

Street Pavements: A Physical Reflection of Street Democracy

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Abstract: Street democracy as an aspect of urban democracy, has been seminal to urban design for over 50 years. Good street democracy requires more inclusion on the street, which helps keep a good public realm for a place. This paper reviews existing discussions of street democracy from people's right to the city and develops the discussion of street democracy related to street pavements. Street pavement should be considered an aspect of street democracy. Street pavement could positively reflect street democracy in a city. This study selects two streets in Cardiff as examples to study their existing street pavement conditions from local and regional policies and observe the changing of street pavements in specific areas during the last decade. The paper advocates for the improvement of street democracy with the development of street pavement in different periods. A good street democracy should have more inclusion and democracy is changing progress for different conditions during different periods.

Keywords: street pavements, street democracy, Cardiff

1. Introduction

Contemporary discussions of democracy inside urban areas have been developed through academic discourses and practices since the birth of the urban design field at the Harvard Urban Design Conference of 1956. This urban democracy concept is following the concept of democracy. One of the key elements of urban democracy is the human's right to the city. Lefebvre argued that city development should consider the priority of the use value of space, and the urban area should have no exclusion from urban society. Lefebvre is against the social-economic inequality that results in residents' exclusion from the city centre [1]. Harvey agreed that the right to the city is not individual but a common right. It is not only the individual liberty to access urban resources. Harvey believes the right to the city is the right to change people by changing the city [2]. Additionally, urban democracy is also developing progress. Sorkin pointed out that urban design should respond to social equity challenges in the developing situation [3].

Urban democracy usually happens in the public space. The contemporary street has been confirmed as the essential public space of the city [4]. Streets and sidewalks are the main public places of a city to carry city's most public social life. Based on this consensus, the street is also confirmed as the place where many urban democracy advocacies focus on. Most street democracy discussions focus on the space allocation between public and private related to the formal divisions and informal

occupations on street. Contemporary main arguments on formal street space division focus on the width of the sidewalk against the car-gentrification leading urban democracy.

Street pavements are the physical foundational elements of the street, their forms and shapes sometimes are influenced by the street space allocations. Meanwhile, pavements also keep differences with different materials, which relates to the discussion of street democracy. Here notices, the relationship between materials and democracy has many already been argued from the architectural aspect and applied in architectural practice. Transparent materials are used in contemporary architecture practices that architects believe they can make the buildings achieve more democracy. For example, the glasses were applied in the National Assembly of Wales Building in Cardiff to create an openness sense, encouraging people to see the decision-making process. The designers believe it could bring good democracy because the transparent materials increase participation.

The paper takes Cardiff's as an example, analyzes the regional and national urban designs, describes existing street pavements, and discusses their relationship with contemporary urban democracy.

2. Theoretical Background

Previous studies mainly focused on street democracy from the street and social life including considerations of street furniture, building interfaces/frontages, street rhythm, street vending and public/private space. However, street pavements, as the street's fundamental physical element, and its relationship with urban democracy are rarely studied. Some arguments proposed applying good quality street pavements for improving urban democracy in developing counties. While some arguments on formal street space division are against capitalism leading urban design, such as widening sidewalk space against the car-gentrification leading urban democracy. Some arguments from the grassroots mainly discuss the street democracy focus on the street informal occupations such as street vending and demonstration. So, here is a research gap on the relationship between street pavements and urban democracy.

As described in the previous part of this paper, the street is the most important public space in urban areas. Most contemporary advocacies of good street democracy are trying to include more user groups and functions on street. Today, street allocation still impacts by the 20th-century bloom of the car industry, and the modernism movement happens in city design. The sharply increasing usage of cars during that period results in the car-oriented urban design concept. This design concept also results in gentrification and exclusion in the urban area. However, it still influenced many cities in the UK nowadays. Asphalt became one of the most popular street paving materials due to this car-oriented urban design. The asphalt paving vehicle lanes commonly occupy the largest area on the street, which results in the paving area for pedestrians and cyclists being limited. Meanwhile, paving materials on pedestrian sidewalks usually relate to the site's geographic conditions and site location-related public realm (CBD or suburban area). It should also notice the application of street paving materials sometimes is considering not only its functions but from aesthetic and culture. This paper discusses the application of street pavements reflecting the democracy on the street main through functional aspects with what pavement materials' inclusion and exclusion of the users. The discussion also mentions how the changing and transforming of the street pavements with the developing of street democracy.

