



# Evaluation and Implementation of Shared Spaces in NSW

## Stage 2a – Empirical analysis of Shared Road Infrastructure in NSW: Collation of shared road infrastructure perspectives and local examples

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### *Executive Summary*

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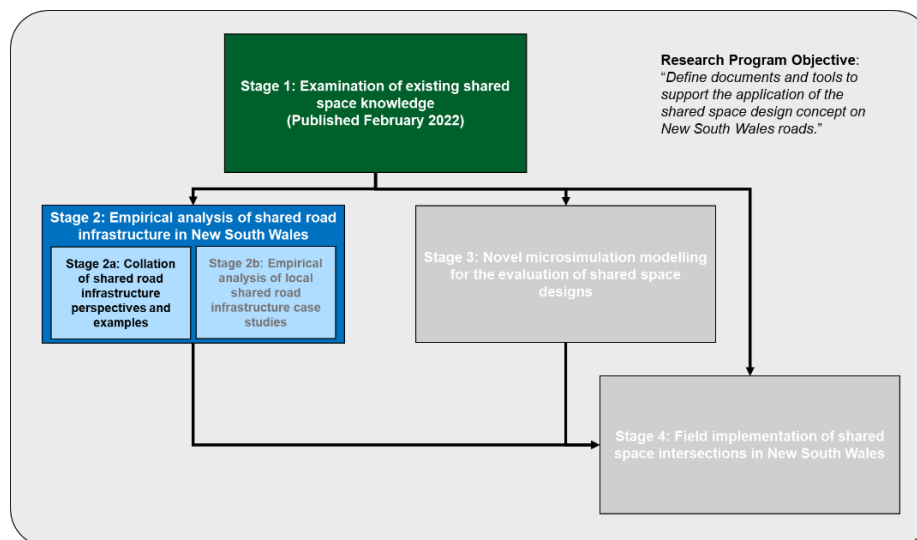
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## Executive Summary

Shared spaces, in the context of road infrastructure, are locations that minimise the separation of road users to reduce and slow vehicle traffic and enhance place characteristics. In New South Wales (NSW), the most common form of shared space is a shared zone, which have strict legislative requirements (10km/h posted speed limits) and alternative shared space solutions do not have detailed guidance or standards. Thus, the Transport Research Centre, within the School of Civil and Environmental Engineering at the University of Technology Sydney (UTS), was commissioned by Transport for New South Wales (TfNSW) and supported by the iMOVE CRC to **collate industry perspectives and examples of shared road infrastructure to provide greater clarity for the development of more comprehensive shared space guidance**. The full report details the findings from Stage 2a of the *UTS Shared Spaces Research Program* and refers to and reflects upon Stage 1, a comprehensive literature review (Wijayaratna et al., 2022). This Research Program aims to **establish the definition and understanding of shared space designs to provide transport practitioners additional options and guidance to define successful places**.



Stage 2a included two work packages, (1) stakeholder workshops to gather experiences, feedback, and future directions from practitioners and (2) development of a database identifying locations and attributes of shared space instances within the Sydney Metropolitan area.

The objectives of Stage 2a were as follows:

- **Clarify** definitions, objectives, design options and limitations of shared space applications in NSW.
- **Establish a database** of shared road infrastructure throughout the Sydney Metropolitan (focus on City of Sydney).

The collation of perspectives presented in this study does not take into consideration community perspectives, given the scope and resourcing that was available for the project. Consistency and clarity across practitioners are key to define guidance but equally important is gathering community views, especially vulnerable road users, to ensure that shared space

infrastructure is usable and accessible. Accordingly, community perspectives will be gathered through a survey methodology in future research and will be compared with the findings of the study presented in this report.

