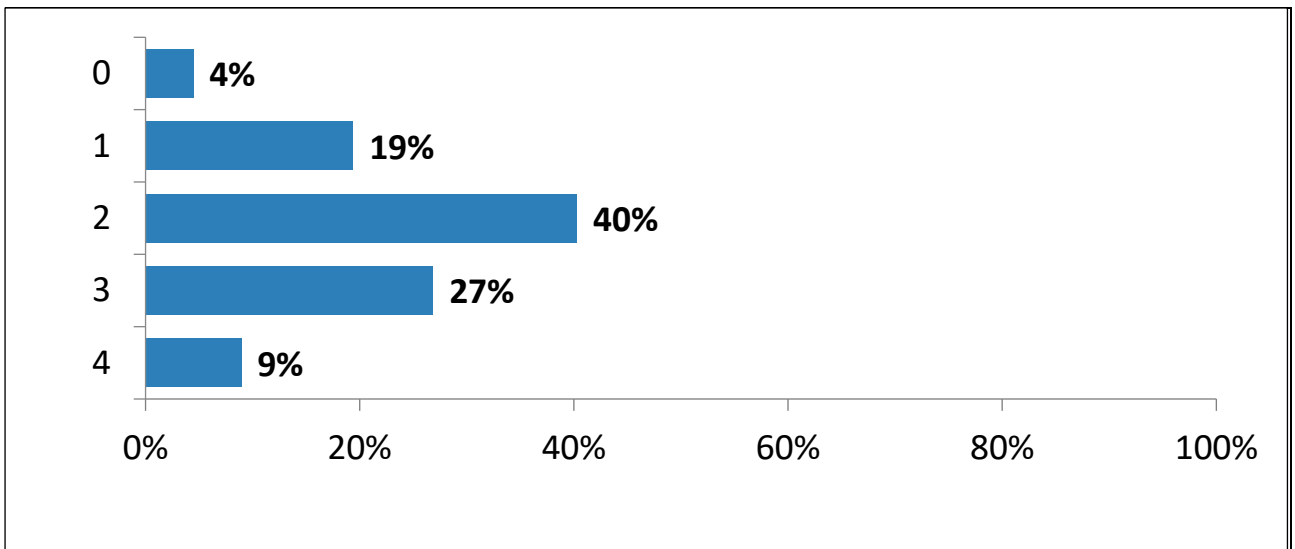
The “other” category (15 responses) included environmental consultants/scientists, waste and recycling providers, planners, and sustainability managers.

Question 2 identified the sectors in which the respondents worked:



