

Evaluation and Implementation of Shared Spaces in NSW: Framework for road infrastructure design and operations to establish placemaking

Examination of existing Shared Space knowledge

Executive Summary

February 2022

Transport Research Centre (TRC), School of Civil and Environmental Engineering,
University of Technology Sydney (UTS)

Contributors

Dr Kasun Wijayaratna

Dr Cecilia da Rocha

Dr Michelle Zeibots

Nicholas Bradbury

Nafisa Nishandar

Disclaimer

This report has been prepared on behalf of and for the exclusive use of Transport for NSW, and is subject to and issued in accordance with the agreement between Transport for NSW and the University of Technology Sydney. Care has been taken in the preparation of this report based on available evidence. The University of Technology Sydney does not make any representations or state that the report is free from error, is current, or, where used, will ensure compliance with any legislative, regulatory or general law requirements. The University of Technology does not accept any liability or responsibility, including for any loss or damage, resulting from reliance on this document. Copying this report without the permission of Transport for NSW and the University of Technology Sydney is not permitted.

Introduction

The Transport Research Centre, within the School of Civil and Environmental Engineering at the University of Technology Sydney (UTS) has been commissioned by Transport for NSW (Transport) to complete a comprehensive literature review of the **shared space design concept and applications in practice**. This concept is a network design and traffic management technique implemented to reduce vehicle dominance at a location and achieve improved place outcomes. However, there has been both positive and negative outcomes from reported implementations, thus requiring further research.

The literature review presented in this report supports the delivery of a research program (Figure 1) aimed at **re-establishing the definition and understanding of shared space designs in order to provide transport practitioners additional options to define successful places**. The focus of this report was to understand this concept and determine how shared spaces can support and enhance the development of “successful places”, a key strategic priority of Transport.

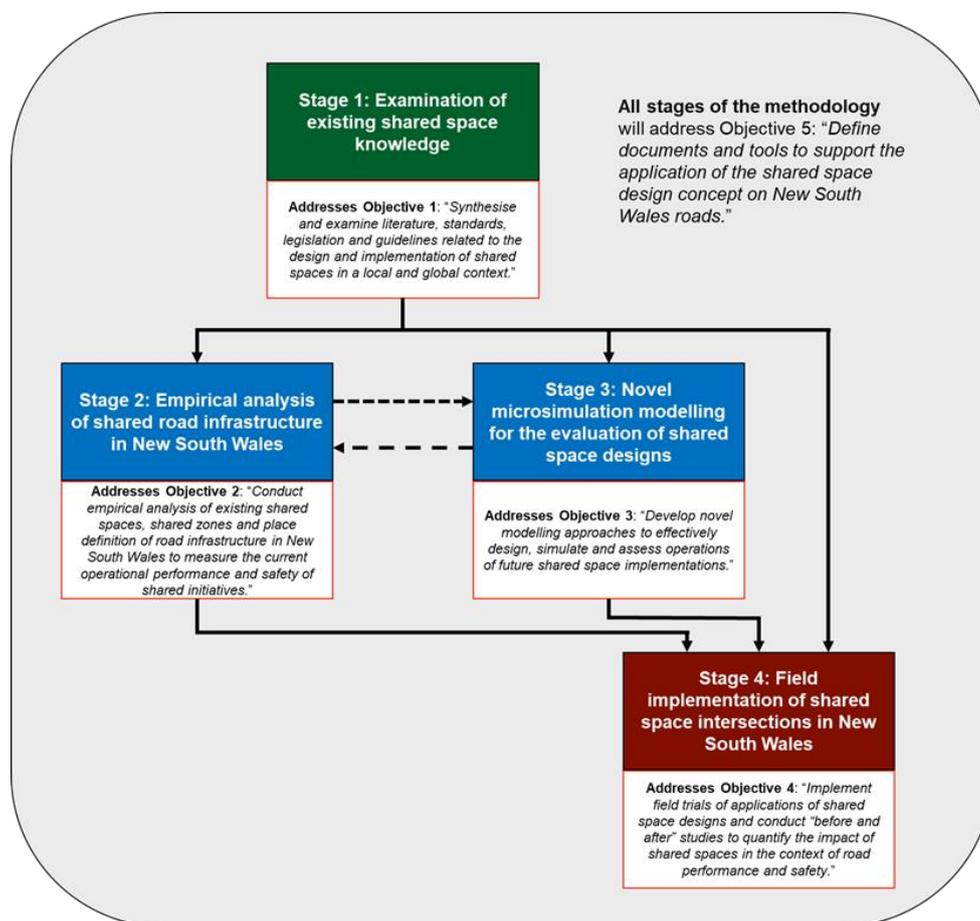


Figure 1: Proposed Shared Space research program

Broadly, high level critical findings include:

- The **shared space design concept** is a tool that can be used to form **successful places** across the community.
- A **spectrum of intervention and design options** are available to transport professionals to achieve a shared space within the road network.

