

# Pedestrianizing Streets as a Strategy for Urban Greenways

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## Abstract

As adequate space to implement new greenways in dense urban centers is difficult to come by, it is vital that planners begin to increasingly tap into the vehicular landscape as a means of creating new space for the public benefit. Pedestrianization of streets helps to reclaim the significant amount of underutilized road space in cities and adjust it to better fit the human scale. In doing so, these pedestrianization efforts unlock copious amounts of space which can become home to new greenways (Lee 2015). Not only do pedestrian zones offer an opportunity for greenway implementation, the aims of these areas are serendipitous and thus result in co-benefits when planned together. In planning pedestrian zones, greenways have been utilized towards improving the livability of the area through the provision of shade, noise reduction, air filtration, and their associated mental health benefits (Maritz 2019). Further, the space freed up by removing automobile traffic from a street is often too wide to be comfortable for pedestrians, therefore greenways are being used to create narrower pedestrian areas with a green edge or median (Dostal 2021).

For greenways, pedestrian zones can help improve accessibility and thus the use of these areas while also creating calmer car-free environments for people and local wildlife alike. Additionally, such integrated developments have similarly been envisioned alongside urban waterways which are often dominated by vehicular traffic, experience higher volumes of foot traffic, and hold great potential for greenways as a means to manage flooding while keeping the land usable for recreational purposes (Horte 2020). Through a systematic review and analysis of separate pedestrian zone and greenway literature, the commonalities and co-benefits of planning these interventions in an integrated manner are derived to form a clear breakdown of best practices. In doing so, the recommendations formed argue why pedestrianizing streets should be pursued as a genuine strategy and opportunity to create new greenways in higher density urban areas.

## Introduction

Pedestrian zones and greenways are generally regarded as separate planning concepts, therefore they have been widely researched and planned individually throughout the years. This is mainly a function of the contrasting landscapes in which they are typically planned for, which are high density urban contexts for pedestrian zones and generally less dense, undeveloped regional corridors for greenways (Iranmanesh 2008; Ahern 1995). Pedestrian zones are areas of a city reserved for pedestrian use in which most or all automobile traffic may be prohibited (Lah 2019). Pedestrianization is the process of implementing pedestrian zones through the removal of vehicular traffic from a designated area in favor of exclusive pedestrian use (Iranmanesh 2008). While greenways are commonly zones of exclusive pedestrian and cyclist use, the encompassing

focus on environmental conservation, green space, and larger scale involved make greenways inherently distinct from pedestrian zones (Hellmund 2006; Flink 1993). Yet when analyzing the inherent implementation goals and benefits provided by the two distinct initiatives, significant synergies can be found which prompt a more thorough examination of how and why a combined approach may be preferred in certain instances. Further, the establishment of several types of urban greenways such as the freeway to greenway concept has created greater overlap between the two (Horte 2020). The promotion of sustainable modes of transportation through the creation of an environment safe for pedestrians and cyclists is a central tenet of both concepts yet in pedestrianization the removal of automobiles from the immediate vicinity is emphasized as the means of accomplishing this ideal (Iranmanesh 2008). The focus on improving the human experience within the urban environment is a central theme which helps dictate how both zones are planned. Further the co-benefits of a combined implementation strategy could significantly improve the human experience of both initiatives if they are planned together or in close proximity. The purpose of this paper is to draw from existing literature on both topics to highlight these shared goals and to exemplify observed and potential co-benefits of a combined planning approach. In doing so, a collection of best practices will emerge to better inform a future combined approach to planning pedestrian zones in tandem with greenways.

## **Literature Review**

### Pedestrian Zones

Amidst the rapidly changing realities of how people live, work, and commute in cities brought upon by technological advances and social change, automobile dominated urban landscapes have become increasingly dysfunctional. The overwhelming dependence on automobiles for even short distance travel has been a major factor in contributing to climate change, while on a local level the pollutants released by these vehicles has been a major player in triggering an epidemic of upper respiratory issues within urban areas (Buckeridge 2002). Further, thousands are injured and killed mere feet from their own homes by vehicular traffic, a trend which had already been increasing pre-pandemic but has spiked over the past two years even as fewer people were driving (Tyndall 2021; Romero 2022). Car dominated streets also serve to separate people from each other both by acting as a barrier to the other side of the street and diminishing the amount of usable pedestrian space, thus diminishing social interactions (Crawford 2004).

