

# Safe & Sound

Connecting with nature to enhance public space experience

# Project description

## Core Concept

Safe & Sound is an interactive public installation that uses creative technology to let people “listen” to the inner life of trees, transforming a busy city street into an engaging, calming, and safer public space. Urban public spaces now face many challenges – from ensuring safety and community wellbeing to fostering sustainability and connection with nature – which demand creative solutions. Our project addresses these needs by harnessing nature’s calming power.

Treestream is a digital platform that lets people ‘listen’ to the inner life of trees, creating a new sensory connection to urban nature. As the precinct is pedestrianised and new trees take root, Safe & Sound amplifies what those trees are already talking about, turning those trees into living musical infrastructure. Discreet sensors capture a tree’s subtle internal signals (like water pulses and bark vibrations) and translate them into an ever-changing soundscape influenced by the light, temperature, species, and eco-health. In stage 1, we will demonstrate proof of concept with a couple of small plants and trees – in Stage 2, this will expand to a variety of natural systems (e.g. underground water streams, insect ecosystems and soil biota).

Listeners experience this in sculptural “listening pods” made from organic, sustainable materials. These pods double as comfortable micro-refuges – providing shade, reducing heat and noise – while subtly enhancing security in the streetscape. By connecting people with nature’s rhythms (and each other), Safe & Sound reimagines how technology and ecology can combine to enrich and protect public space, supporting it to be attractive and comfortable for people to connect and stay.

## Research Innovation

Our team’s prior work has shown that each tree has a unique sonic signature that can be translated into music. The unresolved challenge – and our focus – is applying this nature–technology interface in a busy, high-noise urban precinct. We tackle this through three connected research strands:

**Treestream:** adapt and refine tree-sensing and sonification methods for dense urban settings. Testing sensor placement and durability under noise and foot traffic. Develop real-time compositional systems calibrated to site-specific trees. Design an open-air sound delivery system to engage casual listeners.

**Pod design and fabrication:** innovate with sustainable materials and interactive design strategies to create a multi-functional pod. Key performance goals: acoustic (quiet zone from city noise), structural (durable outdoors), experiential (calming enclosure without isolating the user), climatic (shade and cooling as a heat refuge), and safety (addressing site security threats).

**Stealthy security integration:** integrate protective security features into the pod (e.g. hidden barriers or reinforcement) to enhance safety without compromising the welcoming atmosphere. Currently, protective security in Australia is primarily through overt interventions (CCTV, bollards, etc), which research demonstrates can negatively impact the use of place. Our pod/node will provide safety while maintaining accessibility.

These strands combine environmental data, creative sound design,



material innovation, and security. The result will be a low-cost installation that addresses the impact of climate change-related urban heat while stealthily protecting people and place. It improves well-being by creating a refuge from noise while also offering a place to connect with others, and it uses technology to connect users to learning about environmental and ecosystem health through sound.

### **Creative Technology Approach**

The Safe & Sound prototype is delivered through five key layers, using innovative technology:

**1) Data capture:** Contact microphones, geophones, and bioelectric sensors record acoustic, vibrational, and electromagnetic signatures from selected trees.

**2) Compositional processing:** Custom audio software translates live biometric signals into real-time soundscapes unique to each tree.

**3) Sound Delivery:** Experiment with and determine the best method to convey sound in the open air (e.g. wireless headphones, integrated speakers, or tactile surfaces) for different user group sizes and ambient conditions

**4) Advanced Fabrication Technology:** Investigate how bio-based materials (e.g. mycelium) can be used as a fabrication material to provide a sustainable, organic and robust 3D printing material.

**5) Integrated Design:** Embed stealthy security features and climate adaptation elements (e.g. cooling, shading) in the pod's design to reduce urban heat impact and protect public places.

### **Stage 1 Feasibility**

Stage 1 will focus on design and hands-on testing to ensure viability. We will select robust sensors for continuous use, stabilise the software for

long-duration operation, test material and fabrication design for small-scale pod components, and refine the sound delivery approach. These steps will validate the technical and practical feasibility of the concept, culminating in a proof-of-concept demonstration at the November 2026 CreaTech showcase.

### **Alignment with Jones Street**

Safe & Sound is purpose-built for the evolving Jones Street precinct, but will be replicable for other urban settings. The street's redevelopment prioritises green infrastructure and pedestrianisation; our project extends that vision by turning that infrastructure into an interactive public asset that bolsters environmental awareness and community well-being. The installation's integration of living nature with creative tech gives Jones Street a distinctive identity rooted in place – a contemplative, multi-sensory experience unattainable through screen-based or off-site approaches. Within the Tech Central and Ultimo Creative ecosystem, the project occupies distinct territory: contemplative, biological, and specific to this place and these trees. We will coordinate with UTS Property and the precinct's landscape designers to ensure our prototype aligns with and enhances the site's design and can be integrated into the real-world precinct.

