

TECHNICAL MEMORANDUM

To: Eckington Yards PUD Team

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Subject: Shared Space Roadways

Introduction

This memorandum reviews the concept of shared spaces and their appropriateness in conjunction with the promenade of the Eckington Yards development. Shared space roadways are a relatively modern concept in transportation planning. In essence, a shared space roadway relies on social interaction to a greater degree than traditional traffic controls. They usually have no curbs, a lesser amount of traffic signs and markings, and slow speeds for all modes of travel. The promenade's shared space approach supports a key theme of the project – to bring the public into the project and encourage interactivity.

The intent of shared spaces is not to directly restrict or limit vehicles and speeds, but rather to change roadway user behavior through the design of “public space.” Traffic rules are replaced with informal social rules, and the shared space design emphasizes these rules through the destressing of traffic signs, replacing them with design elements that intuitively encourage social interaction, such as slight changes to streetscape, paving, and clear sightlines. The automobile is treated like a guest on the roadway, just as any other user. Studies and existing examples have shown that the emphasis on social over traffic rules leads to less aggressive behavior in most drivers.

Although the proposed Eckington Yards promenade is a short private roadway, its design uses shared space concepts in order to provide a safe and flexible roadway that can accommodate all users of the project. As soon as vehicles enter the promenade, drivers will become aware that this is not a traditional street but rather a more pedestrian environment where vehicles do not have sole primacy. The following sections of this memo outline the benefits of shared space roadways and the design elements used in developing the promenade concept.

Safety

Research into shared spaces has shown them to improve the overall safety of roadways. Where shared space roadways have replaced traditional ones, before and after studies of crash rates show a reduction in rates, as well as a decrease in crash severity¹. These findings follow those of other studies showing how drivers adjust their behavior based on roadway design and context. For example, studies have found that pedestrian friendly features and high pedestrian volumes lead to lower crash rates on roadways with otherwise similar characteristics².

Three primary safety factors are impacted by the implementation of shared space roadways: Speed, Visibility, and Attentiveness. The promenade within the Eckington Yards development will integrate these three factors to have a positive impact.

¹ *Shared Spaces: Safe or Dangerous?*, Dr. Rob Methrost, Center for Transportation and Navigation, A contribution to the discussion on Shared Spaces at the WALK21 conference, October 2007, Toronto

² *Safe Streets, Livable Streets*. Eric Dumbaugh, *Journal of the American Planning Associations*, Vol. 71, No.3

Speed

The pedestrian environment is significantly safer at lower speeds and the implementation of shared space has been shown to reduce speeds. According to research performed by Great Britain's Department of Transportation, there is a significant correlation between impact speed of a pedestrian-car collision and the probability of death, as shown in Figure 1³. The death rate starts to increase rapidly from 20 to 25 mph and even more so from 25 to 30 mph. While the design team is designing the promenade to avoid even minor pedestrian/vehicular conflicts and the project's speeds of vehicles will not correlate to fatalities, the fatality metrics drawn from the studies discussed in this section are used to prove out safety concepts in the extreme.

In a four-year study performed by the Transport Research Laboratory (TRL), road signs were replaced with aspects of shared space roadways such as trees and street furniture. Giving drivers the responsibility and ultimately the consequences of choosing their own speed resulted in a decrease in speed by up to 8 mph. According to David Engwicht, author of *Mental Speedbumps*, these results are based on the notion of psychological traffic calming, which is the idea that a more integrated roadway system allows for the user to better relate to time, space, and other users of the system⁴. Lower speeds may seem like a restriction to vehicle movement, but because of the reduction in traffic signs, vehicles spend much less time stopping. Instead of traveling 30 mph and stopping at every stop sign, a vehicle may travel 20 mph throughout most of the roadway, stopping only when a need to do so is present. Therefore, a vehicle may end up traveling at a higher average speed that before while also reducing the amount of fatal crashes. Based on the aforementioned studies, shared space roadways result in lower overall speeds and a safer environment for all shared space users.