### Stakeholder Workshops

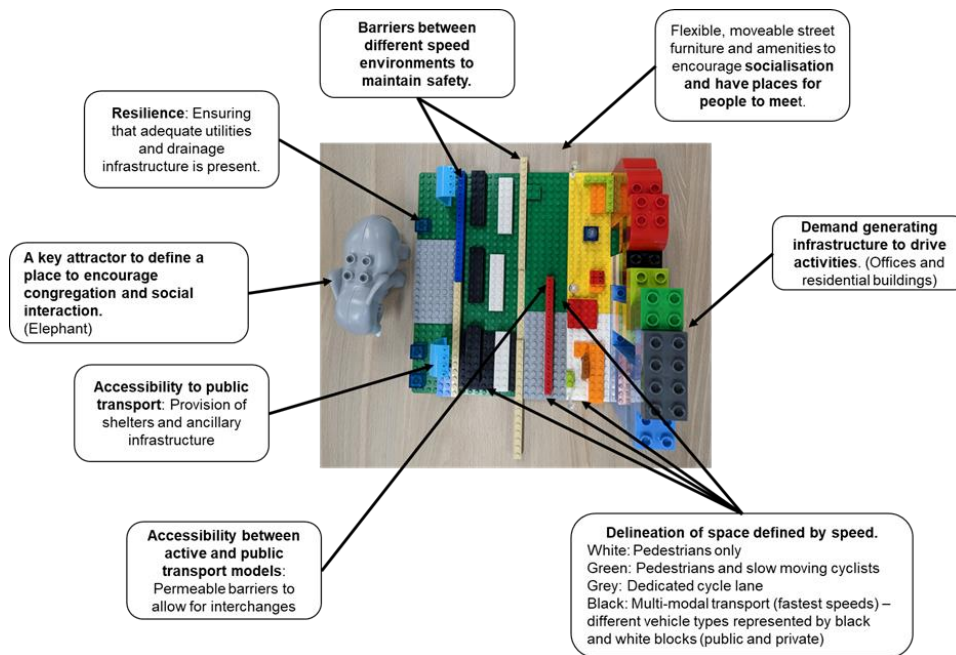
Effective stakeholder consultation with members of an industry is core to developing standards and guidance (Cerè et al., 2019; Fraussen et al., 2020). The workshop included a variety of professionals involved in the planning, design and implementation of shared road infrastructure:

- Transport Planning
- Transport Design/Engineering
- Urban Planning
- Landscape Design/Architecture
- Pedestrian/Cyclist Design and Implementation
- Road Safety/Vulnerable Road User Providers

In addition, representation was necessary from the different sectors across the industry: State Government, Local Government, Developers and Consultants, which all contribute to the delivery of shared road infrastructure. Accordingly, the design of the workshop was inclusive of the diversity in knowledge but also tailored to a participant list that had knowledge and experience in terms of road and street design and implementation.

The overarching objective of the stakeholder consultation workshops was to understand the variety of perspectives and gain clarity for the planning, design, implementation, and evaluation of shared road infrastructure. More specifically, it aimed to identify aspects that create an ideal experience in a street that safely balances place and movement as well as relevant metrics to measuring these aspects. Given the conjecture surrounding the terminology of “shared spaces”, care was taken to frame and structure the workshop. The term “*shared space*” was removed to assess whether the term would be used by participants to describe design options and define metrics within the workshop.

To deliver a holistic and integrated visual and tactile structure of **metrics** associated to key **aspects** (or objectives) related to shared spaces that safely balance place and movement, the Lego Serious Play® (LSP) technique was chosen. Besides achieving a model using the Lego® bricks that visually represents and summarises the group response to a brief, LSP has a number of other advantages. LSP is a problem-solving and facilitation technique that relies on the creation of a model using Lego® bricks and the metaphor/meaning given by its builder (i.e., workshop participant) to the different parts of the model. This creates psychological safety and levels the playing field since participants bring their own perspective by presenting and discussing their model (Wheeler et al., 2020), thus being inclusive of different personality types. This is crucial for a truly successful stakeholder engagement in which everyone’s perspective is elicited, valued, and incorporated in the discussion. The fact that the final model created by the group has physical Lego® bricks of the models individually created by each participant (and its associated metaphor/meaning) is further evidence of the collaborative and inclusive nature of the technique. An example of a collaborative group model and key aspects drawn out by participants is presented in the following annotated photograph.



The workshop was organised into four main parts mirroring the four core steps of the LSP process (Rasmussen Consulting, 2022): (1) the facilitator poses a question; (2) participants (individually or in groups) build a model in response to the question, having an internal mental process of constructing a story/assigning meaning to the bricks; (3) participants (individually or in groups) share the model’s meaning or story to the rest of the group; and (4) the facilitator and participants reflect and crystallise key insights, prompting clarifying and explorative questions about the models. Pilot testing was undertaken to refine this workshop structure.

Once the workshop structure was finalised, workshops were implemented as follows:

- Four workshops (30 March 2023, 13 April 2023, 19 April 2023, 2 May 2023) were held from 9am to 1pm (all executed within the expected duration).
- Two of the workshops considered the “Local Street” context, while the remaining two considered the “Civic Space” context.
- Workshops were held at the University of Technology Sydney within a room that could accommodate up-to 12 participants.
- LSP technique requires a minimum of 2 and but no more than 12 participants per workshop (Rasmussen Consulting, 2022)
- All workshops had between 6 and 10 professionals enrolled, and the attendance varied between 75% and 100% (each workshop had 6 or 7 participants).

