

Can the design of effective public space inform the passenger experience of public transport?

Selby Coxon, Karen Burns and Arthur De Bono

Faculty of Art and Design, Monash University



1 Introduction

Effective public transport can be partly understood as a form of public space. Both can be defined by the understanding that they encapsulate a common ground where people come together to carry out daily life. Literature in the field states that effective public space contains qualities that create a sense of place, fostering social interaction, civic identity, producing community, and with it psychological well being. Like public transport the enforced propinquity of the public domain contains the inherent risks of the company of strangers with both the pleasures and incivilities therein. This paper relates to a small part of the on-going research within the Faculty of Art and Design at Monash University concerning public transport design. This paper focuses upon the development of design strategies to improve the overall perception of public transport for the purpose of enhancing amenity, developing user-value, and going some way to ameliorating anti-social behaviour.

This paper broadly seeks to assess the current literature and investigate:

- The expectations of public space
- What makes a successful public space?
- Can effective public space design strategies rethink the design of public transport?

The first half of the paper outlines theories concerning public space and the second half speculates upon their application to public transport. The authors' contend that in re-defining public transport in terms of public space it is possible to improve the passengers' impression of this essential facility. For example, leveraging those design opportunities for further in-transit time amenity, that personal transport cannot provide, might open up a new approach to transport design and an improved perception of public transport.

2 Defining public space

Both public transport and public space share the aspiration that they are accessible to the community at large. Both provide amenity to society, both are by and large egalitarian and both are bounded by structure, whether it be buildings in the case of public space or the integument of a vehicle. Therefore it can be assumed that the issues facing designers of such spaces are similar. Public transport has the added complexity of being a public space that moves, that is relatively small and despite an approach to universal accessibility generally requires its patrons to pay to enter the space. Further restrictions can be created by the design of the vehicle if it neglects to cater for those who are disabled or have their freedom of movement restricted by the carrying of large objects or accompanying young children. Despite these differences the transport network contributes significantly to the urban form of modern cities and has therefore an integral relationship with public space.

2.1 The key motives of public space

Public space is inherently communal, providing the channels of movement; the ebb and flow of human exchange. There is an assumption in the literature that public spaces are generally

desirable and good for society. Human beings are social creatures and the balance between the public and the private appears to contribute to a healthy psychological and physical life (De Botton, 2006). Public life as opposed to a private one provides opportunities for engagement and social contact. Public space serves as a binder for a society in history and culture. Public space creates a sense of identity and place, defining a type of membership, be it to citizenship or a neighbourhood. This binder is essential to a social cohesion that is central to an urban life in which we are continually amongst strangers (Lofland, 1973).

For the purposes of this research public spaces are defined as an open area in which people can freely congregate for group or individual activities. These spaces contain walkways, seating, visual elements (such as art) and physical elements that support amenity such as platforms, lighting, removal of waste, some protection from the elements or the potential incivilities of other people.

2.2 The forces that shape public life and space

Public spaces are formed by two different processes (Carr, 1992):

- **Evolving.** Those spaces that have developed 'naturally' without deliberate planning, by repeated unchecked use or by the concentration of people through some sort of attraction (for example a river). These spaces become established over time as places of meeting and social exchange.
- **Planned.** Spaces that are the product of architects and city planners. The result of laying out an urban environment or providing a public amenity such as a park or civic square.

It could be contended that many places are a combination of both. Some spaces become something that they were not intended for, particularly if they become inhabited by anti-social elements. Equally urban planners might leverage the growing popularity of a neighbourhood space and formalise the design by creating an amenity, such as a children's playground where once there was just a wasteland. Therefore there is a proliferation of different types of public space, from civic squares to the shopping mall, which signifies the serving of different social groups. Each of these spaces is defined by their design. People become familiar with the visual language of public space. We come to recognise the elements of civic pride with its accompanying monuments and the expectations of a grand atrium of a large modern shopping mall.

