TECHNICAL PAPER

SAFETY AND SHARED SPACES

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ABSTRACT

Shared space is an innovative street design approach which blends the skills of traffic engineering, road safety, urban design and human behaviour research. Whilst a significant number of shared space schemes have already been implemented in the UK and Europe, the approach has recently become popular in New Zealand with a number of schemes due for implementation over the next few years.

As a traffic engineer or planner, working with shared space schemes can be challenging as the overarching design philosophy can conflict with some of our traditional ideas around road safety. This paper discusses the challenges involved in designing and safety auditing shared space schemes and discusses some examples from recent projects in Auckland City's CBD including the Elliott Street and Fort Street Streetscape Upgrades currently under construction.

The paper suggests that successful design of these schemes requires collaborative working between traffic engineers, planners and urban designers and that by adopting a balanced approach shared space schemes can be implemented without compromising road safety principles.

1.0 INTRODUCTION

Shared space is a term used to describe a particular streetscape design philosophy primarily aimed at changing the impact of motor traffic in public spaces used by pedestrians (UK DoT, 2009). Whilst the use of the term shared space varies in different countries, all definitions refer to two main design criteria:

- The reduction/removal of traffic control devices
- The reduction/removal of barriers between pedestrians and vehicles

The design philosophy states that these design treatments enable reduced vehicle speeds due to drivers no longer assuming they have priority and being forced to be aware of other road users. The reduced speed and increased awareness results in an 'environment of care' where the use of the space is more balanced between all road users.

The claimed benefits of shared space schemes are wide and varied including improved pedestrian amenity, increased vibrancy of the street environment, increased walking trips, reduced vehicle speeds, reduced accident rates and increased property values. Whilst a significant number of shared space schemes have already been implemented in the UK and Europe, the approach has only recently become popular in New Zealand. There are now a number of schemes due for implementation by many local authorities throughout New Zealand.

As a traffic engineer or planner, working with shared space schemes can be challenging as there is a lack of existing standards and guidance. In addition the overarching design philosophy can conflict with some of our traditional ideas around road safety. This paper discusses the challenges involved in designing and safety auditing shared space schemes and discusses some examples from recent projects in Auckland City's CBD including the Elliott Street and Fort Street Streetscape Upgrades, currently under construction.

2.0 EXISTING DESIGN GUIDELINES

There are no existing design guidelines specific to shared space schemes in New Zealand or Australia (or internationally we could find). However there are a number of guidelines for shared zones including an RTA guide dating back to 1987 (RTA, 1987). In addition, more recent RTA publications (RTA, 2000) and Austroads (Austroads, 2009) provide some limited guidance on shared space schemes. The lack of formal guidelines can make the design process challenging for traffic engineers and it is considered that some of the existing guidance does not align with the most recent research or existing practice from overseas. Particular knowledge gaps or areas of potential conflict are discussed in the following sections.

2.0 THE CHALLENGES

2.1 Separation Of Pedestrians and Vehicles

One of the main design principles in the development of shared space schemes is the removal or reduction of barriers between vehicles and pedestrians. This can be achieved through a number of ways but the most common method is through the implementation of a level surface. Traditional road safety research would encourage the separation of vehicles and pedestrians, particuarly when consideraing vulnerable users and it can be difficult to

determine when it is safe to reduce or remove this separation. Particular knowledge gaps or conflicts in the existing guidelines include:

Vehicle Volumes – Much of the exitsing guidance in New Zealand and Australia indicates that shared space schemes are only suitable for areas with very low traffic volumes (eg 300 to 1,000 vehicles per day) where as overseas examples indicate the concept can work with traffic volumes of up to 20,000 vehicles per day and more (eg Drachten and Haren in the Netherlands).

Links and Intersections – Much of the existing guidance discusses shared space schemes in terms of mid block applications only and many state that cross traffic should be avoided. There is very limited guidance on how shared space intersections can be achieved in new Zealand and in particular those areas of transition between conventional streets and shared spaces environments (thesholds).