The current pandemic has further exacerbated these issues by exposing the inherent flaws of the vehicular landscape and accelerating certain trends that have diminished the appeal of most cities in their current form. Large volumes of people are now able to work from home, releasing them from having to live near their place of work. An inability to congregate inside has left many without adequate spaces to exercise, relax, and socialize with these activities often relegated to a thin strip of sidewalk (Barbarossa 2020). The rise in outdoor dining as a replacement for on-street parking helped exhibit the value of reclaiming street space to businesses and the general public alike (Bereitschaft 2020). Thus, it is vital now more than ever that streets are given back to the people in order to make them both more livable for citizens and more sustainable.

Rather than being an entirely new trend, pedestrianization projects have seen rises and dips in popularity over the past few decades. While much of these developments have stuck and flourished in Europe warranting further expansion, a good amount have stagnated and either gone back to a vehicular landscape or required a redesign to improve the space in the United States (Ferial 2020). Much of this can be attributed to the disparity in the contextual factors that set pedestrian projects up for either sustainable viability or eventual reversion.

Pedestrian projects perform best in high density areas with narrow streets and a comprehensive public transportation system to get people to and from the pedestrian zone (Kott 2016). Further, the much greater reliance and ownership of motor vehicles can create more intense opposition and result in a project becoming an isolated pedestrian pocket rather than a cohesive part of the city (Parajuli 2017). The way these places are supported after being built is also critical to their endurance, with consistent programming being vital to supporting long term viability. Lastly, the use of pilots or part-time pedestrianization in places without existing examples of pedestrian zones has been effective at promoting positive public opinions on these projects. This strategy is also a relatively inexpensive method of introducing the concept of pedestrianization to areas which lack several prerequisite contextual factors as well as stimulating demand for further pedestrian efforts (Soni 2016). These pilot projects act either as a proof of concept for more comprehensive efforts or as a method of temporary pedestrianization in itself.

### Greenways

As urban dwellers became increasingly disconnected from the natural world with the rapid development of the urban landscape over the past two centuries, Greenways have emerged as a means to both protect existing open space and to facilitate the integration of stretches of green space within cities. Greenways have been defined as “ecologically significant corridors”(Fábos 2004) with a significant focus being placed on their recreational, historical, and cultural values. The concept of the Greenway in the American landscape can be traced back to the 19th century with Frederick Law Olmsted being instrumental in the early implementation with his pupils later spreading the idea further. The phenomenon began to be named by its current terminology in 1959 by William H. White who coined the term “Greenway,” the idea of which has undergone rapid growth and international recognition since the 1980’s (Fabos 2004).

The proliferation of protected open space through the process of creating greenways contributes a variety of benefits to the urban landscape. Within urban areas, the implementation of new greenways often means the creation of significant amounts of new green space which may help improve local air quality by filtering air pollutants to reduce the amount of particulate matter inhaled by pedestrians, though it is important to note that they can also have a negative effect on air quality by emitting biogenic volatile organic compounds and pollen (Ahn 2021; Eisenman 2019). This expansion of greenery also aids in improving water quality through the prevention of soil erosion and filtering pollution from runoff, preventing it from reaching the water along the riparian corridor (Teng 2011). Locating greenways along waterfronts such as rivers and streams is beneficial in protecting the natural floodplain which allows for better management of floodwaters which prevents damage to the urban environment further inland. Thus, greenways can keep the land directly adjacent to bodies of water accessible for recreation when dry while processing floodwaters when necessary. Greenways serve to promote active

living and recreation by providing an attractive and safe area that is separated from automobile traffic for people to spend time in (Gobster 1995). This helps promote more sustainable modes of transportation such as cycling and walking which can improve local health outcomes. The economic effects of all of these benefits are seen in a rise in adjacent property values and increases in local business revenues as a result of the increased activity and tourism surrounding the greenway (Lewis 2002).

