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Risks and strategies in tackling pedestrianisation process in the development of future sustainable cities

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Abstract

Dehumanisation of the public urban spaces, as a side effect of the hypertrophied transport system, has been inherited from the 20th century (often regarded as the age of automobiles) and has manifested in our streets. Precisely the streets have become the main battleground of ideas in search for paths to sustainable future. The concept of street pedestrianisation has boomed in the western world since the 6th decade of the last century and recently, due to the pressing ecological issues, it has received even more attention in the discourse of the city design. Pedestrianisation has been used in a number of cities but with mixed success. Newly created pedestrian routes often became inseparable part of the re-imagined identity of the city, but other times these spaces faced further decline and the idea ended in failure. This report offers an overview of the recent research on the subject of pedestrianisation and the range of criteria that the different fields of research use in analysing it. A review of successful and unsuccessful examples is used to identify if the urban-architectural approach should be used in the interdisciplinary research of the pedestrianisation to provide a robust understanding of this process. Identifying and adopting the relevant criteria of pedestrianisation could not only predetermine the successful outcomes but also expect a wider support of the public to the idea of sustainable future city.

Keyword: pedestrianisation, urban spatial system, modal shift, sustainable urban design.

Introduction

Pedestrianisation is one of the tools applied in the redevelopment of cities. While this concept is not new and has been tested with mixed success in the decades after its birth, it has been recently re-discovered in the context of emerging focus on the sustainable future of our cities. At the first glimpse the idea of turning a clogged city road into a bustling recreational and social space for everyone in the community sounds like a straightforward thing to do and yet these initiatives in most of the cases prove to be struggling in ensuring the initial popular support and relies on persistent determined political will to be implemented. This lack of overwhelming public enthusiasm is rooted in many causes such as inherent resistance to change, unwillingness to spend taxpayers' funds, concerns regarding the loss of the historical identity of the space, impact on the traffic to name just a few. Even though a list of highly successful pedestrianisation case studies clearly demonstrates the rewards of such initiative and is employed to win a public consent and proceed with a particular project, there are still a number of examples where the benefits of the pedestrianised urban spaces have failed to materialise thus encouraging a sceptical attitude towards such proposals.

The environmental pressures together with the re-discovered and growing sense of community within the city, manifesting at the streets and other urban spaces, leads to a convincing conclusion that the sustainable

future of our urban spaces will require a modal shift from the private motor vehicles to pedestrian movement, making pedestrianisation into a mainstream feature of the urban design and redevelopment of the cities in the decades to come. This assumption leads to a need of the robust understanding of the pedestrianisation process, that would help us to assess the suitability, choose the right strategy and confidently predetermine a successful application of this tool, therefore enabling it to ensure the public support based on scientific facts rather than mere political will.

This paper provides a brief overview of the ways pedestrianisation process has been analysed within the different fields of research and demonstrates case study examples of successful and unsuccessful attempts to implement this idea in several European cities. The main objective of the authors of this paper is to encourage further research of the pedestrianisation through the defined set of criteria that could subsequently be used as objective parameters in assessment, strategy, and implementation stages of the process. Deeper understanding of this subject would help to ensure the successful results of pedestrianisation initiatives as well as facilitate science-based public discourse regarding the future of our cities.

Background

Pedestrianisation process involves several aspects that are subjects of separate fields of research, such as: pedestrian behaviour, social composition of city population, transport system, ecology, sustainability, built environment, urban design, architecture, identity and character of the city, economics, social and cultural patterns etc. This demonstrates the complex nature of the process and may suggest that the overall understanding of this subject requires multidisciplinary approach. However, this type of approach is still relatively new in the scientific community and the conducted overview of the research work done on the subject of pedestrianisation reveals fragmented effort of separate disciplines attempting to analyse this topic. The majority of studies and research on the subject of pedestrianisation could be grouped in the following categories:

- environmental approach (analysing air quality, health, biodiversity, natural sustainability aspects).
- socio-economic approach (focusing on the use and function of pedestrian spaces, economic impact, human behaviour, matters of social and cultural identity etc.).
- civil engineering approach (predominantly focused on pedestrianisation as a challenge for the transport system, also covering the subjects of road network, movability, modal share of the transport types etc.).
- urban-architectural approach (focused on the built environment of the city on both local scale by the matters of architecture and urban design as well as wider, inter-city scale where the city is treated like a system and pedestrianised areas are considered as important nodes in the system on public urban spaces).

