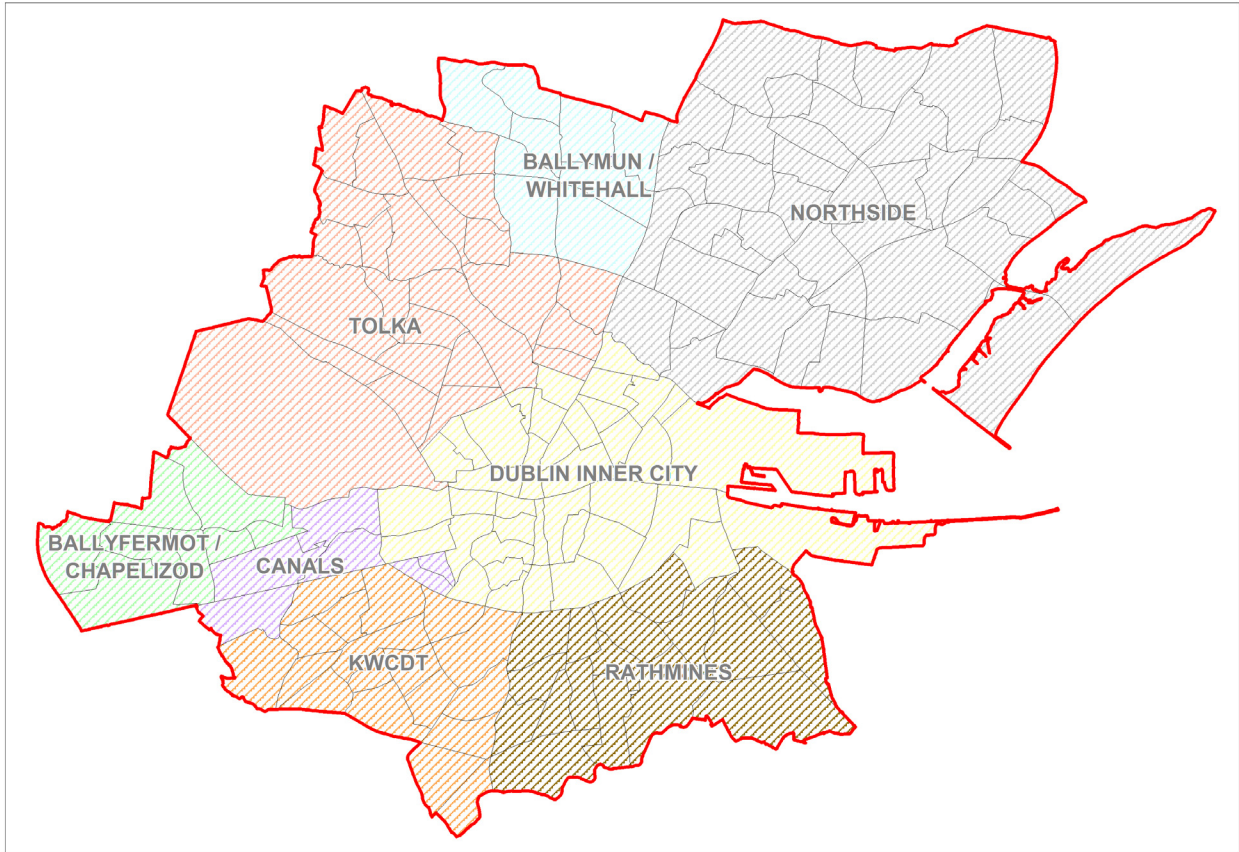




New Ways of Mapping Social Inclusion in Dublin City



A Joint Initiative of Dublin City Partnership/Dublin City Development Board

Justin Gleeson, Rob Kitchin, Brendan Bartley, Caroline Treacy
NIRSA, NUI Maynooth, March 2009



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Foreword

The Dublin City Area Based Partnerships are pleased to present this report “New Ways of Mapping Social Inclusion in Dublin City”.