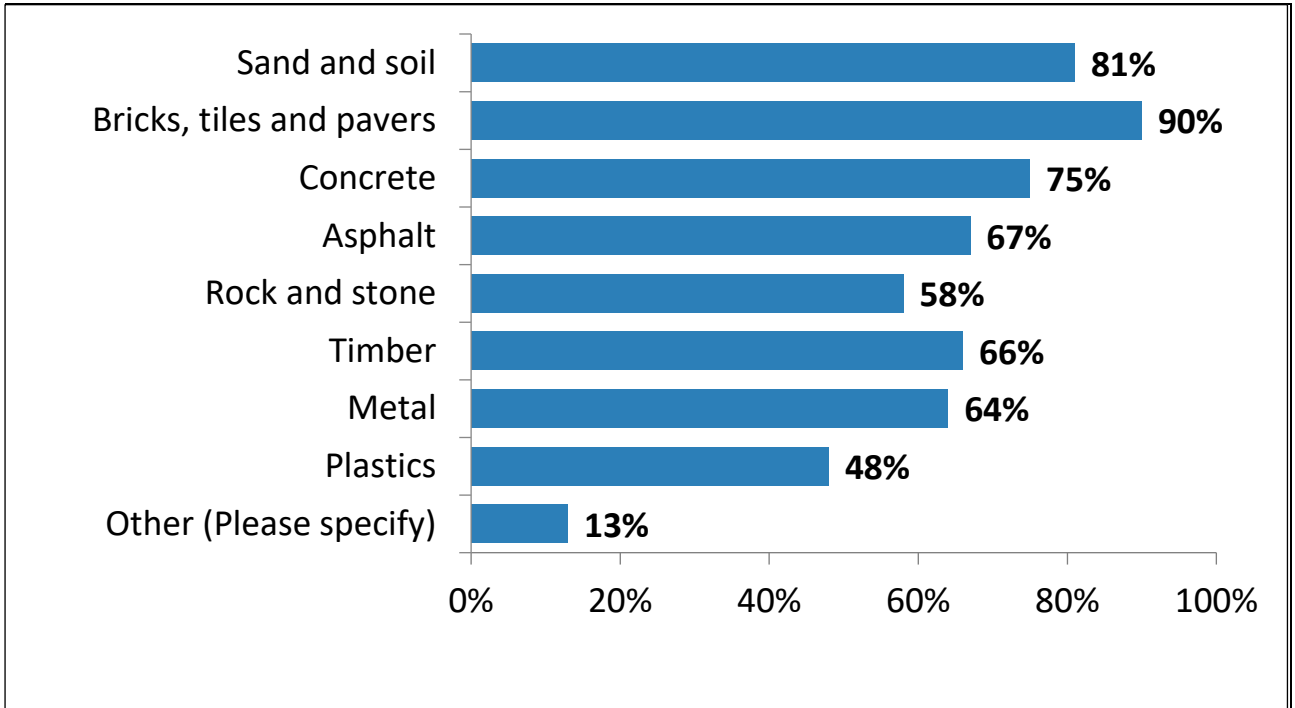
The other category captured government head contractor, civil contractor, waste and recycling provider.

Question 3 asked respondents “How would you rate your awareness of recovered or recycled construction materials available in WA? (0=none, 1=limited, 2=some, 3=broad, 4=high)”



This response reveals that 2 in 3 industry participants (or 63%) have no, limited or only some understanding of recovered or recycled materials available in WA. Conversely 36% have broad or high knowledge of recovered or recycled construction materials.

Question 4 asked respondents about their awareness of materials that are being recovered and reused in WA.



These results suggest that awareness of recycling of sand, soil, bricks tiles and pavers is relatively higher than less frequently recycled materials such as plastics, metal, timber and rock and stone. “Other” materials identified by respondents were glass, rubber, hydrocarbons, trees, furniture, and tyres.

Question 5 asked respondents to “identify any projects where you are aware of recycled construction products being used in WA and what they were used for (ie project name or build, location and application of the recycled product).

Notably, 2 in 5 respondents (or 39%) were not able to identify any projects where they were aware of recycled products construction being used.

The 61% of respondent who were able to identify projects where recycled products were being used did however provide an extensive list of potential case studies:

Below is a table of supplied examples of recycling. Where multiple responses have been received, the table notes this (eg. X2).

Alkimos Beach (& Alkimos Vista) (x4) by LendLease and DevelopmentWA-builders waste from participating builders was recycled by Earthcare, sand from lots used as deep fill, rest sent to recyclers and some of the crushed material (recycled sand, concrete, bricks, asphalt) was used for commercial builders drainage works