Vulnerable Users - People with visual impairments can rely on the separation of vehicles and pedestrians and traffic control decices such as signalised pedestrian crossings. There is evidence from the UK and Europe that people with visual and hearing impiarments can find shared spaces difficult to use (Guide Dogs for the Blind, 2006).

2.2 Traffic Control Devices

Removing or reducing traffic control devices is another of the key design criteria for shared spaces. Based on human behavioural research shared space theory hypothesises that the removal of signs encourages drivers to think and react to the environment that they are driving by reducing predictability and encouraging mental engagement.

In New Zealand the installation of traffic control devices is controlled by the Traffic Control Devices (TCD) Rule 2004. Some of the potential conflicts with the concept of shared space and the TCD Rule include the requirement to provide regulatory signage at priority controlled cross intersections, to set speed limits, to enforce parking and loading restrictions and to enforce one way restrictions. A road controlling authority wishing to allow non compliance with the TCD Rule must gain approval from NZTA.

2.3 Speed Management

One of the key features to the success of a shared space scheme is the reduction of vehicle speeds. New Zealand and Australian guidance indicates that a speed limit of 10 km/hr is recommended in a shared zone (Austroads, 2009). Guidance from the UK indicates that 20 miles per hour (m/hr) (around 32 km/hr) is the preferred upper threshold (DoT, 2009).

When reviewing the existing guidelines there appears to be some conflict as to how this reduction in speed is achieved. The existing guidance on shared zones from Australia and New Zealand is generally aligned with traditional Local Area Traffic Management (LATM) principles stating that speed reductions should be achieved through the use of sharp deviations, speed humps and thresholds. Much of the guidance indicates that straight stretches of more than about 25 m or 50 m should be avoided (RTA, 1987) (Vic Roads, 2008). However guidance from the UK and Europe and the more recent discussion documents on shared space schemes available in New Zealand (NSCC, 2010) aim to achieve reductions in speed through the removal of predictability and emphasising pedestrian priority as opposed to physical devices. The European Shared Space Project (2005) states that "*a key theme of shared space lies in finding creative ways to reduce speeds through the use of intrigue, interest and engagement of drivers with their surroundings and with fellow users*".

As a result many of the schemes from the UK (and many of the planned Auckland schemes) include long stretches of straight space, which is in contrast to traditional LATM measures to reduce speeds.

2.4 Risk

The idea of risk is another key challenge for traffic engineers working with shared space schemes as risk is promoted as a positive in the design concept. It is the unpredictability and increased awareness of risk which is used to slow vehicle speeds and create a more useable environment for pedestrians.

Undertaking Road Safety Audits (RSA) is a key area where traffic engineers become involved in streetscape design and where understanding this role of risk is very important. This is recognised as a key learning area in the European guidance (Shared Space Project, 2005) which states that "*in the safety audit process there is a safety paradox in the design of shared space schemes as 'human risk compensation' is essential to understanding why shared space principles work"*.

There has been some negative commentary on RSAs in the UK regarding their role in streetscape design, particularly with schemes which have shared space components. It is argued that the current approach to RSA can result in the risk of certain aspects being over emphasised (and engineered) resulting in risk aversion. Despite these criticisms, RSA is still acknowledged as an important element of streetscape design and it is important that practitioners ensure they are constructively involved in the design process.

3.0 WORKING THROUGH THE CHALLENGES

3.1 Example Schemes

In 2008 Auckland City Council commissioned the design of a number of shared space schemes in the CBD area. From a traffic engineering perspective safety was a key priority and many of the issues outlined in Section 2 of this report were discussed as part of the design and safety auditing process. The following sections provide information on how these issues were addressed.