2.3 The expectations of public space

Public space is the domain in which human beings encounter each other and with that an expectation of how they will live their lives in common (Henaff and Strong, 2001). Although public space implies freedom (within a framework of social or legal rules) there are moral or legal entitlements that accompany the use of public space. These appear to be broadly divided into three concepts, that of universal access, ownership, and change.

2.3.1 Universal access

It can be argued that an essential feature of public space is the notion of accessibility. Accessibility refers to the extent to which the public space enables people to reach, enter or walk around the places they wish to regardless of any physical, sensory or mental impairment. This is also referred to as 'universal access'. In poorly considered public spaces physical, visual and symbolic barriers limit accessibility as they can do in public transport. Physical access refers to the ingress and egress of a space, and moving about within it. Visual access concerns how a person 'reads the landscape' and to the extent they feel either

encouraged or alarmed by what is set before them. Symbolic access refers to the implied meaning inherent in the space, for example whether it is bounded by expensive shops that suggest an expectation of a certain type of patronage (Carr, 1992).

It has been of growing concern amongst the competing design interests of planned public space to embrace the disadvantaged by creating highly accessible spaces. Provision for people with sensory and mobility impairment requires a combination of structural forms; ramps, steps with handrails, the thoughtful siting of signage, and appropriate surfaces that can be maintained in both winter and summer. The ageing processes create both physical and cognitive challenges, for example older people fear falling or getting lost. The latter exacerbated with any onset of dementia or cognitive impairment. Key elements of accessibility in these circumstances include the provision of landmarks or distinctive features that reinforce a person's 'mental map' of a place (Burton, 2006). Features such as clocks, fountains, and sculptures give clues to one's relative position in the environment. A variety of features can assist older people, but too many and too complex can be counter productive.

2.3.2 A sense of ownership

Both architectural and sociological literature suggests that it is a human characteristic to express ownership of a place or space even if it is transitory. The marking out of a territory to a like minded group of individuals for personal use to carry out desired activities represents a perceived right in many public spaces (Lofland, 1973), and leads to the notion of privacy within a public domain. This 'claim' behaviour (Carr, 1992) strikes a balance between territorial rights and the denial of access to other groups. Ownership of a space can be time dependent with different groups claiming the space at different hours, for example older people by day and teenagers by night. It is argued that appropriation of a space can be useful since it demonstrates that someone cares for the place. A good example of this would be the development of an urban garden by local residents where formerly there had been no activity at all. Once again the arrangement of seating within the public space can facilitate the creation of territories. The deliberate subdivision of space is known as a 'home zoning' in the Netherlands and supports space divided between the cyclist, the pedestrian, cars (moving at a very low speed), play areas and soft landscaping (trees and shrubs) (Burton, 2006).

Many social freedoms are associated with the right to congregate in a public area but they need to be reconciled with competing interests. Public space is in many ways said to be created by the actions of human beings and that the democracy (of its use) sharing information, and social cooperation is a 'built-in' part of that space (Henaff, 2001).

2.3.3 Change

Change is another dimension of public space that is said to contribute to its quality (Lynch, 1972 in Carr, 1992). Change can be of a permanent or temporary nature. This depends upon how the change might be facilitated. Temporary change includes the location of markets, festivals and demonstrations. Permanent change might include sculptural installations. Part of the engagement of a society with a public space is manifested in adding, removing or altering elements of that space. Making a personal statement to a public space most commonly appears as graffiti. There is considerable debate concerning the relative merits of this form of artistic expression. (Carr, 1992). It can be argued that certain changes in appearance to a space pre-suppose a symbolic meaning to the type of activities that could be carried out in the area. Negative symbols such as unchecked vandalism suggest abandonment by civil order and that the activities carried within the space are in some way subversive. However positive symbols such as the use of movable furniture and certain types of adventure playgrounds suggest that there is an enhanced engagement with the space if the patrons are allowed to change or adapt it. This can re-enforce the notion of a particular interest groups claim to a space and the evolution of territories.