This initiative is a collaboration between the Area Based Partnerships, Dublin City Development Board (DCDB) and the National Institute for Regional and Spatial Analysis (NIRSA).

The commissioning of this report stemmed from a need to source accurate and timely data to aid the targeted delivery of supports to help those most at need within our communities.

The research has created a localised evidence base which will ensure a more effective deployment of our limited resources. This will have the potential to achieve better outcomes within our communities.

The report demonstrates that with the agreement of data holders we can significantly enhance our knowledge base and decision making.

We expect that on reading this report, government bodies, and other relevant stakeholders will see the benefits in sharing information at a local level to inform policy making and, as a result, ensure the better targeting and delivery of public resources.

We wish to take the opportunity to thank all those who have worked with us on this report and especially NIRSA project team who have completed the work to the highest professional standards.

Martin Kavanagh: Director of Community and Enterprise,
Dublin City Council

Marian Vickers: CEO Northside Partnership

Ciaran Reid: Manager Ballyfermot/Chapelizod Partnership

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Executive Summary

There is a long history of programmes undertaken by the Irish state aimed at tackling issues of poverty and social inclusion. To date the predominant evidence base used to formulate and monitor the success of such programmes at the local scale has been the five-yearly census reported at the Electoral Division (ED) scale^[1] and individual research projects. And yet, high quality data and analysis at a finer spatial resolution and of a more timely nature will be of enormous value to government and on-the-ground agencies to be able to identify and target particular needs as effectively as possible and to ensure efficiencies in the delivery of public services.

This pilot project was tasked with examining and illustrating new ways to improve the evidence base for policy formulation with respect to social inclusion that could be rolled out on a systematic basis across the state. To that end the project team undertook four distinct phases of research, each accompanied by a case study focusing on the two pilot partnership areas of Ballyfermot/Chapelizod and Northside, that highlighted the value of the new data and methods used to mine them.

The research clearly demonstrates that it is possible to monitor and analyze social inclusion in a more comprehensive, systematic and timely manner than has hitherto fore been the case. In particular, it is possible to:

- significantly increase the spatial resolution of analysis – mapping census and other data at scales below the traditional ED scale using Enumerator Areas^[2] and the new Small Areas^[3];

- analyze and map data already in the public domain that has to date been little used, such as POWCAR^[4] (travel to work data) to explore local labour markets;
- create and map data new kinds of data at the local level such as the Live Register and access to key public services such as GPs and schools;
- analyze and map data at a local scale generated on a much shorter timeframe than the five yearly census, such as the weekly or monthly Live Register.
- provide the data and maps in a user-friendly and interactive format accessible across a secure Internet connection that encourages widespread usage.

One of the project's prime goals was to try and secure data from different organisations that traditionally has not been released or analyzed spatially. To that end a number of government departments were contacted with a view to geocoding their data. Whilst we had limited success persuading departments to work with us, the Department of Social and Family Affairs agreed to participate in the project. As a result, it has been possible to map for the first time at a very small scale using the new Small Area boundaries (c. 100-120 households) Live Register data and to monitor this over time (on a weekly or monthly basis). Analysing and understanding such data opens up the possibility of area-targeted initiatives and their monitoring on a very timely basis at the very local scale. This is an especially important

[1] An Electoral Division can range in size from less than 50 people to over 30,000 people. In general, in cities they usually contain on average about 3-4,000 people.

[2] Enumerator Areas (EAs) constitute the area/workload assigned to each Census enumerator and on average contains 330 households.

[3] Small Areas (SAs) are new data areas that contain on average 100-120 households and have a minimum of 65 households.

[4] Place of Work Census of Anonymized Records

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outcome as it demonstrates that it is possible to analyze data held by state agencies in a powerful new way, vastly improving how such data can be used and potentially revolutionising policy formulation, whilst at the same time making Ireland compliant with the EU INSPIRE directive concerning data quality and standards. In addition, by working with the Data Protection Commissioner the project has identified a robust and secure procedure for the appropriate handling, geocoding and outputting of sensitive data held by state agencies.

