YOU WANT WSUD WITH THAT?
IDENTIFYING AND BREAKING BARRIERS TO UPTAKE

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Manaaki Whenua Landcare Research

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National Science Challenges | BUILDING BETTER HOMES, TOWNS AND CITIES | Ko Ngā wā Kainga hei whakamāhorahora

Outline

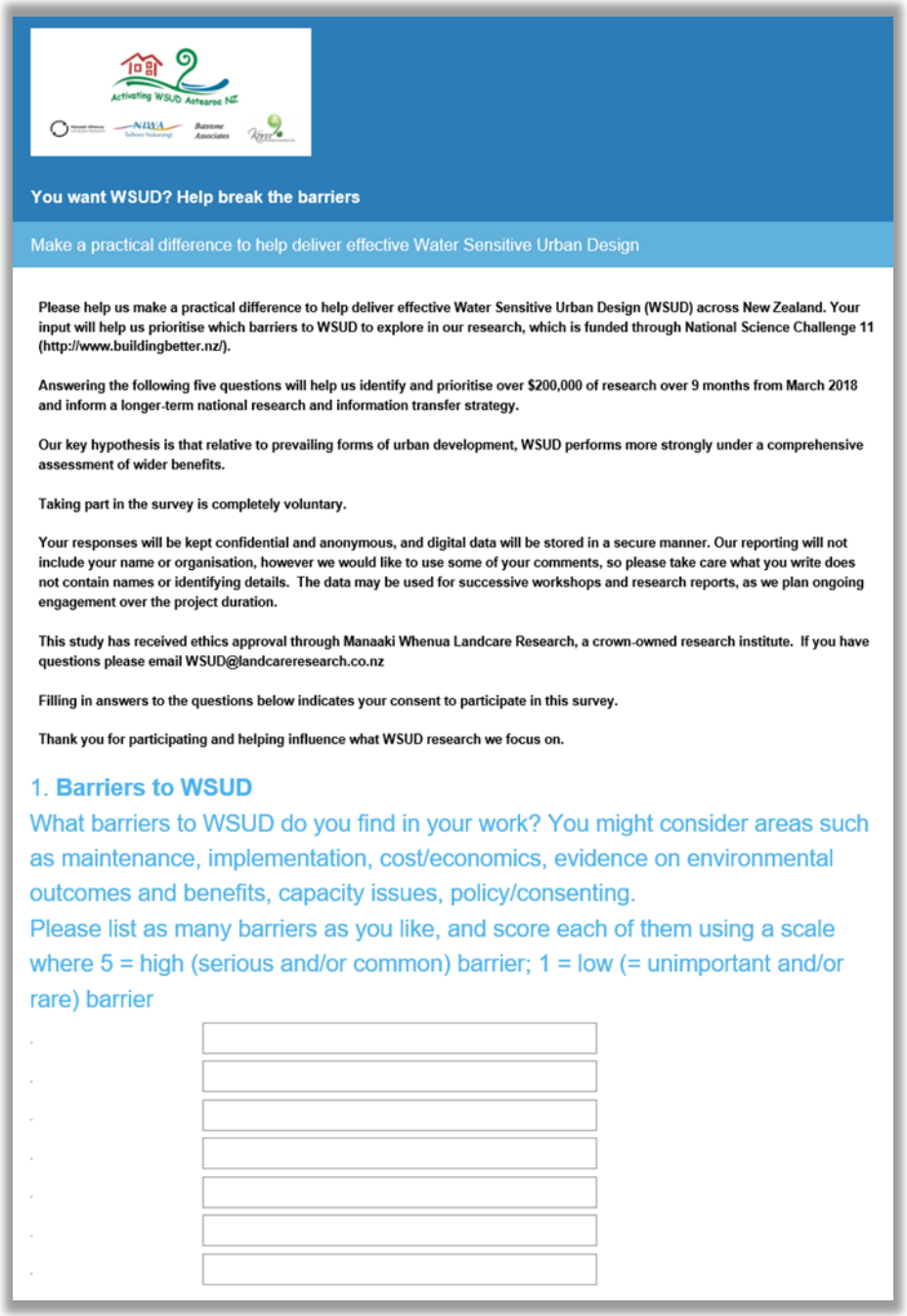
- Project overview
- Methods
- Findings
- Next Steps