2.4 Identifying and evaluating people's needs in public space

There is a complex interaction between people, their values and behaviours toward any particular site. Analysis of these factors will help to determine why some spaces are more successful than others. Case study literature suggests (Kraul *et al.*, 2006) that many planned spaces are predicated upon what is expected to happen in them rather than what eventuates. Effective design and management of public space is determined by an understanding of the role these places play in peoples' lives. Why spaces are enjoyed or abandoned. People go to public spaces for a specific purpose, to eat lunch, to rest, or an opportunity to exercise or be entertained.

Commentators suggest that effective public space provides an opportunity to escape from the confusion, noise, crowds and overload of the surrounding city streets, and enter into a stimulus shelter, the opportunity to re-group ones resources before moving on. Contemporary literature on the subject uses phrases such as retreat, relaxing, comfortable, tranquil, and sanctuary. Spaces offer a contrast to the daily routine and become a transition from the world of work to that of leisure. There is an expectation that specific experiences are possible in the public domain. Beyond the defining rights of public space described earlier the literature suggests that people have five significant needs in public spaces (Carr, 1992):

2.4.1 Comfort

Comfort afforded from protection from the elements, particularly a hot sun or heavy rain. Sufficient seating that includes important features such as how it is orientated, proximity to areas of access, seating that is movable, seating for individuals and groups. Seating with backs and seating that affords sightlines to children. Studies show that people like to face the traffic flow and don't like having their backs to passing people and objects (Carr, 1992). Attention to features that reduce threat to safety are likely to increase a feeling of comfort (Frank and Paxson, 1989). Open visibility, avoidance of barriers to sightlines, a psychological forewarning issue. Comfort includes having available bathroom facilities, and ones that are easy to maintain.

2.4.2 Relaxation

This quality is different from comfort by the level of release it describes – being much more psychological and the opposite to liveliness. The principle factor that supports relaxation in public space appears to be contrast or separation from adjacent urban activity especially traffic, for example a small garden 'oasis'. Natural elements such as trees, grass, waterfalls accentuate this contrast. Architects in the Netherlands use hard urban landscaping to delineate space. However in the setting out of these quiet spaces we could be also creating insecure areas at times of limited use.

2.4.3 Passive engagement

This category describes the interest and enjoyment people derive from watching others within the passing scene. There is an awareness of the surroundings but no accompanying actions. It is reported that 'people watching'; observing others about the space is a popular activity (Whyte 1980 in Carr 1992). But this might also include the opportunity to observe activities such as street performers in a more formal setting. Elevated areas such as steps create a sense of detachment from the adjacent scene in a relationship similar to an amphitheatre or a stage.. In a study of the qualities of what people prefer in public spaces (Baker and Montarzano, 1983 in Carr *et al.*, 1992) water was the single most desired feature. Passive engagement also encompasses the appreciation of the physical and aesthetic qualities of the space. This factor encompasses public art; from monumental statues and abstract sculpture to functional street furniture. The most contentious debate of aesthetic

value concerns the validity of graffiti as an art form in public space. Art in mural or sculptural form lends interest to the experience of public space and in turn helps set an identity (Miles and Hall, 2005).

2.4.4 Active engagement

Active engagement represents a direct experience with the space, and can be the antithesis of passive relaxation. This can involve the striking up of conversation in circumstances dictated by linkages such as watching a street entertainer or by two strangers in proximity to an interesting physical feature. Shopping streets and malls represent active engagement where those with a common interest might interact. For example spaces in which there are parents with children, where the space is a complex mixture of tolerance and mutual concern. Active engagement includes spaces that provide a setting for the interaction of friends and acquaintances. Providing active recreational needs is a common thread in public space design where facilities exist for eating, play sport or games. Qualities people enjoy in public space are the pleasures of engaging in multifaceted activities encompassing, socialising, entertainment, consuming food and purchasing goods. Therefore spaces with a combination of affordable interaction with a carnival atmosphere can be the difference between an area of boredom or one of enduring interest.