## **Methods**

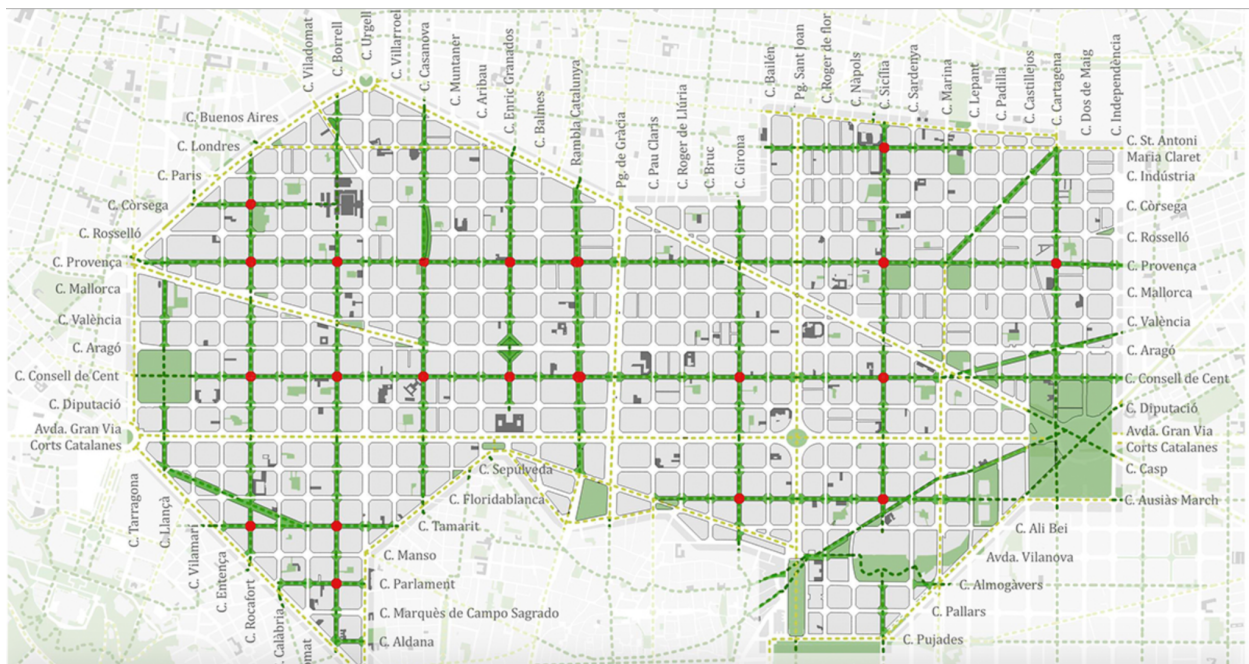
The research methodology for this thesis will primarily be rooted in analyzing the breadth of scholarly articles, municipal evaluations, and governmental agency studies in order to synthesize findings into a cohesive document which lays out not only how pedestrianizing streets can create the space needed for greenways but also the impacts of that being planned together or in close proximity can have for both initiatives. This paper is based heavily upon literature review focusing on academic journal articles, books, municipal and regional government documents, and media reporting on the topic. Essentially, there is a significant base of existing research on the topic yet they exist in a fragmented context in which there is a significant vacuum in works drawing connections between the various studies. Previous researchers have already undertaken the arduous quantitative data collection and case studies, thus this thesis will be able to rely mainly on qualitative methods to derive common themes among findings.

The analysis will be focused on how pedestrianization creates an opportunity for greenway implementation and identifying the co-benefits of such an integrated approach. In approaching the paper in this manner, the analysis can be split between the separate impacts that the pedestrian zone and greenway have on each other when applied in conjunction. This allows for a critical perspective in pursuit of a more balanced view of the topic, highlighting not only the benefits, but also the potential drawbacks. Stemming from this synthesis of information will emerge a clear and encompassing set of recommendations which will aim to inform planners towards the long term implementation of combined pedestrian and greenway efforts.