The report concludes with a set of recommendations designed to improve the evidence base used by government and the third sector going forward. These include: formulating and implementing a Dublin City data strategy to provide high quality data for the entire city for use in policy development and the monitoring and evaluation of programmes.

- conducting a feasibility and cost benefit analysis of providing the data to all partnerships and other parties using a user-friendly, interactive, web-based system such as Instant Atlas.
- working with government departments to examine how their data can be geocoded and mapped at the Small Area scale.
- extending the analysis to rural areas to ensure that the methods developed can be rolled out systematically for the entire state;
- extracting as much value as possible from existing datasets that are at present often overlooked;
- examining the technical and ethical issues that may arise in mapping the 2006/2011 census data at the Small Area scale

- conducting more research into the development of a deprivation index that extends beyond census data to include measures of access to services and other data relating to health, housing, crime, education and so on;
- exploring whether it would be possible to undertake the analysis on an all-island basis

The first step towards addressing and solving a problem is to understand the nature of the problem. The pilot project demonstrated that it is possible to significantly improve the evidence base used to try and understand social inclusion in Ireland. It is our hope that the data and methods we detail in the report will become the first step in a process that transforms how future policy is formulated and how its implementation is monitored and evaluated.

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1. Introduction

In March 2008, PLANET – The Partnerships Network, in conjunction with the Social Inclusion Measures Group of Dublin City Development Board (DCDB) and Dublin City Council (DCC), engaged the National Institute for Regional and Spatial Analysis (NIRSA) at the National University of Ireland Maynooth (NUIM) to undertake a pilot research project to explore new ways to spatially analyse and map social inclusion data in Dublin City. The rationale for the project was that providing partnerships and others concerned with social inclusion with a greater level of detail and access to information at the local community level will enable better area-based policy formulation based upon a fuller understanding of the nature of local communities and their specific needs.

With a specific focus on Dublin-based partnership areas a pilot project was undertaken concentrating on two individual study locations – Ballyfermot/Chapelizod Partnership and the Northside Partnership. For Dublin as a whole, and these two locations in particular, spatial analysis of social inclusion and deprivation was undertaken at the ED and sub-ED level for a variety of data, much of which had never been previously mapped or not at such fine scales. Drawing from this analysis the project then evaluated the lessons learned with a view to rolling out new ways of mapping, presenting and assessing levels of social inclusion data across all local development, area-based partnerships.

Since the late 1990's, there have been a number of key strategies and programmes that have gradually highlighted the need for a multi-faceted approach towards combating the effects of social inclusion within Irish society. The adoption of

key policies such as the National Anti-Poverty Strategy, the funding and priority given to social inclusion within the national development plans, awareness of social inclusion across local government and the flexibility given to local partnerships to implement pertinent strategies at a local community level, are positive steps towards the alleviation of the problems of social inclusion across the country.

Highlighting areas of specific need within the local community, the development of policies that can alleviate such need, their implementation and eventual monitoring and evaluation are at the core of partnership strategies. As such, the need for a detailed and timely evidence base to inform policy development and implementation is increasingly important to their work. Given the current economic downturn and the increasing pressure being exerted on operational budgets it is now essential that partnerships, and indeed all areas of the public sector, operate in the most strategic manner as possible. Having a detailed and robust evidence base as the background to policy development will ensure maximum benefit is drawn from public finances. For such evidence to have real utility it needs to be firmly anchored to the lived realities and geographies of people and thus analysed spatially and at scales that reveal the micro-geography of social inclusion and deprivation. One way to ensure this is the case is to map relevant data at as finer resolutions as possible to expose the patterns that characterise an area and its population.