Amberton estate (x2) - Construction waste being used in footpaths by Stockland
Aveley North Primary school - Green waste mulch
Brownlie Towers,
Bushmead (x2) - Crushed concrete and aggregate as road base; Timber for landscape features, recycled materials in retaining wall backing blocks.
Bushmead Estate (x2) - recycled concrete pavement used in road base, recycled concrete eco block for retaining wall construction, recycled timber used in play equipment. Mulch, clay, gravelly sand reused on site or stockpiled for future reuse.
Busselton Playspace - recycled timber to custom play equipment.
Calleya
East Village - recycled steel in shade structures, E3 Living Lab materials and potential reuse, recycled aggregate in road base.
East Village, Fremantle. Recycled concrete in use in boundary and retaining walls. Steel beams from another site re-purposed in the shade structure.
Golden Bay - recycled sand, bricks, plastic strapping
Hamilton Hill Senior High School, Hamilton Hill (x6) by DevelopmentWA. Targeting 100% reuse of demolition materials (concrete, bricks, asphalt, glass, trees / timber.). Imported RAP being investigated for road surfaces - recycled materials included bricks tiles, concrete and other demolition materials for use on site as road base and landscape elements. Used for civil and landscape items including road base, paving, drainage aggregate, shelters, walls, art / interpretation.
Harrisdale North Primary School - crushed recycled brick/concrete as a mulch
Cockburn https://www.cockburn.wa.gov.au/About-Cockburn/News/Latest-News/Two-new-roads-paved-with-recycled-waste-products
Kingsford - Recycled brick, tiles etc for landscape elements
Kwinana Freeway upgrade (x3)- sub base material
Kwinana power station CRC
Margaret River Shire were creating a glass sand product from recycled glass at the top that was used throughout the shire as fill sand. This was probably 2012 -2014
Metronet - Forrestfield Airport Link
Montario Quarter
Murdoch ETC - recycled glass aggregate (concrete), recycled plastic screens

New Perth Stadium - Site salvaged trees and recycled timber used in playground and through parkland
Pear Tree Cafe in Hamilton Hill - Pop Up Forest
Port Coogee - Plastics in the asphalt
Primarily blended soils in POS areas and R&D waste for track and road construction
RAAF air base but approval pending as its an alternative to the virgin specification in the civil contract.
Reid Hwy over Swan River - Main Roads Project - Embankment Fill Gateway WA - Recycled Tyres in Noisewall - Towie Street
RioTinto NatureScape - recycled timber to walkway structures
Roads to Reuse by Main Roads- recycled concrete used in Road Base
Rosehill Waters
Sienna Wood
Subiaco Oval (x3) demolition by Development WA - re-use of concrete from the grandstands as road base by Main Roads.
Sunset Park - Dalkieth - Extensive use of recycled material in gabions, furniture etc
TAFE Greenskills Facility - recycled timber (internal fitout)
The Amble, crushed concrete and aggregate as road base; recycled sand for fill, recycled materials in retaining wall backing blocks.
Vale
WGV by LandCorp, Fremantle. Removed vegetation reused as mulch and to construct public space furniture
Whiteman Edge x 4 (Stockland) using a recycled asphalt made partly from plastic bags, ink containers and glass bottles
Yanchep Golf Estate - recycled timber, plastic strapping, sand

Some respondents noted general reuse examples:

- Generally - use of recycled bricks in residential construction
- Specifically - use of recycled crushed bricks as gravel paving material
- Bricks & concrete for major new roads as sub-base.

- Gold mines use waste rock and tailings to construct tails dam lifts eg northern star south Kalgoorlie
- Green concrete, recycled timber, general crushed aggregate. All non reusable materials on site are sent off site for recycling.
- Reconosphalt

Question 6 asked respondents to list suppliers and the recycled / waste-derived products they supply.

