



# Shared Space Guidelines: Categorizing Their Environment and Analyzing Claims

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## Summary

This report is part of a bachelor's of science thesis for the department of transport and planning at the TU Delft. The objective of this project was to identify principles and concepts for shared spaces for differing urban-rural areas by first addressing claims made by the DfT for shared spaces and secondly identifying the inherent properties that dictate shared space performances for differing urban-rural regions.

Four key findings were found to lack validity in the shared space publications made by the DfT. Requirements satisfactory to disabled users involve extending priority to pedestrians without having to deter to users of other modes in shared spaces, and 'Safe Zones' should be implemented in all shared space schemes. Furthermore shared space schemes cluttered with street furniture's and motor vehicle obstacle increases the sense of belonging and place making for pedestrians. Levels of demarcation are dependent on the volume of users in a shared space configuration. Accident statistical data are not accurately represented due to some incidents not being recorded and the fact that many users defer to taking longer routes by avoiding dangerous areas does not suggest some shared space schemes as being safe.

In addition, three urban-rural classifications were defined, which are rural, urban-clusters, and urbanized areas. These were established based on population size and population density. Furthermore, the qualities and priorities that govern rural and urban-cluster/urbanized areas were established. Two approaches were developed for rural areas. These were an approach for residential areas or "Home Zones", and an approach for main streets and market squares in small towns and villages.

Urban-Clusters and Urbanized shared space areas were found to be governed by the same approach. Preserving the mobility, and accessibility were priorities for shared space schemes in urban areas in addition to creating an environment for place making, which stimulates social cohesion and economic impetus.

Three existing shared space scheme were analysed and evaluated based on the properties and principles identified for the three classifications and the four key findings identified from the DfT publication on shared spaces.

The results suggest that no set of rules can be developed to dictate implementations for shared spaces. Shared spaces characterization vastly varies, and no two are alike. Furthermore, claims about cluttered spaces by the DfT and safety need to be revisited. The ideas and concepts covered in the DfT publications are not utilized in practice.

The DfT should revise their claims made for shared spaces considering the amount of research that has been carried out since their publications. Safety audits should be carried out and more studies should be conducted on shared space before any new shared space development scheme can be realised. In addition, a more ecologically friendly approach involving interventions that work to reduce ecological footprints specifically in urban areas should be practice.

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## 1. Introduction

An alternative to conventional traffic and public space design is the concept of shared spaces. The Concept of shared spaces defined by (Kaparias et al., 2012), is “an approach to improving streets and places where both pedestrians and vehicles are present, with layouts related more to the pedestrian scale and with features encouraging drivers to assume priority having been reduced or removed” (as cited by Anvari et al., 2012). Experts have differing views on what shared spaces really is, and what it intends to provide. This definition is one of many as it relates to the concept of shared spaces.

Although earlier reference to this concept was introduced in the 1960's by neighbours aiming to slow on-going motor traffic in the city of Delft (Project for Public Spaces, n.d.), the concept of shared spaces was first coined by the Dutch traffic engineer Hans Monderman. Over the past years, the concept has gained popularity and several initiatives have been developed, such as the Interreg IIIB North Sea Programme (The North Sea Region Programme, 2009), whom were able to oversee 8 pilot projects that aimed to provide knowledge on contemporary urban settings by developing innovative road traffic standards that aim to improve participation and civility in urban communities with the implementation of shared spaces.

Moreover, there are also other interpretation on the concept of shared such as, the Centre for Social Innovation, whom aim to promote social innovation by implementing shared spaces in workplaces (Malinsky, n.d.); this interpretation is considered out of context for the purpose of this project. The focus here will be on public spaces, catering to the public realm and not the private sector.

Shared spaces, as it is a relatively new concept, divides opinion among experts on whether they provide an effective alternative to traditional designs. Furthermore, there lacks a comprehensive approach where the environment of the locations considered for implementing shared spaces are not extensively analyzed. The focus in general, is on the implementation guidelines for city centers in urbanized areas. The lack of attention towards more rural areas for instance, is echoed by Gerlach et.al. whom stated that “with prudent application and limitation to short sections and intersections of small-town high streets, shopping streets or main shopping streets, the advantages of the concept can be properly exploited” (Gerlach et. al., 2009). Therefore, a need to categorize the environments for possible implementation and establish appropriate guidelines aimed for a particular environment such as rural areas is inevitable.

The department for transport (DfT) in the UK has made numerous publications outlining the principals and standards that govern shared spaces. Guidelines for shared spaces are introduced in Manual for Streets (Bradbury, 2007), Manual for Streets 2 (Young and Jones, 2010). Following these two publications, in 2011 the DfT published an extensive Local Transport Note (LTN) titled Shared Spaces (Department for Transport, 2011) that outlines principles for shared spaces in high street environments. They also claim that most of the principles provided, apply to other environment as well. Their most extensive publication “focuses on shared space in high street environments” (Department for Transport, 2011). The emphasis in their publication is on the stakeholder's engagement and inclusive design, but in the UK it is well noted that many implementation of shared spaces are not solely in high streets. Shared spaces have been established in rural areas and residential areas to name a few as well.

MVA consultancy, in 2009 published their appraisal DfT Shared Space Project (Reid, 2009), which was commissioned by the DfT. Their objective for this appointment was to do an extensive study on 10 existing shared spaces in the UK. The findings and conclusions in these publications form a basis for what can be found in the LTN on Shared Spaces. Hence, some of these being in rural areas, and not limited to high streets. The basis for developing the principles for shared spaces as claimed by the MVA and DfT, was based on an evidence-based policy. Some academics whom have studied shared spaces were skeptical about the evidence-based claims made by the DfT, such as Moody and Melia, (Moody & Melia, 2014) whom state that despite some of the findings possibly being true, additional evidence is needed. Some factors that may have had an influence on their findings were not accounted for, resulting in unsupported claims.

In addition to the doubts surrounding some of the claims made in the LTN, some experts argue that there is no set of principles yet established that can be carried out in all shared space environments. This is echoed in (Schönauer et.al., 2012), whom stated that “there is not a well-defined set of optimization attributes which fits for every shared space”. The qualities potential, and limitations of a region being the subject of a shared space configuration should be defined in order to effectively achieve the goals shared spaces offer. The importance of distinguishing regions is echoed by Alasia, whom stated that, “regions have different characteristics that shape their potential path of development and that the policy process should not overlook the diversity of their conditions”(Alasia, 2014).

**This leads to the following question. How can generic shared space guidelines be redefined to suit specific shared space areas categorized by their urban-rural classification?**

Some of the principles outlined in the DfT publications do not apply to all settings. Shared space environments are very complex and can differ significantly from one another and are thus not all governed by the same set of rules. The majority of the claims do extend to all configurations of shared spaces. Thus, a focus on attempting to extend the claims for shared space to more specific defined regions, but also addressing some claims deemed not accounted for or unsupported by the DfT.

An attempt to classify three different shared spaces, that is, rural, urban clusters, and urbanized areas based on their population and density, but also requirements and priorities associated with these environments. The conflicting claims and unaddressed issues presented in the above mentioned publications by the DfT will be defined. A theoretical framework will be established supported by literature relating to the concept of shared spaces for urban-rural classification and the key issues identified in the DfT publication. In addition, existing shared spaces will be addressed and findings and conclusions from studies done on these will be presented. This will involve surveys, data analysis, and video footage studies done by experts. These will then be evaluated using the ideas and claims presented in the theoretical framework. Finally, a conclusion and a recommendation will be established, which will aim to provide some clarification on the issues not accounted for in the DfT publications on shared spaces, but also how differing environments require differing approaches.

## 2. DfT Guidelines Review

### 2.1. Introduction

This chapter will introduce the focus and implementation strategy devised by the DfT for shared spaces. Furthermore, the claims made for shared spaces that lack validity and elements not presented in the DfT publication for shared spaces will be introduced. As stated in the introduction, the DfT has made several publications since 2007 outlining their policy and implementation strategies for shared spaces. The most detailed publication to date, the Local Transport Note 1/11 (Department for Transport, 2011). In an attempt to redefine elements of design strategies for urban-rural classifications, which supplements the existing guidelines, those elements lacking must be addressed.

### 2.2. Shared Space Interpretation by the British Department for Transport

The DfT defined shared spaces as “ a street or place designed to improve pedestrian movement and comfort by reducing the dominance of motor vehicles and enabling all users to share the space rather than follow the clear defined rules implied by more conventional designs”(Department for Transport, 2011). So the focus here is undoubtedly the improvement of pedestrian experience by expanding the boundaries conventional design lacks for pedestrian users.

A framework in which, a scheme is developed is also provided by the DfT; this is illustrated in the figure 1 below. A vision for the concept of shared space is defined with a focus on high streets that does not necessarily constitutes to other possible settings for shared spaces. Furthermore, the purpose is defined as a means for improving the economic vitality by way of increasing pedestrian activity, rather than having social cohesion amongst the users as the primary objective. Finally, some of the actions taken for obtaining the vision defined are contradictory. Such as, de-cluttering the streets while also providing street furniture's. Furthermore, strong arguments are made that suggests that minimal cluttering leads to better conditions for disabled users and also increases functionality of the space (Department for Transport, 2011). Suggesting that the removal of obstruction and amenities that enhance pedestrian experience while making it more difficult for vehicular movement seems counter-intuitive.

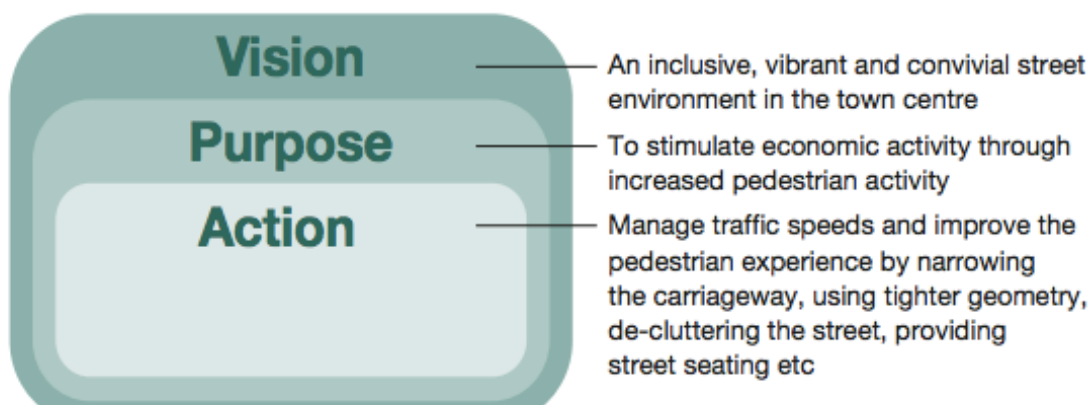


Figure 1: DfT Scheme Development (DfT, 2011).