Project overview

- Building Better Homes, Towns and Cities National Science Challenge
- Project Aims
  - Activate WSUD community of practice
  - Deliver ‘quick wins’
  - Longer term strategic research plan
- Project Structure
  - Discovery phase
  - Research phase
  - Dissemination phase

Methods - Survey

- Barriers
- Activating factors
- Recent experience
- Sector / Expertise / Region



You want WSUD? Help break the barriers

Make a practical difference to help deliver effective Water Sensitive Urban Design

Please help us make a practical difference to help deliver effective Water Sensitive Urban Design (WSUD) across New Zealand. Your input will help us prioritise which barriers to WSUD to explore in our research, which is funded through National Science Challenge 11 (http://www.buildingbetter.nz/).

Answering the following five questions will help us identify and prioritise over $200,000 of research over 9 months from March 2018 and inform a longer-term national research and information transfer strategy.

Our key hypothesis is that relative to prevailing forms of urban development, WSUD performs more strongly under a comprehensive assessment of wider benefits.

Taking part in the survey is completely voluntary.

Your responses will be kept confidential and anonymous, and digital data will be stored in a secure manner. Our reporting will not include your name or organisation, however we would like to use some of your comments, so please take care what you write does not contain names or identifying details. The data may be used for successive workshops and research reports, as we plan ongoing engagement over the project duration.

This study has received ethics approval through Manaaki Whenua Landcare Research, a crown-owned research institute. If you have questions please email WSUD@landcareresearch.co.nz

Filling in answers to the questions below indicates your consent to participate in this survey.

Thank you for participating and helping influence what WSUD research we focus on.

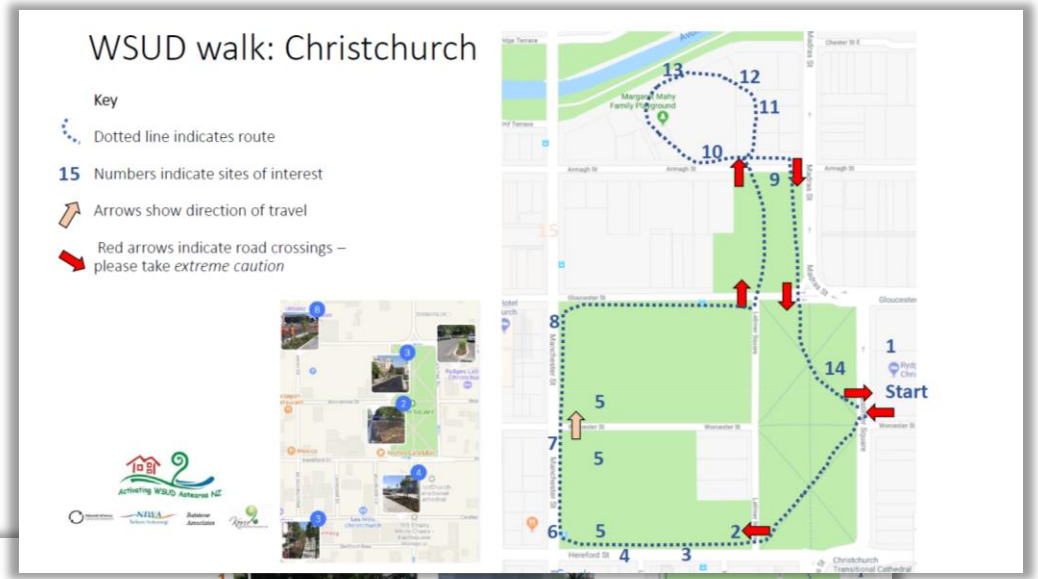
1. **Barriers to WSUD**

What barriers to WSUD do you find in your work? You might consider areas such as maintenance, implementation, cost/economics, evidence on environmental outcomes and benefits, capacity issues, policy/consenting.