### **Interdisciplinary Contribution**

Safe & Sound is an inherently interdisciplinary collaboration. It poses and answers questions at the junction of multiple fields – how to convert biometric data into cultural experiences; how interactive sound and organic design influence public comfort; and how a public installation can double as both security and climate adaptation intervention. The UTS team spans public space design (BE), landscape design & smart environmental technology (Arch), and interaction design and human-computer interaction (FEIT), is joined by industry partners Cobalt

Engagement (creative audio technology & community engagement), Core42 (public-space security design), and Artefact (Aboriginal cultural heritage values). This breadth of expertise ensures all technical, aesthetic, and social aspects are holistically addressed.

### **Engagement with Country**

Jones Street is Gadigal Country. Jones Street is Gadigal Country. In Stage 1 we will work with Artefact to create a strategy to engage with Dharug knowledge holders in Stage 2 to guide how the project can respectfully reflect the significance of trees and listening to Country. Their input will shape the project's narrative and educational elements, particularly in a future permanent installation, so that the outcome remains culturally responsive and connected to Country.

### **Stage 2 Pathway**

Stage 2 will progress along two parallel tracks. The first focuses on integrating Safe & Sound into the Jones Street Landscape Project – working with UTS Property and landscape architects to make the pod a lasting feature of the precinct. The second track pursues external research funding and formalises the UTS–Cobalt Engagement–Core42 partnership as a sustained research program. The Stage 1 demonstration at the November 2026 showcase will serve as a springboard for both tracks.

This stage will focus on the 1:1 digital fabrication and installation phase of the designed pod (post-refinement). We see the future of the node as a patentable and marketable intervention that will be attractive to major project developers looking to meet social and environmental sustainability and security targets. Ultimately, a permanent Safe & Sound on Jones Street will ensure the trees are never just trees – they will continuously share their hidden music with everyone who stops to listen.

# UTS Team

**Pernille Christensen, Lead Investigator, Associate Professor in the School of Built Environment.** With more than 25 years of professional and academic experience across architecture, urban planning, sustainable development, and resilience. Her research focuses on urban resilience, examining how cities and infrastructure can better withstand social, environmental and security-related disruptions.

**Nimish Bioria, Professor in the School of Architecture.** His work advances nature-based solutions and resilient urban futures through design-led, data-driven research grounded in social justice, participatory methods, and technology-enabled innovation, informing urban policy and sustainable infrastructure.

**Kumar Biswajeet Debnath, Chancellors Research Fellow at the Faculty of Design and Society, UTS.** He is a building physicist advancing Bio-Intelligent Building Systems that integrate living materials, AI-driven design, and biotechnology to create self-regulating structures for extreme climates.

**Tran Dang, technical expert at the UTS Advanced Fabrication Lab leading research in robotic fabrication and computational design.** His work focuses on large-scale robotic 3D printing, 3D knitting, augmented reality, and custom robotic systems.

**Martin Bryant, Professor in the School of Architecture.** As a practitioner, he has led the design of significant contributions to Darling Harbour, Sydney Olympic Park, and Green Square. His research focuses on urban ecology and urban resilience. He has won multiple national and international design and research awards.

**Elise van den Hoven, Professor of Human-Computer Interaction in FEIT.** She is a researcher working across design, psychology, and people-centred interactive systems. She leads the Materialising Memories programme, exploring how objects, digital media, and the body support remembering and forgetting, and how interactive designs enhance everyday memory practices.

# Industry Team

**James Peter Brown, Creative Director, Cobalt Engagement + Composer and Sound Designer.** A composer and sound designer with over 20 years of experience across theatre, film, installation and large-scale public works. His practice sits at the intersection of sound, technology and human sensory experience, with a particular focus on site-responsive and immersive work, and a particular interest in Meditation Practice and mindfulness.

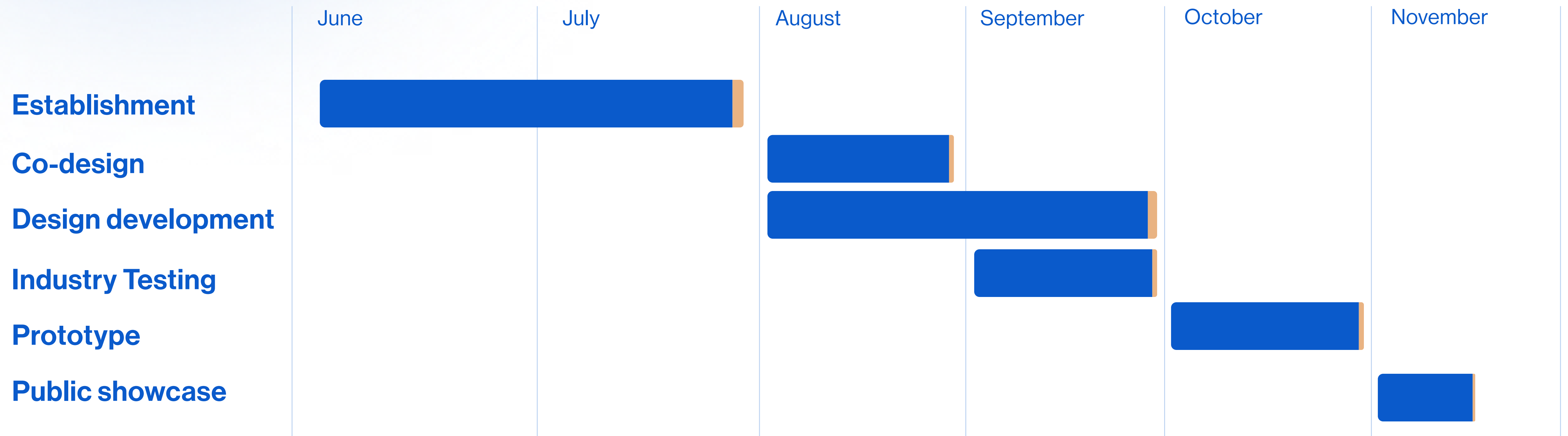
**Nicole Dennis, Founder + Director, Cobalt Engagement.** An urban and regional planner and placemaker with 20 years of experience in community engagement, strategic planning, placemaking and resilience-based strategies. Her practice integrates community and place-led approaches into urban design, master planning and public domain activation, with award-winning projects across councils, developers and government agencies nationally.