### 2.3. Unsupported Claims by the DfT

In order to reproduce a scheme of guidelines for differing environments, certain issues in the existing guidelines need to be addressed. The following findings are those that were found to be lacking in validity or not properly addressed in the guidelines provided by the DfT:

- **Lack of detailed design solutions for disabled users:**

As it pertains to disabled users, the publications made by the DfT only offers suggestions for mitigating challenges that exist in shared spaces. The guidelines cover issues disabled users may confront in a shared space scheme but refer to other sources such as, 'A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure' (DfT, 2012), which provides guidelines for conventional traffic configuration rather than shared spaces. Recommendations provided by the DfT involve concrete or stone setts surfaces, tactile paving, contrast in colour, corduroy paving as delineators, and comfort zones. The latter is defined as "an area of the street predominantly for pedestrian use where motor vehicles is unlikely to be present", (DfT, 2011). The idea of comfort zones might be the best plausible solution for addressing the needs of disabled people, but a more detailed approach for integrating comfort zones where disabled users feel comfortable is lacking. Organizations such as the Guide Dogs, have done several studies on this issue and their findings suggest that some of the recommendations by DfT not to be effected. These will be discussed in the theoretical framework in the following chapter.

- **A claim that the reduction in demarcations leads to more sharing**

According to the DfT, "as the level of demarcations between pedestrians and drivers is reduced, the level of sharing is increased", (DfT, 2011). This claim is not necessarily true in all cases. The concept of shared spaces involves a reduction in demarcation, but many more factors such as the configuration of the shared space setting and interventions introduced in this space need to be considered as well. Vulnerable users are hesitant to accept a shared space configuration and the absence of conventional demarcations in some cases provides a negative perception amongst users.

- **Lack of accidents monitoring schemes**

The general belief argued by the DfT and some experts is that shared spaces reduce accidents, thus are a safe alternative to conventional traffic configurations. This claim is not presented with the appropriate evidence according to those on the opposing end of the spectrum in regards to the safety concerns in shared spaces. Holmes, who carried out a study in where he surveyed users of shared spaces, and found that the methodology used in determining accidents is not accurate (Holmes, 2015). One can argue that many accidents in a low speed environment where the damages are not of high severity might go unnoticed or not be recorded.

- **De-cluttering of the streets leads to more sharing and improved safety claim**

According to the DfT, the act of de-cluttering the street where more open space is created, leads to users moving about more freely, and therefore better usage of the

entire space in a shared space configuration. Furthermore, they argue that a de-cluttered street is a key feature of shared spaces. This approach seems to contradict the efforts for stimulating users to stay and occupy the shared spaces instead of merely a means to move about. The main objective of shared spaces is to promote social cohesion and improve the economic vitality of an area. De-cluttering the streets in some cases, defeats the purpose. Further reference to this will be covered in the following chapter.

### 3. Theoretical Framework

#### 3.1. Categorization of Urban-Rural Classifications

The categorizations are developed using the definitions for rural, urban places clusters, and urbanized areas defined by the U.S. Census Bureau (U.S. Census Bureau, n.d.). Rural areas are defined as settlements outside urbanized areas with populations of no more than 2,500. Urban clusters or Census Designated Places (CDP) are urban places with populations over 2,500 located outside of urbanized zones that have their own name and community and are not affiliated or incorporated in other places. Urbanized zone are continuously built areas with populations of over 50,000; these areas form a basis for conurbations. These definitions do not offer enough insight on the areas defined by these categorizations. Therefore the density definition defined by the Euro Stats, which states that an urban setting is defined as a space with a population density of 300 per  $km^2$  and everything less is rural (Euro Stats, 2007). This definition is added to the first as for some places may be defined as urban according to the first definition but the distribution of the population may be concentrated leading to sections within a city, or town having a rural feeling.

For areas with shared spaces, the overall population of the city should be defined in addition to the population density. The population density should be defined for a space within a range of 1  $km^2$  with the shared space scheme as its center in order to determine whether it can be categorized as a rural or an urban space. In addition to these to distinction, the broader region should also be identified such that the distinction between urban clusters and urbanized areas can be obtained. There are many more variables that govern a location's attractiveness and its importance than just population. A city may be defined as rural solely based on its population, but may also be a place where many whom do live in a more urban area work based on the fact that most factories are in more rural areas. There is good evidence to suggest that urban and rural areas require differing approach in achieving a successful shared space configuration. The reality is that many factors govern a city or a town's identity but this project is only limited to the ramifications due to their population.

The below figure offers an overview of the 3 environments identified in relation to shared spaces. The term 'home zones', which are residential configurations of shared spaces will be covered in the following section.





Figure 2: Urban-Rural Classifications.

### 3.2. An adaptive Approach for the 3 Urban-Rural Classifications

Socio-economic advancement and safety improvement is what shared spaces are intended to achieve. They are regarded as an alternative to conventional traffic configurations, and with that are subject to extreme scrutiny.

The policies, guidelines, and consideration as mentioned earlier, fail to denote specific practices and implementation strategies for differing regions. Differing characteristics exist for each environment and they are also governed by differing policies. This is well noted in Schönauer, who stated that “shared space differ from each other because of the big variety of local conditions, design elements and traffic mixes. This makes it extremely difficult to show the effects of planned shared space with the presently available tools” (Schönauer, 2012, p7). The guidelines offered by the DfT offer a generic approach, and as stated earlier are aimed for high streets with many of the principles being applicable to other settings. So to label the guidelines by the DfT as generic is due to no considerations taking into the characteristics of the environments where shared spaces exist. Shared spaces can be found in a vast kind of settings. They are implemented in some of the largest cities in Europe and around the world to some of the more rural secluded villages. The following concepts are not intended to represent a completed definition in its entirety for the urban-rural classifications, but should be interpreted in a comparative context. The principles are exploratory in nature and aim to relate shared space schemes to urban-rural settings.

#### Rural

Definitions for rural areas vary vastly around the world. This is echoed in a publication by the European Commission, whom stated that the United Nations (UN) typically publishes data on rural and urban communities but rely on differing national definitions

of these areas (Dijkstra & Poelman, 2014). For this very reason, a definition was established in the previous section. The fact that policy makers impose their policies such as the UN to rural and urban classifications highlights the importance in characterizing differing regions, especially rural environments considering their limitations and vulnerabilities. The socio-economic stability and progress of these areas should involve a focus on improving the existing qualities embedded in them. Shared spaces can play a vital role in the development of these regions with careful considerations.

Rural areas are often secluded regions that are governed by their historical and cultural identity. An adaptive approach that is designed for rural streets and lanes is the 'Context Sensitive Design' approach. This is defined as an approach where "the street design builds on extensive understanding of the distinctive qualities of place and emphasizes the peculiarities of their surroundings" (Hamilton-Baillie, 2010). Kent Downs AONB Unit insist that design in rural streets and lanes should not be "overly large or garish or place undue reliance on signs, lining or lightning. Schemes should wherever limit air noise, and light pollution" (Kent Downs AONB, 2009, p61). This approach preserves the qualities that exist in rural areas. It allows for an increase engagement with the surrounding which consequently leads to motor vehicle users naturally traveling at lower speeds. The subtle approach uses the intrinsic historical or cultural qualities in these areas to predicate behavior of its users. This is also formally known as physiological retreat. There are limitations to this approach, as the morphology and landscape are critical. Streets that lack peculiar character would probably work with the approach covered in the next section below. The main areas for which the 'Context Sensitive Design' approach works is in market squares and main streets in small villages. These areas offer an increase attentiveness to the surroundings and thus therefore an increased engagement with the surrounding.

Another street typology that comes to mind in rural areas is the residential street. These streets are typically governed by low traffic volumes, and are often subject to having recreational implication for children living in these areas. The concept of shared spaces for these streets has adapted a different name formally known as 'Home Zones'. Streets Manual 1 by the DfT defines 'Home Zones' as residential areas designed to better meet the needs of the local community and drivers by including shared surfaces in the scheme (Bradbury et.al., 2007). These configurations involve participations of local residence, local access groups, and local authorities.

The development of the 'Home Zones' can be attributed to the much earlier similar development in the Netherlands called 'Woonerf'. The 'Woonerf' was developed by Niek de Boer and Joost Vahl in the 1960s and 1970s in the city of Delft (Steinberg, 2015). The principles that define the 'Woonerf' involve the presence of clear demarcation referencing the entrance and end of a 'Woonerf' zone. The space in a 'Woonerf' is intended to be shared by all users, restricting vehicular traffic to 15km/h. Physical barriers are elements of the design of 'Woonerf' areas. These provide hindrance, and sharp curves that restrict vehicular traffic to slow travelling speeds. A cluttered environment dominates the 'Woonerf' scheme with furniture's and landscape trees.

The 'Woonerf' is regarded as being very successful and is adapted by many countries around the world. The principles created in the 'Woonerf' can be adapted in rural areas

that do not attract people from outside of their communities. It is an approach suited for small limited users, where shops, and business' are absent. On the other hand, market squares, communal centers in rural areas can adapt the 'Context Sensitive Design', which is governed by subtle and limited elements in the shared space schemes.

### **Urban-Clusters and Urbanized Areas**

Most of the principles that will be established for the following classification can be applied to the urbanized areas classifications. Urban-clusters or urban areas are governed by a built-environment and complex infrastructure. Opposed to rural areas, shared spaces take on a vital role in urban-clusters and urbanized areas. In these areas one of their primary roles is to provide efficient movement of vehicles. This is central in the design of shared spaces in these regions. Higher vehicular traffic is expected to prevail in these areas, and considering the dense nature of these regions, traffic congestions presents difficult situations. As noted in Shared Space in Urban Environments, "the most successful shared spaces have been designed within the context of their existing environment and the aims and objectives of the streets" (Joyce, 2012, p2). Next to the traffic implications, shared spaces play a vital role in improving the economic state of urban-clusters and urbanized areas. Urban areas are not only attracting more people looking to live, but businesses are also trending to urbanised localities. Shops, and leisure business such as bars, restaurants, and pubs experience a boost in profit in areas with shared space schemes. The implementation of a shared space in New Road in Brighton UK saw 80% of the businesses surrounding the shared space scheme see increase in profit (Joyce, 2012). Shared spaces have greater implication for economic vitality than those in rural areas. The urban streets cannot all be characterized as the same sort. Urban streets are very diverse, and as stated by Karndacharuk et.al., "urban streets can be classified independently based on travelling speeds, transit-oriented arteriability (i.e. strategic contiguity or routes connected op contiguously) and urban place criteria" (Karndacharuk, 2014). The third element is introduced by shared spaces. The social enhancement by having users occupy the space provides an added dimension in the urban street. The first term relates to movement and in a way the most critical component for shared spaces in urban-clusters or urbanized areas. The importance of accessibility is noted with the second elements. Implementation of shared space scheme should not forfeit the overall accessibility of a region. Urban-clusters and urbanized areas are very sensitive to disruptive traffic developments created by accessibility issues, which can cause difficult situation for these regions. These three functions of movement, access, and place are depicted in the image below. They form the basis for designing shared spaces in urban areas.

The findings suggest that even though urban-clusters can be categorized differently from an urban planning perspective, the ideas that govern urbanized areas also apply to urban-clusters. The sensitivity to place, mobility, and accessibility are highlighted in urbanized areas and should therefore subject to increased scrutiny.

