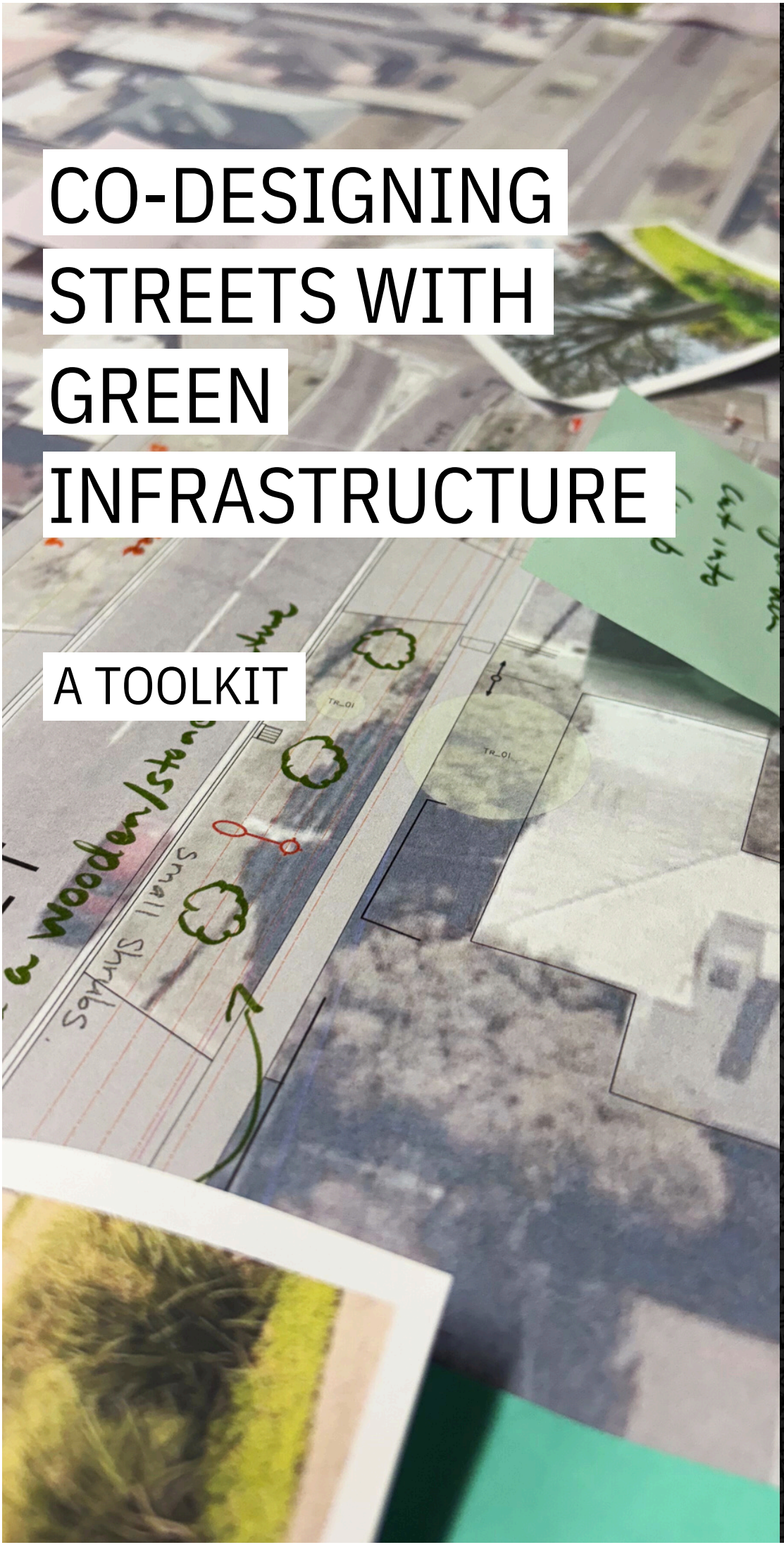
CO-DESIGNING STREETS WITH GREEN INFRASTRUCTURE

A TOOLKIT



THE UNIVERSITY OF MELBOURNE

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Soanes K, Langenheim N, Blackham D, Chew HTG, Croeser T, Dade M, Nice K, Bell S (2026) Co-designing streets with green infrastructure: A toolkit. Report prepared by The Retrofit Lab, Melbourne Centre for Cities. The University of Melbourne.

The Re-imagining Streets with Green Infrastructure project is an interdisciplinary team spanning urban greening, landscape architecture, engineering and social sciences from the University of Melbourne, in collaboration with partners from Mosaic Insights and RMIT University. The team includes Professor Sarah Bell, Dr. Kylie Soanes, Dr. Marie Dade, Dr. Nano Langenheim, Dr. Kerry Nice, Dr. Dom Blackham, Gavin He Tian Chew, and Dr. Thami Croeser. The project is funded by Hort Innovation and co-investment from the Australian Government, the University of Melbourne and the Victorian Government. The project 'Re-imagining streets with green infrastructure' (GC22011) is a strategic levy investment through the Green Cities Fund, under the Hort Frontiers Strategic Partnerships Initiative. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture. This project has human research ethics approval from The University of Melbourne Project ID #30838.

Cover image: Sarah Bell

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CO-DESIGN IS A PROMISING TOOL TO SUPPORT EFFORTS TO RETROFIT GREEN INFRASTRUCTURE INTO EXSTING STREETS IN A WAY THAT IS TECHNICALLY FEASIBLE, SOCIALLY ACCEPTABLE, AND RESULTS IN GREENER, MORE RESILIENT STREETSCAPES.

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INTRODUCTION

Streets have the potential to support climate resilient communities, through the provision of greening, the mitigation of heat and flood impacts, and the strengthening of relationships between community members and local government.

The process of co-design, in which community, local government, and other stakeholders, come together to build a shared vision supports the achievement of these aims. Given the technical and complex nature of deep retrofits to existing streetscapes, the diverse knowledges and experiences held by urban communities, and the varying capacity of government stakeholders, co-design in the street context will often require unique approaches.

We have developed a set of tools and activities tailored to context of green infrastructure in streets.