A few of the authors provide an overarching view covering more than only discipline, but it is evident, that the topic of pedestrianisation has yet to be researched in depth within the context of all the relevant disciplines or at least have a mapped out and defined list of contributing fields of research.

In the spectrum of conducted academic works on pedestrianisation there is a notable lack of research that would look at this topic from the point of view of architecture and urban design. The predominant approach seems to dissect this process through the parameters of air pollution, traffic intensity, pedestrian count, economic impact. Urban environment (including architecture, urban design and urban planning), even though being a physical embodiment of the street, appears to be side-lined and treated as a static and rigid framework distanced from the dynamic processes and interactions within it.

The authors of this paper seek to challenge this view and invite a further debate in order to establish the role of the built environment disciplines in transformation of our cities towards the sustainable future. Personal and professional experiences observing the implemented examples of pedestrianisation demonstrate that the successful outcome is not always guaranteed. This suggests that the current model of assessment, preparing the strategy and enacting it in real life may not be as robust as it could be. An overview of the current theoretical background of pedestrianisation does lack overarching approach with majority of research focusing on a few particular aspects.

Based on the mixed successes of pedestrianisation attempts and fragmented research of the subject, the authors hypothesise that the current sets of theoretical criteria and parameters are incomplete due to the lack of interdisciplinary research regarding the process of pedestrianisation, thus preventing the holistic approach in analysing real life case studies and threatening the chances of successful results.

Methodology

The existing research papers analysing the subject of pedestrianisation use the parameters that are relevant to the particular field of research, demonstrating a link between the transformation of a street and the parameter that has been assessed. However, this selective focus on the particular aspect of this subject does not necessarily reveal the complex nature of pedestrianisation. The hypothesis of this paper suggests that the success of pedestrianisation is dependent on many factors representing different research disciplines. Taking into account all the aspects in play is essential in order to demonstrate the full picture of this process so that it could be well understood and this knowledge could be applied in the real life projects.

To illustrate the complexity of pedestrianisation this paper proposes to overlay the existing cases of pedestrianisation with the parameters that are relevant to the subject of urban planning and urban design as well as other relevant fields of research. The connection between existing research on pedestrianisation in separate research fields, implemented case studies, and the role of urban-architectural criteria in this subject is demonstrated in this paper through the selected methodology, consisting of four steps:

1. Identifying the criteria that have been used in previous research works to analyse the subject of pedestrianisation.

An analysis of the relevant research sources on this topic enables us to identify the list of criteria that represents each approach to the subject of pedestrianisation. For the purposes of this paper the list of identified criteria is limited to several key representative criteria for each type of approach. The complete list of criteria would be significantly larger as well as continuously growing and evolving due to the further research being carried out, and the extent of such overview would detract from the main message of this paper. The identified and selected criteria have been listed in the Table 1.

Table 1. The list of identified criteria that has been used in analysing the subject of pedestrianisation

	Criteria	Sources
Environmental approach	Air pollution	(Wallztrom, 2004); (Maritz, 2019); (Chiquetto, 1997)
	Noise pollution	(Chiquetto, 1997)
Socio-economic approach	Space user quantity	(Choi, 2012), (Maritz, 2019)
	Economic impact on the local businesses	(Parajuli, 2017 and Pojani, 2017); (Wallztrom, 2004)
	Return on public investment	(Parajuli, 2017 and Pojani, 2017)
Civil- engineering approach	Congestion on nearby roads by displaced traffic	(Cairns <i>et al.</i> , 2002); (Wallztrom, 2004); (Melia, 2016 and Shergold, 2016); (Maritz, 2019)
	Public transport usage	(Wallztrom, 2004)
	Modal distribution of the traffic	(Melia, 2016 and Shergold, 2016);
	Parking facilities	(Parajuli, 2017 and Pojani, 2017); (Melia, 2016 and Shergold, 2016);

The multidisciplinary nature of the subject of pedestrianisation is recognised by many of the authors where the scope of their research often extends beyond the boundaries of a single research field. However, it is also noticeable in these sources that the physical built-up environment shaping these urban spaces in question is left outside the focus area of these research works and often reduced to a simple aesthetic quality of the space. Following the hypothesis of this paper, it is questionable if this approach provides a full picture of the subject and if it facilitates the robust conclusions successfully adaptable in real life cases.