Similar to many other cities in the UK, urban democracy in Cardiff is impacted by neoliberalism and has been developed over several decades. The street design concept was impacted by car-oriented development in the past. With the rise of sustainable development concepts, the local and regional development plan documents have focused on sustainability. The new transit-oriented concept pays more attention to the experience of cyclists and pedestrians, rather than the car-oriented concept. Here argues that, in Cardiff, the democracy on the street has a literately achievement because the local

development plan and strategies consider more inclusion of users on the street. But street democracy still needs more development. Because the street still has many inequalities and exclusion results in the existing street pavements' conditions. So, the study follows the arguments of the relationship between paving materials and urban democracy by pointing out the inequalities in Cardiff's street pavements. Meanwhile, the study also considers the changing of street pavements in Cardiff during the last decade and discusses the reflection of this change on urban democracy as consider urban democracy is fluctuant.

3. Case Study

3.1. Background of Cardiff City

The site is a 1km * 1 km area in Cardiff City Centre (Figure 1). The Cardiff City Centre is identified as Cardiff Central Enterprise Zone and Regional Transport Hub by Cardiff Council in 2016 and then becomes a hotspot in local urban development. Many advanced urban design strategies and concepts are applied, and it holds more investment than other urban areas. However, existing street pavements have different conditions, some places keep a good public realm while some places do not.

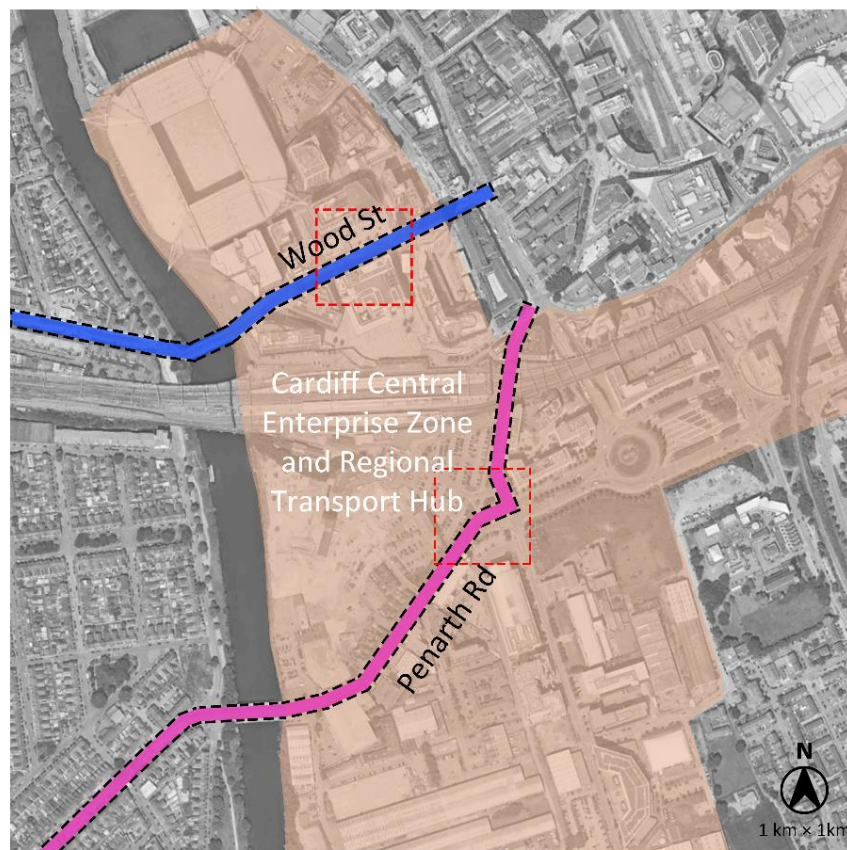


Figure 1: Case Study Site Map (From Google Earth map).