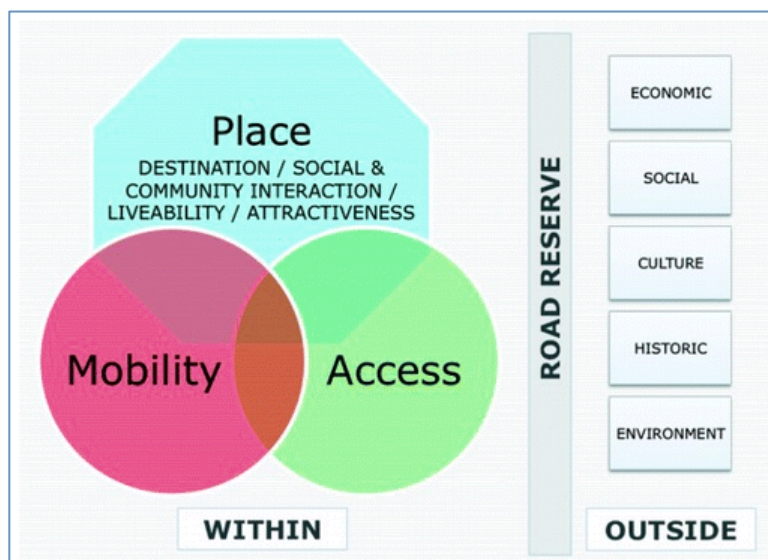


Figure 3: Urban Shared Space Framework (Karndacharuk et.al., 2014).

Opposed to rural areas, where accessibility and mobility are of a lesser concern, in urban-clusters and urbanized shared space schemes where traffic management are reduced, the implementation of a shared space should comply with standard traffic operations. Taking these elements into considerations, shared space schemes are intended to reduce the dominance of vehicular traffic, thus these schemes should be implemented in areas critically dependent on the fluidity of the overall traffic network of an urban area. The scheme should be concentrated in streets being able to cope with lower traffic intensity without significantly altering the surrounding traffic operations. As stated in *Manual for Streets* by the DfT, 100 vehicles per hour should be the maximum allowable vehicular intensity for shared spaces to work (Bradbury, 2007). These figures suggest that when vehicular traffic is perceived as very high, pedestrians tend to defer from shared space schemes to conventional pedestrians-only paths. The pedestrian intensity in general does not seem to create problems, though there are studies that analyse the quality of traffic movements, comfort level and safety aspects for pedestrians in shared space (Pascucci & Friedrich, 2017). Urban shared space schemes should be implemented in streets that support expansion of social institutions, are capable to cope with large body of crowds, and streets that are attractive or inline with key pedestrians or cyclist paths.

### 3.3. Implications for Disabled Users in Shared Space Schemes

One of the key elements in shared space schemes is the negotiation of right between the users. This implication does not only extend to pedestrians, but for all modes of transportation in these schemes. The process by which this is typically done in these schemes is by eye contact. All users possess equal authority in this configuration where the traditional traffic rules do not apply. This presents concerns for disabled users, specifically those that are blind or partially sighted.

The UK has implemented policies that protect these vulnerable users such as the Disability Discrimination Act, and the Disability Equality Duty under the Equality Act of 2010, which requires public institutions to adhere to the requirements and right of these users. In their publication on shared spaces, the DfT makes an attempt to address these concerns, but do not cover all of the issues disabled users may face in shared space

schemes. One of their proposed solutions is the creation of 'Safe Zones'. This approach encapsulates the vulnerable users from other modes in shared space schemes. A designated area is created where motor vehicles and cyclists, to a great extent cannot occupy. In addition, the DfT insist that keeping the building line clear from any obstruction is vital to blind and partially impaired users using shared space scheme. Furthermore, they discuss the implementation of corduroy tactile paving as delineators at crossings, which disabled users can identify.

The considerations mentioned by the DfT are not always implemented in practice. Furthermore, there are groups like the Guide Dogs that lobby for disabled users whom believe that the solutions discussed by the DfT do not comply with requirements for disabled users. The Guide Dogs commissioned the international design practice Ramboll Nyvig whom were given the task to develop principles that could be integrated into shared space schemes for disabled users, more specifically blind and impartially blind users. They concluded that the creation of 'Safe Space' within shared space schemes would increase confidence levels of disabled users to use the streets independently (Guide Dogs for the Blind Association, 2008). Thus, to some extent they agree with the recommendations made by the DfT but one are of concern was how to demarcate these 'Safe Spaces' with the absent of the traditional kerb.

During their tests they used various tactile paving modification as delineators and tested them on a group of volunteers that were either blind, partially blind or mobility impaired. A total of 12 design configurations were tested and it was concluded that a central delineator was best suited to meet the needs of all parties. The central delineator is of a trapezoidal shape. Though the central delineator was considered the better option, the Guide Dogs note that further research is needed considering the considerable amount of volunteers who believe it not to be sufficient.

In a follow up publication of the Guide Dog for the Blind Association, they underlined some key elements they consider to be appropriate for shared space design.

They are as follows:

- Priority for Pedestrians
- Appropriate Traffic Speeds
- Logical Layouts and Reference Points
- Clearly Defined, Obstacle Free, Pedestrians Routes
- Pedestrian Crossings
- Visual Contrast and Good Quality Lighting
- Disability Quality and Consultation
- Education and Training (Guide dogs for the Blind Association, 2010)

Some of the points above are covered in the publications of the DfT. Others such as the prioritizing of right to pedestrians, which the Guide Dogs argue, should allow pedestrian to assume priority over both vehicular traffic and cyclist. In shared space configurations. Furthermore, during the development stage of shared space schemes, representatives of disabled groups should be included in the planning process. This is advocated in the DfT to some extent, but groups like the Guide Dogs are of the opinion that this is not the case in practice. Better involvements of these groups should be practiced. Education and training refers to all users of the space, according to the Guide Dogs. The DfT mentions the importance of incorporating training programs for disable users the become familiarize with shared space scheme, but the Guide Dogs argue that these efforts should

be intended for all parties involve. From designing, planning, and managing to all users of the scheme. “Disability awareness and equality training, including a sound understanding of the mobility needs of blind and partially sighted people, are crucial in achieving this” (Guide dogs for the Blind Association, 2010, p18).

There is a consensus disapproval of shared space scheme among the disabled community. Considering the Equality Act of 2010, and the requirements public officials have to meet for disabled users, shared space schemes are not favorable alternatives for this group. Furthermore, lobbyist such as the Guide Dogs for the Blind Association call on the discontinuance of shared space implementation until new and improved guidelines are developed that adhere to disabled users’ requirements.

### 3.4. Demarcations in Shared Space Schemes

Reduced demarcation refers to the act of removing or limiting traffic signs, pedestrian crossings, kerbs, bollards, and guard railings. The DfT advocated the following about demarcations: “as the level of demarcation between pedestrian and drivers is reduced, the amount of sharing is increased” (DfT, 2011, p10). Furthermore, the DfT claim that the removal or reduction of demarcation also leads to lower vehicular traffic, therefore resulting in a safer environment. This correlation between sharing and demarcation is illustrated in the below figure by the DfT.

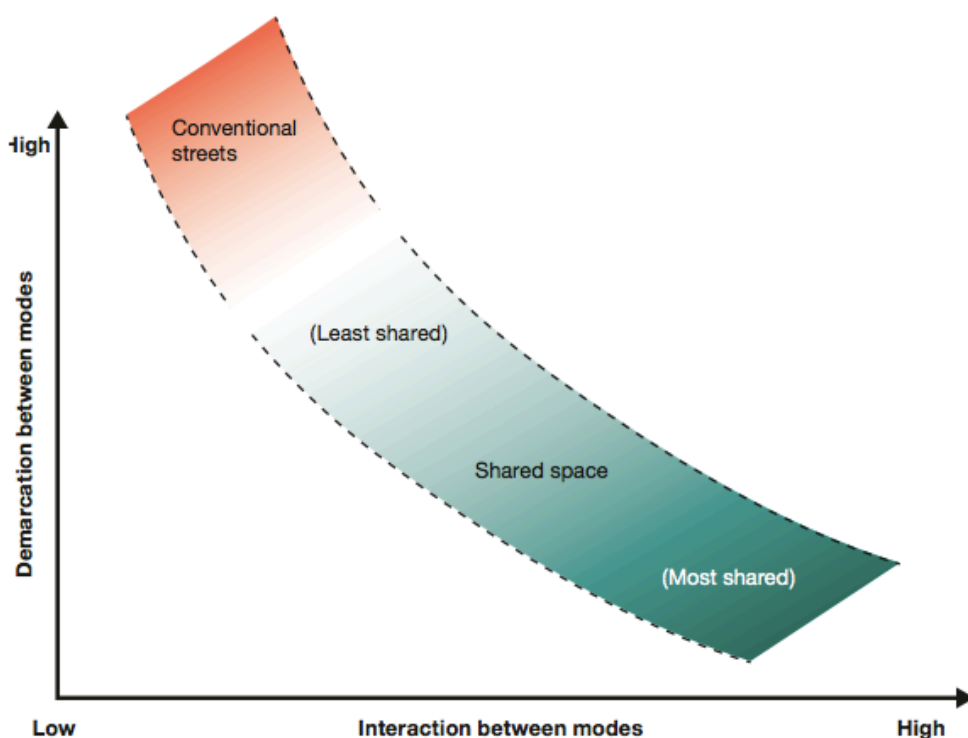


Figure 4: DfT Demarcation and Sharing (DfT, 2011).

MVA consultancy, an independent consultancy firm commissioned by the DfT concluded three findings in their assessment on shared spaces. They found that vehicles travelling at lower speeds resulted in drivers more frequently assuming priority to pedestrians, as the number of pedestrians increase the degree of giving way to pedestrians increase, and the greater the degree of demarcation, the less likely drivers were willing to give way (Reid, 2009). Though some of these findings might be true about the reduction of

vehicular velocity, actions taking by city officials in existing shared spaces seem to indicate otherwise. According to Lord Holmes of Richmond, as cited by (Paton, 2016), “at least 14 local councils had scrapped shared space schemes by reintroducing zebra crossings and segregated cycling lanes”.

One of these schemes is a shared space configuration in Hackbridge London UK. Here, zebra crossings were interchanged with courtesy crossings and the consequence of this form of demarcation led to many users of this shared space complaining about not being able to cross the street to get to the shops due to drivers now slowing down (Holmes, 2015). This may be due to many people not knowing about shared spaces and how conventional traffic rules do not apply in these configurations. The Sutton council is a governmental agency overseeing the Hackbridge neighbourhood. They commissioned Capital Traffic, which is an independent traffic and highway consultancy firm to carry out a safety audit where their findings reaffirmed the concerns of users in the Hackbridge shared space scheme (Sutton Council, 2015). The safety audit combined with the concerns of the residents led to the reinstatement of the zebra crossing and, mini round about at a junction and the initiation of a traffic speed audit in the shared space configuration in Hackbridge.

Due to the chaotic experience and perception of users in these shared space schemes, users were developing a perception of unsafe and feeling disorientated. What should be noted from Holmes’ statement is that many of these localities were identified as busy shopping areas. The notion of poor performances from reduced demarcations in shared space schemes is further supported by Gerlach et.al. , Whom concluded that in high traffic intensity schemes of shared spaces, outstanding visibility arrangement is crucial and by therefore reintroducing traffic signs, performance in these schemes can be improved (Gerlach et.al., 2009). The thought-process in both cases seems to suggest that the absent of demarcation raises some questions when a shared space scheme is governed by high level of traffic intensity. The lack of clear visibility, which users typically depend on in these schemes are forfeited.

