



# The impact of the great recession on Irish air travel: An intermodal accessibility analysis



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## ABSTRACT

This paper quantifies the changes in accessibility at small area scale arising from the combined effects of dramatic air traffic declines and a greatly expanded motorway network in Ireland during the period of the great recession. The subsequent policy decisions by government are assessed in light of the intermodal accessibility changes identified. The Irish Government engaged in an extensive motorway construction programme throughout the 2000s, greatly increasing the overall length of the inter-urban motorway network. The essential air transport services programme put in place in the 1990s to guarantee a minimum level of air access to disadvantaged regions was significantly reduced at the end of the 2008–2011 period, with only two of the six regional airports continuing to have any form of subsidised public service obligation for the period 2011–2014. In this study, small area datasets are used to measure the net impact of these changes on air transport accessibility in Ireland and the potential spatial inequalities that arise as a result of these changes. An inter-modal accessibility approach is used where the physical characteristics of the road transport network to airports and the network structure characteristics of the air transport system are taken into account to evaluate the levels of air transport accessibility at the small-area district level. Results from the analysis show that the improved surface access to the larger Irish airports (Dublin and Belfast) has enhanced the range of European and global locations directly accessible by air for many communities in Ireland. The net effect of these changes has been to concentrate air traffic at the largest Irish airports.

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## 1. Introduction

This paper quantifies the changes in accessibility at small area scale arising from the combined effects of dramatic air traffic declines and a greatly expanded motorway network in Ireland during the period of the great recession. The subsequent policy decisions by government are assessed in light of the intermodal accessibility changes identified. Changes to European Union (EU) air transport regulations now require analysis and assessment of Public Service Obligation (PSO) air route impacts, costs and 'proportionality', and this paper aims to demonstrate such an analysis and assessment in Ireland between 2005 and 2010.

The Irish government and European Union engaged in an extensive series of investment programmes in transport

infrastructure during the 1990s and 2000s using EU structural funds and Irish government exchequer funding. These investment programmes aimed at greatly improving the roads network, airports and ports as well as some sections of the rail network. A series of Irish government documents set out 5-year plans for transforming the transportation infrastructure and achieving broad objectives of more balanced economic growth, increased employment and economic and social cohesion.<sup>1</sup> This paper will focus on the air and road transport networks and examine the changing policy context for enhancing air transport accessibility over a 20 year period.

<sup>1</sup> See "Operational programme on periphery: roads and other transport infrastructure 1989 to 1993", Government of Ireland and Commission of the European Communities, 1989; "Operational programme for transport 1994 to 1999", Government of Ireland, 1994; Ireland National Development Plan 2000–2006 – Economic and Social Infrastructure Operational Programme, 2000; National Strategic Reference Framework 2007–2013, Government of Ireland, 2007; National Development Plan 2007–2013, Government of Ireland, 2007.

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The investment in Irish regional airports during the late 1980s and early 1990s resulted in a nine-airport network for the Irish Republic and a 12-airport network for the Island of Ireland by 1993. Along with the infrastructure investments, the Irish government put in place an *essential air transport policy* to ensure a basic minimum level of air service to the regional airports during the 1990s and 2000s in order to facilitate the development of tourism products and encourage industrial developments outside of the Dublin/Eastern region. The road investment programme was the largest investment programme undertaken by the Irish state, significantly increasing the total motorway length as well as upgrading significant portions of the national and regional road networks. This resulted in substantially lower travel times and higher travel speeds between the main urban centres in the country.

The aim of this paper is to measure the combined effects of the reduction in air transport services and the improvement in road transport accessibility for the 2005–2010 period and to examine the implications for transport policy in Ireland in the recovery period from 2010 to 2014. The long term policy implications will also be outlined. An inter-modal accessibility approach is adopted where the physical characteristics of the road transport network linking airports and the network structure characteristics of the air transport system are taken into account to evaluate the levels of air transport accessibility at the small-area district level. The paper contributes to the literature on air accessibility measurement, impact assessment and the leakage of traffic from small regional airports to larger airports (Lieshout et al., 2015; Wei and Grubestic, 2015; O'Connor, 2003; Burghouwt and Redondi, 2013; Suau-Sancheza and Burghouwt, 2011).

