

What is the potential for a Liverpool City Region bike share scheme?

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Project Background

Traffic congestion, car-dependence, pollution and respiratory diseases are an increasing problem in large conurbations around the world. A growing trend of sustainable transport place cycling activities and bike-share schemes as useful tools to increase active travel in cities as they offer an alternative mean of transportation that benefits the individual health, the environment and urban mobility. Consequently, many cities have expanded bike lanes and bike-share systems to promote cycling. However, not all perceptions towards bike usage are as positive as they may appear since increasing cycle infrastructure occasionally implies a reduction of car space, which in turn cause disputes between car owners and cyclists. Hence, selecting areas for cycling investments is an area of major concern for authorities and governments. In this context, the Liverpool City Region (LCR) recognises that the area of Liverpool has increasing levels of air pollutants and increasing the use of cycles and the CityBike in Liverpool, could have positive effects on health and the environment.

Data and Methods

This study stems from the interest of the LCR in assessing the potential to cycle in the region. The aims of this research are: determine the main factors that influence cycling to work in the LCR, evaluate the effect of CityBike on the cycling activities in the LCR, and lastly, identify the top cycling routes and its relation with the existent cycling infrastructure. In this research, we use linear regression to weight the effect that sociodemographic, environmental and structural variables have over the proportion of individuals that cycle to work in the region. With origin-destination (OD) flows we identify the top cycling routes in the region and determine areas not covered by cycling infrastructure.

Key Findings

Our results showed that terrain, rainfall, temperature and the CityBike scheme have a strong influence in commutes to work by cycle for

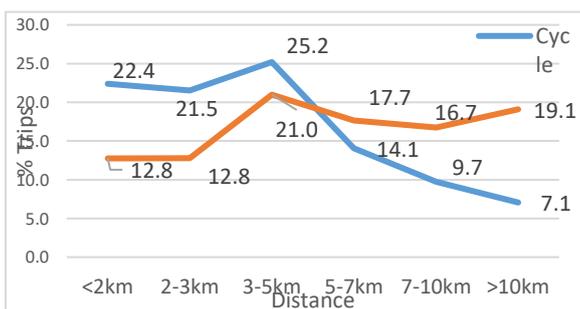


Figure 2 - LCR car and bike trips by distance

the entire region, slope poses a negative relation while CityBike exerts a positive impact. For the cycling routes, we identified that the top regional destination area is the Liverpool CBD and Speke and Garston in south Liverpool. Additionally, we compared the study's top routes against the priority corridors identified by the LCR. Thus, we concluded that infrastructure covers some of the most used routes partially and highlighted routes segments that could benefit from investments.

Value of the Research

In sum, we identified the priority cycling routes and suggest areas where cycling infrastructure can benefit the existing cycling activities in the region. Specifically, we evidence the lack of cycling infrastructure on courses that are extensively used by cyclists to improve the coverage of infrastructure not only to maintain the current cycling flows but also to entice more individuals to cycle. Our findings highlight the importance of assessing the main factors that influence cycling at a regional and local authority level. At the regional scale, the presence of a CityBike station is a strong determinant in cycling to work, whereas slope poses a negative effect on cycling to work. At a local scale, for Liverpool, the slope, car ownership and CityBike were the strongest determinants of cycling to work, whereas in Wirral, distance and terrain are the most significant determinants on cycling to work. This result reinforces our assumption that Wirral's location poses a limitation for cycling commutes that depend on the availability of ferries, bus or rail to connect with the LCR main area. Furthermore, the evidence presented in this study suggests that the presence and accessibility to a bike-share system (BSS) increase the potential of using bike over car and other means of transport.

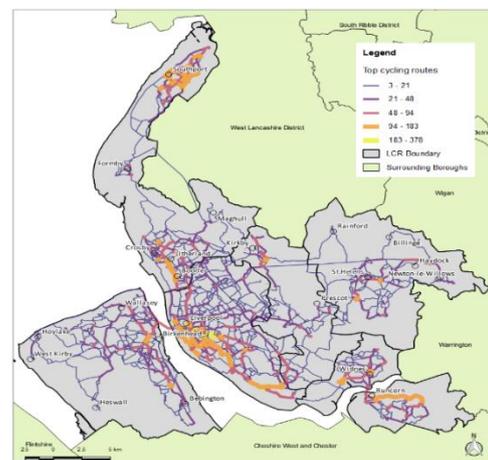


Figure 1 - Top cycling trajectories using route network (street-level lines)