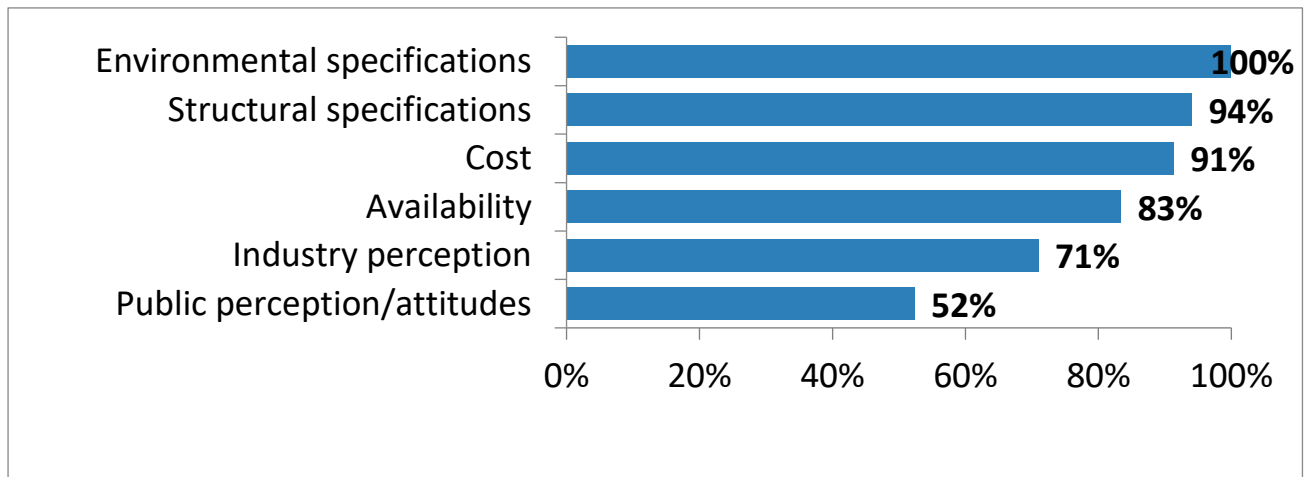
118 suppliers were named as the 68 respondents could list multiple waste services companies.

After removing duplicated names, there were 50 suppliers identified.

2 were based over east. Corporate groups (eg Boral, BGC) were treated as 1 supplier, even if they have multiple businesses recycling.

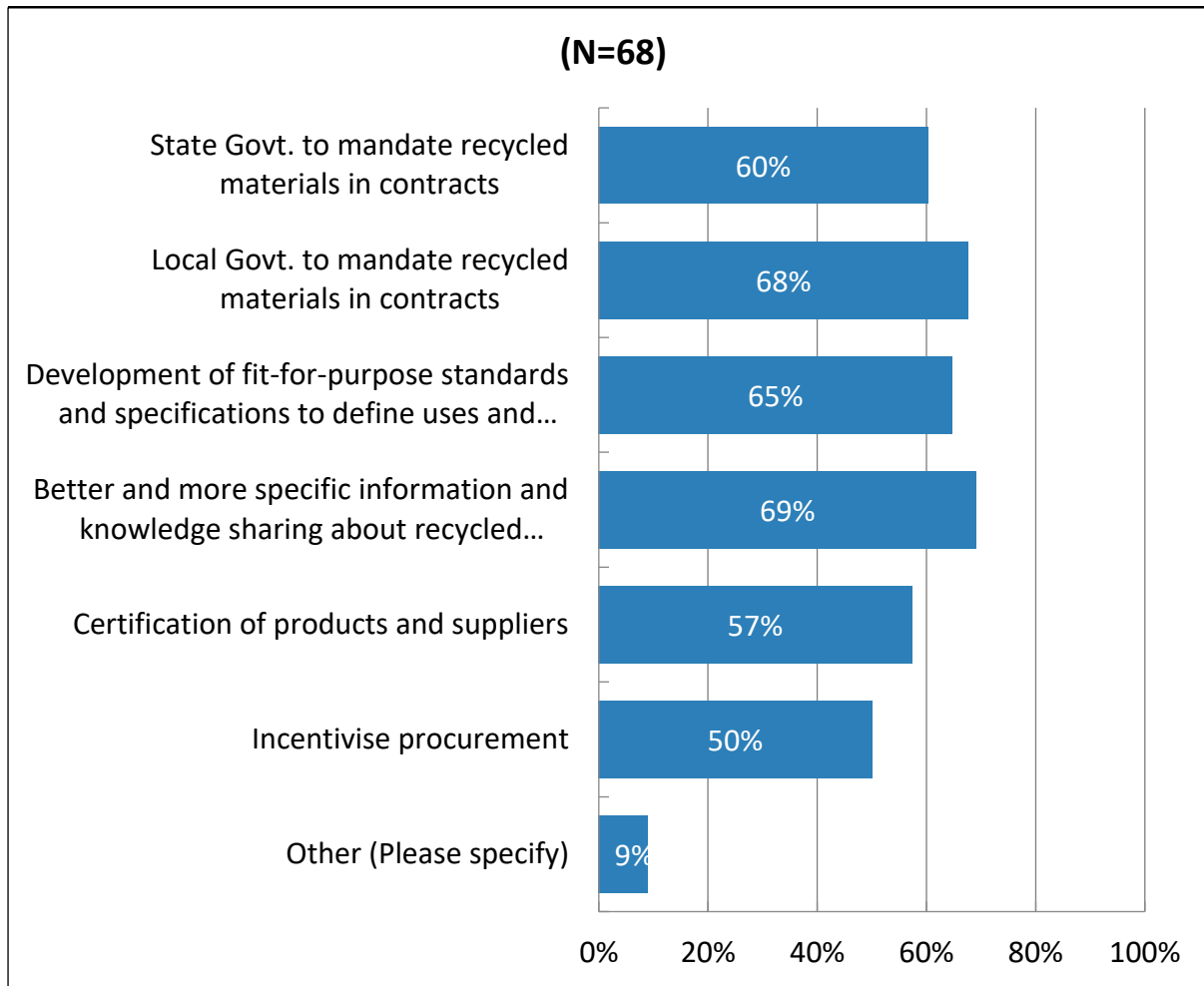
Responses indicate a significant variety of suppliers of recycled construction materials available.