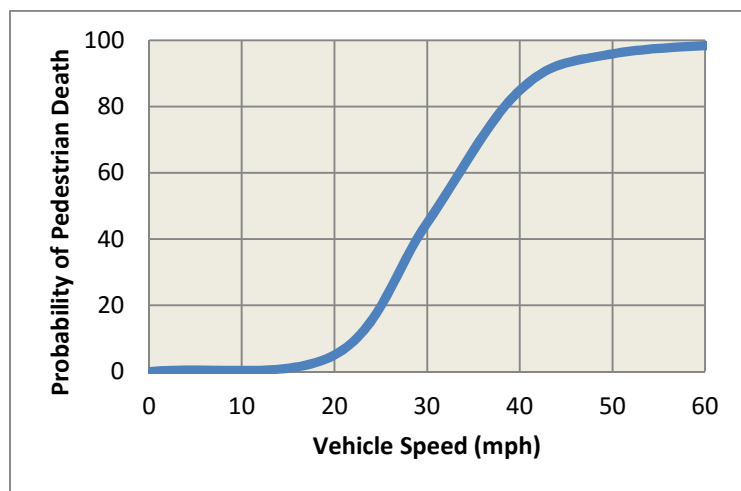


Figure 1: Correlation between Impact Speed and Probability of Death

Visibility

Visibility, another important aspect of safety, is also positively impacted through the design of shared space roadways. A safe minimum sight distance is an important element for driver perception time; however, too much clear sight distance is not

³Gilman, Celeste and Robert. "Shared-Use Streets - An Application of "Shared Space" to an American Small Town." 7 May 2007. *Urban Street Symposium*. 18 July 2012. <www.urbanstreet.info>.

⁴ "Behavioral Psychology's Unexpected Lesson For Urban Design." 6 December 2006. *Seed Magazine*. 17 July 2012.

desirable. If a driver has a very clear view of the road ahead, it can be seen as a signal that it is safe and acceptable to travel above the speed limit. Shared space roadways allow for better balance of these sight distance concerns. Design principles of a shared space roadway include the application of trees, street furniture, flags, and the use of special pavers to create patterns and borders. When possible a shared space roadway may also implement a slight curve or shift in the road. Such a shift in the roadway with narrowed borders has been introduced at the project. The promenade will be lined with street furniture, plantings, hanging lights, and sky bridges and other structural elements, while the walls of the building itself will further frame the space. All of these features can be combined to create an appropriate sight distance for users of the roadway, while not leading to unnecessarily high speeds. It is important to create an environment that is not overly predictable in order to keep people driving slowly and carefully.

Attentiveness

One major advantage of a shared space roadway is the increase in driver attentiveness. According to research provided by the National Highway Traffic Safety Administration and Virginia Tech Transportation Institute in 2006, 65 percent of near crashes and almost 80 percent of crashes involve driver inattention³. The use of road signs, pavement markings, and controlled crossing locations between vehicles, cyclists, and pedestrians gives people a false sense of security. Drivers feel as though they can travel faster without any unexpected occurrences, which results in the inattention of the driver. Users of transportation facilities, whether they are roads, sidewalks, or bike lanes, do not always prescribe to the designated facilities laid out for them. The combination of inattentive drivers and improper uses of transportation facilities can lead to pedestrian conflicts.

Although it may seem counterintuitive, giving drivers other features to look at signals them to expect the unexpected and in turn increases attentiveness. Because the shared space roadway is so integrated between vehicles, cyclists, and pedestrians, all parties using the roadway are forced to become more aware of their surroundings.

Design Guidelines

The amount of guidance on designing shared spaces is limited relative to the guidance on designing traditionally controlled streets. One such guideline for developing shared spaces based on social rules is written by David Engwicht⁵, and contains several design principles. These principles help create the safe speed, visibility, and attentiveness environment described above.

The goal of these design principles is to control roadway user behavior through social rules instead of traffic ones. The design of the promenade within the Eckington Yards development closely follows the following principles:

- ***Create rooms rather than corridors***

The concept of this principle is to design roadways to read as rooms rather than as corridors. A key element of this concept is careful treatment of the ground plane, using special pavers, patterns, and borders to help define space. In addition, gateways in and out of the roadway help create intimacy and intuitively help roadway users to transition to the shared space. It is important that motorists are aware that they are entering a different zone and must drive with more caution. Other design elements of this principle include creating an implied ceiling via tree canopies, sky bridges, banners, flags and lights, and adding street furniture and art.