2.4.5 Discovery

A desire for novelty can embrace both an active and passive engagement. Some sort of stimulation on our own terms; observing the different things people are doing while moving through the site. The quality of exploration through a changing vista. An arrangement of built elements that can provide an element of (pleasant) surprise.

2.4.6 Amelioration of incivilities in public spaces

Successful public spaces include those that diminish the fear of coming into contact with anti-social elements. In this issue public spaces coincide with the operational necessities of public transport. Qualities that support this sense of protection include (Painter and Tilley, 1999):

- The presence of authority in some form
- Closed Circuit television surveillance
- Street lighting
- Animated areas (having activities such as shopping)
- The repair and maintenance of the space immediately that damage is discovered
- Complex art forms or textures that make the application of graffiti difficult
- Spaces that reduce the fear of entrapment (Hickman and Wilson, 1995)
- Access to real time information such as waiting time to the next bus or train.

Lighting and CCTV do not in themselves form a physical barrier to any criminal or anti-social behaviour, but they can at least introduce the element of risk of being caught in the mind of the potential perpetrator (Painter and Tilley 1999). However as people become accustomed to an environment these crime prevention measures have been shown to fade in their effectiveness (Berry and Carter 1992).

Washington DC has high levels of reported crime (Snyder and Sickmund, 2006). However its subway system has a good reputation. Police or security staff vigorously pursue even minor offences and infringements in the hope that it will deter individuals from committing more serious violations. Ironically the presence of other people is both a deterrent (BAH, 2006) and a source of protection in public space (Carr, 1992). The difference lies in the level of forced proximity, the behaviour of other people and presence of escape routes. The feeling of control in any situation contributes to the level of anxiety experienced by the individual.

3 Employing effective public space strategies in the design of public transport modalities

The needs of public transport patrons cover a number of the same needs of public space. They include physical comforts such as relief from the elements, respite, seating and visual stimulation and the protection from threats. Current design methodologies appear to approach vehicular design from, understandably, rational approaches to safety, efficiency and a tolerable level of comfort to provide the most cost effective service. Public Transport struggles to deliver a high level sense of self or unlimited freedom from the front door. There is no reflected personal prestige in the patronage of suburban public transport. The advantages of the collective are sometimes more subtle and belong to the community at large rather than with the individual. The result is that the design of public transport vehicles driven by commercial imperatives provides a single solution to accommodate a wide range of individual passenger motivations and requirements. They are often considered substandard compared to private cars with a corresponding negative perception of public transport.

The previously discussed literature reveals that there is a set of expectations or rights to public space and a set of needs or qualities that describe successful or effective public space. In the following section the authors associate these expectations and qualities with potential developments in the design of public transport vehicles.

3.1 Universal accessibility in public transport

Universal access asserts that all people are to have equal opportunity and access a public space regardless of age, social circumstance or physical disabilities. More than an aspirational goal it is in some cases a legal obligation. In many developed countries an infrastructure exists to help implement universal access. There is already a legislative approach to ameliorating the current barriers to universal accessibility in public transport. However these changes in the design rules of stations and vehicles are far from fully implemented and struggle to meet deadlines (Department of Infrastructure, 2002).

Access to public transport begins with the design of the vehicle thresholds because they clearly delineate who should occupy each side of the door and in what circumstance people are allowed to cross. The threshold of a vehicle entry into the vestibule can inspire anxiety if a person does not know what lies beyond it or a sense of safety if a person can see a group of people who clearly appear to belong to the internal space. Barriers exist to entry even when aboard the bus (Figure 1). Treatment of a barrier can alter its meaning. The turnstile in Figure 1 while apparently necessary in this context could be made to contain aesthetic sensibilities that do not de-humanise the experience. Barriers are the trade off between opacity and visibility. They are the handshake of universal access to the public domain.