Question 7 asked respondents to rank, in order of significance, barriers to the use of recycled construction materials (1=most significant; 6=least significant)



This suggests that there are mixed views about industry perceptions and public perceptions of recycled products. However, it is clear that environmental specifications, structural specifications, cost and availability are regarded as the main barriers to recycling by a strong majority of respondents.

Question 8 asked what are the policy and/or procurement changes that would increase the uptake of recycled products in WA.

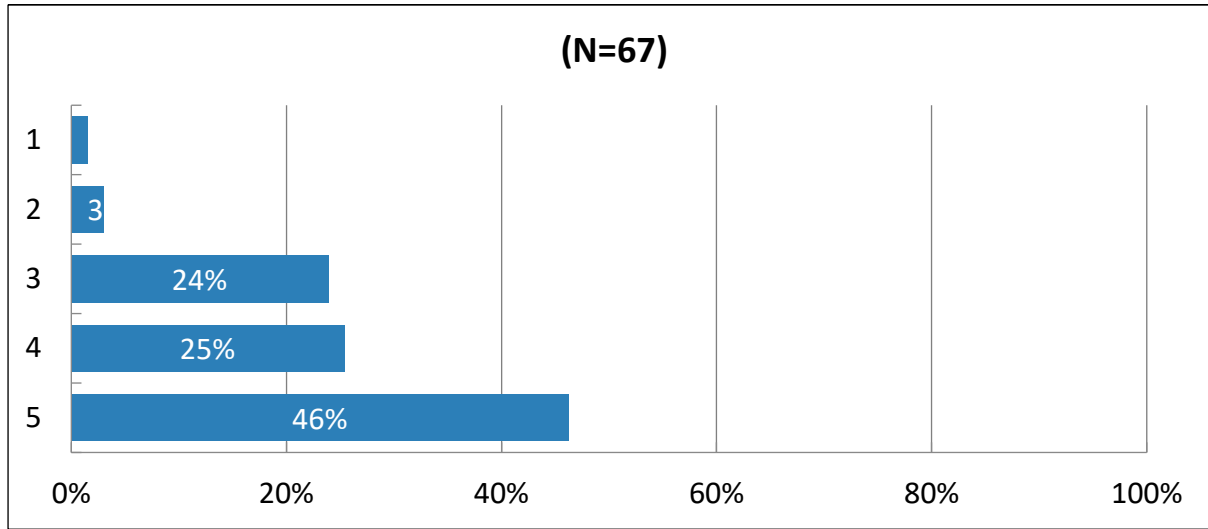


A majority of respondents support mandated recycled materials in Government contracts. There was also majority support for fit-for-purpose standards, better knowledge sharing, certification and incentivised procurement.