## **Results**

The overarching shared goals of providing a sustainable way of getting around, creating a safe space that respects the human scale, and creating a livable environment which people would want to spend their time in creates an opportunity for a synergistic combined implementation. A caveat to this is that pedestrian zones need high density and existing pedestrian volumes in order to survive, thus they are generally incompatible with greenway implementation in less dense areas (Kott 2016). Building upon the work of Horte, her typology of urban greenways includes “freeway to greenway” an endeavor which essentially applies the process of pedestrianization at a large scale, thus there is a recognized precedent of a combined implementation (Horte 2020). Pedestrian zones and greenways can benefit from being planned as part of the same network, as part of the same pedestrian development, and as a united approach to an urban waterfront.

Within dense urban centers, sustainable transportation initiatives such as pedestrian and cyclist prioritization treatments benefit greatly from being connected to a larger non-vehicular network so that people are able to traverse the city without an automobile (Tal 2012). Separate greenways and pedestrian zones in the same city should be connected within the same cohesive non-vehicular network, thus allowing for greater integration between the zones (Senes 2010). While they are generally considered to be a part of the same network, the geographic realities of existing pedestrian zones being predominantly located in central business districts and greenways around natural ecological corridors means that pedestrian zones can often act as isolated pockets of pedestrian space rather than as a part of a greater network (Parajuli 2017). Connections facilitated through urban greenways can help better integrate pedestrian zones into a more comprehensive non-vehicular system (Mustafa 2020). This may take the form of longer greenway corridors stretching from less dense parts of the city leading into centrally located pedestrian zones. A great example of this is seen in how the city of Barcelona plans on integrating new blocks of pedestrian zones, part of its “superilles” program, with longer greenways (City of Barcelona 2020; Figure 1). This would improve the cohesiveness of the pedestrian and cycling networks being enacted, facilitating improved safety through better connectivity and reduced travel times as a result of diminished vehicular intrusions on the network.



**Figure 1. Planned Pedestrian Zone and Greenway Network: Eixample District, Barcelona, Spain**

Pedestrianization efforts can unlock significant amounts of space by removing automobile traffic from the landscape (European Commission 2004). In doing so, this process creates ample space for pedestrians, though in many cases it can create too much space. Reductions or even temporary removals of vehicular traffic can be effective at creating pedestrian space, but the continued inclusion of automobiles in the landscape fundamentally limits the potential uses of the space, both in programming and infrastructure (Sisman 2013).

Therefore, such initiatives are better defined as “semi-malls” distinct from fully fledged pedestrianization efforts (Sisman 2013). As more modern streets are designed to best accommodate several lanes of car traffic rather than humans, they are often poorly configured and do not conform to the human scale. As humans have been shown to prefer more enclosed urban spaces, these wide corridors created by removing automobile traffic can be uncomfortable for humans to navigate and experience (Mattsson 2019). Therefore, there is a considerable amount of space that can be allocated to other uses in order to either split the pedestrian zone in two to create two more intimate streets on each side, or to divide the space more evenly between a pedestrian zone and another use. In this manner, greenways can and have been utilized to fill in this extra space. An example of this principle in practice can be found in the vibrant pedestrianized city center of Košice, Slovakia which splits its pedestrian zone in two narrow paths with a series of urban parks, greenery, a water channel, and cultural buildings (Kristianova 2015; Figure 2). In this manner, cities can effectively redevelop a wider downtown street into a pedestrian zone with a greenway running through it to provide access to both a safe public space for pedestrians with access to local businesses and cultural sites as well as a linear park where recreation and cyclists are prioritized.



**Figure 2. Pedestrian Zone split by a central Greenway: Košice, Slovakia.**

Such a combined approach would be beneficial not only in improving how space is allocated along a pedestrianized street, but also in elevating the human experience of the area. The incorporation of significant amounts of greenery found within the greenway would help combat the urban heat island effect in an adjacent paved pedestrian zone through the provision of shade and evapotranspiration, lowering temperatures and making the immediate area more comfortable to pedestrians (Bowler 2010). Additional, albeit smaller improvements to the adjacent environment include air filtration, noise reduction, aesthetic enhancement, and

associated psychological boosts which can all factor into making the zone more habitable for pedestrians to spend greater amounts of their time (Wolch 2014). This in turn helps create more patrons for local businesses and institutions, helping with the economic sustainability apart from just the notable positive effects of green space on nearby property values (Wu 2015). Benefits to the greenways in this type of integration beyond the creation of more space for their implementation is improved accessibility to open green space for nearby populations and a rise in the amount of users which can help spur the further development of more greenways. This can be seen with the popularity of the New York City's Highline prompting continuous expansion over the past decade while connection with the newly created pedestrian zone at the Hudson Yards development has further improved pedestrian access to this greenway (Lang 2016; Figure 3).