- **Defining relationships between design parameters and performance metrics**, are key to determine the factors that lead to successful shared space implementations.
- **Current guidelines, standards and practical processes limit the application of novel shared space solutions as well as other traditional solutions that value place over movement.** The key findings of each section of the report are summarised in the following sections

Section 2: Background and Literature

Shared space terminology is varied, synthesis of several publications and government documents led to the definition highlighted below which offers greater flexibility to account for vulnerable road users.

Shared Space Definition:
 A public street or intersection that is intended and designed to be used by all modes of transport equally in a consistently low-speed environment. Shared space designs aim to reduce vehicle dominance and prioritise active mobility modes. Designs can utilise treatments that remove separation between users in order to create a sense of place and facilitate multi-functions.

Though initial implementations of shared spaces focussed primarily on measures to create an entirely shared environment (removal of all separation infrastructure), authorities in New Zealand and the United States of America (USA) have proposed a “zone-based” approach to implementation (Figure 2). **The shared space is separated into zones where all users can share the space and other protected zones that provide vulnerable road users safe accessibility.** This is reflected in the multitude of public available standards, guidelines and technical reports.

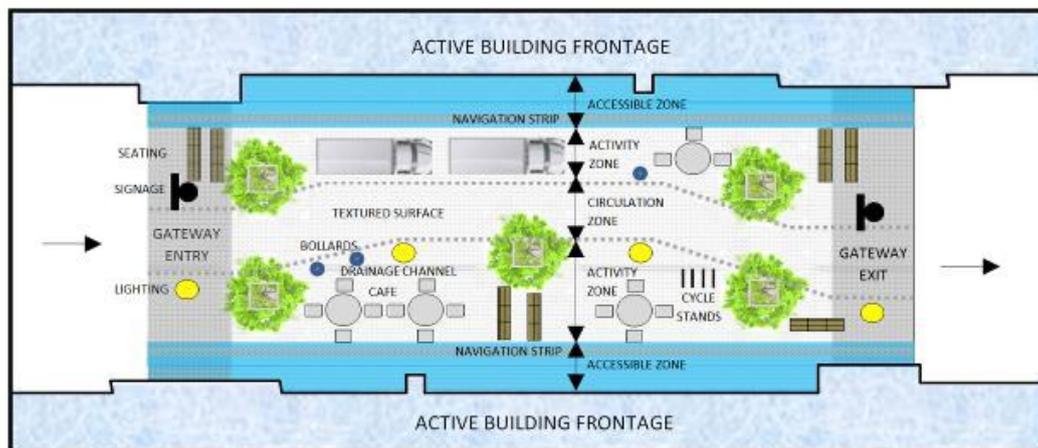


Figure 2: Shared space separated into Accessible Zone/Activity Zone/Circulation Zone (Auckland Council, 2017)

In general, Australian authorities have implemented a constrained version of the traditional shared space design concept, referred to as “shared zones”. Shared zones have historically had strict limitations on speed (10km/hr) that limit applications. **More innovative designs (for example, flush intersections) require a series of complex approvals that need to be simplified in the future.**

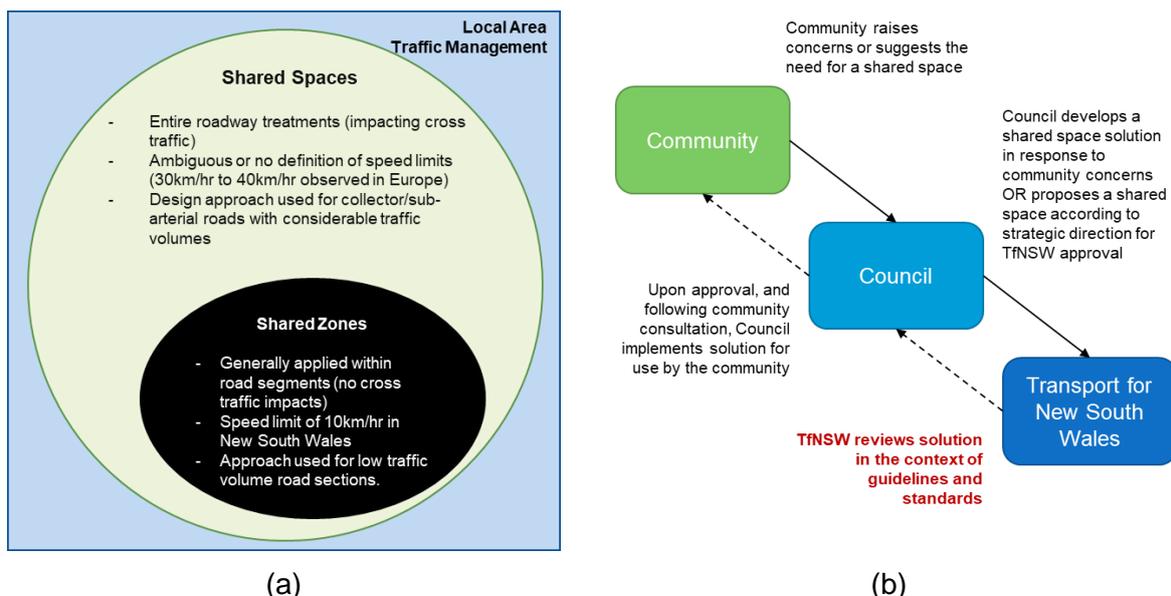


Figure 3: a) Relationship between shared zones (as used in NSW) and the traditional Shared Space definition, b) Procedure for the implementation of novel designs (such as shared spaces) for local area traffic management purposes.