Figure 1 – Bus entry turnstile, Rio de Janeiro (author's photograph)

3.2 Exploiting potential design strategies pertinent to public transport

3.2.1 Territory

Public space is transformed into a private or semi-private public space by the creation of home territories. That is the taking over of a space by a group of like-minded individuals on certain occasions known to each other. There is fluidity to the spatial order on public transport through the unplanned and uncoordinated actions of individuals and sub groups. This transient colonisation works against the prevailing spatial order each time the train, tram or bus pulls up at a stop. These could be groups of school children, football fans, and patrons on their way to a concert or even periods in which perhaps more elderly passengers might be using the transport system. The process of creating 'colonies' is continual as is the process of abandoning them. The colonisation process makes things safer for those that belong to that group. When sufficient numbers are reached they feel free to act in a way that is in contrast to the actions of others in the same locality yelling across expanse, using obscene language, laughing at 'in jokes' and displaying proprietary behaviour. Territorial behaviour can be formalised by creating zones pertinent to specific needs. For example train carriages for bikes or areas reserved for pushchairs etc (see 3.2.3 spatial divisions).

Inappropriate colonisation is engaging in activities for which the space was not intended and leads to fear from other passengers and anti-social behaviour. Group dynamics on board transport modalities have a great influence upon the general atmosphere of the transit experience. For example it has been observed (Stewart-David, 2005) that a critical mass of considerate travellers has a greater prospect of establishing a colony of respectable behaviour on-board the vehicle. Stewart-David also argues that it is not improved technologies that improve the people's expectations of public transport but just nicer people.

3.2.2 Flexible space

As observed in examples of public space, seating arrangements can go a long way to preparing the ground for colonised space. Especially the type of arrangements that offer some kind of flexibility: seating that can be moved so groups can be re-arranged. Facing the direction of travel, sitting at right angles or accommodating pushchairs or bicycles. Some modes try to cater for these activities but they are generally fixed and limited to space adjacent to vestibules etc. It is appreciated that it would be quite impractical to have seating floating about the cabins, however some flexibility can be introduced relatively easily as exemplified by folding seats, and as seen in the suburban system in Wellington New Zealand and older Sydney trains, bench backs that swing across the seat pan to suit the direction of travel. Thoughtful design could create more.

3.2.3 Spatial divisions

Flexible space means accommodating the variations of patronage throughout the day. More or less seating depending upon crowding but also the provision of space for special interest groups such as carriages for cyclists, or pushchairs only. From the authors initial research it is clear that the current design of the vehicle interiors make for management difficulties. For example the arrangement and location of seating on some urban trains can and does contribute to the placing of feet upon them. The propensity of specifiers to choose foam padded soft materials for padding has led to cleaning difficulties with easily slashed and vandalised seats.

3.2.4 Passive engagement

Public transport has the advantage of offering the passenger stimulus through their journey. The convenience begins by describing the levels of comfort one can experience in seating, lighting and temperature. Beyond this the passenger has the potential to indulge in passive or active engagement with the space. There are already some urban train networks that have established screen based entertainment (and with them opportunities to build advertising revenue) and there appears to be a growing enthusiasm for it (Railway Interiors International, March 2008). As with public space a prominent location attracts lucrative advertising.

What is entertaining for one is disturbing for another. More passive qualities of visual culture can be found in the various enthusiasms for bringing art into the transport domain. Public art reaches those people who might not usually go to art exhibitions. Art can be renewed and changed thus providing change and novelty. The introduction of this sort of stimulus is again not new but is equally has not been as fully developed as it might. Public art placed in transit modalities appears confined to simple framed images in spaces otherwise fought over by advertisers. If the cabin space is initially set up to accommodate a range of changing internal landscapes then opportunity for adventurous or creative outcomes is possible. Some art installations have been created specifically to counter vandalism (Figure 2). The graphic enhancement of material and textures attract the passenger to an experience not available in the private car. It can leverage the enthusiasm of diverse cultural communities and make the visitor feel socially included.



