Transportation Research Part A 61 (2014) 216–226

Contents lists available at ScienceDirect

Transportation Research Part A

journal homepage: www.elsevier.com/locate/tra

Re-cycling a city – Examining the growth of cycling in Dublin

Brian Caulfield *

Department of Civil, Structural and Environmental Engineering, Trinity College Dublin, Dublin 2, Ireland

ARTICLE INFO

Article history:
Received 12 June 2013
Received in revised form 29 November 2013
Accepted 4 February 2014

Keywords:
Cycling
Sustainable transport

ABSTRACT

In the past few decades much research has been conducted on the increasing numbers of commuters taking up cycling to work. This modal shift has been encouraged by pro-cycling policies to increase the attractiveness of cycling and the construction of new cycling infrastructure. In Dublin, several policies have been applied such as a bike rental scheme, bicycle-purchasing schemes, reducing speed limits and the construction of segregated cycle lanes to promote cycling. This paper seeks to examine what, if any, impact these policies have had on cycling rates in Dublin. This paper compares census data from 2006 and 2011 to determine how cycling rates have changed and if the demographics of cyclists have changed in the city. The results presented in the paper show that cycling rates have increased in Dublin and that a greater percentage of females, those in higher age and socio-economic groups are cycling to work on a regular basis. The analysis presented in this paper identifies groups of individuals that have recently shifted to cycling to work, by identifying who these people are, policymakers can tailor strategies to target these groups to encourage others in these groups to take up cycling.

1. Background and introduction

Dublin is the capital city of Ireland and has a population of 1.2 million (CSO, 2012). The topography of the city is relatively flat which makes it an ideal candidate city for cycling. Dublin has a mild climate with on average 61 mm of rain per month. This compares with 64 mm in Amsterdam, 44 mm in Copenhagen and 78 mm in Freiburg, all cities with a traditional reputation of being the most cycle friendly cities in the world (World.Climate.com, 2012). Given the climate and topography of Dublin it is an ideal candidate for improving growth in cycling rates.

Since 2008, there has been a concerted effort in Dublin to improve the image of cycling in the city and to increase the modal share of cycling. These policies are discussed in the next section. Internationally, several authors have written about increasing the modal share of cycling. A growing literature in the area points to several factors that are responsible for the growth of the mode share of cycling. Pucher and Buehler (2006) in a comparison of cycling rates between the United States and Canada cite increased car ownership costs, safer cycling environments and investments infrastructure as factors responsible for higher rates of cycling in Canada compared to the United States. Pucher et al. (2011a) conducted a similar study comparing Sydney to Melbourne. In Melbourne, the authors found that cycling rates were twice those experienced in Sydney. The authors attribute this to climate, topography and infrastructure for the difference in cycling rates. However, the study also cites public advocacy of cycling in Melbourne as one of the reasons for the growth of cycling in the city.

* Tel.: +353 1 8962534.
E-mail address: brian.caulfield@tcd.ie

http://dx.doi.org/10.1016/j.tra.2014.02.010
0965-8564/

Pucher et al. (2011b) examine the increases in cycling in North America over the past two decades. The authors find that while cycling rates to work have grown, the most substantial increases were shown to have happened in cities that have actively promoted the mode and have invested in cycling infrastructure. Numerous studies have shown that cyclists have a better perception of cycling than non-cyclists (Caulfield et al., 2012; Lawson et al., 2013b; Gatersleben and Appleton, 2007).

Other studies have examined the propensity to cycle using large datasets. Vandenbulcke et al. (2011) used data from the 2001 census in Belgium to determine what factors impacted upon cycling rates. This study found that several factors including town size, demographic characteristics impacted upon the propensity to cycle. Wardman et al. (2007) used data from the National Travel Survey in the UK to determine what policies could increase the potential to cycle to work. The results of this study found that improved on-route facilities and financial incentives would increase the numbers who cycle on a daily basis. McMillan (2007) examines the potential of children to use non-motorised modes of transport to travel to school using census data from the USA. The author used the data to determine what factors influence the propensity to use these non-motorised modes of transport and found that urban form played a large part in the decision to use one of these modes of transport.

The literature shows several examples of positive interventions that can be conducted to improve cycling up take in urban areas. A consensus is being reached in the literature that shows that a two-pronged approach of segregated infrastructure and behavioural change is required to encourage individuals to cycle to work on a regular basis. The results presented in this paper show how the bundle of policies implemented in Dublin have been used to improve cycling. While the data used in the study cannot single out the impact of any one single intervention, the findings do show how cycling in the city has increased and how the demographics of those that cycle to work has changed. The paper contributes to the field of research by showing how Dublin, a city with a traditionally low cycling base has changed to a city with increasing numbers of cyclists.

The research objectives of this paper are to examine how cycling patterns have changed in the two census periods examined in the paper and to ascertain how the demographics of cyclists have changed in Dublin. To determine what changes have happened in cycling in the city, a multinomial logistic regression model was estimated to show the relationships between a series of variables and increases in cycling rates. By identifying those groups that have switched to cycling recently it is aimed to identify those that are 'near market' or in other words, those most likely to switch to cycling. This will then allow policymakers to tailor solutions, campaigns and other interventions at these groups to encourage more people to take up cycling.

2. Policy interventions to improve cycling in Dublin

This section of the paper describes the different policy interventions in Dublin to encourage cycling under five headings. When encouraging cycling, like any other mode of transport, it requires the use of push and pull factors making cycling seem more attractive and other modes less attractive (Rietveld and Daniel, 2004). The policies described in this section of the paper describe mainly the push factors used in Dublin to achieve a modal shift to cycling.

2.1. Financial incentives

Financial incentives have often been used as a policy measure encourage effective sustainable modal shift. In Ireland one such policy was the introduction of tax-free loans to purchase bicycles. Caulfield and Leahy (2011) examined how individuals that purchased bicycles under the tax-free loan system in Ireland had used their bicycles. The findings of the study showed that 48% individuals that had not owned a bicycle in over 7 years were now cycling on a weekly basis and the main reasons for this take up in cycling was attributed to health benefits and the flexibility of the mode.

2.2. Infrastructure provision and traffic calming

One of the barriers to cycling is a perceived poor safety record. Cycling in Dublin is generally perceived as unsafe by both experienced cyclist and non-cyclists, but the increased provision cycle lanes may change this perception (Lawson et al., 2013b). Caulfield et al. (2012) also found that the provision of segregated cycle lanes in Dublin can change the perception of safety and further increase the attractiveness of cycling in the city. To improve the safety of cyclists and the attractiveness of the mode, over 120 km of cycle lanes have been constructed in Dublin since 1990, 25 km of which are off-road cycle tracks (Dublin City Cycling, 2012). In tandem with the introduction of this new cycling infrastructure, Dublin City Council has introduced traffic calming measures by introducing 30 km speed limits in the city centre. The city council has also constructed a freight tunnel in the city called the Dublin Port Tunnel. The tunnel, opened in 2006, extends for 5.6 km and connects the Port of Dublin with the outer motorway. Prior to the tunnel opening in 2006 heavy goods vehicles (HGV's) would have had to travel through the city centre. Since opening, any HGV with five or more axels has been banned from the city centre. The construction of the tunnel has removed largest vehicles from the streets of Dublin city making it a more attractive place to walk and cycle.