1. Tools for building a shared vision
2. Tools for street design
3. Tools for integrating technical knowledge
4. Tools for evaluation

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The tools and activities outlined here have been trialled and developed as part of the Re-imagining Streets with Green Infrastructure project, following a six-step co-design process (opposite).

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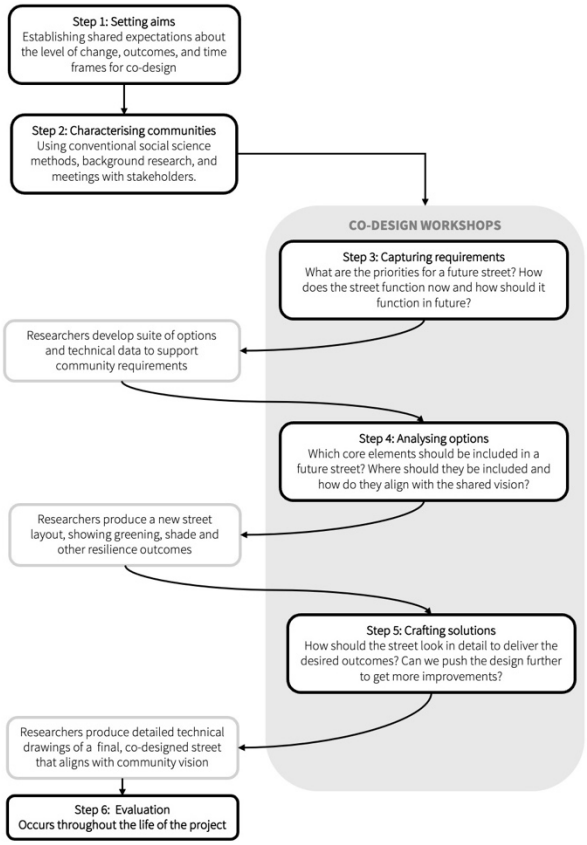
OUR SIX STEP CO-DESIGN PROCESS



TOOLS FOR BUILDING A SHARED VISION

Central to the co-design process is the development of a shared vision for the future street. Co-design is not about consulting or gathering feedback on an existing design, or changing community views to accept a single approach, but building a coherent consensus among co-design participants: what do we want our street to be?

Identifying a shared vision is best achieved through multiple exercises which allow different values and priorities to come to the fore. A mix of activities that encourage compromise and new understandings among participants, require the consideration of trade-offs, rankings and priorities, and more nuanced, unprompted or individual contributions to the collective discussion.

Activities should help participants explore and evaluate broad concepts and outcomes, spatial arrangement of features and functions, and preferences for specific aesthetics and character. Ultimately the goal is to help participants consider not only their own needs and goals, but those of others in their community.

In this section, we present a set of tools and activities to support the development of a shared vision for a future street redesign:

- Hopes and fears board
- 2-4-8 consensus building
- Crafting a future street
- Walking infrastructure safari
- Virtual infrastructure safari
- Gallery wall

HOPES AND FEARS BOARD

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What is this activity for?

An informal icebreaker as participants are arriving for the first workshop in the series

How it works

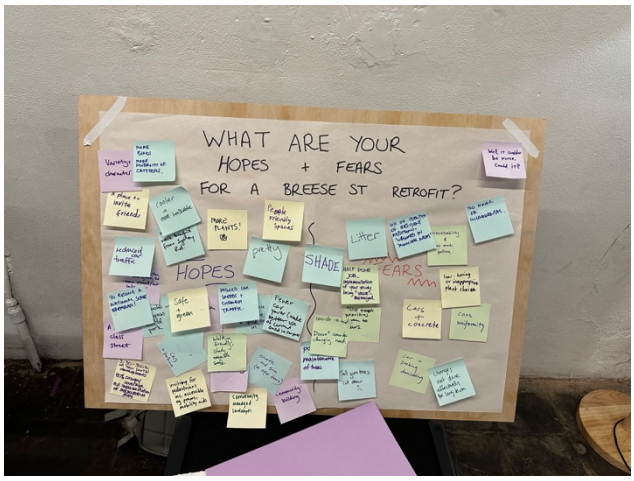
The first workshop in a series can be a time of high nerves and uncertainty – the participants and research team may not have met in-person before. The Hopes and Fears board is a simple, easy-to-complete task that can help alleviate social anxiety, provide a conversation starter, and get people in the right mindset for work to come.

A poster board asks the question "What are your hopes and fears for a future [name] street?". Using handwritten responses on sticky notes, participants are invited to add their hopes to one side of the board, and any fears to the other. The poster board is displayed at the entrance table alongside name tags and other background information, enabling participants to have an activity, start thinking about the task at hand, and consider the future of their street in a way they may not have thought yet.

This exercise also serves as a useful complement to the more structured '2-4-8' elicitation exercise, as the simplicity of the question can capture responses that might be overlooked in exercises requiring group consensus. The exercise is deliberately open ended and informal, allowing participants to respond as many times as they would like about any topics that come to mind. All responses are visible to other participants and the poster board is retained and displayed throughout the workshops serving as a useful touchstone when decisions need to be made.

What you need

- Poster board, white board or butcher paper
- Sticky notes and markers



2-4-8 CONSENSUS BUILDING

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What is this activity for?

This activity is designed to support consensus building amongst participants, and is particularly effective in larger groups

How it works

Participants are asked to form pairs. Each pair is provided with a pad of sticky notes and a pen and asked to agree on their top three priorities for a future green street. Pairs are given three minutes to develop their top three, with each priority written down on a single sticky note.

Pairs are then asked to join with a neighbouring pair to form groups of four. Each new group of four are then given three minutes to discuss and agree a new top three priorities. This may involve selecting three from their combined list of six, or re-writing new priorities that better reflect the group consensus.

In the final stage, groups of four are asked to join to make groups of eight. The priority selection occurs again, with a new agreed set of three priorities developed for each group. Depending on the total group size, this may result in one or more sets of 'top' priorities for discussion.