Figure 2 – Art installation in railway carriage.

Source: Pottier, (2008). Photograph: Gordon Graham

3.2.5 Active engagement

On-board activity is currently expanding to include an increasing connectivity with the world outside the transit space. Internet connection is not unusual in city-to-city trains, but could they have site specific enhancements that encourage facility while on board the vehicle? Once again the ability to work at least at some times of the day increases the perception of the value of the transit in the mind of the patrons.

Public space is changing finding new ways to spend our leisure time. In quieter times of reduced patronage, during the daytime when inactivity leads to an opportunity for crime then modalities such as trains can take on extra amenity such as small kiosks and authorised 'buskers' the fabric of the moving market place of civic squares. Evidence suggests that a critical mass of well-behaved people is a deterrent to those who feel at liberty to damage or commit incivilities (Stewart-David, 2005). This is especially the case during peak times in the morning and late afternoon. Creating this critical mass is dependent upon the attractiveness of the mode. Fewer visible staff contribute to an impression of abandonment by the 'forces of order' or authority.

Greater animation of the transit space as well as the stations that populate the network provide interesting and diverse experiences for passengers. A good journey experience much like a positive experience of public space promotes a positive sense of participation, an opportunity to linger in and enjoy in a variety of ways.

3.2.6 Vehicle as a form of architecture

The very form of the vehicle can be re-defined from the rectilinear box to that of engaging transient architecture. Buildings suggest belonging and can define a sense of place, with forms, shapes and graphical treatments that become the unique emblems of a city. Trams are particularly good at this and would appear to be popular too. Buses and trains appear to fall behind in emotional affection, with the possible exception of London buses. The top deck of a double-decker bus in London is enjoyed, especially those with open rooftops, because they afford a vista that is unusual and not provided by travelling at street level. The window of a moving train is a proscenium within which the changing composition of the outside landscape is constantly framed, temporary and transient. While it might not always be pleasant or even visible in the case of underground trains, the relationship between the internal space and the changing outside world is one that might be explored further. If the notion of relaxation to the passenger is one in which they sit under sunlight bursting through treetops then an interior cabin space that plays with light and graphical elements to evoke a similar effect will increase the pleasure of the transit time.

3.2.7 Ambient experience; utilisation of light and sound

The imaginative use of lighting can go beyond mere illumination to create amenity, such as highlighting exit and entry points but can also contribute to a comfortable ambience and even drama to the environment. Illumination forms a crucial role in the presentation of public transport. Equally noise abatement or even sound design; the shrill of the brakes as the train enters the station or the idling of a diesel engine bus, indicate positive and negative associations with public transport patronage. A high-pitched whistle can support the sense of speed and expression of high technology, but the dull knocking of idling bus engine reinforces a second-class inadequacy to the purr of the private car.

The relative pleasure of transit is not supported by the creation of the instruments of annoyance, for example the unthinking use of mobile phones and the littering of free newspapers, access and miss-use of products such as indelible marker pens and spray cans. Some networks ban the use of phones, for example Tokyo or have phone free

carriages such as the United Kingdom. Once one thoughtless act, torn newspaper or the placing of feet on seats is accepted then a chain reaction is precipitated. The approach should be to design out the issue in the first place.