3.2 Traffic Control Devices

One of the overarching philosophies of the design of the Auckland CBD projects was to allow for minimal intervention of traditional traffic infrastructure and techniques and to take the opportunity to monitor the behaviour and increase the infrastructure if needed. Therefore the minimum amount of regulatory signage was provided initially to enable enforcement and management of the space without overly cluttering the streetscape.

In order to transform what were historically conventional roads into larger spaces more appropriate for pedestrians, a significant pendulum swing was considered necessary. The concept of shared space is very new to the New Zealand motorist (and pedestrian) and as a result the design team was conscious that the overuse of these devices could give the motorist too much confidence and guidance and the space would continue to evolve as a conventional traffic environment.

The "minimum intervention and monitor" approach provided some comfort to the road controlling authority reducing some of the risks around road safety. A series of "back up" interventions to address those safety concerns have been developed.

3.3 Speed Management

In all instances the Auckland CBD projects have followed the more recent guidance from the UK and Europe by avoiding wherever possible the use of traditional speed controlling devices. To positively influence motorists' behaviour and specifically encourage them to move slowly through the space, the designers sought to introduce more pedestrian activity and motorist uncertainty into the street using the following techniques:

- The use of a level surface across the street, a distinctive paving pattern that speaks of 'space' rather than a carriageway
- A minimal use of conventional traffic management infrastructure (kerbs, roadmarkings, signage, barriers and bollards) collectively seek to encourage pedestrians to move more freely along and across the street and "force" motorists to get their behavioural cues from pedestrian related activity
- Providing opportunities for activation of the shared space, e.g. outdoor dining, permanent seating areas, and gathering/performance areas. Such pedestrian activity creates 'side friction' and adds to the behavioural uncertainty of pedestrians as perceived by the motorist
- Activation of the street edge by business activities which are likely to increase the number of pedestrians using the street, e.g. retail and hospitality

In the absence of formal guidance indicators motorists entering the street are expected to drive more cautiously and negotiate the street observing the different cues such as paving patterns, vertical street furniture elements, concentration of pedestrian activities and the availability of clear path ahead. Forward sight lines, safety stopping distances and intervisibility requirements therefore play an important role to ensure negotiation of the shared space is completed without incident or conflict with pedestrians and street furniture.

3.4 Thresholds

One of the key challenges of the design process was the design of the areas transitioning between the conventional street environment and that of the shared space environ. This is the point at which motorists and pedestrians would need to adjust their behaviour between the two very different environments.

It was also recognised that a consistent approach to layout was not possible due to a number of factors including road hierarchy, vehicle flow direction and intersection controls (whether it would be priority control or signals). A number of key principles were adopted to ensure safety was maintained:

- Giving priority to pedestrian movement across the "ends" of the shared space in all cases except where the intersection is controlled by traffic signals, this conventional control must provide the governing factor to separate vehicle/pedestrian movements.
- Provide suitable messages to all road users that these are areas where pedestrians and vehicles are mixing and both should proceed with caution,

particularly where vehicles will be crossing areas of high pedestrian flow such as the junction of Queen Street and Fort Street. This gives priority to pedestrian movement across the "ends" of the shared space.

- All entry and egress points were treated similar to typical vehicle crossings, providing the impression of motorists leaving or entering the road. The flush surfaces and definition of a kerb line provides the most suitable threshold between the two typologies of streetscape.

4.0 CONCLUSIONS

This paper outlines some of the key challenges to traffic engineers and planners working with shared space schemes and identifies a lack of formal guidance (or inconsistencies in the existing guidance) on the design of these spaces. The paper then outlines how some of these issues have been addressed as part of the design and safety auditing process of recent projects in Auckland City's CBD including the Elliott Street and Fort Street Streetscape Upgrades which are currently under construction.

The paper suggests that successful design of these schemes requires collaborative working between traffic engineers, planners and urban designers to ensure the benefits of shared space schemes can be realised. The examples have shown that by adopting a balanced approach, shared space schemes can be implemented without compromising road safety principles.

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