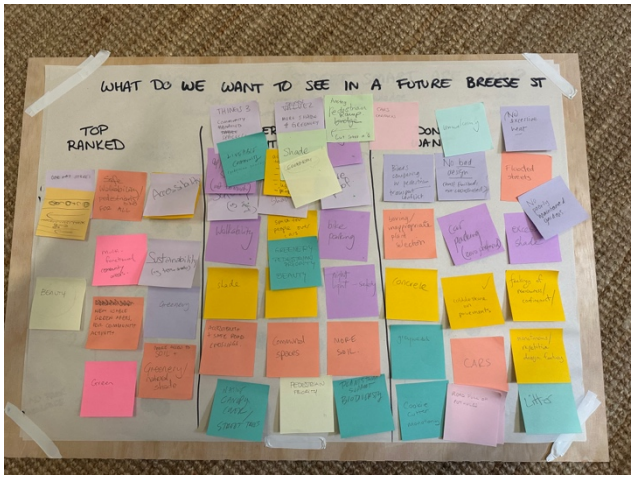
The final set of three priorities is then collected from each group and displayed on poster board and discussed in a whole-group reflection. "Do we think these reflect our views as a street?", "Is there anything important missing?". Priorities that were named during the exercise but not selected in the final three are also collected and displayed on the board under an 'other priorities' title. This allows the participants to visualise the breadth of the things important to them and see themes that recurred throughout the broader group.

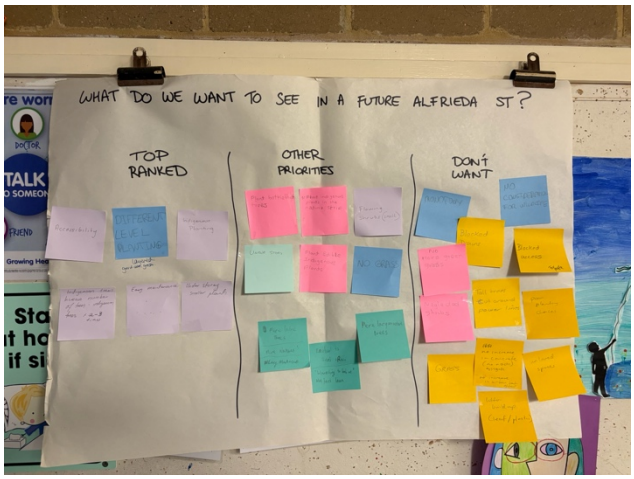
Finally, the exercise can also be run for a final quick-fire round, inviting people to spend one minute listing things that they *don't* want as part of their street. This reframing helps provide clarity around the shared vision by identifying potential negative outcomes that the community would like to avoid.

The results from this exercise are foundational to the co-design process and are frequently returned to during subsequent workshop discussions to help participants make decisions that align with the shared vision. The strict time limit forces groups to focus on prioritising and avoid getting side-tracked in semantic discussions (while useful, not the point of this exercise). It can also serve as a natural interruption to disagreements. The number of priorities and time given can be adjusted as needed to suit the context, group size, and time constraints (e.g. 5 priorities in 5 minutes).

What you need

- Poster board or white board
- Sticky notes and markers
- Facilitators to help collect 'non priority' notes from each round to be captured and displayed in the 'other priorities' section of the board.





CRAFTING A FUTURE STREET

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What is this activity for?

Allowing the community to illustrate their priorities and desires for a future street in a spatially-explicit format. This playful creative exercise supports the exploration of a future street without constraints, recognising that constraints will be formally considered in the second workshop.

How it works

Preconceived ideas and social norms about what streets are for and what is possible can constrain creative problem solving in a workshop context. Activities that encourage participants to think about how their street *should* look, feel and function, in an unconstrained way, is useful to support more ambitious goal setting. The design choices can also help identify further requirements for a future street design that may not arise during more structured elicitation activities.

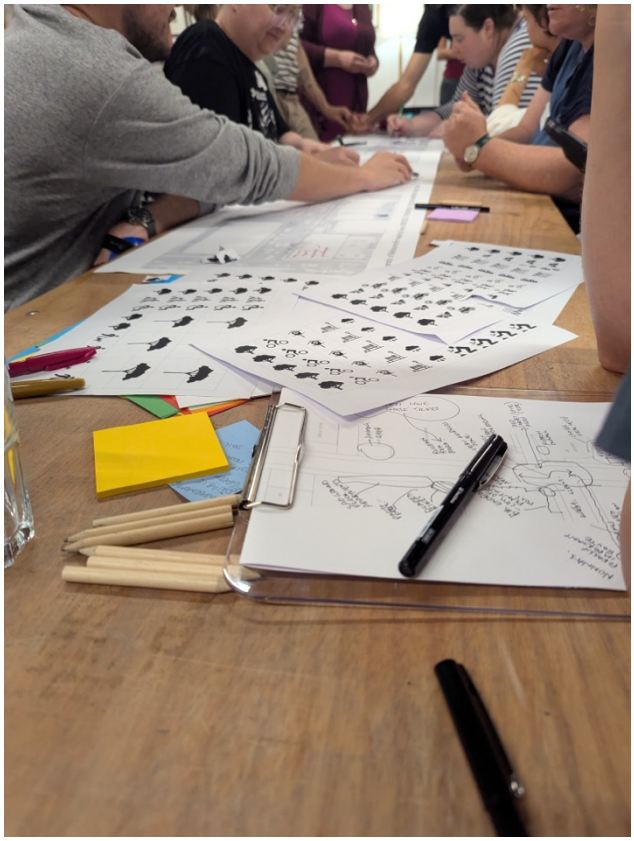
During the exercise, participants are presented with a large aerial printout of the street section to be redesigned and an array of craft materials. Participants were given 20 minutes to design their ideal street. Depending on the number of participants, may be divided into smaller groups, each designing their own version of the street.

The aim of this activity is to take the discussion from general values and desires, to a specific focus on the real street. Pairing the standard satellite imagery with technical line work also primes the participants for viewing their street in aerial view and architectural drawings during later stages of the co-design process.

