

Exploring Transport Modeling to Estimate Demand: Case Study Of the Cardiff development Planning in UK

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Abstract: This article identifies the challenge of Cardiff transport from economy, congestion and social respectively and the Cardiff Local Transport's vision. Some objectives are dedicated to setting the targets which are long-term influence.

Keywords: Model; Estimate demand; Exploring transport modeling

1. Introduction

Cardiff is a 'Core Cities' in UK. It is the one of Europe's liveable capital cities. As the financial centre of Wales in spite of its apparent good fortune in recent years, Cardiff's competitive position has worsened in comparison with other 'Core Cities' in UK (SPCC, 2012). The Cardiff requires a transport system which maximizes the city's economy efficiency and the quality of life of its citizens. Therefore, Cardiff Local Authorities of the South East Wales Transport Alliance integrates with WG's National Transport Plan to make the LTP, which identifies the key transport issues relevant to Cardiff, outlines the Council's medium and longer term aspirations up to 2030 and include the primary reference for funding bids to Welsh Government as well as other grants from external bodies. The vision of plan set out based on the existing data and model suited for the plan. Finally, it given strategies highlighted in the key connectivity projects, which will integrate with other plan to achieve the LTP's vision.

2. Challenge

The Cardiff Capital Region has experienced rising population, economic growth and increasing employment, without a corresponding growth in the supply of sustainable transport. Over this period, transport investment was insufficient to the add the new capacity needed to economic and demographic growth. The result has been growing traffic congestion, inconvenient public transport facility and unreliable public transport services. The following parts review the transport challenges, including economy aspect, sustainable issues and congestion problems.

2.1. Challenge of Economic and Demographic Growth

Cardiff has experienced the national average GVA per capita declined since 2001, from 110% to 102% in 2011, with standing worsened competitive position in comparison with the UK's 'Core Cities' like Bristol, Manchester (ibid). However, 198,400 jobs in 2011 in Cardiff and it would add 40,000 jobs between 2013 and 2026, which would significantly contribute to the economic growth. Along with the projected increase in employment, the expansion will result in a 32% increase in traffic (SPCC, 2013). It requires transport plan need to consider the growth and support the development of extensive to improve the current economic status of worsen. Cardiff is the largest urban centre which is expected to continue to grow from 348,000 to 430,000 by 2036 according to CCR(2013). The additional population would contribute to generate significant additional accommodation requirements. It is expected that around 30,000 new homes will be located in inner Cardiff. The provision of good transport access will be a critical part of meeting Cardiff's expanding housing needs.

2.2. Challenge of Promoting Sustainable Transport

It showed that 30% of households in Cardiff have not access to a car in ACS (2011), which means accessibility can be a particular problem for less mobile people such as young people, older people, and people with disabilities. The public transport must support people with different characters could be able to access different destinations to opportunities.

In addition, people who living in deprived area that are often poorly served by the transport networks would more dependent on car. It leads another issue-health, currently only 24% of Cardiff residents meet physical activity guidelines and 51% of Cardiff residents are obese (CCC, 2014). Promoting sustainable travel is necessary for helping more people undertake exercise and avoid the health problems.

Alongside revitalizing Cardiff's transport with new investment and making it accessible to a wider section of society, the local road transport has to tackle the damage to the environment, which accounts for 24% of all carbon dioxide emissions in Cardiff (LDP,2012).

2.3. Challenge of Network Pressure & Congestion

There are two trends which critical influence the traffic congestion. One is the growth of volume of vehicles, which grew by 19% between 1998 and 2008 according to the Cardiff Council Annual Surveys. Furthermore, in recent year traffic on Cardiff's road network grew by 12% between 2000 and 2010. The result is that congestion situation would be deteriorated when the existing network roads are difficult to supply the rapid growth of the number of vehicles.

Another factor is about the large number of car travelers, especially in commute trip. As of 2011, 57% of Cardiff residents commuted by car, and nearly 77,900 people commuted into Cardiff from areas outside the city each day (37% of Cardiff's workforce), which travel into the city by car occupied by 80% of this number. Additionally, Ask Cardiff Survey founded that the share of work travel by car is higher in some of the more peripheral areas of Cardiff such as Lisvane (81%), Creigiau St Fagans(83%) (2011).The factors of two aspects contribute to the results that the current weekly travel mode split (2011) is 64%:36% car based: non-car based. It reveals the model of car has dominated the work trip. Therefore, the strategy in Cardiff Local Transport Plan need to attract more sustainable travel rather than car.

3. Vision

To deal with these challenge, which are crucial for Cardiff's future, CLD draw the blue picture in 2026 in transport. It will be necessary to achieve a significant modal shift that need to achieve a mode split of 50:50 in 2026. At the same time improving connectivity between Cardiff and the wider region. Furthermore, a safe, efficient, and sustainable transport system serve for all. To sum up integrated all vision to achieve the target of minimizing car travel and maximizing sustainable transportation.

4. Objectives

Working towards the achievement of this vision will ensure that progress is made in Cardiff towards meeting the government objectives for sustainable development in Cardiff. These are four main objectives as follow.

4.1. Demand management solution

Supporting sustainable economic growth by tackling congestion and satisfy the demand based on the Council's modelling assessment indicates, it brings forward objects to improve connectivity between the Cardiff Capital Region and the city of Cardiff which is the heart of

economic area in Walsh. As well development of the Cardiff Enterprise Zone according to CLD contribute to promote the economy development. Additionally, improvements to existing transport facilities to meet the growth travel demand will need to be supported such as selected expansion of road capacity, provision of new link in conjunction.

4.2. Developing the public transport network

To increase sustainable access to jobs and services across all parts of the city including derived areas two main reports have highlight those objectives. Rapid Transit for Cardiff: LDP 2006-2026 set out the development of rapid transit routes and a multi-modal transport hub at Cardiff Central in conjunction.

Similarly, with the bus development from North West Cardiff Corridor Study that include designing new routes, adding services and improving interchange facilities. These priority measures and strategic bus corridor will make it easier for people to access their workplaces and for businesses to move.

4.3. Integration with Regional Infrastructure Improvements

To achieve modal shift and alleviate pressure on Cardiff's road network and improve connectivity within the city there are a number of key projects in the SRTP and WIIP. In terms of rail will add platforms at frequency station and increase carriages to peak time service. In parallel, development of bus priority measures on the existing roads. Further development of strategic in interchanges either for bus or rail that require to achieve more accessible, reliable and feasible.

4.4. Social inclusion & Widening Sustainable Travel Choices

The new settlements would be achieved fully accessible by sustainable travel, which should make sustainable transport and travel planning integrate with the regeneration schemes according to the South East Wales Integrated Transport Task Force Report (2013), and it required the services, healthcare, education, tourism and leisure facilities to be considered. Furthermore, it encouraged to improve the quality, efficiency and reliability of the transport system.

As well as promoting the health of residents of Cardiff include making neighbourhoods walkable, encouraging more cycling and limiting speed in Cardiff Strategic Cycle Network Plan (2011) and Walkable Neighbourhood Programme (2013).

The objectives have taken account of both vision from plan and challenge of current transport, which also need to using appropriate mode to set the suitable target and measures.

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