2. Extension of the list of criteria to include the urban-architectural approach.

The list of the identified criteria to be extended by a selected set of criteria that represents the urban-architectural approach. The full list of urban-architectural criteria relevant to the process of pedestrianisation would be extensive and deflect the focus from the main message of this paper, as it was with the other fields

of research. Therefore, a few key criteria have been selected for the purpose of this exercise. These criteria could be separated into two groups, based on the scale of the object that they are defining:

- a) City-wide urban-architectural criteria - analysing the major features of the urban form of the city.
- b) Local space criteria - focused on the features of the particular urban space.

The proposed grouping of the urban-architectural criteria is reflecting the significant difference in research-object scale between the fields of architecture, urban design, and urban planning. The list of the selected criteria has been presented in Table 2.

Table 2. The list of the selected urban-architectural criteria to assess the cases of pedestrianisation

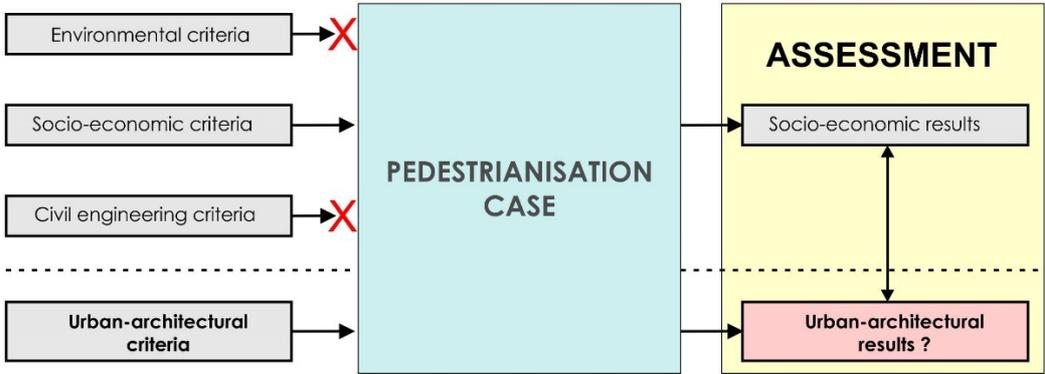
City-wide criteria	Local space criteria
Street network integrity	Spatial parameters of the urban space (ratio between the width of the street and the height of the built-up boundaries)
Block size	Activeness of the street level frontage
Urban Spatial Network	

3. Applying the selected criteria to both successful and unsuccessful cases examples of pedestrianisation.

The selected set of criteria has been applied to the existing cases of pedestrianisation. In this paper a ‘successful’ case of pedestrianisation is classed as an urban space that (1) has been transformed to reduce (or completely eliminate) private traffic in favour of pedestrian space, (2) has demonstrated the increased usage of the space by the pedestrians (liveliness), and (3) did not cause negative effects on the existing framework on the city (such as nearby road traffic increases, economic decline, safety issues) beyond the expected margin. In this regard, unsuccessful pedestrianisation would primarily be an empty and unused urban space, decline and closures of local businesses, significant traffic disturbances beyond expected margins or adjustment periods.

The fractured research field is once again illustrated by the fact that separate studies have chosen to analyse cases in different cities. This means that no city has been conclusively analysed based on full set of criteria and the accurate direct comparison between the separate cases or between the criteria of different research fields is impossible until further research can be done and separate case studies are assessed on the same full set of criteria. The lack of conclusive analysis of the same case circumstance limits the insights that this paper can produce but the chosen path forward is to compare the known parameters and results of the particular city with criteria of urban-architectural approach in order to establish the potential link between the two (Figure 1).