Following the 20 minutes of design time, each group reports back, talking through their design with the broader group. Gathered around large tables, facilitators and other participants ask questions "Can you share the motivation for this garden here?", inviting deeper exploration of the reasoning and design intent. Finally, the facilitator guides a whole group reflection: “Have we addressed the priorities we built earlier? Perhaps new ones are emerging?”. Asking "What do we notice that's similar between these designs?" can help reinforce a set of shared ambitions for future street design. Participants were also able to observe where other groups achieved the same outcomes but in a different design, opening new ideas for exploration.

What you need

- A large, scaled printout of the street in aerial view. The map may include satellite imagery. Where possible, this can be overlaid with technical specifications from feature surveys, showing the direction of traffic, the location of formalised parking, measurements of road and footpath width, and the location of underground and overhead services and drainage.
- Printed icons or images of street features, such as trees, cars, seating and wildlife
- Sticking materials, such as tape, glue, or tack
- Pens, markers, and other craft materials to support annotation, drawing, or creative expression of community vision



WALKING INFRASTRUCTURE SAFARI

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What is this activity for?

Encouraging participants to explore the street and map their perspective, knowledge, and lived experience. The goal is to collect information about the current state of the street not captured in other forms. The activity also provides an opportunity for participants to see their street with fresh eyes, and to share their observations with each other, prompting a deeper, shared understanding of the streetscape.

How it works

Participants are each provided with simplified maps of the streets. Details on the map should be minimal, indicating roads and paths, but with little other imagery.

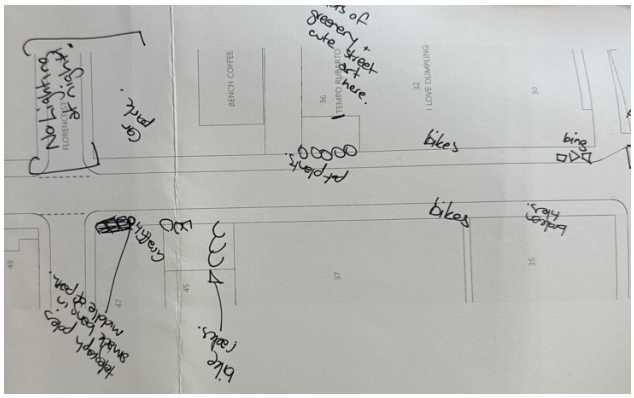
Participants then spent approximately 20 minutes walking the street, alone or in small groups, noting down their observations. They are encouraged to add stories or notes (e.g. this is where it floods in heavy rains, this is where it's sunny in the morning), and to capture not just the physical elements of the street but their unique experience of it.

Depending on the group size, there is an option to regroup after the first ten minutes and provide additional prompts from the technical experts that may further support the participants exploration (e.g. "These markers indicate stormwater outlets", "Note the powerline height here and what that might mean for greening", "These existing trees are native and support nesting birds").

After the 20-minute walk, the whole group reconvenes at the venue and are invited to share some reflections "What surprised you?", "What did you notice?". Participants report that being directed to inspect the street and take notice rather than simply passing through, allowed them to see the street with fresh eyes and notice things that they hadn't previously, even after years of living there.

What you need

- Printed base maps of the street. Details should be minimal to prompt annotation and the inclusion of concepts that would normally not be considered for mapping (e.g. stories, diagrams, lived experience)
- Clip boards and pencils
- Where a physical walk is not possible, a virtual tour (page 9) can be an alternative.



VIRTUAL INFRASTRUCTURE SAFARI

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What is this activity for?

While the physical infrastructure safari street walk is a hugely beneficial exercise, there are instances where a physical tour may not be practical or accessible. It is not always possible to identify a venue on the target street, having a large number of participants walk the street may not always be safe, or the length of the walk required may exclude participation for some. A virtual tour can support the aims and intention of the physical tour.

How it works

Video recorded of the street and projected on a large screen can create an immersive experience that prompts participants to view the street in a new light and pay close attention to details. We achieved this using a go-pro camera mounted on a bicycle, cycling slow laps of the street segment to be redesigned, collecting footage from the footpath and road. The video played on a loop during the workshop, while participants are provided with a clipboard and blank page and invited to note down their observations and reflect on what they saw in discussion with their nearest neighbour.

Following 10 minutes of quiet observation, th facilitator then begins to prompt guided discussion. "What are some of the things we've noticed about this street?", "Was there anything that surprised you?", "What do you think it feels like to live here or walk along this path?" The observations help ground the participants in place, remembering that the street is not an abstract concept but a real place where people live.

What you need

- Video of the street can be captured via smartphone camera or other recording device while walking or cycling. A slow pace encourages participants to experience the street from the perspective of a pedestrian, rather than a car.
- Several clips can be cut together and played on a loop.
- Projector and screen, for display

GALLERY WALL

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What is this activity for?

A picture speaks a thousand words. In many cases, workshop participants may not have considered that their street could look or feel any other way than its current form. Showing photos of precedents, real streets that have embraced a different design can prime participants for redesign activities. This exercise is useful where collecting written preferences is not practical or accessible.

How it works

Colour A4 printouts of example streets are pinned to a wall or whiteboard as a 'gallery' of potential street aesthetics. The photos should be selected to show a range of potential design styles, including options similar to the current street layout. Participants are each given 3-5 sticky dots, and invited to peruse the gallery and add dots to mark their favourites (10 minutes). After all selections have been made, a discussion is facilitated to explore the choices. Critically, photos that appeared the most and least popular should invite deeper questioning "I can see these two were quite popular. What was it about these images that people like?", "Nobody picked this one. Does anybody want to share why this one didn't get a vote?". Probing questions help ensure that preferences are provided in context and interpreted correctly.

What you need

- Colour printouts of example street greening projects. These can be tailored to the local context (e.g. from greener streets within the same neighbourhood), or provide international exemplars of best practice.
- Sticky dots

TOOLS FOR STREET DESIGN

Following the initial visioning exercises, the important work of redesigning the street begins in earnest. To ensure that the participant's desired outcomes are achieved, activities to support the street redesign go beyond reimagining and deal with the real context and challenges. Potential constraints are presented as a problem in need of a solution, rather than a immutable limit.