Other suggestions included:

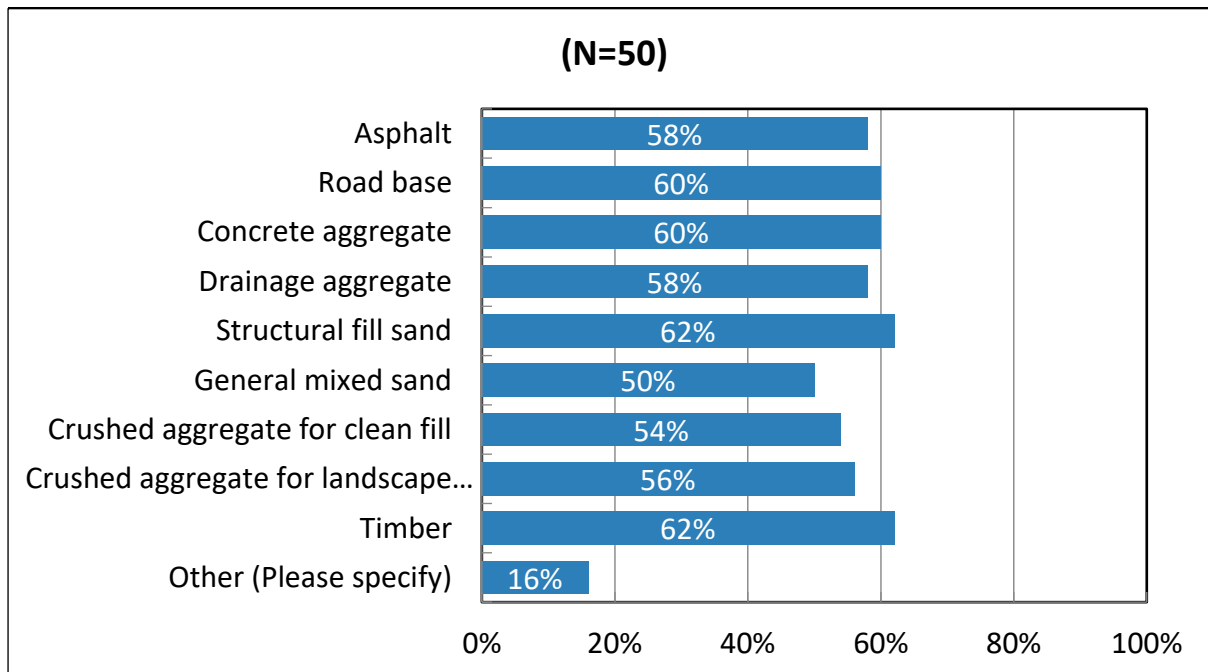
- Incentivising private investment in technology that supports more effective recycling methods of materials
- Ensuring local governments are prepared to accept the products in their assets, which is the biggest impediment. If the developer needs to provide indemnities, operate trials, or accept risk, then it limits the application.
- Demonstration projects that have stretch targets for resource recovery, use of reused and recycled materials, and that communicate the outcomes comprehensively.
- Removal of the waste levy

Question 9 asked how likely respondents were to use recycled construction materials in future projects? (1=never, 2=unlikely, 3= possibly, 4=very, 5=definitely)



71% of respondents were very likely or definitely to use recycled construction materials in future projects. Only 5% said that they were unlikely or never going to use recycled construction materials in the future.

Question 10 asked whether respondents would like any more information on various recycled products.



This indicated that a majority of respondents wanted more information on the more commonly recycled materials.

Other suggested information needs were

- “Recycled content in steel fittings and pipelines, recycled content in PVC pipe, Recycled content in copper pipe etc.”
- “Plastic”
- “Waste to Energy Byproduct materials”
- “Everything please - we want to be able to set up at least in our own internal XXX owned developments better use of recycled products and any information on sources, specs, alternatives, suppliers will be gladly received”
- “Recycled plastic products”
- “Recycled Organics”
- “Anything else”



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APPENDIX 1 – FULL SURVEY AND RESULTS