The choice of selected cases has been made based on the available data to compare with the findings of other fields (these tend to be successful cases where the research was able to demonstrate significant change) and based on the evidence of unsuccessful results of pedestrianisation (to provide a balanced scope of both successful and unsuccessful case examples).



X -data not available

Figure 1. Model of case assessment when the available data is inconclusive

4. Assessment: can urban-architectural approach explain successful or unsuccessful outcomes?

The final step aims to assess if the successful and unsuccessful cases of pedestrianisation can be explained by the urban-architectural criteria (Figure 2). This case analysis proposes to look into the integrity of the pedestrianised spaces in the context of city-wide and local features of the urban structure of the city.

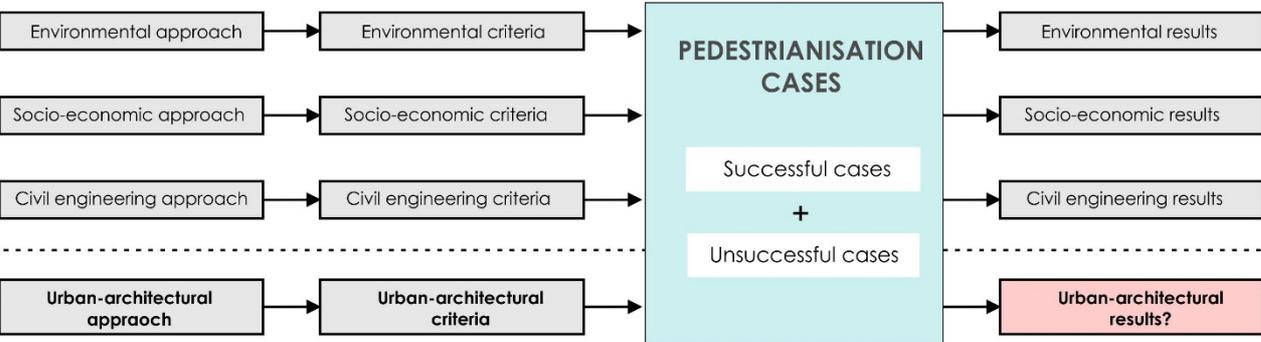


Figure 2. Model of case assessment in order to establish the role of urban-architectural approach to the process of pedestrianisation

Results and Discussions

The range of existing cases of pedestrianisation spans across the world with immense count of variables involved. In order to narrow down the potential influencing factors, this research focuses on the cases from the representative countries of Western and Eastern Europe – United Kingdom and Lithuania, both familiar to the authors of this paper. This selection of the particular counties presents an opportunity to compare two distinctive contexts: United Kingdom and Lithuania has spent a large part of the 20th century on the opposite sides of the Iron Curtain resulting in different social and economic conditions. The urban development of

countries on both sides have been significantly influenced by the modernist views, but the scale and nature of such ideas implemented (including pedestrianisation) has varied due to disregard for the private property and businesses in the countries behind the Iron Curtain.

The authors of this research have assessed the total of 19 cities (11 in the United Kingdom and 8 in Lithuania). Two cities from each country representing successful cases of pedestrianisation have been selected for more in-depth analysis as well as two other pairs demonstrating the underperforming cases. The selected 8 cases were evaluated based on the urban-architectural criteria proposed by the authors.

One of the case examples illustrating this research is The Moor – a major street in Sheffield, UK, linking the core of the city centre with the surrounding neighbourhoods to the south. (Figure 3). It was pedestrianised in 1979 but subsequently declined until a major regeneration project started in late 2000s. The analysis has shown that the scale of the surrounding block sizes is significantly larger compared to the surrounding areas of the city centre. Also, the ring road encircling the city centre acts as a barrier, isolating the city centre from neighbourhoods to the south and significantly reduces the footfall and linkage of this street.