Please list as many barriers as you like, and score each of them using a scale where 5 = high (serious and/or common) barrier; 1 = low (= unimportant and/or rare) barrier

Methods - Workshops

- Auckland and Christchurch
- Burning issues
- From device scale to strategic level
- Walking tour



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- Auckland and Christchurch
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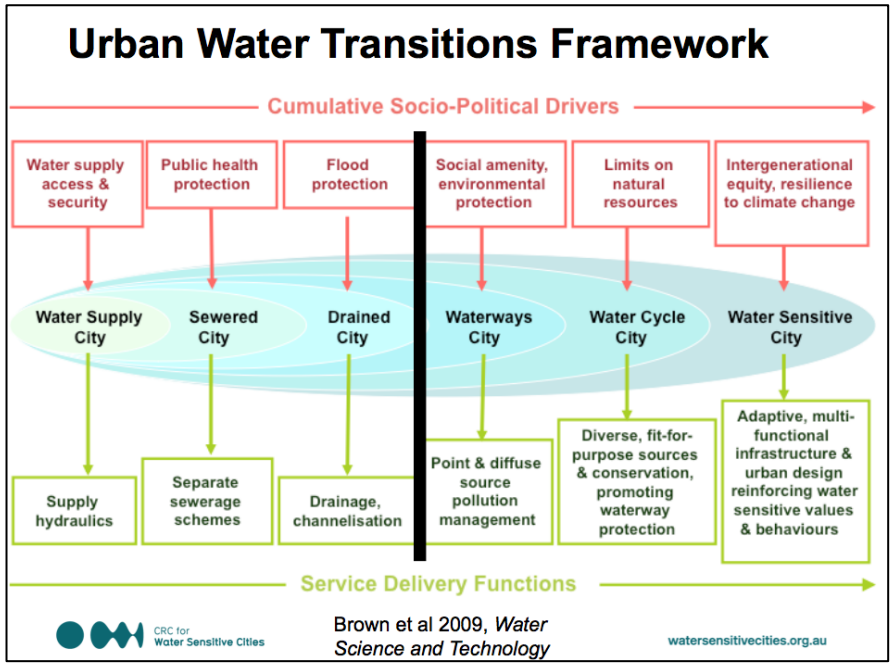
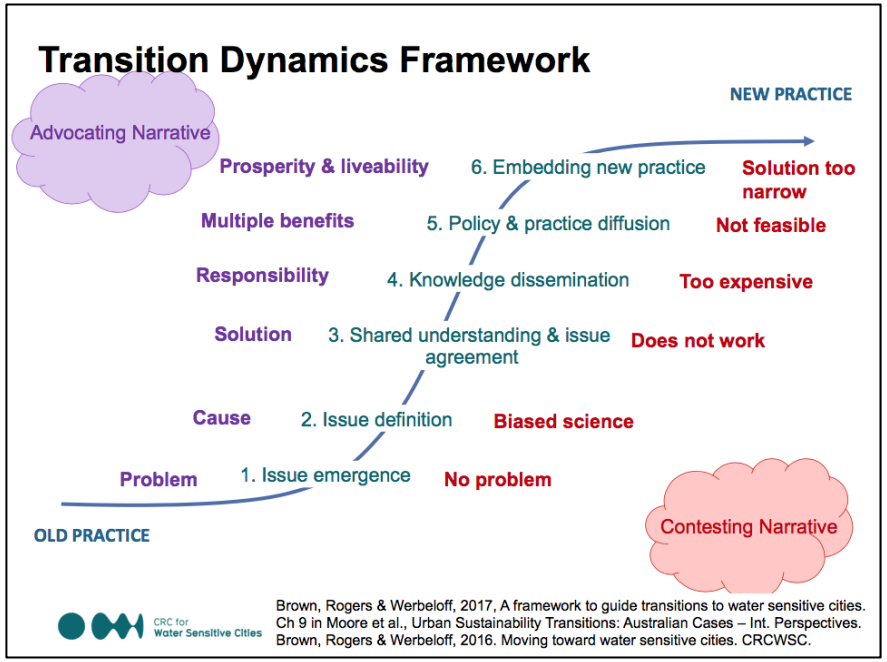
- Benchmarking exercise