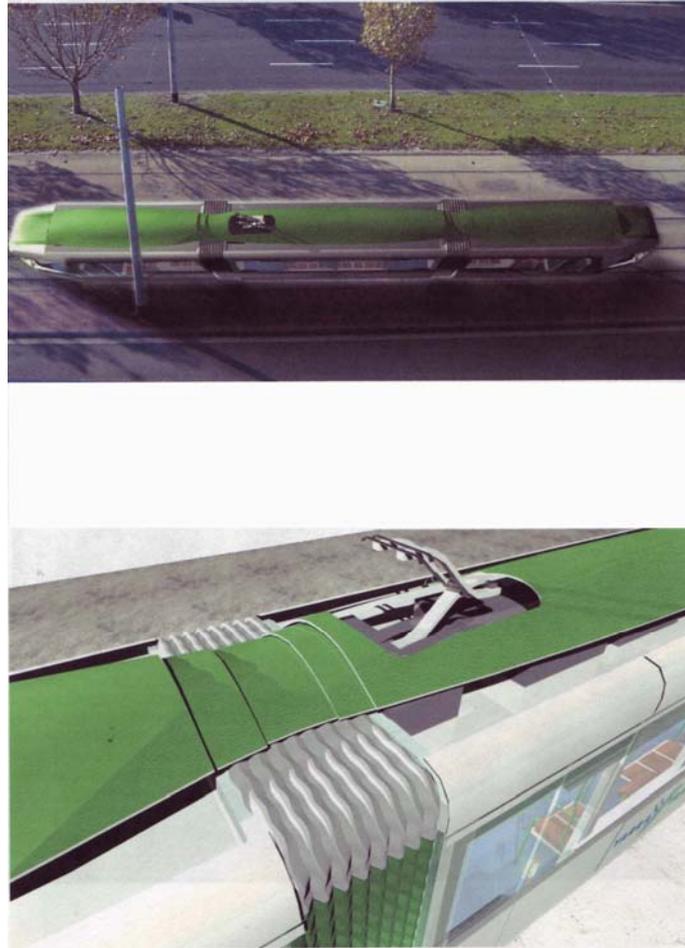


Figure 3 – Image of tram as viewed from above improving the vista afforded by those looking down from tall office blocks

Source: Tam, A. Pacholio, A. and Nissen, J (2004) Monash University.

4 Conclusion

This paper has sought to outline exploratory research undertaken as part of a wider programme intended to affect a fresh approach to public transport vehicular design. Public transport vehicular designs have been approached historically from an economic rationalism approach to efficiently and economically move large numbers of people around the urban environment. The authors contend that this approach does not fully explore the possibilities of the commuter experience in the way that effective public space presents a designed environment to entice and facilitate the public realm. An inquiry into the literature surrounding public space has revealed that there is some common ground in the approach to designing public transport. Public transport like public space fills a void between places, however public transport is also concerned with the void in the time it takes to get from one place another. The authors have suggested a response to this by examining the design of public space where it brings together people, amenity, and social inclusion in a safe environment.

The authors point to strategies such as:

1. Flexible space, that is demand responsive integrating with the pre and onward needs of a wide range of patrons. Spaces that alter their environment appropriate to the time of day and number of passengers. Versatile, subdivided spaces that create choice in the levels of engagement or disengagement with the surroundings.
2. Active, interactive space, that responds to our increasing desire and requirement with digital media and communication.
3. Designing to the observations of how people move, act and behave rather than force people into what is perceived as an efficient space.
4. Effectively managed space where the employment of material and systems support the maintenance of the environment and negate the appearance of abandonment to anti-social elements.
5. An aesthetic approach that recognises a sense of place and supports psychological as well as physical comfort, and the inclusion of 'art' installations already an occasional intervention on some networks around the world.

Design contains an emotional and sensory engagement that exceeds appearance alone. In combination with amenity and importantly the careful design of systems to support the utility economically then public transport might compete with the dominance of the car. Facilities embraced by the community are often treated differently from those embraced by the individual. The appearance of a well looked after system sends out a positive message the purpose of which could promote positive standards of public behaviour.

The next stage of this research intends to use the public space design approach as a briefing mechanism to stimulate new thinking about public transport design. A number of practical case studies will be undertaken to explore the implications of applying effective public space theories to a public transport context.

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