This reveals some interesting findings in the role of demarcations in shared space configurations. Pedestrians become more reluctant to assume priorities over vehicular traffic, drivers are in some instances unaware or are unwilling to negotiate right of way with pedestrians, and in highly dense traffic volume, people seem to experience a chaotic environment and tend to become disorientated. The DfT’s claim for advocating that a design approach which intends to stimulate more sharing and creates a safer environment due to drivers being cautious by reducing demarcations should be revisited.

### 3.5. Monitoring Schemes for Recording Accidents in Shared Space Schemes

One of the most unnoticed issues in shared space schemes is the recording of accidents. Shared space schemes have been advocated by its supporters as being a safer alternative to conventional traffic configurations. Some experts on the other hand argue that the claims made for shared spaces as being safe cannot be supported by the available evidence. For example, Holmes argues that “courtesy crossings or uncontrolled crossings, often introduced as part of shared space design, have no official category thus accidents on them are not recorded as such making shared space accident data very unreliable” (Holmes, 2015, p6-7). Furthermore, some pedestrians resorted to diverted routes due to feeling discomfort and unsafe in shared space scheme.

Out of 523 people surveyed by Holmes, 28 reported to having been involved in an accident in a shared space schemes. Only 3 were reported to the police, while only one to the local council (Holmes, 2015). Though only a limited representation is provided, these findings by Holmes indicate that there is a lack of monitoring activity in shared space schemes. Furthermore, the fact that some users resort to deviating to get to their destination in shared space schemes suggest that accidents occurring in these schemes may also be limited due to behaviour of concerned users. This is echoed by Methorst et.al., whom stated that “the proposition that ‘dangerous is very safe’ or worse, the introduction of danger to incite safe behavior, is disputable and brings along unacceptable risks for those that have limited traffic abilities” (Methorst et.al, 2007, p15). In order for shared spaces to be objectively evaluated on safety concerns, users of shared spaces need to be using these schemes in a way where they do not deter from their line of travel due to concerns of safety.

Two main issues can be drawn from an accident recording perspective. The statistical data representing the total accidents in shared spaces is not well represented due some cases of accidents not being recorded. In addition, these figures are positively represented due to some users choosing to take longer and safer routes. Secondly, local councils, city officials, and traffic management officials should implement better monitoring schemes for recording accidents. The fact that shared space scheme is a relatively new approach, it should come under increased scrutiny and possible safety audits for extended periods of time should be carried out. This involves better observation of interaction between users on courtesy crossings and uncontrolled crossing that occur in shared space configurations.

### 3.6. De-cluttering of Shared Space Schemes

De-cluttering of shared space schemes refers to limiting or removing street furniture such as, seating, cycling stands, planters, and litterbins. In some cases it is analogous to the definition of demarcation. The latter more specifically refers to elements assigned to manage and segregate the various modes of traffic. The DfT advocates if needed, each item should be used to serve multiple purposes which by doing so limits the amount of street furniture present in shared space configurations (DfT, 2011). Ironically, the DfT defines shared spaces as a scheme where pedestrians “move freely around the street and use parts of it that, in a more conventional layouts, would be considered largely dedicated to vehicular use” (DfT, 2011, p17). In order to get pedestrians to occupy spaces that are conventionally considered for vehicular use, incentives that stimulate pedestrians to occupy these areas have to be in place. Gerlach et.al. identified the importance of having items such as street furniture’s and lightning in shared space schemes. “The planning of streets and their environment is to rely on distinctive environment elements and as little as possible traffic control measures in order to promote social relationships” (Gerlach et.al., 2009). Instead of having conventional traffic demarcations, furniture’s can be used to demarcate certain areas such as parking for vehicles or comfort zones while at the same time improving the quality of shared space schemes. The quality of the environment should be predicated by the presence of furniture’s which pedestrians can identify as those typically found in configurations governed by pedestrians. This may reinforce the pedestrian user to being open to using the space rather than seeing it as an obstacle.



Moody & Melia go on to conclude that “the provision of ‘safe zones’ created by vegetation and street furniture increase the willingness of pedestrians to share space with vehicles” (Moody & Melia, 2014, p3). Moreover, Holmes identified an interesting perspective from several vehicular drivers in a survey he conducted. He concluded that some drivers preferred driving through shared spaces over conventional traffic routes to avoid traffic lights and street furniture in order to speed up their journey (Holmes, 2015). These findings are in fact suggesting behavioural contradiction to what shared spaces are intended to achieve. They are meant to create uncertainty and a more difficult situation for motor-vehicle users, which leads to an increased awareness and consequently a safer environment. A de-cluttered shared space configuration possibly encourages drivers to assume dominance over vast empty spaces in these schemes. In fact, one shared space scheme in New Zealand completely challenges the claims for de-cluttering shared spaces by the DfT. On O’Connell Street in Auckland, New Zealand, the integration of a cluttered environment was part of the scope and objective in the design phase. This was attributed to urban planners whom understood the positive implications cluttered environment can present for pedestrians.

The following was part of their strategy, “Provision of street furniture including benches, trees and allowance for outdoor dining. This was implemented not only to reduce vehicular dominance and act as passive traffic calming, but also to informally define various zones”, (Karndacharuk et.al., 2015, p2). Furthermore, the overall perception of the O’Connell Street shared space scheme was positively perceived. Safety concerns were absent, and most importantly, the “transformation particularly succeeded in improving the user perception of the ‘Placemaking and Economic impetus” (Karndacharuk et.al., 2015, p13). Street furniture’s tends to facilitate the use of space for pedestrians by allowing pedestrians to recognize elements which are usually present in pedestrian dominant settings.

The presence of a cluttered environment makes it challenging for motor vehicles users and thus cluttered environments actually can promote increase activity in shared spaces by pedestrians, which consequently leads to socio-economic improvements. As seen with the strategic approach in the shared space scheme in Auckland, New Zealand, many experts’ stands on cluttered streets, apposes those of the DfT. The National Association of City Transportation Officials (NATCO) echoes this in their Urban Street Design Guide (2015). “Street furniture, including bollards, benches, planters, and bicycle parking, can help define a shared space, subtly delineating the traveled way from the pedestrian-only space” (Wendell, 2015, p393). The thought process involves blurring the transition from conventional pedestrian-only to shared space schemes. This negates the hesitant feeling pedestrians may acquire in shared space configurations.

Cluttered spaces do present some challenges. People with impaired mobility for instance, may experience challenges in shared spaces governed by increased level of furniture’s. Consideration should be made when distributing these elements in such a way that users with disabilities are confronted with limited obstructions. On the other hand, this does not take away the positives that can be achieved with well-placed street furniture’s.

To summarize, cluttered spaces stimulate the process of having users occupy the spaces in shared space schemes. They help in creating ‘safe zones’ by barricading designated areas in shared space schemes from vehicular traffic. They allow pedestrians to

recognize acceptance in shared space schemes. Vehicular traffic is often encountered with a less attractive and challenging scheme. Moreover, the main objectives of improving social relations and economic vitality are stimulated by encouraging pedestrians users to be more open to using and occupying these spaces.

#### **4. Methodology**

This project aims to clarify some of the misconceptions found in the DfT publications on shared spaces, but also aims to specify how shared space schemes can be integrated into differing urban-rural regions. The ideas and principles discussed in the theoretical framework form a basis for analysing existing shared spaces. An attempt is made to classify 4 shared space schemes in terms of their urban-rural classification. The ideas and principles discussed are analysed and evaluated. Furthermore, the unsupported issues identified from the DfT publication will also be analysed and evaluated.

##### **Analysis**

The 4 areas were deliberately chosen to represent shared space schemes implemented in several countries and urban-rural categorizations. The approaches and design strategies for some of the shared space schemes differ from those provided by the DfT. They do not affect the procedure taken in evaluation the schemes, but this matter should be considered. The basis for the analysis will comply of information gathered by others whom have done their own evaluations. Considerable reliance is placed on the data, statistics, and surveys collected in other reports, but the evaluation for this project is done in accordance with the ideas and principles discussed in the theoretical framework.

The ideas and principle discussed in the theoretical framework, which if subject to interpretation, will be covered in the evaluation are summarized and can be found in Appendix A.

##### **Evaluation**

A multi-criteria qualitative evaluation is conducted. The criteria arise from the subjects discussed in the theoretical framework. This evaluation is intended to establish a correlation between the ideas and principles discussed in the theoretical framework and the actual performances in practise. It attempts to distinguish how the ideas and principles are represented in the schemes and how the issues they address are experienced in practise.

Any attempt to interpret these results should take the context of this project into consideration. Shared spaces are governed by various elements, which are not all covered in this project. The results are intended to clarify some misconceptions and arise speculations and discussion in the manner that shared spaces schemes are being designed.

## 5. Analysis of Existing Shared Spaces

### 5.1. Elwick Square in Ashford, Kent, England

Elwick square is a shared space scheme situated in the town of Ashford. The area where the shared space is situated can be categorized as being rural. Ashford has a population of 123,300 (Population.City, n.d.), and a total area of 580.6 km<sup>2</sup> (Office for National Statistics, 2017). Though the population might suggest Ashford as being an urban area, the population density at 212.4 suggest otherwise.

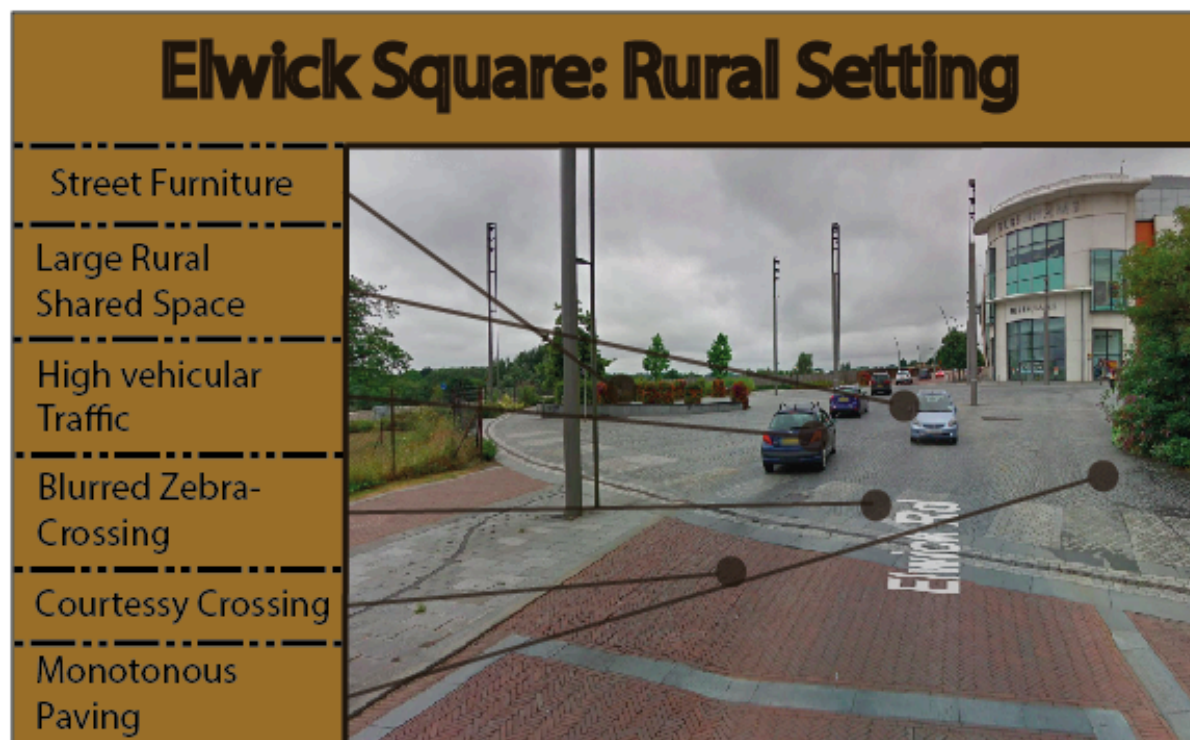


Figure 5: Elwick Square Analysis

Elwick square is a large shared space configuration, which is integrated on the junction between Elwick Road and Bank Street. The Elwick Road is part of a network of ring roads that surround the Ashford Borough Council. As stated in (Kent County Council, 2009), Approximately 11,00 vehicles use the square per day and up to 850 vehicles per hour (As cited by Moody & Melia, 2014). These figures may be even greater at the present time considering they are representative to several years back. The layout consists of a monotonous paving and with the expectation of blurred zebra crossings and courtesy crossings found on both the northern and southern side of Bank Street on the Elwick Road. There is some vegetation towards the west of the scheme in addition to some light post.