⁵ *Intrigue and Uncertainty, Towards New Traffic-Calming Tools, Version 2.1, David Engwicht. www.creative-communit.es.com*

- *Reduce traffic oriented devices*
This principle recommends minimizing traffic oriented devices because they dictate a strict set of rules about what is and what is not acceptable. Removing these elements creates a space where social rules dictate behavior. Instead of drivers feeling as though they must obey a sign, the driver is able to take responsibility in their actions on the roadway, which makes for a friendlier overall environment for all users. A goal of this principle is to create a playing field where all modes are equal, eye-to-eye contact is essential and all traffic moves at relatively low speeds.
- *Create ever-changing streetscapes*
This design principle recommends having flexible or moveable elements in the streetscape, so the design is not permanent. This includes features such as flexible seating elements, dynamic public area and moveable planters/landscapes.
- *Build ambiguity and legibility*
The goal of this seemingly contradictory principle is to both remove the traditional devices that segregate modes, such as curbs, bollards and signs, and replace them with intuitive guides, such as pavement changes, light poles and planters. Ideally, this will encourage people to explore the space more, while still providing enough guidance for social interactions between users. By denoting sidewalks by texture and color as opposed to a curb, users are able to see eye to eye and negotiate right-of-way by human interaction as opposed to frequently ignored signs.

National Examples

The idea of shared space roads dates back to the 1970's woonerf ("living playground") movement in The Netherlands. Traffic Engineer Hans Monderman, regarded as the founder of shared spaces, took the concepts of this movement and applied them to intersections and roadways⁶. Over the last few decades, many types of roadways, from residential streets to downtown arterials and intersections have been constructed utilizing the design principles of shared spaces. Europe in particular has successfully implemented these designs in cities all over the continent. Examples from the United States are less common, although many cities and municipalities have recently completed shared space roadways, are constructing them, or have recently developed plans. The following section reviews the impacts of shared space roadways in the US.

- *Batavia, Illinois*
Batavia converted a block of River Street on the east bank of the Fox River utilizing principles of shared space design. The street now hosts the downtown Batavia Farmer's Market and the re-design has energized the area and local businesses. Concerns regarding pedestrian safety have been proven unfounded, as multiple modes mix without concern.
- *Harvard Square in Cambridge, Massachusetts*



⁶ Sutcliffe, David. "Shared Space and Naked Intersections." 19 July 2009.

In Cambridge shared space concepts were applied to a commercial corridor with heavy pedestrian and retail activity. Automobiles are allowed to drive, but are treated as guests. Different times of the day allow for more or less automobile activity depending on the overall person-activity, allowing for things such as informal pick-ups and drop-offs, late night taxis, early morning deliveries, and other benefits provided from automobile access.

- *Festival Streets in Portland, Oregon*

The Festival Streets of Portland, Oregon were designed as curbless streets with a dedicated walkway on either side. They provide some design elements of shared space including gateway features, decorative paving and street furniture.

Due to the many European cities that have adopted the idea of shared space roadways, concrete data has been extracted that shows the quantitative benefits of the shared space concept. In nearly all cases the speed and number of accidents decreases significantly. Data is not as readily available from the US as this is a recently adopted concept; however, the shared space roadways that have been implemented are showing similar outcomes to those in Europe. In addition, many other states within the US are looking into shared space as an option for the future.



Shared Spaces in Washington, DC

Cady's Alley – Georgetown

Located within the historic Georgetown Neighborhood, Cady's Alley formerly served warehouses and industrial buildings along the C&O Canal. Recent redevelopment projects have converted the roadway into a mixed-use shopping destination. However, the existing geometric constraints within the roadway have by necessity created a shared street serving pedestrians, bicycles, and vehicles café seating within an upscale retail environment.



<http://www.flickr.com/photos/greatphotographicon/5996641316/lightbox>

<http://www.homeanddesign.com/content.asp?admin=Y&contentid=983>

Ellsworth Drive – Downtown Silver Spring

The Downtown Silver Spring retail and entertainment district has been configured as an outdoor town center featuring an extended pedestrian mixing area along Ellsworth Drive. Vehicular traffic is permitted on this street to facilitate pedestrian pick-up and drop-off activities, but the street was purposely designed to feature narrow conditions, traffic calming measures, and a variety of streetscape features in close proximity to the travel lanes to increase driver attentiveness.



Google Maps

Conclusions

The shared space roadway concept has been around for a long time and has proven to be successful in both adding to the quality of user-experiences and in increasing safety. Specifically, a shared space roadway has a large impact on vehicle speeds, driver visibility, and overall user attentiveness. Europe has been converting many roadways to shared space over the past few decades and statistics have shown the benefit of them. With positive quantitative results emerging, the concept of shared space is quickly spreading to other areas of the world such as Australia and the US with similar success.

The promenade within the Eckington Yards development has been carefully designed based on the best practices of shared space design principles and will have a great benefit to future residents, employees, and visitors to the development.