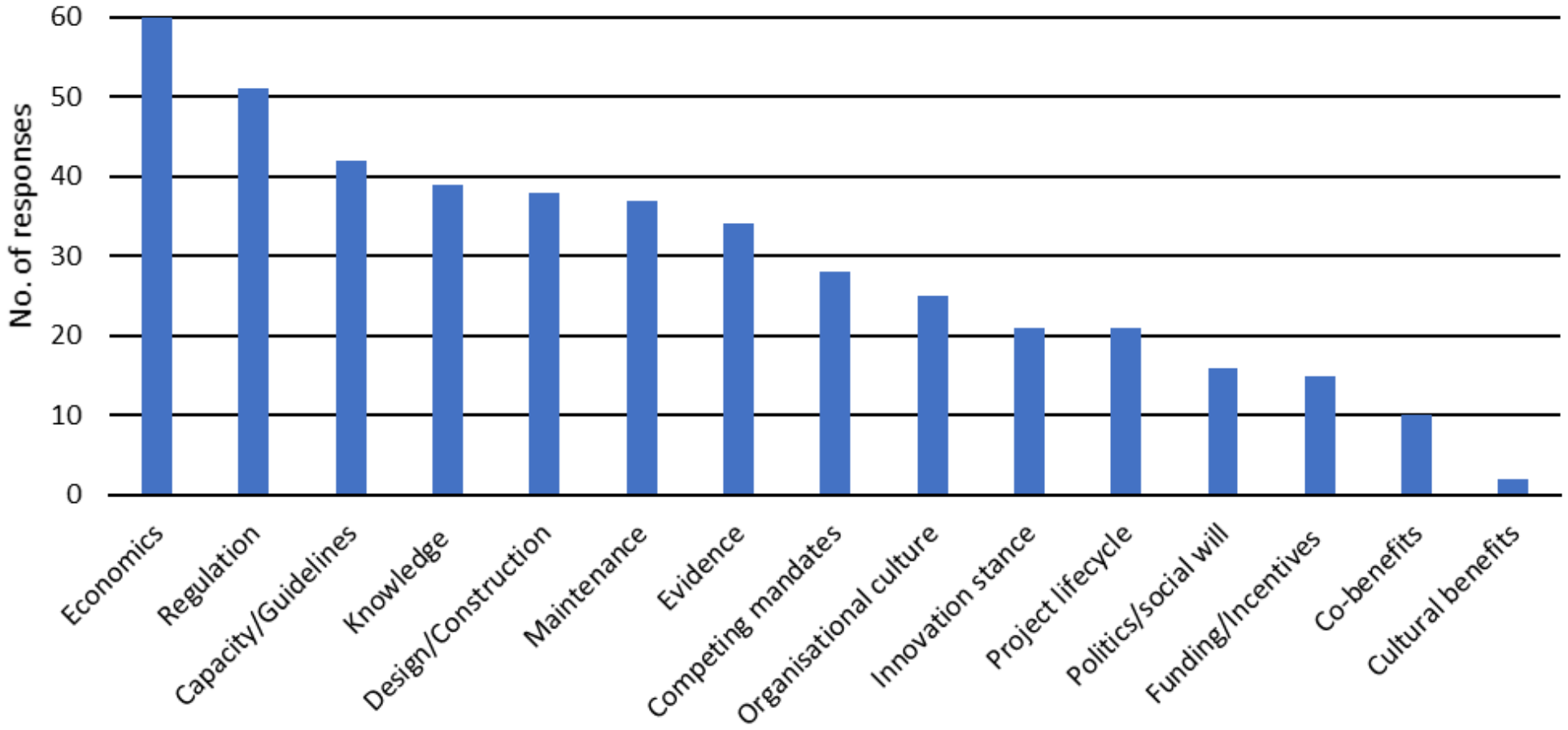




Findings – WSUD barriers

Theme	Examples of barriers
1. Knowledge of WSUD concepts, vision and benefits	Lack of awareness/buy-in to WSUD philosophy.
2. Precedents / evidence of WSUD performance and outcomes	Lack of NZ / local examples of WSUD delivering.
3. Economics	Perceived higher costs, lack of cost-benefit examples.
4. Innovation stance	Institutional risk aversion to new methods.
5. Māori cultural benefits	Business case failure to consider culturally-specific benefits of WSUD.
6. Social, health and environmental co-benefits	Business case failure to consider amenity, health, climate adaptation and other co-benefits.
7. Political will / social licence	Lack of political leadership and/or community-led demand.
8. Regulation, policy, planning, consenting and compliance	Ambiguity in regional and district plans, inflexible consenting processes.
9. Design and construction	Poorly designed and built systems leading to substandard performance.
10. Maintenance	Maintenance poorly understood and delivered including lack of compliance monitoring.
11. Project lifecycle	Poor integration / hand-over between design/construction/operations.
12. Funding and incentives	Lack of funding and/or incentives leads to continued business-as-usual approaches.
13. Organisational culture	Poor collaboration between and within organisations.
14. Capacity, training and guidelines	Lack of WSUD expertise or education for upskilling relevant professions.
15. Competing mandates	WSUD trumped by other functions such as road safety and flood control.

Survey results – WSUD barriers



Important note: only a small numbers of Maori practitioners, developers, landscape architects and roading engineers participated in the survey and workshops

Findings – examples of key messages

- Capacity, training and guidelines
  - Key sectors in the WSUD value chain, for instance construction and maintenance contractors, often lack the basic knowledge for successful implementation of WSUD.