In Cardiff city region, street pavements usually support vehicle lanes, bicycle lanes and pedestrian footways. Refers to the Cardiff Public Realm Manual document, Macadam (asphalt) is commonly used for both vehicle and bicycle lanes [5]. Existing footway pavement uses six different materials including Granite, Pennant, Clay Pavers, Concrete Products, Macadam, and Resin Bound Gravel (Figure 2). All these six materials are applied with different forms and colors in different locations

resulting in different functions and public realms. The proposal of using these materials is to make a good local public realm and improve local urban democracy.



Figure 2: Example Images of Footpath Paving Materials (images from Cardiff Public Realm Manual).

The application of street pavements also impacts other local and regional designs. Contemporary street design in Cardiff straightly refers to Cardiff Public Realm Manual [5], Cardiff Local Development Plan [6], Wales Place Making Guide [7], and Manual of Street [8]. The purpose of these documents is to increase urban democracy through new design visions and strategies to provide more inclusion in the urban area. The common acknowledgement for the street design in Cardiff is to make the street a place not only to support multiple modes of transport but also a place with inclusion, high quality, safety and enjoyable. It tries to make the application of materials help enhance the relationship between the street and buildings and align the place's character. It also guides the materials to be associated with the traffic on street.

3.2. Two Typical Street Pavements

This paper picks up Wood St and Penarth Rd for a detailly analysis of their street pavements (Figure 3) and their impacts on street democracy. For Wood St, it just finished its street re-new project this year. The new designed layout follows the guidance from the transit-oriented design concept. The new street layout provides a good consideration of street allocation for vehicles, cyclists, and pedestrians. It includes 2 meters width macadam paving bicycle lanes, more than 6 meters width pedestrian footpath paving with granite slabs and 3 meters vehicle lane on both sides of the street. Also, some special kinds of tactile paving are used for disabled people at pedestrian crossings to help disabled people cross the street. The new pavement design keeps a good rule on the street with more inclusion of multiple users and functions on street, and shows a good urban democracy on the street.

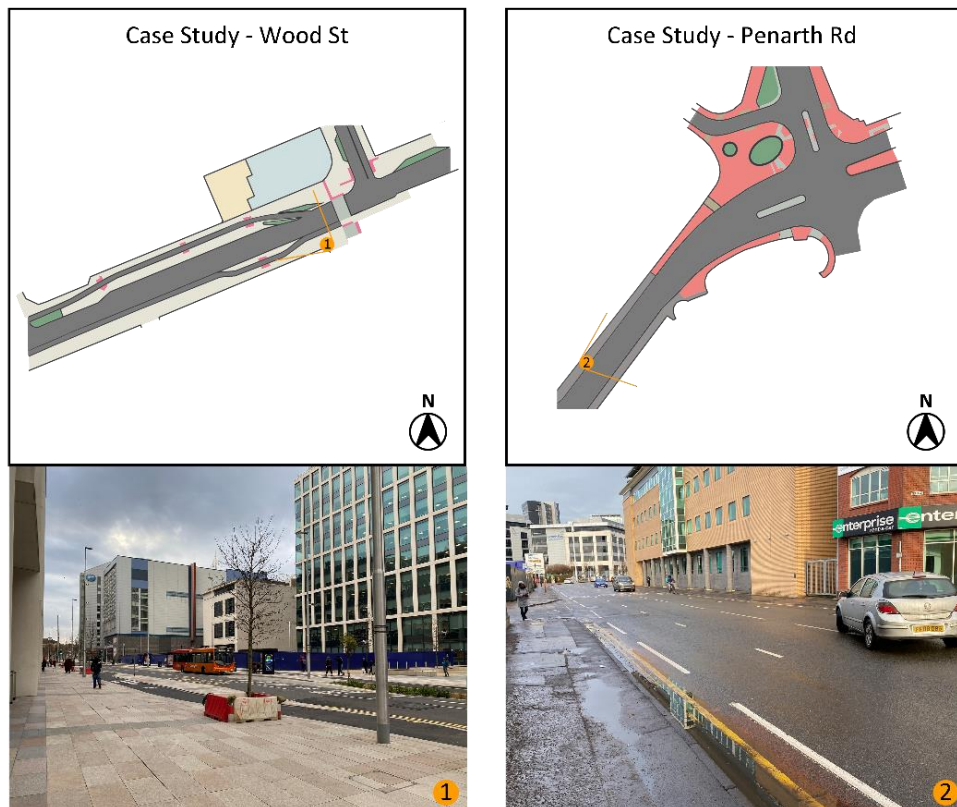


Figure 3: Detailed Map of (1) Wood St and (2) Penarth Rd (images by author).