A total of **27 practitioners participated across the 4 workshops, which to the authors’ best knowledge, is one of the largest in-depth stakeholder engagement exercises involving practitioners within the transport landscape** (focused on road and street design). Local government involvement was identified as a critical component of the stakeholder workshop design because these professionals interact with the strategic guidance provided by state government/researchers, must address community needs and implement designs in practice. Accordingly, 12 of the participants were Local government professionals, representing 11 Local Government Areas in the Greater Sydney region. In addition, the participants included 6 State Government professionals and 9 professional who were Engineering/Planning or Landscape Architecture technical professionals providing consultation and advice to implement street and road designs.

The outcomes of the stakeholder workshops, based on the analysis of the data, can be summarised as follows:

- All participants were engaged with the material (offering valuable insights) and enjoyed the unique nature of the workshop.
- The workshops generated professional connections and insights allowing for an appreciation of diverse perspectives.
- **All workshops yielded discussions concerning themes that could be related to existing objectives of shared space designs.**
- Though there was a **consensus in aspect definition** regarding safety, enhanced priority for active and public transport modes, lower speed environments and establishment of a place using nature and other social infrastructure, there were differences between the Civic Space context workshops and Local Street context workshops.
  - Respondents in the Civic Space context generally suggested a need for a focal point attractor within the space as well as acknowledging the need to achieve economic success, two aspects that were not discussed in the Local Street context.
- Given the consistency of responses across the workshops, **a consolidated perspective to achieve an ideal shared road infrastructure experience was formed.**
- **The terminology of “shared spaces” was used in every workshop, indicating that it is a core component of achieving both movement and place within a design.** Furthermore, all aspects highlighted by participants aligned with the high-level objectives identified in CIHT (2018) which confirms that shared space designs are a potential solution to achieve streets that have a balance between movement and place.
- Collectively, participants suggested **“strategic use of shared road infrastructure”** indicating zone-based approaches are beneficial where protected/separated design attributes are present alongside shared spaces.
- 153 metrics (113 unique) were identified by participants with most metrics focussed on measuring the comfort and safety of users.
- 20 out of 113 unique metrics identified were similar or identical to Built Environment Indicators (BEI) metrics<sup>1</sup>, constituting approximately 18% of the responses. Thus, there are several additional considerations when appraising shared spaces.
- **“Vehicle speed”, “diversity of users” within the space/street, “Mode split” and “tree canopy cover”** were the most highly cited metrics by workshop participants. These are the most logical metrics to use to evaluate whether a location has lower speeds, greater socialisation or community engagement or increased walking and cycling.
- Metrics of importance tended to focus on social interaction and liveability with the **presence of “nature/vegetation” being identified as key for evaluation.**

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<sup>1</sup> The NSW Government “*NSW Movement and Place*” website clearly articulates the need to systematically incorporate social, environmental, and economic aspects into roads and street design and operations and formally presents 36 Built Environment Indicators (BEIs) to establish a common language and quantification approach for road infrastructure evaluation across industry and government.

Using the responses from the workshop, and consistent with definition of shared spaces established in Stage 1, the following consolidated perspective to achieve an ideal shared road infrastructure experience was formed:

*“In order to achieve an effective shared space that can create an ideal experience for the community, **people must be prioritised ahead of vehicles. Lower speed environments** that promote accessibility and safety for all users in terms of mobility and, access to amenities and services **can enable changes in driver behaviour. The natural environment (vegetation and tree canopy) and zone-based applications of shared space designs should be leveraged** to transition from movement-oriented infrastructure to a place-oriented space. This strategic direction can cultivate an **inclusive shared space that fosters a sense of community while maintaining mobility.**”*

## Shared Road Infrastructure Database

In parallel to the stakeholder consultation presented above, another gap the Stage 1 of the research program identified is the lack of documentation of existing sites that could be classified as a shared space. Understanding the location and attributes of existing locations can provide practitioners a foundation in designing, implementing, and evaluating future shared spaces. Accordingly, the second core objective of the project was to collate key information of existing shared road infrastructure across the NSW road network. This resulted in the development of a shared road infrastructure database.

Consideration was given to determine the key variables that would be collected for each shared space. The variables that were used align to TfNSW’s BEI framework and is augmented with physical design features and spatial information. The variables used are outlined in the table below.