The west of the Square is installed with a pedestrian bridge that leads to a large residential area. During a video analysis done by Moody & Melia, they found that within a 10-hour time frame, 8:00 to 18:00, 281 pedestrian movements were recorded, from which 179 crossing movements were identified (Moody & Melia, 2014). These figures coupled with the approximately 800 vehicular movements per hour confirm this shared space configuration to predominantly be utilized by vehicular traffic. The pedestrian routes recorded during the video analysis can be found in Appendix B.

## 5.2. O'Connell Street in Auckland, New Zealand

Auckland has a population of 1.377 million and a population density of 1,210 people per km<sup>2</sup> (Auckland Population, 2017). While 70% of Auckland is considered rural, 90% of its population live in urban areas. The environment of O'Connell Street can therefore be categorized as an urbanized area.



Figure 6: O'Connell Street Analysis

The O'Connell Street is situated in the city centre of Auckland. Albeit in an urbanized area, the O'Connell Street shared space scheme does not attract a high level of vehicular traffic. The current configuration is that of a one-way street, which before the transformation, hosted approximately 1,800 vehicles per day and this figure has been reduced to about 1,100 after the transformation (Karndacharuk et.al., 2015). The space is governed by an extensive amount of street furniture's and trees. Plenty of social incentives can be seen from the adjacent buildings, and 'Safe zones' are created by the placement of the street furniture's. There are also designated parking arrangements located on the street.

In a survey of 227 users conducted by Karndacharuk et.al, they found that the most important aspect of the transformation to a shared space was the safety aspect and the place making qualities (Karndacharuk et.al., 2015). The overall distribution can be found in Appendix B. Signs indicating the transition into a shared space are placed on both sides of the streets. As mention before, 'Safe Zones' are created on both side of the street, which are delineated by a 600mm tactile strip (Karndacharuk et.al., 2015). The pedestrian intensity was regarded as being very low as Karndacharuk et.al. recorded at 0.07 pedestrians/m<sup>2</sup> or 14.3 m<sup>2</sup>/pedestrians (Karndacharuk et.al., 2011). So this shared space scheme albeit in an urbanized area, is governed by low vehicular and pedestrian traffic.

5.3. The Drift/Torenstraat/Kaden intersection in Drachten, the Netherlands  
 Drachten is a town in the municipality of Smallingerland, the Netherlands. It has a population of 44,660 (AlleCijfers, 2017). The suburb town of Drachten has a population density of 3083 per km<sup>2</sup> (Drimble, n.d.). The town of Drachten is also part of the Friesland Province, which can be categorized as rural considering its vast size compared to the population. Since the town of Drachten, which is located within the Friesland Province, has a very dense population, it can be categorized as an urban-cluster.

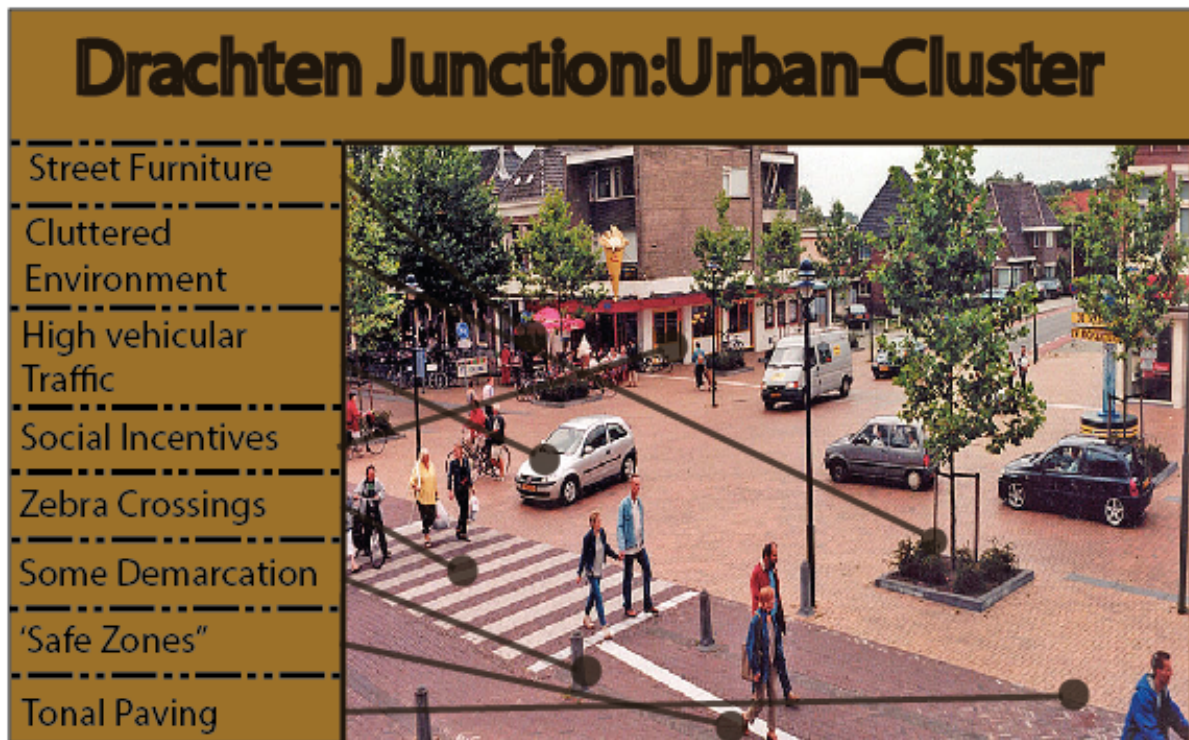


Figure 7: Drachten Junction Analysis

The shared space scheme on a junction in Drachten experiences approximately 15,000 motor vehicles per day along with an additional 7,000 cyclist per day (Gerlach et.al., 2009). The road to the west leads to the city centre and is only accessible by pedestrians and cyclist. Motor vehicle traffic are allowed to proceed in the remaining 3 directions. As can be seen in the image above, there are 2 zebra crossings, one as seen in the image, with the other one located at the north end of the junction. Furthermore, bollards and planters can be seen distributed about the space. A 'Safe Zone' is created at the southern trajectory of the scheme. Café's and Restaurants are located in the vicinity but seating is limited to the businesses around. Since the transformation, accidents figures remained unchanged with the Total amount of accidents in a 3 year span prior to the transformation totaling 20, and the most since transformation in 1999 for a 3 year span being 21 (Edquist & Corben, 2012).

## 6. Evaluation of Existing Shared Spaces

### 6.1. Introduction

The following evaluation as mentioned previously takes on a multi-criteria qualitative approach. A brief explanation of the various elements considered in the evaluation scheme is provided in Appendix C. A scheme for evaluating 'Home Zones' can also be found in the Appendix. This was not covered in the selected schemes, but the approach for evaluating these schemes were developed. In addition to the evaluation performed in the table below, a brief explanation on each scheme is provided.

The grading criteria is based on a 3-point grading system and is as follows:

- Poor: --
- Average: +-
- Good: ++
- Not Applicable: N/A

### 6.2. Elwick Square in Ashford, Kent, England

*Table 1: Elwick Square Evaluation*

<b>Elwick Square: Rural Shared Space Scheme</b>		
Compliance with regards to Disabled Users	Prioritizing Rights to Pedestrians	--
	Effective Presence of 'Safe Zones'	--
	Usage of Delineators for Demarcating 'Safe Zones'	--
	Presence of Visual Tonal Contrast	--
Use of Demarcation	Presence of Courtesy Crossings	++
	Presence of Increased Demarcation in Highly Dense Areas	N/A
	Clear Indication of Entry and exit Points in Shared Space Scheme	+-
Safety Perception	Limitation in Diverted Pedestrian Routes	--
Cluttering	Presence of Street Furniture's	--
	Barricaded 'Safe Zones'	--
	Presence of Vegetation	+-

<b>Evaluation Scheme for Main Streets/Market Squares for Small Villages and Towns: Elwick Square</b>		
Rural Approach	Presence of Limited Light Pollution	<b>+ -</b>
	Size of the Shared Space Scheme Limited	<b>--</b>
	Limited Garnish in Scheme	<b>++</b>
	Limited Demarcation	<b>++</b>

*Table 2: Elwick Square Rural Evaluation*

The Elwick square as can be seen above fails to meet the needs for disabled users. In fairness to the DfT, this shared space fails to comply with some of the principles discussed in their publication such as the absence of ‘Shared Zones’. The scope of the shared space is overly dimensioned; furthermore, this configuration is predominantly used by vehicular traffic. There is a tonal difference and uprising in the surface indicating the presence of a shared space, but these could be placed at a further distance considering the fact that pedestrians use these as crossing points within the schemes.

### 6.3. O’Connell Street in Auckland, New Zealand

*Table 3: O’Connell Street Evaluation*

<b>O’Connell Street: Urbanized Shared Space Scheme</b>		
Compliance with regards to Disabled Users	Prioritizing Rights to Pedestrians	<b>++</b>
	Effective Presence of ‘Safe Zones’	<b>++</b>
	Usage of Delineators for Demarcating ‘Safe Zones’	<b>++</b>
	Presence of Visual Tonal Contrast	<b>+ -</b>
Use of Demarcation	Presence of Courtesy Crossings	<b>--</b>
	Presence of Increased Demarcation in Highly Dense Areas	<b>N/A</b>
	Clear Indication of Entry and exit Points in Shared Space Scheme	<b>++</b>
Safety Perception	Limitation in Diverted Pedestrian Routes	<b>++</b>
Cluttering	Presence of Street Furniture’s	<b>++</b>
	Barricaded ‘Safe Zones’	<b>+ -</b>
	Presence of Vegetation	<b>+ -</b>

Table 4: O’Connell Street Urbanized Area Evaluation

<b>Evaluation Scheme for Urbanized Areas: O’Connell Street</b>		
Urban Approach	Preserving Mobility	<b>+ -</b>
	Sense of Belonging	<b>++</b>
	Preserving Accessibility of Surroundings	<b>++</b>
	Significance to Pedestrians and Cyclist	<b>+ -</b>
	Economic Presence	<b>++</b>

The Scheme on O’Connell Street meets several requirements for disabled users. ‘Safe Zones’ can be found on both sides of the streets. These are marked by a delineator with a tonal difference to the remaining surface of the scheme. Furthermore, Signs at both ends of the street clearly indicate the presence of a shared space. The vehicular activity pre and post transformation has not changed dramatically. Moreover, the scheme offers plenty of recreational options for users to stay and occupy the space, thus increased sense of belonging. Benches and trees are also found along with a not too crowded environment. The O’Connell Street can be seen as a shared space well designed, but the mere fact that the street is not heavily used by pedestrians suggests its transformation being a trial to possible bigger schemes.