However, the street pavements on Penarth Rd does not have much improvement in recent years. The street keeps the old car-oriented design layout. That most areas of the street use macadam pavement, resulting in car occupation. A narrow space on the macadam is colored red to create a bicycle lane. The pavement for pedestrian areas has differences. On the west, it uses macadam, while on the east it uses clay pavers to keep the same public realm from Callaghan Square. The pavement layout provides 4.5 meters for vehicle lanes, 0.8 meters for bicycles, and 2 meters for a pedestrian on both sides of the road.

The street pavements show the space allocations are unequally for walking and cycling. Also, it lacks a consideration of disabled people, which results in some exclusions on the street. Meanwhile, the street pavements on Penarth Rd lack maintenance, which results in terrible street surface conditions and causes unsafe and unsuitable walking experiences for pedestrians. Especially during special weather conditions, the street may stop pedestrian from it. For example, on some rainy days, the street surface is ponding because of the broken pavement, while in some cold winter days, it is icing on the clay pavers. Both conditions make pedestrian hard to use this street.

4. Discussion

4.1. Different Pavements Refer to Different Street Democracy

Although both streets belong to the City Centre area and their straight distance is not far from 500m, the street pavements conditions are very different. The street paving on Wood St is more considered that include more user groups and allocates space for different users fairly, which refers to a good street democracy. While the pavements on Penarth Rd provide more space for vehicles, its footpath paving has the exclusion of user groups, which shows a demanded improvement of street democracy.

When comparing these two streets, it also refers an inequality in urban development and shows the weakness of street democracy from a large scale. The reasons for these differences may include:

Firstly, the difference in economic conditions on two streets. Wood St received more investments and more attention from local urban development projects than Penarth Rd. This may be because of their different locations and surrounding. Wood St is surrounded by many economic and new development office buildings such as BBC Wales, Tŷ William Morgan (a UK government building) and South Gate House, resulting in a high quality environment and public realm. In contrast, Penarth Rd is surrounded by a developing area and fewer business and economic activities.

Secondly, relating to the economic, the surrounding buildings' functions are different on two streets. The difference in building functions impacts the users of two streets. Wood St keeps more pedestrian flows and fewer private cars, while Penarth Rd keeps high usage of vehicles.

Thirdly, the different maintenance conditions on two streets make Wood St keeping a good walking experience and inclusion of disabled people on street than Penarth Rd. So, the discussion should conclude the street pavements reflecting the inequality on the streets. Different street pavements set inclusion and exclusion on the street and sometimes it stops some people access this area. It should notice that inequality is caused by many different aspects and refers to people's right to the city that not only results in the street paving conditions. In addition, this discussion of inequality can be aligned to the streets in the rest of the city region. The inequality also happens between streets in the centre area with other local streets.

4.2. The Evolution of Street Democracy Reflects on Street Pavements

The street pavements are developing with the development of street democracy. Streets in Cardiff have some evolutions with the development of policy and design guidance documents. Takes Wood St again as an example, urban design practice has changed under the changing of the policy. Before 2008, Wood St is a two-way street with footpaths on both sides and it was a car-oriented street. The street pavement uses macadam for vehicle lanes and textured concrete slabs on footpaths without a special lane for cyclists. The street layout lack consider of some user groups and reflected a weak street democracy. In 2008, the building on one side of the street is knocked down for new commercial buildings. This project blocked the footpath on that side, and it narrowed down the space for pedestrian while having less impact on vehicle lanes. When it came to 2011, the building knockdown project was finished, and the pedestrian sidewalk on that side was recovered using macadam for pavement. This condition was maintained until 2014, with a new public space built on the previous building field. It used concrete paving, connecting with existing footpath pavements, which increased the space for pedestrians on that side. The site had a huge change from 2016 when with the construction of office and commercial buildings in the Centre Square area, that part of the footpath was occupied again. Although the construction also occupied some space for a vehicle, it kept more impact on the pedestrian. When the construction was finished in 2018, the street footpath had a new design layout using beautiful pennant slabs and became wider than the original design in 2011. Meanwhile, the construction on the north area of the street started and blocked that side's footpath. A new design layout with adding bicycle lanes and rain gardens on the street was built on Wood St in 2019 and was finished at the end of 2022.