  - There is a need for national definition, leadership and guidelines on WSUD

"There is massive value for money in using the right people. It is easier to teach certain people skills than others."

"A nationally or regionally recognised guideline document which provides information on effective solutions and designs."

Findings – examples of key messages

- Economics
  - Reliable information is needed on the full lifecycle costs of implementing WSUD.
  - Maintenance costs are a specific knowledge gap.
  - Reliable methods and information is required for assessing the full range of direct and indirect benefits.

> *"Make the costs of not doing WSUD and the benefits of doing it more tangible to people."*

> *"The real costs of business as usual piping/stormwater management needs to be realised, including both acute and chronic impacts on waterways."*

Findings – examples of key messages

- Regulation, policy, planning, consenting and compliance
  - There is a need for greater emphasis, transparency and consistency on WSUD in council plans and consenting processes
  - A lack of cohesion between regional and local government regulations are a barrier to the implementation of WSUD.

"A robust and transparent decision-making process that is mapped out to carefully take account of the lifecycle through planning, design, construction, handover, maintenance and operations, through to asset disposal/renewal."

"Jurisdictional boundaries between regional and district councils in terms of who is responsible for water quality (regional) and who is responsible for the design of new subdivisions (district)."

Findings – examples of key messages

- Maintenance
  - Maintenance requirements are often poorly specified and hence appear as a burden, as a result of lack of a full lifecycle plan for WSUD installations.
  - There is a paucity of reliable data on maintenance costs.

"Very weak knowledge and appreciation of the variety of monitoring and maintenance activities needed throughout an asset lifecycle (cyclic, periodic, reactive, renewal, improvement, asset disposal)."