6.4. The Drift/Torenstraat/Kaden intersection in Drachten, the Netherlands

Table 5: Drachten Junction Evaluation

<b>Drachten Junction: Urban-Cluster Shared Space Scheme</b>		
Compliance with regards to Disabled Users	Prioritizing Rights to Pedestrians	<b>+ -</b>
	Effective Presence of ‘Safe Zones’	<b>+ -</b>
	Usage of Delineators for Demarcating ‘Safe Zones’	<b>--</b>
	Presence of Visual Tonal Contrast	<b>--</b>
Use of Demarcation	Presence of Courtesy Crossings	<b>++</b>
	Presence of Increased Demarcation in Highly Dense Areas	<b>N/A</b>
	Clear Indication of Entry and exit Points in Shared Space Scheme	<b>+ -</b>
Safety Perception	Limitation in Diverted Pedestrian Routes	<b>+ -</b>
Cluttering	Presence of Street Furniture’s	<b>+ -</b>
	Barricaded ‘Safe Zones’	<b>+ -</b>



	Presence of Vegetation	+ -
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Table 6: Drachten Junction Urban-Cluster Evaluation

Evaluation Scheme for Urban-Clusters: Drachten Junction		
Urban Approach	Preserving Mobility	++
	Sense of Belonging	+ -
	Preserving Accessibility of Surroundings	++
	Significance to Pedestrians and Cyclist	++
	Economic Presence	++

The shared space scheme at the junction of Torenstraat and Noordkade/Zuidkade consist of several pedestrian crossings within the scheme and ‘Safe Zones’ can be found throughout the scheme. There is strong presence of business surround the area and at one corner a café can be found with outside seating. Street furniture’s are non-existing in this scheme, and the use of the space is not evenly distributed by pedestrian activity. High levels of motor vehicles dominate the central areas it the scheme. There is a good presence of cluttering distributed by trees and planters, furthermore bollards can be found throughout the scheme suggestion there exist some level of demarcations. Tonal difference in the surface is limited to the ‘Safe Zone’ areas. An adjacent pedestrian and cyclist zone helps diffuse the transition into the shared space scheme. The scheme does not extend beyond the junction and since only fringe areas is used by pedestrian, which are marked with zebra-crossings a satisfactory mixed use of the space can not be concluded.

## 7. Conclusion

The objective of this project was to identify principles and concepts for shared spaces that govern differing urban-rural areas by first identifying claims made by the DfT for shared spaces that needed to be addressed and secondly identifying the elements that dictate the performance of shared spaces for differing regions based on their urban-rural inherit properties. Varying regions are governed by differing priorities and qualities. Therefore requiring differing approaches when implementing shared space configurations. There are no sets of rules that dictate what a shared space should consist of or in what proportion differing elements should be integrated into shared space scheme. This is attributed by the characteristics of varying regions were shared space schemes are implemented.

The properties that govern shared spaces in rural areas differ from those in urban areas. Rural areas are environments identified by their historical and cultural qualities and are subject to lesser crowds. Two differing approach were identified for rural areas. An approach intended for main streets and market squares in small towns and villages, and an approach intended for residential areas, such a suburbs or small communal streets.

The first approach intends to bring out intrinsic qualities that exist from the landscape in rural areas. A subtle approach to the design of shared space coincides with an increase engagement of the surroundings. This is also known as psychological retreat. An increased awareness and engagement of the surrounding predicates the experience of these shared space schemes. There are some limitations in this approach, considering the dependence on the intrinsic qualities of the environment dictates how successful this approach is.

The other approach identified for rural areas is the 'Home Zone', which is derived from the Dutch approach called 'Woonerf'. This approach is intended for residential areas that are governed by low traffic. Opposed to the main street or market square approach, the 'Home Zone' approach suggests a more cluttered environments dictated by landscaping, street furniture's and physical barriers. The aim in this approach is to obtain liveable streets by encouraging those living on these streets to engage in outside space activity.

Urban-Clusters and urbanized areas were to other two urban-rural classifications identified. The qualities and principles that govern these areas were determined to be identical. Preserving the fluidity of traffic movement in shared spaces in urban-clusters and urbanized areas and maintaining accessibility within the region is of primary importance. In addition to these to factors, place making plays a vital role. Increasing the sense of belonging of the users in urban schemes correlates to improved social cohesion and economic impetus. Urban areas are subject to larger crowds, a more complex infrastructure, thus reaffirming the logistics of movement within urban areas governs the implementation of shared space schemes.

The findings in this report reveal that some of the claims made by the DfT for shared space to be inaccurate. The level of demarcations that should be carried out in shared space schemes is dependent on the volume of users in these areas. Users tend to become disoriented. The presence of demarcations, which stimulate a controlled movement of users in shared space schemes contributes to a better experience. Street furniture's vegetation and other cluttering scheme promote the use of space and increases the sense of belonging amongst pedestrians in shared space schemes. These efforts coincide with what pedestrians experience in pedestrianized zones, thus convincing the pedestrian to use and occupy the space. Users that identify as blind, partially blind, and physically impaired are of the feeling that shared spaces do not work. Those whom lobby for the disabled users argue that pedestrians prioritize shared space scheme, not differing to other modes occupying the space. Furthermore, greater proportions of 'Safe Zones' should be integrated in the designs of shared spaces.

Better monitoring schemes need to be implemented for recording accidents. Accidents that occur on courtesy crossings and in some cases uncontrolled crossing are not recorded and therefore not properly represented in the statistical data on the safety of shared spaces. Safety audits should be carried out. In addition, pedestrians who deter from their line of travel and are subject to reroutes suggest that these users are uncomfortable or feel unsafe in shared space scheme. The fact that users are taking longer routes to get to their destination due to safety concerns, does not suggest a safer environment.

## 8. Recommendations

The DfT should revisit their stands on shared spaces. Many of their claims do not translate in practice. This report attempts to draw some attention to the implication of differing regions. Shared spaces guidelines should be categorized in the same manner highways and roads are categorized. Furthermore, interventions promote a more conscious ecological approach should be adapted by guidelines. Shared space schemes have gained popularity over the years and are seen as a viable alternative for urban areas. With urbanization happening all over the world a critical approach to how design practices are carried out should be adapted. Interventions that reduce our ecological footprints can contribute to a more integral approach when designing shared spaces.

In regards to disabled users, shared space schemes can be materialized but with limitations. Disabled users are vulnerable in shared space schemes and cannot be relied on to negotiate right of way in these schemes. Furthermore, the perception of shared spaces being safe lack merit considering the 'Dangerous' experience users experience in these schemes. This is validated by the behaviour of frequently choosing longer routes by certain users.

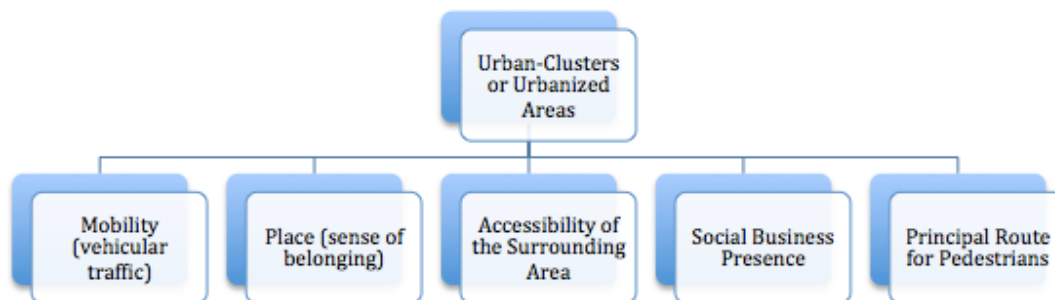
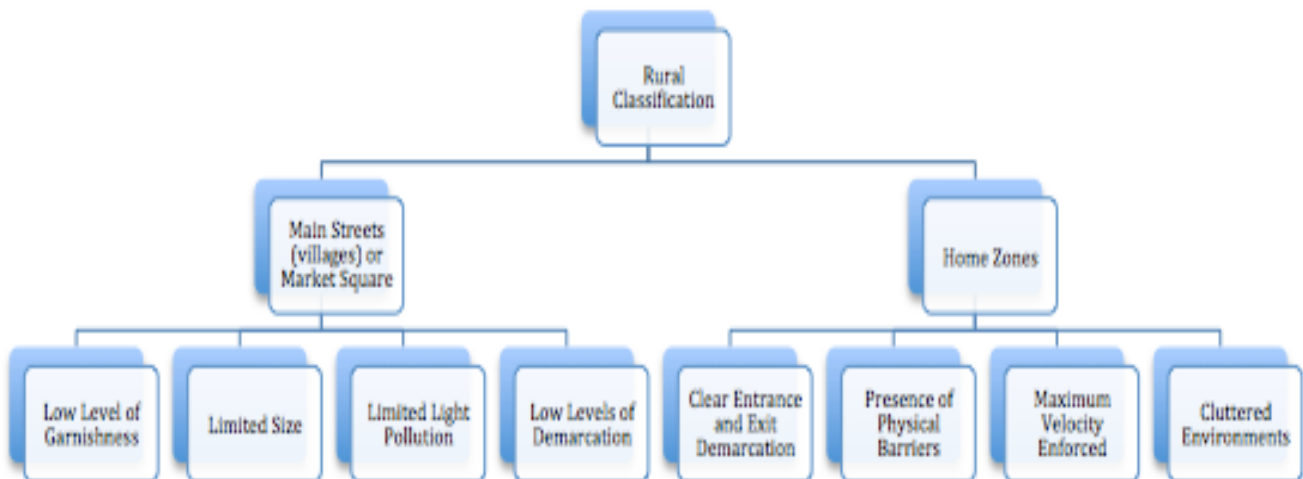
The integration of shared spaces should take on a gradual approach since many people do not know about them. Allowing users to familiarize with the schemes by disregarding some demarcation and keeping others, allows for a more acceptable transition to the use of this alternative.