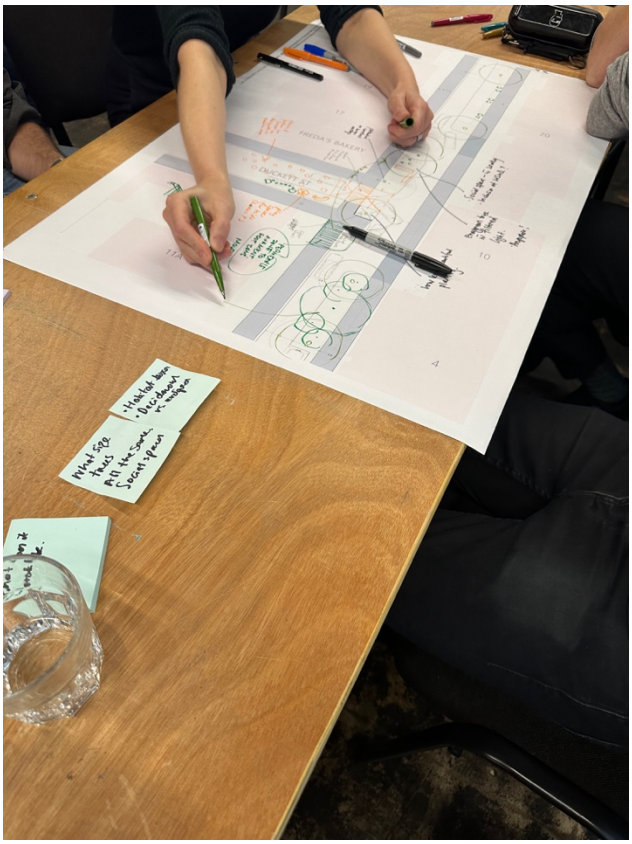
Useful tools are those that:

- support the consideration of designs at the correct scale
- enable measured, spatially explicit choices
- make technical challenges visible
- respond to the local needs and context identified through the 'shared vision' exercises

In this section, we present a set of tools and activities to support street design:

- A blank play space
- Function tiles
- Three-dimensional model
- Functional layout world café
- Maximum greening
- Challenge spots and trade-offs

These activities typically take place during the second and third workshops of the co-design process described on page 3 and can support Analysing Options and Crafting Solutions.



A BLANK PLAYSPACE

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What does this tool support?

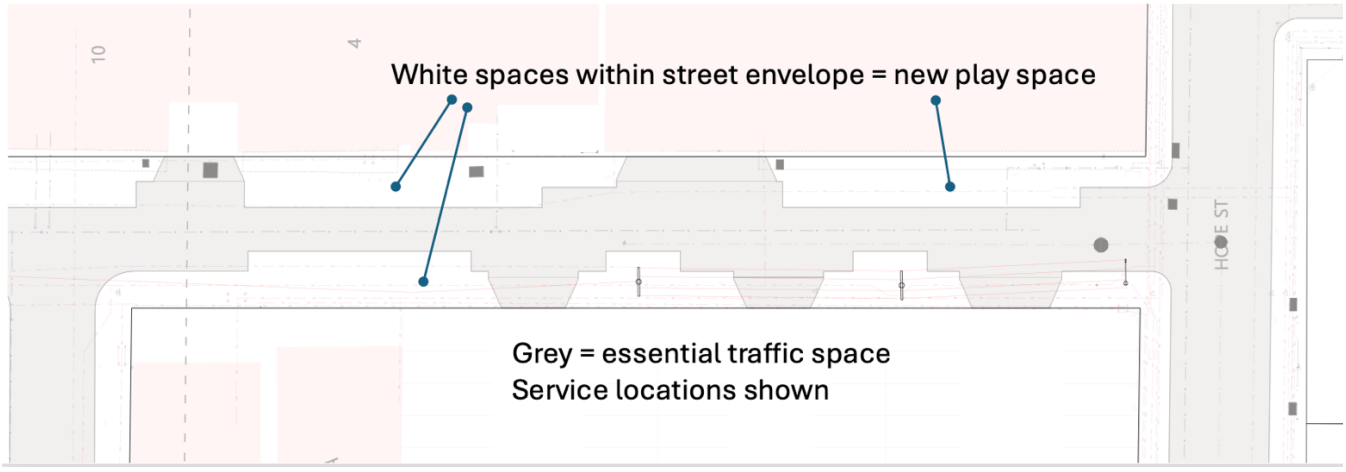
Envisaging the scope for change can be difficult when the crowding of concrete and cars in streetscapes seems fixed. This tool helps participants visualise the extent of street space that is available for change.

- The bounds of the changeable space are clearly delineated by thick black linework. In our case, we limited participants to the street corridor.
- A minimum area of street space that must be dedicated to traffic can also be indicated. For example, driveways that enable access to properties and the associated turning zones, or a minimum traffic lane width, can be indicated in grey.
- The location of essential services (underground and overhead) are also shown.
- Everything else within the street corridor is removed – paved areas, parking, existing trees etc – and made a blank, white space. This is the 'blank play space', the total area available for the participants to change.

Participants are then prompted "Imagine you are able to build your street from scratch? What do you put back in?" This tool can form the base map for the 'Functional Layout' activity (Page 15), and the use of functional tiles or three-dimensional elements.

What you need

- A modified survey drawing of the street segment in aerial view. The 'play space' can be guided by the outcomes of workshop 1 (Capturing Requirements) – what would best support *this* community in a street redesign? The playspace can also be guided by input from local government stakeholders (e.g. the spatial bounds of the project area).
- Clear, simple visuals to show what is available for change and what is not. The inclusion of additional space can be distracting and results in effort to redesign spaces that may be out of scope (e.g. private residences).
- A small number of clear 'playing rules' can also help set bounds. E.g. "You must include a footpath", "You must include at least one traffic lane, but you can move where it sits", "You can reintroduce parking if you like, but you do not have to".
- Include scale, direction, and clear landmarks to help participants orient themselves and align the scope of their changes to the real-world measures.



FUNCTION TILES

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What does this tool support?