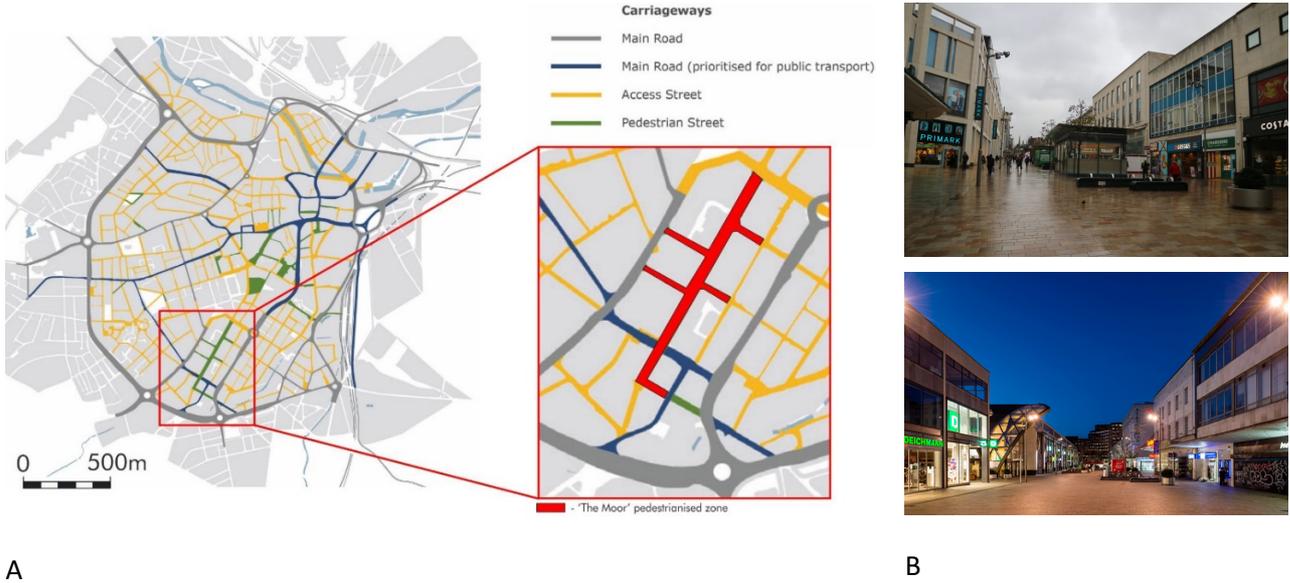


Figure 3. Sheffield: A – The Moor location in Sheffield city center; B – The Moor scene looking towards NE (above) and SW (below)

The insights into the case studies of pedestrianisation then leads to the assessment of correlation between urban-architectural criteria and criteria from other fields of research may provide insights into the following questions: Can pedestrianisation be successfully implemented despite problems within the urban structure of the city? Is effective urban structure of the city necessary for successful implementation of pedestrianisation initiative? Can effective urban structure of the city alone be enough to ensure a successful result of pedestrianisation? The answers to these questions may reveal which conditions are necessary and which are optional in attempt to achieve positive results in the complex process of pedestrianisation as well as demonstrate if the successes and failures of this process can be explained or even predetermined by the urban-architectural features of the cities.

Conclusions

Pedestrianisation is a popular tool in sustainable city redevelopment and regeneration found in number of implemented examples with varied degree of success. Often pedestrianised streets provide a new space for a range of social and economic activities and reduced traffic not only increases the environmental quality but also encourages the shift in modal share of traffic in favour of pedestrian and non-motor transport. However, there are also unsuccessful examples of pedestrianisation when the transformed spaces demonstrate a lack of social activity and users, local businesses decline or the traffic systems unable to cope with displaced traffic.

The overview of the selected examples suggests that successful understanding and implementation of pedestrianisation process requires a broad spectrum of analysis from several different fields of research. Only the complete interdisciplinary approach and research into this subject can provide a robust set of criteria that would allow us to design and implement successful pedestrian zones.

This paper demonstrates that architectural and urban environment can facilitate or hinder pedestrianisation attempts depending on the quality parameters of the urban tissue of the city. Such link should be further investigated by researching pedestrianisation as an interdisciplinary subject with urban-architectural approach being part of the broad spectrum of research fields involved.

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