Variable	Purpose
<b>Geographic Location</b>	Latitude/Longitude, Street Name, Adjacent Street Names, Suburb and LGA are all documented to gauge spatial positioning and relationships of sites.
<b>Adjacent Land Use</b>	Allows to draw relationships between land use and shared road infrastructure.
<b>Intersection Site</b>	To signify the type of road infrastructure being transformed, is it isolated to an intersection or is it a road section/network treatment.
<b>Speed Limit</b>	Critical to collate as a means of maintaining safety in shared environments. Also, necessary to conduct compliance studies when speed data is collected.
<b>Shared Zone/Space Signage</b>	Is the location an existing shared space (clear definition using “shared” signage) or a potential site (no clear definition/signage but operates as a shared space)? – allows for differentiation between formal/informal sites.
<b>Street Furniture</b>	Place oriented variable common to shared space applications globally. Can be used as an independent variable in assessing impacts.
<b>Foliage/ Greenery/ Tree Canopy</b>	Place oriented variable common to shared space applications globally and integrated within the BEI. Can be used as an independent variable in assessing impacts.
<b>Pavement Type</b>	Place oriented variable common to shared space applications globally. Can be used as an independent variable in assessing impacts.
<b>Kerb/ Guttering</b>	Place oriented variable common to shared space applications globally. Can be used as an independent variable in assessing impacts.
<b>Safety Barriers</b>	Provides an indication to the degree of separation within the shared space. Can support the development of the categorisation shared road infrastructure.

Variable	Purpose
<b>Traffic Signals</b>	Traditional shared space definitions/implementations remove signalisation. This variable can provide insights into local applications which may require an adjustment for the Australian/Local context.
<b>Signalised Crossings</b>	Traditional shared space definitions/implementations remove signalised crossings. This variable can provide insights into local applications which may require an adjustment for the Australian/Local context.
<b>Marked Unsignalised Crossings</b>	Traditional shared space definitions/implementations removes marked crossings. This variable can provide insights into local applications which may require an adjustment for the Australian/Local context.
<b>Other Informal Crossings</b>	Pavement colouring, raised pavements, road cushions and other traffic management devices maybe perceived as an informal crossing by pedestrians.

In addition to the primary variable of “Geographic Location”, variables such as the type of infrastructure (Intersection Site) and adjacent land use provide indication of the street context (Main Street, High Street, Civic Space or Local Street). The “Shared Zone/Space Signage” variable was collected to determine the formalisation of the shared road infrastructure. The database has been designed to capture formalised shared spaces with signage but also allows practitioners to note prospective or proposed sites that currently do not have signage but have features of shared road infrastructure.

The Microsoft Power BI platform was used as the primary medium for cataloguing and representing shared zones. Power BI is a powerful data visualisation platform, that is used by TfNSW. Power BI, like some features of Geospatial Information Systems (GIS) software, is able to represent data with a spatial component. Unlike GIS, Power BI is interactive platform that is designed to be intuitive, not requiring prior experience for users to navigate and operate. Furthermore, it is augmented with sorting and filtering functions such that specific data attributes can be selected and analysed by users.

Latitudinal (*lat*) and longitudinal (*long*) data for each shared space was used to spatially locate and represent length and geometry of the infrastructure. Each shared space was given a unique ‘ID’ number to differentiate it, with a particular shared space also containing an added attribute of a ‘Segment Number’. This was used to capture geometry such as curves along the road alignment by having unique *lat* and *long* for each segment as well as the start and end points of a particular site. Furthermore, splitting each site into segments allowed for the identification of nuances in features along the length of a shared space. The population of the database involved leveraging several data sources to verify the presence of shared road infrastructure sites. The method involved examining the following resources:

- **Geographical Information System (GIS) Maps:** GIS maps of the Sydney Road network was used to initially identify sites that had sign-posted speed limits of 30km/hr or less (with a particular focus on sites that were 10km/hr as this is the required limit for a shared zone)
- **Aerial Maps:** Nearmap© and Google Maps© were used to gather visual cues of sites that had shared space features. Traffic calming entry treatments, coloured pavements, bollards, and street furniture supported in the identification of both defined and potential shared road infrastructure sites.
- **Google Street View© and Site Investigation:** Street views and site investigations were conducted to confirm design features and spatial information.



The database infrastructure was constructed to collate data for sites across NSW, and as a pilot, 71 formally defined sites within the City of Sydney have been included in the current version of the database, as shown in the map below.



Collecting this information, even at a preliminary level allowed for spatial analysis, indicating key relationships between shared road infrastructure and other variables. For example, within the City of Sydney, more than half of the shared space locations were in a “General Residential” land use category.

### Final remarks

Stage 2a revealed the significance of shared space solutions in achieving streets that strike a safe balance between movement and place, aligning with various street classifications defined by TfNSW. In addition, the database development highlighted a sample of the existing sites present on the network. However, there is currently a lack of formal guidance for practitioners to effectively adopt shared spaces, potentially complicating future applications. **Continued research will address this gap and comprehensively understand the impacts of shared spaces. This can ultimately lead to evidence-based frameworks and guidelines that facilitate appropriate implementation and evaluation of these solutions.**

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