Scaled tiles representing a set of overarching resilience functions (e.g. Canopy tree, stormwater reduction, biodiversity, social spaces) provide a useful means of developing a broad layout for the functions of the street prior to delving into detailed design options. Focusing on functions encourages participants to think about what these spaces should achieve, before becoming lost in the detail of *how* to achieve them. It enables easy measurements of change by counting the number of tiles of each function that were used, e.g. "How much of the street should be dedicated to traffic?", "How many carparks were replaced with trees?", "Where should flood mitigation and stormwater treatment be focused?". This tool can be combined with the blank play space or other base maps to support the design of a functional layout or the exploration of trade-offs.

What you need

- A base map (satellite imagery, feature survey, or blank play space). Divide the base map into relevant grid blocks that will guide the size of the tiles. For example, 1 x 1 m grid, or the size of an average carparking space.
- The grid size can be marked on the floor of the workshop space in tape to show participants what each tile represents in real space.
- Tiles cut to scale to represent parcels of land on the street. These can be paper, card, or wood. Materials should be easily movable and invite play.
- Use colours, icons, or three-dimensional features (see below) to indicate the functions of different tiles

THREE-DIMENSIONAL MODELS

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What does this tool support?

The task of redesigning a street is complex and challenging, particularly in a group setting, and requires a large amount of creative problem solving. Introducing physical, three-dimensional play pieces allows participants to be more intuitive, and dedicate less mental energy to figuring out what different functions that tiles are intended to represent – a tree looks like a tree. These model elements can take the place of two-dimensional tiles described above.

Physical structures also have the advantage of making trade-offs and challenges more tangible. For example, if the tree is too tall to fit under the powerlines, it must be cut short or the powerline must be moved. This helps ground the design decisions in reality.

What you need

- Model street elements scaled to the base map print out being used. Hobby and craft stores are a good source of features such as trees, cars, and people. Black twine can be used to illustrate powerlines. Cuttings from real plants can be modified to suggest trees and shrubs.
- Elements should be fixed to a tile base and scaled to represent the physical area the element would occupy relative to the street.

EXAMPLES OF FUNCTIONAL TILES AND THREE-DIMENSIONAL ELEMENTS USED IN WORKSHOPS

FUNCTIONAL LAYOUT WORLD CAFÉ

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What is this activity for?

Breaking the process of street redesign down into stages reduces overwhelm and helps participants consider multiple elements. In this stage, participants focus on the desired functions of each area of the street should perform (e.g. improve tree canopy/shade, reduce stormwater run-off, create social spaces, provide other greening), rather than the specific tools or design responses that will be used to achieve those functions.

How it works

Participants are divided into groups of approximately 4-6 members. Each group is allocated a segment of the road to be redesigned, represented by a large scaled, aerial printout.

In a series of rounds, the groups are asked to redesign their street by focusing on one task at a time.

- Round 1: Add canopy trees and vehicle space
- Round 2: Add features to reduce stormwater run-off and other greening
- Round 3: Add other elements (e.g. social spaces, biodiversity habitats)

Groups spend ten minutes adding each function to their street, progressing through one round at a time. An expert facilitator present at each table supports discussion, and technical experts are on hand to answer specific questions.

After all rounds were completed, the multiple street segments are taped together on display in the centre of the room. A group discussion is then facilitated to explore the different design choices, the ways in which each group approached and solved problems, and the alignment with the shared vision and priorities identified in Workshop 1.

The functions and order in which they are present can be adjusted to reflect the project goals and local priorities. For example, the focus of our project was canopy trees and climate resilience, so these elements were introduced first, prompting participants to explicitly consider how much of their space should be allocated to trees and how much needs to be retained by vehicles and parking.

What you need

- A base map of the street section to be redesigned. This can be a blank play space (Page 12), aerial image, or feature survey.
- Movable pieces that represent the functional elements. These may be photos, paper icons, or the functional tiles and three-dimensional elements described above (Page 12).
- Adjustable sticking media, like tack or re-usable adhesive.
- Markers and sticky notes to support annotation, allowing participants to explain the rationale behind different decisions.

MAXIMUM GREENING

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What is this activity for?

Supporting ambitious visions of future street greening for participants who may not have considered the potential of their street. This activity also identifies areas of potential trade-offs between greening and other functions and objectives .

How it works

Typically, street design exercises start by inviting participants to add trees to their street. In this exercise, we flip the process, starting with a highly greened street and asking participants "What would you take out to make this street functional?".

Participants are presented with a large printout of their street, showing the location of current traffic uses, existing trees, other services and infrastructure. Then, using the three dimensional tree models or other functional tiles, facilitators fill the street corridor with trees with the goal of achieving a high canopy cover (up to 80%). However, trees are placed with no consideration to what currently occupies the space on the base map. For example, trees may take up car parks or traffic lanes, block powerlines or other service areas.

In this way, participants are invited to work backwards, exploring how much of the greening can be retained while still allowing the priorities and needs identified in Workshop 1 to be achieved. Where the location of trees appears to clash with other infrastructure or functions, participants have the option to shift trees to another location, craft novel solutions to accommodate both the tree and the infrastructure with the support of technical experts, or remove the tree entirely.

For participants who have never considered street greening before, this exercise can support more ambitious visions by starting from a high level of canopy cover. For those who are passionate greening advocates, it encourages engagement with complex trade-offs and the needs and priorities of other street users.

Combining this exercise with those where trees are added to a blank play space offers interesting opportunities to explore how different approaches yield different levels of greening ambition.

What you need

- A large printout of the street to be redesigned, with satellite imagery showing the current state. Annotations can indicate current uses and functions. Overlaid feature surveys are useful to show the location of services and critical infrastructure.
- Three-dimensional tree models or functional tiles (Page 13)

TOOLS FOR SHARING TECHNICAL KNOWLEDGE

Streetscapes present technical challenging to green infrastructure and an understanding of the constraints and complexities facing green infrastructure in streets can support co-design participants to achieve designs that are both ambitious and feasible. Information regarding the presence of utilities and services, impacts on traffic and parking, the requirements of healthy tree growth, as well as the resilience and biodiversity outcomes of urban greening are all valuable inputs into the co-design setting.