"We need to change the perception that maintenance is a burden by making it accounted for at the start of the design process."

"A lack of understanding of the lifecycle cost of WSUD due to a paucity of maintenance cost data."

Findings – examples of key messages

- Precedents / evidence
  - There is a need for evidence from precedent implementation NZ exemplars.
  - Recent/current WSUD developments provide opportunities for monitoring case studies.
  - Evidence should include information on costs, device performance and the full range of environmental, social and cultural benefits.

"…can we tie to real, measured water quality and ecosystem health improvements."

"Lack of proven effectiveness - need more monitoring."

"Evidence/data for optimising design"

"Case studies, local examples."

Findings - benchmarking results

Transition phase	Champions	Platforms for connecting	Knowledge	Projects and applications	Tools and instruments
1. Issue emergence	Issue activists		Issue highlighted	Issue examined	
2. Issue definition	Individual champions	Sharing concerns and ideas	Causes and impacts examined	Solutions explored	
3. Shared understanding & issue agreement	Connected champions	Developing a collective voice	Solutions developed	Solutions experimented with	Preliminary practical guidance
4. Knowledge dissemination	Influential champions	Building broad support	Solutions advanced	Solutions demonstrated at scale	Refined guidance and early policy
5. Policy and practice diffusion	Organisational champions	Expanding the community of practice	Capacity building	Widespread implementation and learning	Early regulation and targets
6. Embedding new practice	Multi-stakeholder networks	Guiding consistent application	Monitoring and evaluation	Standardisation and refinement	Comprehensive policy and regulation

Auckland

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Christchurch

Findings – NZ v overseas

- Common themes
  - Business-as-usual is not a problem
  - Poor collaboration between departments / organisations
- Overseas themes
  - Drought and combined sewers as drivers for WSUD
  - More emphasis on co-benefits
  - Use of incentives: e.g. impervious surfaces charges
- NZ themes
  - Links with indigenous cultural values
  - Legislative tensions