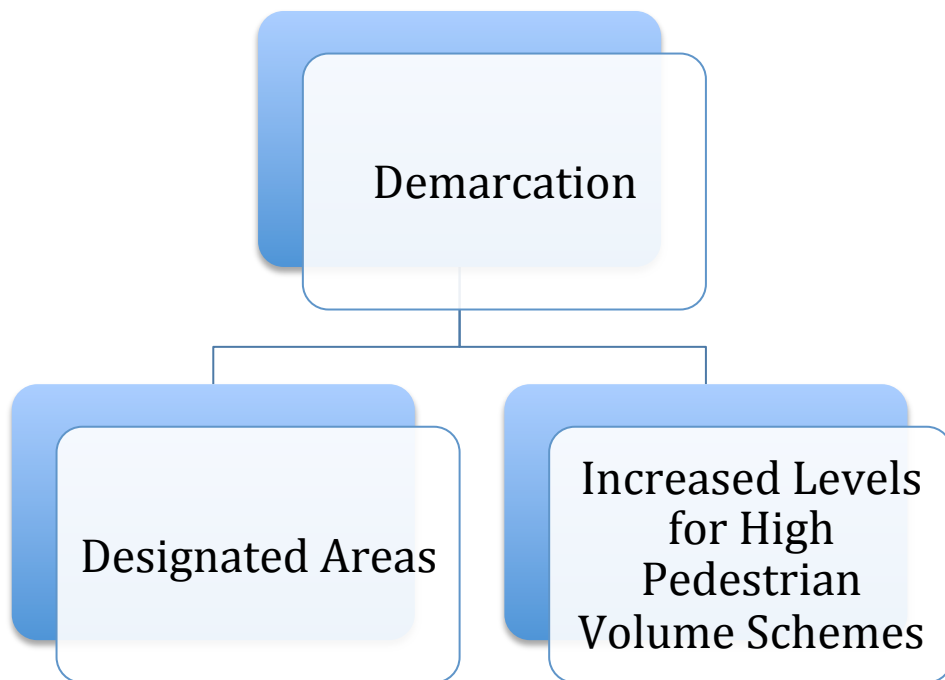
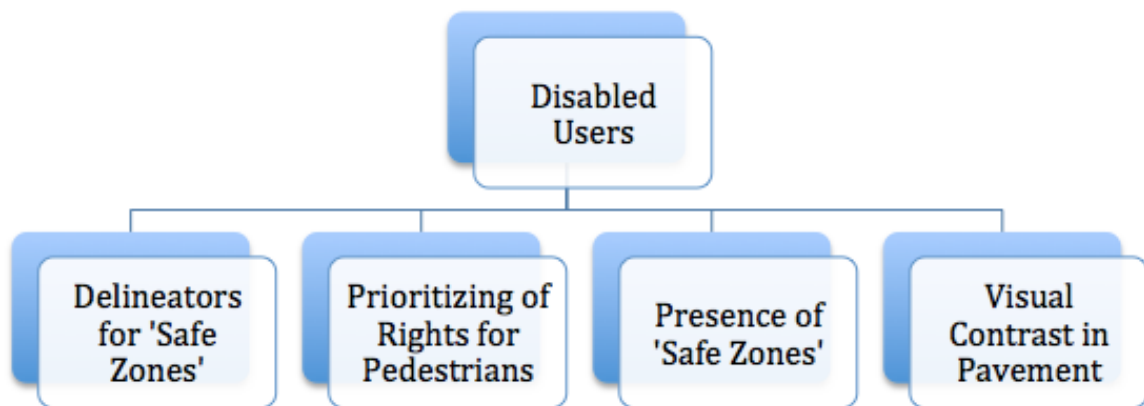
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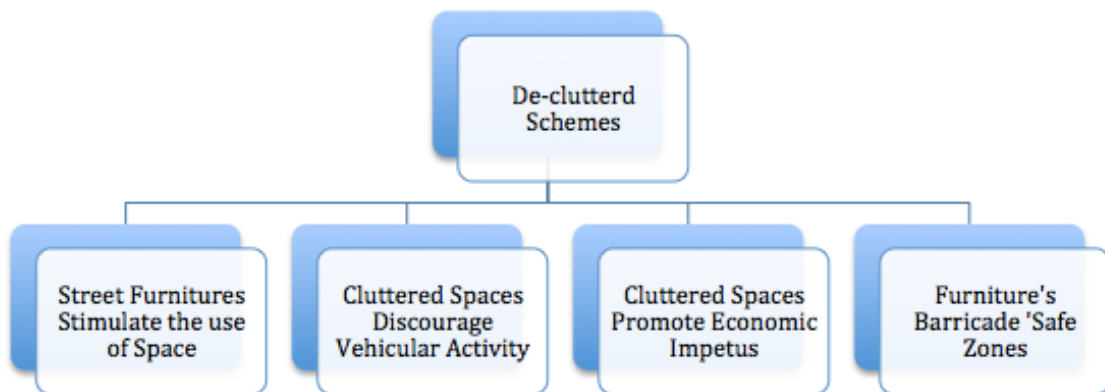
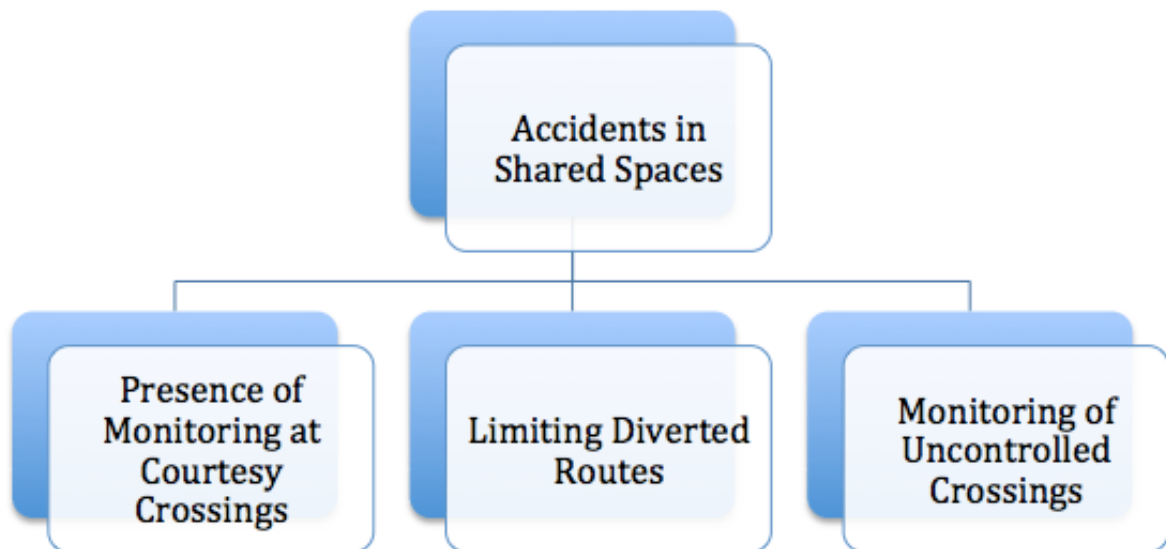
- Alasia, A. (2014). *Mapping the Socio-Economic Diversity of Rural Canada: A Multivariate Analysis*. Statistics Canada, Agriculture Division
- AlleCijfers. (2017). Informatie Over Wijk Drachten. Retrieved October 19, 2017, from <http://allecijfers.nl/wijk/drachten-smallingerland/>
- Auckland Population. (2017). Retrieved October 12, 2017, from <http://worldpopulationreview.com//>
- Bradbury, A., Cameron, A., Castell, B., Jones, P., Pharoah, T., Reid, S., & Young, A. (2007). *Manual for Streets*. Thomas Telford Ltd
- DfT (2011) Local Transport Note 1/11. Department for Transport, The Stationery Office, Norwich, UK.
- Dijkstra, L. & Poelman, H. (2014). A Harmonised Definition of Cities and Rural Areas: The New Degree of Urbanisation. Retrieved October 3, 2017, from [http://ec.europa.eu/regional\\_policy/sources/docgener/work/2014\\_01\\_new\\_urban.pdf](http://ec.europa.eu/regional_policy/sources/docgener/work/2014_01_new_urban.pdf)
- Drimble. (n.d.). Informatie Centrum (Drachten). Retrieved October 19, 2017, from <https://drimble.nl/buurten/900001/centrum.html>
- Edquist, J., & Corben, B. (2012). Potential application of Shared Space principles in urban road design: effects on safety and amenity.
- Euro Stats. (2007). Urban-Rural Typology. Retrieved September 25, 2017. From [http://ec.europa.eu/eurostats/statistics-explained/index.php/Urban-rural\\_typology](http://ec.europa.eu/eurostats/statistics-explained/index.php/Urban-rural_typology)
- Gerlach, J., Methorst, R., Boenke, D., & Leven, J. (2009). Sense and Nonsense About Shared Space- For an Objective View of Popular Planning Concept. *Luettavissa*: [http://katana.hsrb.unc.edu/cms/download/shared%20Space\\_short\\_german-Eng.Pdf](http://katana.hsrb.unc.edu/cms/download/shared%20Space_short_german-Eng.Pdf)
- Guide Dogs for the Blind Association. (2010, January). *Inclusive Streets: Design Principles for Blind and Partially Sighted People*. Retrieved September 30, 2017, from [http://www.guidedogs.org.uk/media/1497778/Inclusive\\_Streets\\_Design\\_Principles\\_booklet\\_Guide\\_Dogs\\_2010.pdf](http://www.guidedogs.org.uk/media/1497778/Inclusive_Streets_Design_Principles_booklet_Guide_Dogs_2010.pdf)
- Guide Dogs for the Blind Association. (2008). *Testing Proposed Delineators to Demarcate Pedestrian Paths in a Shared Space Environment*. Retrieved September 30, 2017, from <http://www.guidedogs.org.uk/supportus/campaigns/streets-ahead/information-for-street-designers-and-councils/reference-documents/#.U6BTy03Qee9>
- Hamilton-Baillie, B. (2010, June 25). *Shared Space and Street Design: Best Practise for Reconciling People, Places and Traffic*. Retrieved October 12, 2017, from <http://www.cpij.or.jp./eng/file/hamilton-bailie.pdf>
- Holmes, L. (2015). *Accidents by Design: The Holmes Report on "Shared Space" in the United Kingdom*. Retrieved September 19, 2017, from <http://www.theihe.org/wpcontent/uploads/2013/08/Holmes-Report-on-Shared-Space-pdf>.
- Joyce, M. (2012, July). *Shared Space in Urban Environments: Guidance Note*. Retrieved October 7, 2017, from [http://www.transportationgroup.nz/publications/120706\\_Shared%20Space%20Guidance%20Note\\_Issue%203.pdf](http://www.transportationgroup.nz/publications/120706_Shared%20Space%20Guidance%20Note_Issue%203.pdf)
- Karndacharuk, A., Wilson, D. J., & Dunn, R. (2014). *A Review of the Evolution of Shared*