In this section, we present a set of tools and activities that support the integration of technical expertise and data into the co-design process:

- Feature surveys
- Real-world heat and shade
- Technical expo
- Fact libraries

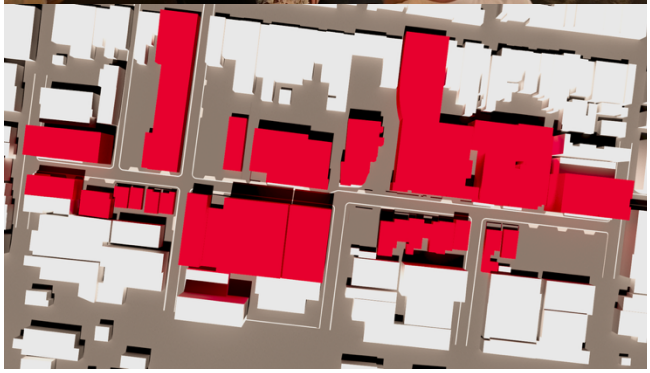
FEATURE SURVEYS

What does this tool support?

Feature surveys detailing the infrastructure and services present on the street are a valuable addition to the co-design process. These can be obtained through partnership with local government or authorities responsible for the street, or through services such as Dial Before You Dig. Revealing the location and specifications of overhead and underground services, for example, is critical to supporting design decisions.

How we used it

Feature surveys were used to show the location of overhead and underground services on all base maps presented to the participants during activities such as the 'Craft your future street', and 'Blank Playspace'. Feature surveys were also used to support the detailed design drawings.



REAL-WORLD HEAT AND SHADE

What does this tool support?

Technical information can be difficult to engage with when present in broad, abstract terms. Collecting real-time data on resilience outcomes that affect people's daily lives, such as heat and shade, can provide meaningful context for participants to consider in their design.

How we used it

We installed weather stations along the street, collecting information on maximum temperatures throughout the day. Shade models were also created from building heights, showing the shade cast at various times during the day. This information was then presented back to participants at the beginning of Workshop 2, so that the data could inform their initial designs.

TECHNICAL EXPO

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What is this activity for?

To support the sharing of technical knowledge with participants in an engaging, accessible, locally relevant way.

How it works

The technical experts present as part of the research team prepared materials on their speciality topic that were relevant to the local street context. They may draw on direct measurements collected as part of the project, existing reports or literature undertaken as part of council studies, or broader datasets such as maps of heat or flood vulnerability.

The venue is structured to allow four zones, each with a technical expert hosting a specific topic: trees and shade, flooding and water sensitive urban design, the social benefits of green space, and biodiversity. Participants are then invited to pick the topic they would most like to hear more about and head to the relevant zone for a discussion with the technical expert. Technical experts share a 2-minute introduction to their topic before opening up to questions.

Participants then spent ten minutes in conversation with the technical experts, exploring topics in a relaxed conversation, gaining a deeper understanding of different elements of green, climate resilient streets, in a way that related directly to their local experience.

Participants are then invited to choose a second topic, and the process was repeated.

What you need

- Materials prepared included printed photos, fact sheets.
- Subject matter experts in the resilience outcomes relevant to the local street context (e.g. urban forestry, ecology, social science, traffic engineering, landscape architecture, heat mitigation, stormwater).

TOOLS FOR EVALUATION

Evaluation is a crucial component of the co-design process that occurs throughout the life cycle of the project. In the context of co-design workshops, evaluation may occur during regular reporting back and checking in with participants (e.g. “During the last workshop, we heard you say this…Does that sound right? Have we missed anything?”) to ensure that the design decisions and interpretations are an accurate reflection of community needs and priorities

Another goal of co-design is to provide participants with new knowledge and understanding of climate resilience and street greening, to empower them to advocate for future change. Participation in the co-design process may alter community sentiment or expectations around street greening, the kinds of designs that are acceptable, by correcting misconceptions or prompting new ambitions.

In this section, we present two tools for evaluating the impact of co-design on community knowledge and preferences relating to climate resilient street design.

- Rate your street smarts
- Structured questionnaire

RATE YOUR STREET SMARTS

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What is this activity for?

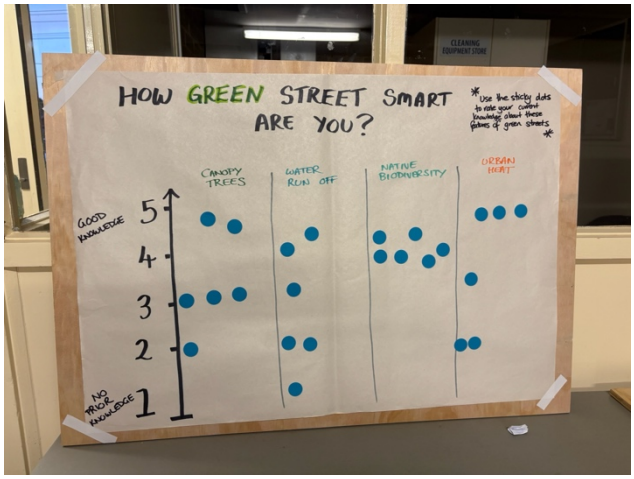
Evaluating participants pre-existing knowledge about the elements of climate resilient streets and identifying whether their participation in co-design led to improved understanding.

How it works

This evaluation tool invites workshop participants to self-identify their level of understanding across four different elements of green streets: Canoy cover, urban heat, stormwater, and biodiversity. The level of knowledge is ranked on a scale from 1 to 5, 1 being 'very little knowledge', to 5 'high level of knowledge'. The chart is drawn up on a large sheet of poster paper and participants are invited to add a sticky dot across each of the four elements. Collecting this information before the start of the first workshop (e.g. during arrival and icebreaker time), and after the end of the final workshop provides a before-after comparison, enabling us to assess whether participation in the co-design workshops improved participants understanding of some of the resilience outcomes associated with green infrastructure.

What you need

- A poster board or butcher paper, markers, sticky dots.
- Displayed at the entrance to the workshop venue
- Participants complete activity upon arrival at the first workshop and repeat the activity before leaving the final workshop.