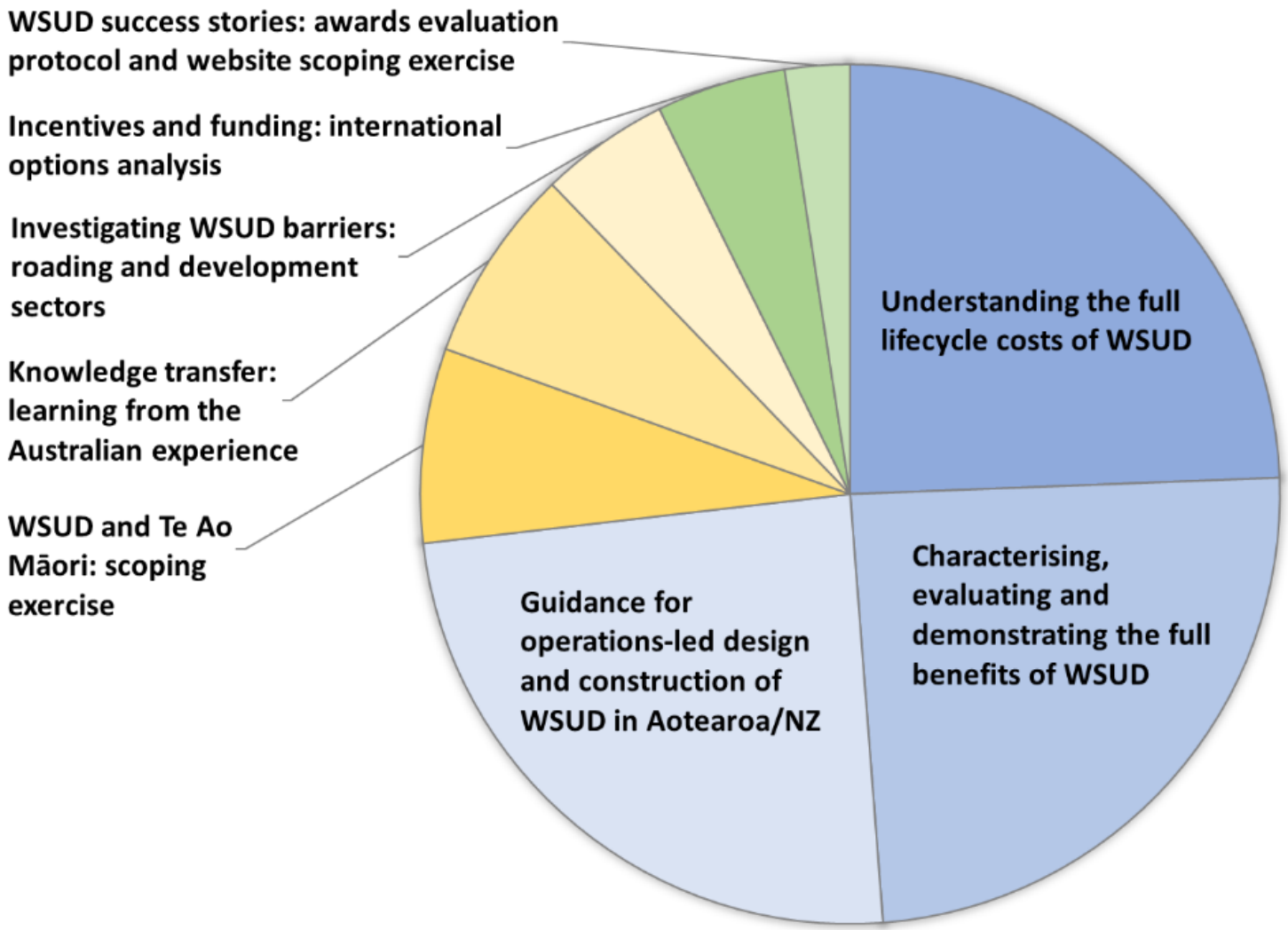
Response

- Identified and evaluated potential responses
  - Quick win research
  - Longer-term research
  - Other (non-research)