Academic literature concerning shared spaces can be broadly separated into qualitative conceptual studies focussed on user perceptions and quantitative studies that focus on traffic performance measurements. There is a lack of research proposing frameworks for a comprehensive evaluation of shared spaces performance in terms of place and movement.

Studies on shared space evaluation are fragmented in terms of design parameters and performance metrics with limited correlation between these two domains. The research presents a preliminary conceptual mapping of design parameters and performance metrics currently highlighted in the literature.

Section 3: Review of Case Studies

Currently, there are only very few scientific publications or government reports that document shared space case studies. The report provides detailed assessments of 4 case study sites from the UK and NZ which consisted of publicly available documentation. A summary of the analysis is presented in Table 1.

Overall, the case studies investigated reveal positive outcomes in terms of safety and objective achievement (creating a successful place) however public perceptions has been mixed. Some vulnerable users have indicated additional travel stress while other sectors of the community believe it has been a benefit.

Small sample sizes and the limited use of before and after studies are two major drawbacks. This can be rectified through the application of a comprehensive evaluation framework which will be investigated in the future and can be developed within this research program.

Table 1: Summary of Case Study Analysis

Site	Purpose of Shared Space	Traffic Conditions	Design Features	Key Defining Findings
Horseshoe Common, (UK, 2014) Pearson et al., (2019)	Promote sustainable travel and improve safety	4800 veh/day 5 casualty collisions per year	<ul style="list-style-type: none"> • Roundabout + Pedestrian crossing removed • Introduction of tactile pavements + flush kerbs 	<ul style="list-style-type: none"> • 38% reduction in casualty collisions. • Footfall increased by 126% • Positive feedback overtime.
Acorn Road (UK) Clarkson (2017)	Create a better environment for walking and cycling	4000 – 4500 veh/day, 25km/hr, 300 people/hr	<ul style="list-style-type: none"> • Conversion to 1-way street • Shared raised platforms • Reduction of parking 	<ul style="list-style-type: none"> • Reduction in vehicle volumes (30%) and speeds (19%) • Positive attitude and more cooperative travel behaviour.
Elliott Street, (NZ) Karndacharuk et al., (2014b) Karndacharuk et al., (2016)	Reduce vehicular dominance, and encourage community interactions	1800 veh/day	<ul style="list-style-type: none"> • Introduction of pavers, flush kerbs, street furniture • Removal of bollards 	<ul style="list-style-type: none"> • Reduction in daily vehicle volumes (45%) and speeds (20%) • Quality of place improvements measured (significant and positive)
Fort Street, (NZ) Auckland Council (2012)	Create a distinctive public space to increase footfall.	6000 veh/day, 29km/hr	<ul style="list-style-type: none"> • Introduction of pavers, flush kerbs, street furniture • Removal of line marking and parking 	<ul style="list-style-type: none"> • 54% increase in pedestrian volumes, 45% reduction in vehicle volumes, 47% increase in economic activity* <p>* Note the after surveys were conducted during the time of the NZ Rugby World Cup 2011</p>

Section 4: Challenges and opportunities for the implementation of Shared Spaces

Shared spaces are driven by the requirements of a community and the need to create community, therefore trust, collaboration, and close engagement are integral to their successful design and implementation.

Shared spaces need to be developed and implemented in alignment with the Towards Zero vision (a road network free from death and serious injury). This adds important requirements to limit the amount of force that vulnerable road users may be exposed to. It also has implications on regulation (maximum speed limits) and design features that are needed to support safer environments.

Transport has the opportunity to be a global leader in shared space adoption by supporting further empirical research of existing and future applications of this innovative concept and defining guidance for effective and sustainable implementation.

Section 5: Concluding Remarks

This research has shown the potential for shared spaces to develop successful places. By continuing further research and application of this design concept, Transport can better support practitioners in delivering a transformation of the urban landscape and road network that services people rather than vehicles. This can pave the way for a more sustainable transport system while also supporting the development of active communities and places.

References

Auckland Council 2012. An evaluation of shared space in the Fort Street Area, Auckland New Zealand Auckland Council.

Clarkson, J. P. 2017. The effect of shared space on attitudes and behaviour. Newcastle University.

Karndacharuk, A., Wilson, D. J. & Dunn, R. C. 2014b. Safety performance study of shared pedestrian and vehicle space in New Zealand. *Transportation Research Record*, 2464, 1-10.

Karndacharuk, A., Wilson, D. J. & Dunn, R. C. 2016. Qualitative evaluation study of urban shared spaces in New Zealand. *Transportation Research Part D: Transport and Environment*, 42, 119-134.

Pearson, R., Philp, S. & Hoyle, S. Delivering shared-space schemes: two case studies from Bournemouth, UK. *Proceedings of the Institution of Civil Engineers-Municipal Engineer*, 2019. Thomas Telford Ltd, 197-208.