STRUCTURED QUESTIONNAIRES

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What is this activity for?

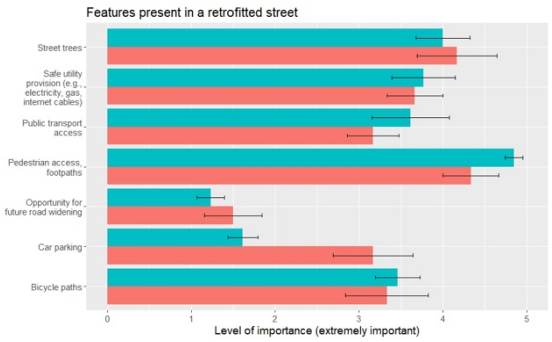
Eliciting community preferences and values regarding green infrastructure in streetscapes, and determining whether these change as a result of participation in co-design workshops.

How it works

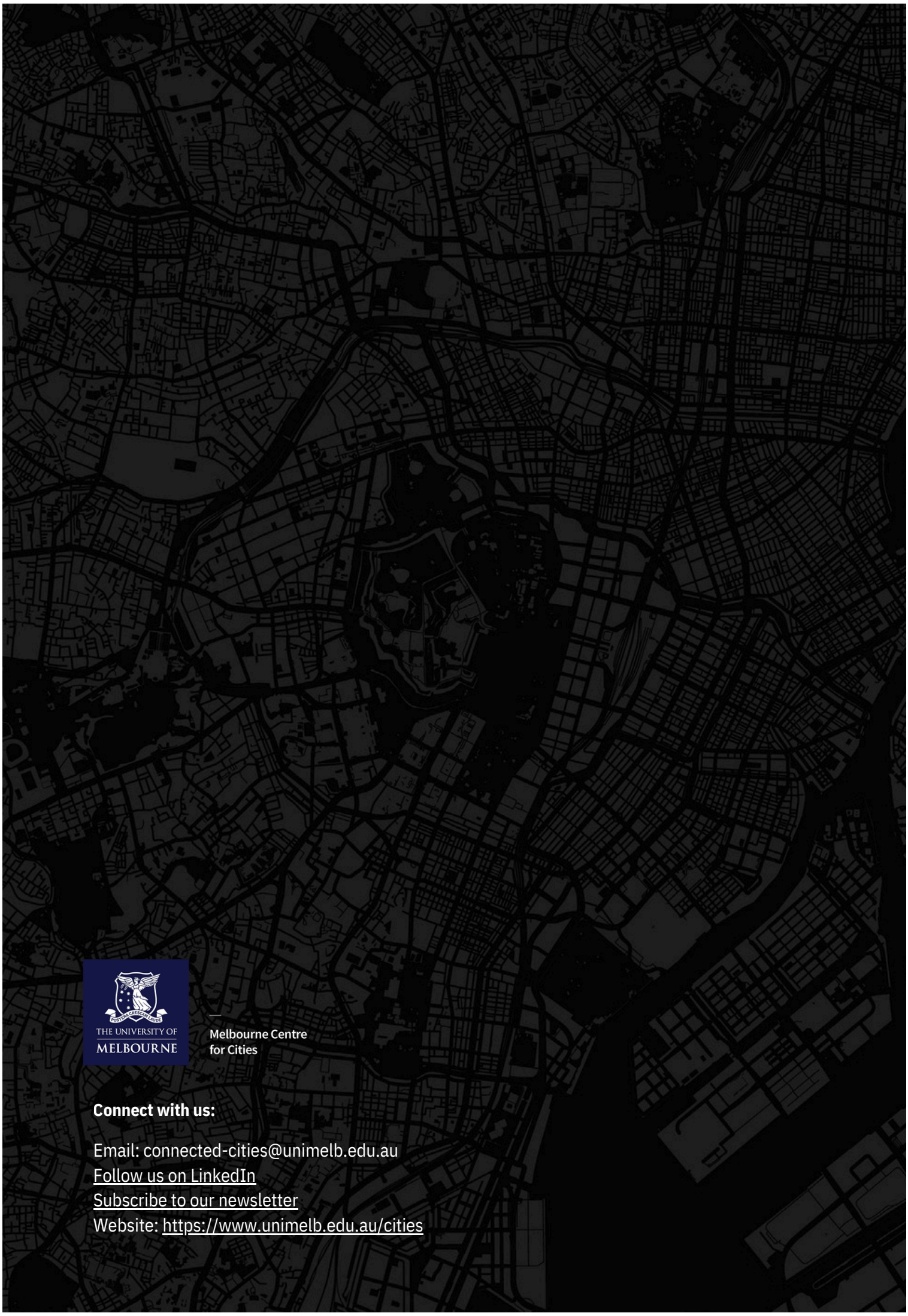
Questionnaires can be used to understand the relative importance of different elements of green infrastructure, preferences, and concerns. For example, "How important is it to you that the future street design includes the following", with options such as street trees, bicycle paths, car parking, provided an opportunity to rank from Not Important at all to Extremely Important. Questions can explore the participants views on parking, plant design, climate resilience, social objectives, and potential negative outcomes of street retrofits. The responses can be used by the research team to gain a broader understanding of the range of issues important to the community (characterising community), including prompting participants to consider issues that may not arise organically during workshop discussions. When implemented before and after the co-design workshop series, the questionnaire can also serve as a marker of if and how participation in the co-design process has altered community views. In this way, the questionnaires can serve a dual purpose, both helping to characterise the community and evaluate the impact of co-design. Shorter, simpler questionnaires are more likely to be completed by participants.

What you need

- A structured questionnaire can be administered through trusted online platforms such as Qualtrics, enabling the questionnaires to be completed outside of the workshop timeslot.
- Alternatively, printed copies can be provided to participants to complete during the workshop. However, note that this may require 10-15 minutes of time.
- Questionnaires should be designed and implemented in accordance with the relevant ethical approvals and National Standards for Ethical Research, including informed consent, voluntary participation, and anonymous contributions.



A sample of the results from a structured questionnaire eliciting community preferences for features present in a retrofitted street. Different coloured bars show the response of two different co-design communities.



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