Response to findings from discovery phase	Theme														Description of responses, with rationale		
	Knowledge	Evidence	Economics	Innovation	Cultural	Co-benefits	Politics	Regulation	Design	Maintenance	Lifecycle	Incentives	Organisations	Capacity	Comp. mandates	Phase 2 quick wins	Longer-term research	Other (non-research)
(A) Targeted engagement with Māori stakeholder groups, leading to development of WSUD approaches that embrace and cater for Te Ao Māori	x	x			x									x		Required to address major gap in discovery phase – the need to develop an understanding of the extent to which WSUD does and could further deliver culturally-specific benefits. Engage with key Māori practitioners to scope a research and engagement plan for the development of guidance on Aotearoa-specific forms of WSUD and evaluation methods that incorporate mātauranga Māori.	Acting on the scope developed in Phase 2, engage, research and develop guidance for Aotearoa-specific forms of WSUD and evaluation methods that incorporate mātauranga Māori.	Multi-party implementation of guidance when consulting on, planning, designing and operating WSUD.
(B) Targeted engagement with roading and development (public and private) sectors	x			x					x	x	x		x	x	x	Required to address major gap identified in discovery phase – the need to develop an understanding of the relative influence of other mandates in determining the actions of these sectors. Audit relevant WSUD examples and review codes of practice. Present to roading and development sectors, respectively, as a means of initiating discussion and eliciting feedback at targeted workshops.	Acting on the findings from Phase 2, conduct targeted partner research e.g. on materials and methods, value chain analysis, commercial models.	Ongoing actions to raise WSUD profile. WSUD community to actively engage with these sectors via professional meetings etc. Establish champions from within these sectors.
(C) Recognise WSUD success stories: Establish and promote web-based database and awards systems for successful examples of NZ WSUD implementation.	x	x			x	x			x	x				x		Helps build capacity and provides hub for WSUD community. Can be initiated immediately, and added to over a longer time frame. Resurrect the LIUDD case study database and scope enhancements, for instance: linking to walking tour examples from the Phase 1 workshops; developing an awards system and linking to cost database.	Acting on the scope developed in Phase 2, build, populate and promote an enhanced NZ WSUD case study website.	Requires long-term ownership by identified parties in WSUD community to maintain, update and promote it.
(D) Update lifecycle cost databases and models, including data on maintenance and avoided costs. Model case studies including avoided costs.	x	x	x						x	x	x			x		Compilation of the database builds on well-progressed work in this space and addresses a high frequency theme. Through interrogation of existing costs database and the inclusion of data to address key gaps (maintenance costs, avoided costs), derive guidance on unit costs (e.g. dollar per square metre, dollar per kg sediment retained) of implementing WSUD relative to conventional approaches.	Using the updated database, model case studies including actual and planned WSUD developments to demonstrate cost differential when the full range of costs are considered (novel research). Regularly collate additional cost data and review models accordingly. Liaise with the NZ Asset Metadata Standards to determine protocols for collecting, storing and analysing acquisition and maintenance cost data as part of the public network asset data management standards for NZ.	Requires long-term updating of cost databases and could be linked to the WSUD "hub" above.
(E) Develop and provide guidance on methods for CBA/CEA, including assessment of indirect benefits	x	x																
(F) Review effectiveness of WSUD-related plans and regulations.																		of best practice guidelines by councils. Regular review of effectiveness of provisions could be co-ordinated at central government level.
(G) Investigate and develop NZ/regional guidance on WSUD design, maintenance and lifecycle planning, including both greenfield and brownfield settings.	x							x	x	x	x				x	Reviews (documents and in the field) of NZ regional design and maintenance practices draws on well-developed familiarity of this topic area. Involves: (1) conducting field 'training and assessment' workshops in up to three regions (esp. where limited exposure to WSUD to date), to reveal and resolve specific local issues; and (2) Reviewing guidelines and practice in relation to role of WSUD in brownfields development and/or stormwater retrofits/upgrades.	A longer-term programme can extend the reviews to cover additional regions / contexts. Regular updates of design and maintenance 'living document' guidelines to enable practitioners to be informed of evolving best practice.	Multi-party implementation of guidance in planning, designing and maintaining WSUD.
(H) Review and provide guidance on potential options for incentivising uptake of WSUD and potential alternative funding mechanisms for WSUD implementation	x	x	x	x								x			x	Review of international incentives and funding mechanisms can build on previous work to collate and evaluate US/European approaches, with input from workshop participants involved in this work. Liaise with CRC for Water Sensitive Cities to gain insights from Australian research in this area.		Implementation by councils and/or central government.

Phase 2 Activities

- Core research
- Further discovery
- Enhancement & dissemination of existing information



Approved by:

- International peer reviewer
- External Advisory Group
- BBHTC NSC

Phase 2 needs CASE STUDIES

- Life cycle costs ⇨ sue.ira@koruenvironmental.co.nz
- Benefits assessment ⇨ chris@batstone.co.nz
- Operations-led design ⇨ simcockr@landcareresearch.co.nz
  - interviews and field assessment;
  - used to develop training resources.

Please volunteer!

Longer-term locations for monitoring WSUD outcomes jonathan.moores@niwa.co.nz

Acknowledgements

- Building Better Homes, Towns and Cities National Science Challenge
- All our survey respondents and workshop attendees
- EAG: Sue-Ellen Fenelon (MFE), Mike Hannah (Stormwater360/Water NZ Stormwater Group), Stu Farrant (Morphum), Paul Dickson (CCC) and Julian Williams (Te Huia Natural Resource Limited)
- Briony Rogers (Monash University) for peer review

https://www.landcareresearch.co.nz/science/living/cities,-settlements-and-communities/water-sensitive-urban-design

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