So, when considering the changing of street pavements during the last decade, street democracy is also in a changing progress. With the changing of paving materials on the footpath and paving space for pedestrians, the exclusion and inclusion of this space are changing. At this stage, it should say that street democracy has a great improvement through the development from 2008 to today. Today, the street keeps more users by decreasing the space for car usage and good public realm with new considered pavement on pedestrian sidewalks. The rain garden not only benefits humans but also non-human users in urban areas. The development and improvement of street pavement should be

confirmed to improve street democracy. However, the street democracy in Cardiff still has many inequalities including many car-oriented streets; many street pavements still lack maintenance, and the pavement conditions are still different in different areas of the city under the different financial investments. It is hard to predict if Wood St layout still refers to a good street democracy in the future with the development of city.

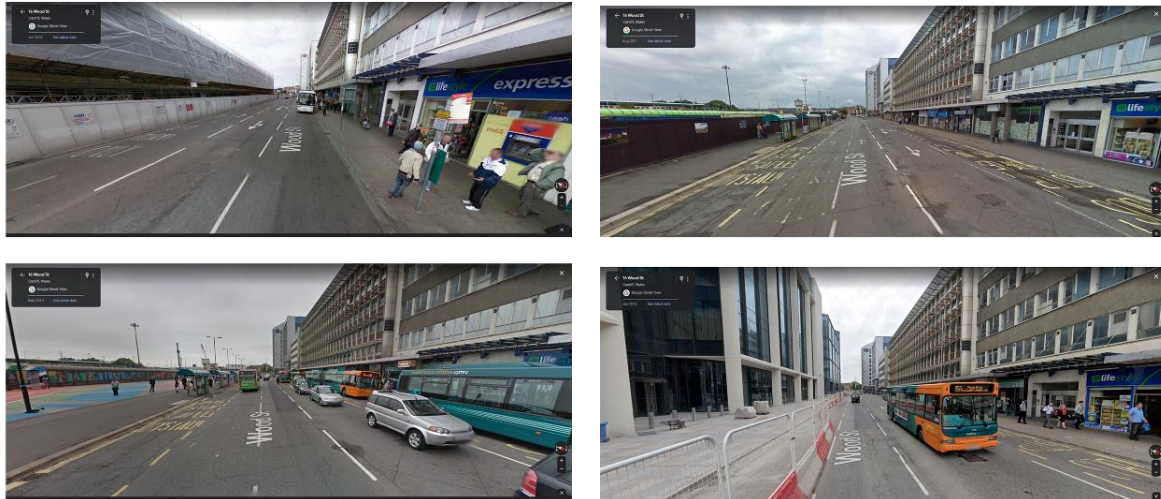


Figure 4: Changing of Street Pavements on Wood St from 2008 to 2018 (images by Google Street View).

5. Conclusion

From the discussion above, the street pavements reflect a city's democracy and the changing of pavements is impacted by the changing democracy. Good street pavements usually keep more inclusions of user groups and a good public realm on the street. This can confirm as a good street democracy because of its equality of useability for different users. Meanwhile, democracy relates to many factors in urban areas that include the economy, society, and policy. It should say some good street paving conditions are impacted by Capitalism investment, which may create unequal street pavements inside a city. This results in even some street pavements keeping more inclusion of users and a good public realm. However, the street democracy inside the city region still needs more improvement. The paper does not suggest every street pavement in a city need to be the same. While to keep a good street democracy needs more consideration of the street users and the street pavements support these usages. In short, a good street democracy should have more inclusion and democracy is changing progress for different conditions during different periods.

This paper's main discussion of street democracy is from the analysis of existing street pavements, changing of street pavements and related policies in Cardiff. This is the shortage of this paper that only discusses the conditions in Cardiff, but the other cities in the world may keep very different conditions than Cardiff. Different discussions of street democracy relating to street pavements may happen when focusing on other cities. The paper only points out that street pavement and the changing of street pavement can be a possible way to analyse street democracy and it still needs further research on this topic.

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