**Figure 3. Highline connection to Hudson Yards Pedestrian Zone: New York City, USA.**

The waterfront is the convergence of the dense urban built environment with a body of water. The edge where cities meet rivers, lakes, and oceans represents a great opportunity for public space, yet many cities have historically used this area for vehicular traffic. As these highways and coastal roads are increasingly eliminated by cities realizing they cut the urban fabric off from a valuable natural amenity, this newfound space is being given to pedestrians (Bocarejo 2015). Waterfronts are naturally attractive for pedestrians as a result of their more appealing microclimate, which has been shown to be significantly cooler than inland parts of the city more acutely impacted by the urban heat island effect (Tuller 1995). Additionally, the appealing views and access to leisure activities on or beside the water contribute to high

pedestrian volumes at accessible waterfronts. Therefore, pedestrian waterfronts are increasingly common and highly popular features of numerous major cities (Hill 2013). The inherent issue with this trend is that these spaces are incredibly susceptible to flooding, making areas inaccessible and causing significant damage to infrastructure and impervious surfaces. As a direct result of climate change, rising sea levels and increasing storm intensity will contribute to more severe and frequent flooding, thus it is imperative that waterfronts are planned to accommodate these changes (IPCC 2021).

The concept of waterfront pedestrian zones and that of waterfront greenways proposed by Horte integrate well together as the space created by pedestrianizing waterfront roads and freeways holds great potential for the implementation of greenways which can be utilized as means of managing flood waters in a manner that keeps the land both aesthetically pleasing and usable for active recreation (Horte 2020). The waterfront pedestrian zones acts as a means for pedestrians to access the site and as a promenade for local businesses to take advantage of the foot traffic while the greenway creates a transition from an impervious dense urban environment to a largely pervious green space that can meant to be flooded in order to protect areas further inland (Le 2019). This enables the combined area to be utilized for water access programming which can act as an attraction for pedestrians to visit the zone as well (Horte 2020). The most robust example of such a combined pedestrian and greenway approach to a waterfront is the Seine riverfront in Paris. The newest space to be claimed for pedestrians alongside the river was previously occupied by the Georges Pompidou expressway with temporary month-long pedestrian transformations known as the “Paris Plages” starting in 2002 (Gale 2010; Figure 4). Receiving over four million visitors in the first few months alone, the initiative was so popular that the 3 kilometer long zone was made permanent in 2018 under Mayor Anne Hidalgo.



**Figure 4. “Paris Plages” Waterfront Pedestrian transformation: Paris, France.**



## Discussion and Conclusion

As pedestrian zones are becoming increasingly popular internationally, it can be anticipated that more examples of interaction and even coordination between pedestrianization and greenway implementation can be found (Salam 2018). A great opportunity for a combined approach lies in pedestrianizing streets in the American landscape, as the abundance of wide streets within urban downtowns presents a challenge for pedestrianization efforts which greenways can help alleviate. Further, the trend of urban highway removals, especially those located along the waterfront of a city can be another avenue for both pedestrian zones and greenways to be implemented in the significant amount of space that can be returned to pedestrians (Spicer 2011). Overall, there is still a considerable amount of research that could and should be done on the topic such as qualitative studies regarding the pedestrian experience in a combined zone and quantitative studies analyzing if this approach produces the inferred economic and increased visitor benefits that each initiative creates on their own. A case study of a location that utilizes a combined pedestrian and greenway approach would be useful in identifying further issues, benefits, and details of such a zone.

In conclusion, there are great opportunities to be found by joint planning pedestrian zones and greenways. As pedestrian zones are experiencing a reemergence and greenway planning continues to rise in prominence, it is inevitable that these two initiatives will begin to interact more regularly. With the inherent similarities between the two and the plethora of potential co-benefits, this field of research will be essential to optimizing our approach to creating more sustainable places at the human scale for people to utilize and enjoy.

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