The next section of the paper sets out the background to the development of the Irish air and road transport networks and details the policy implications for the shifting time-space geography resulting from these evolving networks. The dramatic changes in Ireland's economic circumstances from 2008 are also briefly outlined as this resulted in strong pressure to cut government expenditure and rationalise many assistance programmes including the essential air services programme. The wider European airports network is also described in this section. Section 3 summarises the methodological framework adopted to model both accessibility at the local level and at the international level. In Section 4, the results of this analysis are presented for 2005 and 2010; in this section, the policy impacts arising from reduced travel times by road are highlighted and the increasing costs of continuing to fund public service obligation air routes are detailed. The policy changes introduced in the 2010–2014 recovery period are examined and evaluated in light of the intermodal accessibility results. Section 5 presents an analysis of the inequality in accessibility for the surface and air transport networks. Section 6 summarises the key findings and discusses the implications for further analysis.

## 2. Irish economic development and transport infrastructure investment policies 1990–2010

European Community regional development policies changed significantly during the 1980s with the accession of Spain, Portugal and Greece in 1986. Under the greatly expanded European Regional Policy of the late 1980s and 1990s, substantial EU funds were made available to economically lagging regions in order to reduce the disparities that existed between the regions of the then 15 member states. The structural funds provided large scale funding for programmes of investment in infrastructure, education and training in order to enable economic growth and development and reduce unemployment. In Ireland, the government in conjunction with the European Commission set out a series of 5-year regional

development planning programmes beginning in 1989 with the *Operational Programme on Peripherality*. Subsequent programmes were agreed and published in 1994, 2000 and 2007. The transport component of these plans aimed at greatly improving the roads network, airports and ports as well as some sections of the rail network. These plans represented a new commitment to the process of medium term regional and national planning by the Irish state.

### 2.1. Roads network

The Irish road network changed dramatically between 2000 and 2010 as the substantial government investment programmes (National Development Plan 2000–2006 and National Development Plan 2007–2013) delivered a greatly increased total motorway length thereby substantially reducing travel times and increasing travel speeds between the main urban centres in the country. The earlier programmes had focused on upgrading sections of the national primary and secondary road networks (in many cases to dual carriageway standard), removing bottlenecks, by-passing small towns and villages and removing curves and grades that significantly impacted on driving speeds. The total national road network measured 5306 km in 2014 of which 897 km was motorway (NRA *National Route Lengths as of 31/12/2013*).<sup>2</sup> In this study, the road transport network for the island of Ireland is utilised. The network consists of the motorways, national primary and secondary routes, and regional and county roads networks in the Republic of Ireland and Northern Ireland. The length of motorway in Northern Ireland was 115 km in 2014, with 2290 km of primary roads ('A'- class single and dual carriageway roads).<sup>3</sup> Table 1 shows the total road length of the road network under study and the corresponding average speed by road type. Average speed levels were used to compute average travel times by road type and section to each airport under study (see next section for details).

There was a dramatic increase in the total road length of the motorway network in the 2005–2010 period in the Republic of Ireland. Fig. 1 shows the total motorway length between 1999 and 2013 as recorded by the National Roads Authority<sup>4</sup> and highlights the fact that most of the motorway length came on stream after 2008. The motorway network changed by less than 1 km in the same period in Northern Ireland. The 2007–2013 NDP included a budget of €13.3 billion for completion of the interurban motorway network and the upgrading of key national primary and secondary routes particularly where bottlenecks had resulted in increased travel costs for road users. The motorway network consisted of the upgrading (via widening, realignment and separation of existing lanes and construction of additional lanes) of many sections of the existing national primary and secondary routes, along with significant new road construction (roughly 25% of the total length of motorway). Where new road sections were constructed, pre-existing routes were reclassified. To illustrate the impact of road network changes, the travel times and changes in travel times between each electoral district (ED) and Dublin Airport were mapped. Fig. 2 shows the average free flow travel time in 2010 in minutes between the centroid of each Electoral District (ED) and Dublin Airport. Fig. 3 illustrates the change in average free flow

<sup>2</sup> The regional and county roads network consists of approximately 87,000 km of paved roads and is under the remit of the Department of Transport, Tourism & Sport.

<sup>3</sup> See *Northern Ireland Transport Statistics – 2011–2012*, HMSO (2012); (available at [www.drndni.gov.uk/index/statistics/stats-catagories/ni\\_transport\\_statistics.htm](http://www.drndni.gov.uk/index/statistics/stats-catagories/ni_transport_statistics.htm)).

<sup>4</sup> National Roads Authority *National Route Lengths 2006, 2007, 2008, 2009, 2010* (available at [www.NRA.ie](http://www.NRA.ie)).

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