- (Street) Space Concepts in Urban Environments. *Transport Reviews*, 34(2), p190-220.
- Karndacharuk, A., Vasisht, P., & Prasad, M. (2015, September). Shared Space Evaluation: O'Connell Street, Auckland. In *Australasian Transport Research Forum 2015 Proceedings*.
- Karndacharuk, A., Tse, M., & Wilson, D. (2011). Shared space Performance Evaluation: Quantitative Analysis of Pre-Implementation Data. Retrieved October 14, 2017, from [https://www.hardingconsultants.co.nz/ipenz2011/downloads/Karndacharuk\\_Aut.pdf](https://www.hardingconsultants.co.nz/ipenz2011/downloads/Karndacharuk_Aut.pdf)
- Kent Downs AONB Unit. (2009, July). Rural Streets and Lanes: A Design Handbook. Retrieved October 13, 2017, from [http://www.kentdowns.org.uk/uploads/documents/Rural\\_Streets\\_and\\_Lanes.pdf](http://www.kentdowns.org.uk/uploads/documents/Rural_Streets_and_Lanes.pdf)
- Methorst, R., Gerlach, J., Boenke, D., & Leven, J. (2007). Shared Space: Safe or Dangerous. *A contribution to objectification of a popular design philosophy*, 3.
- Moody, S. and Melia, S. (2014). Shared Space: Research, Policy and Problems. *Proceedings of the Institution of Civil Engineers – Transport*, 169 (6). pp. 384-392. ISSN 0965-092X Retrieved from: <http://eprints.uwe.ac.uk/17937>
- Office for National Statistics. (2017, February). Standard Area Measurements (2016) for Administrative Areas in the United Kingdom. Retrieved October 16, 2017 from <https://ons.maps.arcgis.com/home/item.html?id=a79de233ad254a6d9f76298e666abb2b>
- Pascucci, F., & Friedrich, B. (2017, March). Beurteilung der Leistungsfähigkeit von Straßenräumen mit Shared Space.
- Paton, G. (2016, October 24). Shared Spaces for Drivers and Pedestrians 'are causing chaos'. *The Times*
- Population.City. (n.d.). Ashford - Population. Retrieved October 16, 2017, from <http://population.city/united-kingdom/ashford/>
- Reid, S. (2009). *DfT Shared Space Project Stage 1: Appraisal of Shared Space*. MVA Consultancy.
- Schönauer, R., Stubenschrott, M., Schrom-Feiertag, H., and Menšik, K. (2012). *Social and Spatial Behaviour in Shared Spaces*. na.
- Steinberg, L. (2015, December 7). Woonerf: Inclusive and Livable Dutch Street. Retrieved October 11, 2017, from <https://www.lvblcity.com/blog/2015/12/woonerf-inclusive-and-livable-dutch-street>
- U.S. Census Bureau. (n.d.). U. A. The Urban and Rural Classifications. Retrieved September 24, 2017. From <https://www2.census.gov/geo/pdfs/reference/GARM/Ch12GARM.pdf>
- Young, A., and Jones, P. (2010). *Manual for Streets 2: wider application of the principles*. London: Chartered Institution of Highways and Transportation.
- Wendell, C. H. (2015). Urban Street Design Guide. *Journal of Planning Education and Research*, 35(3), p393-394.

## Appendix A: theoretical Framework Summarized









## Appendix B: Data obtained From Other Projects

### Elwick Square Pedestrian Routes from Video Footage :

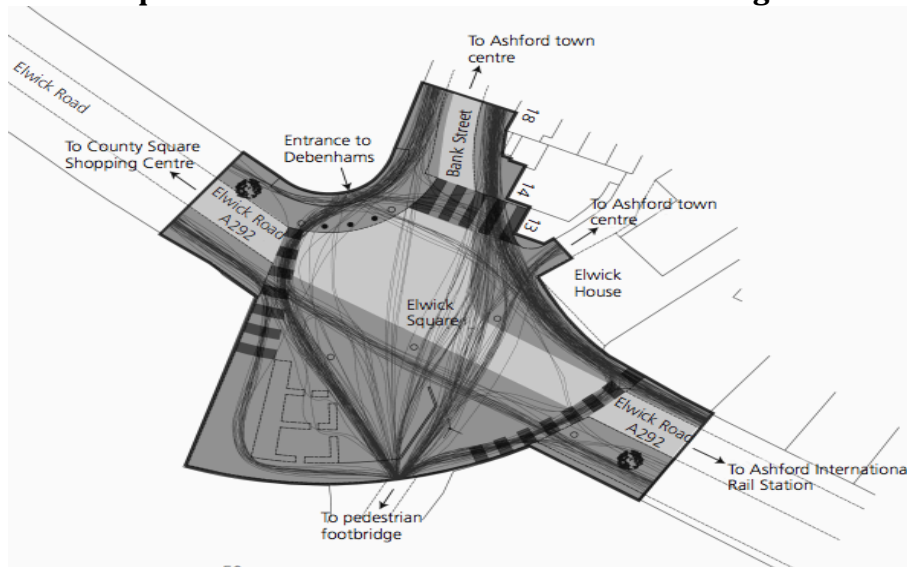


Figure 8: Video Footage Pedestrian activity (Moody & Melia, 2014).

### O'Connell Street Survey Results:

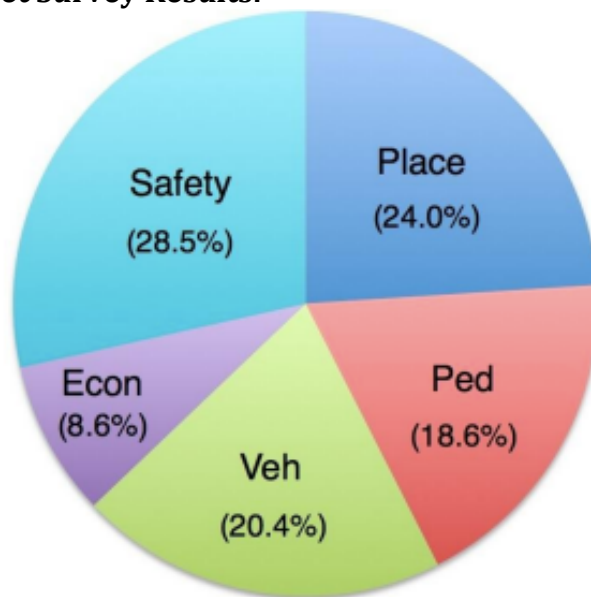


Figure 9: Most important Aspect Ranked by Respondents (Karndacharuk et.al, 2014)

## Appendix C: Evaluation Criteria

Shared Space Evaluation Scheme		
Compliance with regards to Disabled Users	Prioritizing Rights to Pedestrians	--
	Effective Presence of 'Safe Zones'	--
	Usage of Delineators for Demarcating 'Safe Zones'	--
	Presence of Visual Tonal Contrast	--
Use of Demarcation	Presence of Courtesy Crossings	++
	Presence of Increased Demarcation in Highly Dense Areas	N/A
	Clear Indication of Entry and exit Points in Shared Space Scheme	+ -
Safety Perception	Limitation in Diverted Pedestrian Routes	--
Cluttering	Presence of Street Furniture's	--
	Barricaded 'Safe Zones'	--
	Presence of Vegetation	+ -

- **Prioritizing Right to Pedestrians:** As stated in the theoretical framework. Those that lobby for the disabled, blind, and physically impaired feel that shared space schemes should prioritize pedestrians using the space where users of other modes defer to them.
- **Effective Presence of 'Safe Zones':** This refers to the implementation of 'Safe Zones' which disabled users deemed necessary in shared space scheme. The quality of these 'Safe Zones' is determined by the measures used to delineate these zones from the remaining spaces.
- **Usage of Delineators for Demarcating 'Safe Zones':** The usage of an effective delineator, which complies with the limitation disabled users experience in shared space schemes was discussed in the theoretical framework. The central delineator is considered by the Guide Dogs as the most promising option, though concerns about it still remains. Evaluation on this element is done by a comparison approach to the central delineator.
- **Presence of Visual Tonal Contrast:** Partially blind users rely on the tonal differences on the surface.
- **Presence of Courtesy Crossings:** Courtesy crossings are very useful for those who have their reservations about shared spaces. Vulnerable users are at times reluctant to use the entire space to their disposal, thus the presence of courtesy crossings facilitates their experience in shared space scheme.
- **Presence of Increased Demarcation in Highly Dense Areas:** As stated in the Theoretical Framework. Pedestrians tend to perceive dense areas as chaotic may

experience disorientation in shared space scheme. The presence of Signs, a more control environment, correlates with improved usage of the shared space schemes.

- **Clear Indication of Entry and Exit Points in Shared Space Schemes:** Some shared space schemes fail to alert their users that the space they are occupying is intended to be shared equally. Furthermore, motor vehicles are expected to adjust their speeds in these areas. This should be clearly indicated in a shared space schemes.
- **Limitations in Pedestrian Diverted Routes:** As stated in the theoretical framework, the statistical data on the number of accidents taking place in shared space schemes are not clearly supported. Pedestrians tend to divert from their traveling routes in order to avoid certain areas in shared space schemes. A well designed shared space scheme would have a fairly low percentage of users diverting to longer routes due to feeling unsafe in certain areas.
- **Presence of Street Furniture's:** The Place Making element relies on there being incentives for users to feel they belong and consequently occupy the space for longer periods of time. Pedestrians are furthermore familiarized by the presence of benches and similar amenities they would otherwise encounter in pedestrianized areas.
- **Barricaded 'Safe Zones':** 'Safe Zones' Should not simply suggest to motor vehicle users that certain areas are intended for pedestrians, but they should be clearly indicated by not only tactile paving but bollards and planters for instance as well.
- **Presence of Vegetation:** Same as with street furniture, this enhances the pedestrians' sense of belonging in shared space schemes and also improves the aesthetic quality of shared spaces.

<b>Evaluation Scheme: Main Streets/Market Squares for Small Villages and Towns:</b>		
Rural Approach	Presence of Limited Light Pollution	
	Size of the Shared Space Scheme Limited	
	Limited Garish in Scheme	
	Limited Demarcation	

- **Presence of Limited Light Pollution:** Shared space schemes in rural areas should highlight the intrinsic qualities and adapt to a subtle approach, which direct the users attention to the surrounding rather than the shared space scheme. Thus, by limiting light pollution in a shared space scheme, the attention of users can be directed towards the facades and adjacent buildings.
- **Size of the Shared Space Scheme Limited:** The expected users in shared spaces are often limited in numbers. Therefore, schemes should not be overly large and the dimensions of shared space scheme reflect its usage. A specific density has not been established in this report, but limiting the scope is intended to improve the quality and experience of users in rural schemes.
- **Limited Demarcation:** As was the case with light pollution, rural shared spaces as discussed in the theoretical framework, should take on a subtle and a non-garish approach.

Evaluation Scheme for Urban-Clusters:		
Urban Approach	Preserving Mobility	
	Sense of Belonging	
	Preserving Accessibility of Surroundings	
	Significance to Pedestrians and Cyclist	
	Economic Presence	

- **Preserving Mobility:** This refers to the extent does the transformation into a shared space configuration has been able to cope and preserve the vehicular traffic patterns.
- **Sense of belonging:** To what extend does the interventions in the design conform to pedestrians staying and occupying the space.
- **Significance to Pedestrians and Cyclist:** The significance of the proposed location to pedestrians and cyclist. Whether the street/junction is highly attractive to these users.
- **Economic Presence:** Is there incentives to attract pedestrians.

Evaluation Scheme for 'Home Zones'		
Residential Approach	Presence of Physical Barriers	
	Clear Signs denoting Entry and Exit points	
	Cluttered Environment	
	Maximum Velocity Signs Present	

- **Presence of Physical Barriers:** Physical barriers encourage drivers to slow down in 'Home Zones' this involves how effective these are represented
- **Clear Signs Denoting Entry and Exit Points:** The streets in these areas are often occupied by residence playing in the streets. A clear indication of entering these areas should be present as a precautionary measure.
- **Maximum Velocity Signs Present:** Residential shared space schemes involve children playing on the streets. A strict reinforcement effort should be provided.