**Core 42 Team.** A leading specialist security advisory firm focused on public place security, crime prevention, and counter-terrorism, with deep technical expertise in security planning and risk management, including the integration of security into the design process to enable effective protection in non-obvious settings. Codee Ludbey, co-founder, brings over a decade of experience in public place security planning, and Samyak Bharthur, security consultant, specialises in threat assessment, crime prevention through environmental design, and hostile vehicle security. Codee is currently also completing his PhD at UTS in Protective Security and Urban Design, offering a unique perspective on the impacts of security interventions on placemaking.

**Artefact Heritage and Environment.** A heritage consultancy firm specialising in Aboriginal archaeology, built heritage, historical archaeology, heritage interpretation and Connecting with Country. The Country and Culture team, led by Alex Gaffikin, specialise in organising consultation with Aboriginal Traditional Owners and Knowledge Holders in NSW to provide Aboriginal Cultural Heritage Values and advice for development projects.

# Project timeline

We will work collaboratively to co-design this project across the program with place users and industry





**Project establishment,  
planning and literature  
review**

**June-July 2026**

**UTS and industry partners Team Workshop**

Refining research questions and action research methodology

Confirm team roles and industry partner inputs

**Literature review (research assistant)**

**Ethics Application**

*Sub-teams start planning their activities*

PC,ND - Plan & develop co-design workshop 1; recruit participants.

NB, MB, JB, CL, EvdH - "broad net" ideation of materials, sound, pod & interaction design.

**Action Research  
Workshop**

**August 2026**

**Action 1**

**Design experience co-design workshop** focusing on the problems around urban public place design, appreciation of nature in urban settings, user understanding value of GI and environmental health, their thoughts around sensory integration for improving mental health, the idea of sensory escape, and how these could translate into design ideas .

*Output: 2 hour on-site co-design workshop and walkshop, workshop report, collaboration with design development.*

**Design development  
and concept  
prototyping**

**August - September  
2026**

**Action 2**

**Prototype Design Development using inputs from Action 1 - PC, NB, MB, JB, CL, EvdH.**

Advance materials, sound, landscape, lighting and interaction design concepts Preliminary testing of prototype components. Research mycelium materials and integration with 3D printing possibilities for the proposed pod in association with AFRL. Storytelling framework and translation (capturing water and tree sounds with sensors). Engage on prototype feasibility.

*Output: Draft design framework package. Initial renders and diagrams of prototypes.*

### Industry Testing

September 2026

#### Action 3

### Industry Design Development Workshop - PC, ND.

Mid-project Industry Workshop facilitated by Cobalt Engagement with developers, builders and asset owners: feedback on the prototype design (Action 2) to ensure that the final design will be implementable and aligned with industry challenges and innovation goals.

*Outputs: Industry Workshop report, lessons learned, impacts identified for design refinement.*

### Paper prototype production

October 2026

#### Action 4

### Team Workshop: Synthesis of design, research & feasibility insights - PC, NB, MB, JB, ND, CL, EvdH.

Identify potential issues using Action 3 inputs.

Prototype design refinement and finalisation using Action 3 outputs.

Resolve issues as needed for prototype development.

Create next steps in design refinement for Stage 2.

### Preparation of exhibition materials, panels, diagrams and captions.

Renderings, videos and other documentation preparation

Materials and/or printed materials demonstration object (this will evolve based on inputs) and clear communications narrative.

*Outputs: Exhibition materials including material prototypes, final render set, Treestream sensory demonstration, project website, communications narrative, and public showcase presentation.*

### Public showcase

November 2026

#### Action 5

Installation and presentation.

Stakeholder engagement (UTS Property, industry, students, community), invite workshop participants, gather feedback from prototype. Identify improvements and next steps for stage 2.

*Outputs: Journal article 1: "The role of Lived Experience in Green Infrastructure Design."*

*Journal article 2: "Advancing University-Industry Research Collaboration through Action Research"*

*A detailed stage 2 proposal for 2027 can be developed based on stage 2 call and future funding arrangements.*