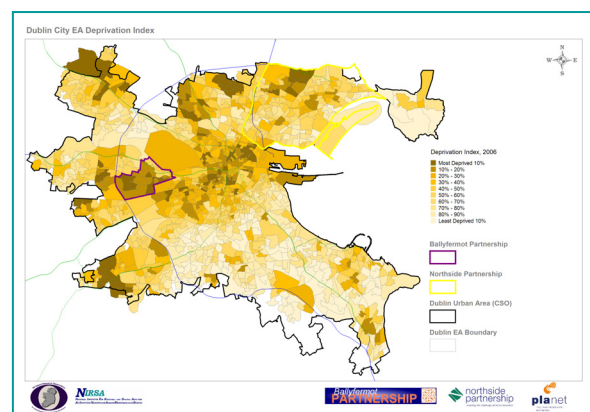
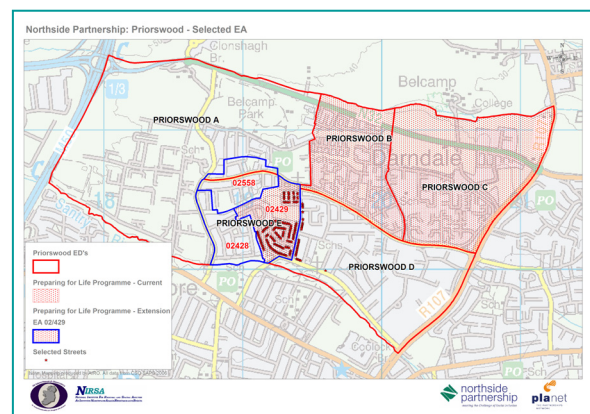
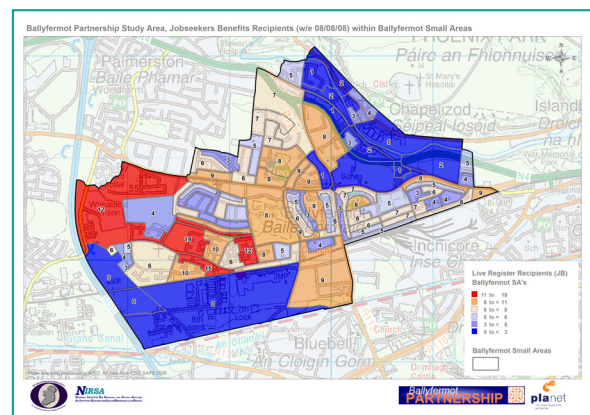
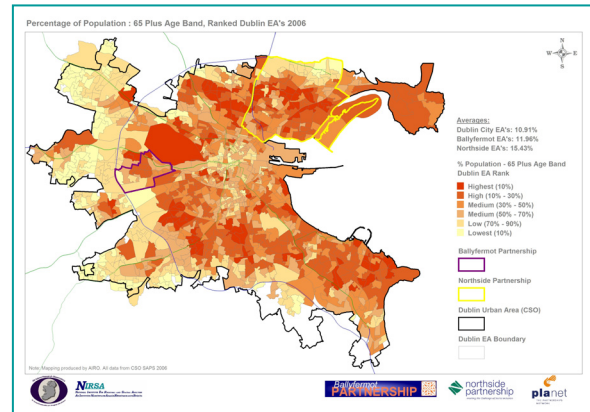
With that in mind the initial objectives for the project was to:

1. Identify data relating to social inclusion held by various data and service agencies, including those that do not traditionally release data or do so at coarse spatial scales.

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2. Work with Dublin City Development Board to persuade agencies to release data at finer scales than usual and where necessary to geo-code data for analysis and mapping in the pilot locations.
3. Structure that data into a coherent database for analysis and mapping, and to work with Dublin City Development Board to explore the possibilities of adding any geo-coded data they might possess (e.g. service locations).
4. Examine various established deprivation indexes (from Ireland and abroad), explore new possible indexes, and to test their usefulness and validity in a Dublin context.
5. Map, where possible, data and indexes into existing administrative boundaries – Dublin City, Partnership, ED and EA.
6. Map various data into new boundaries, specifically the new Small Areas created by National Centre for Geocomputation (NCG) for Ordnance Survey Ireland (OSi).
7. Explore ways of accessing and presenting the data for non-expert users, including the development of online mapping tools.

The project was undertaken over a one year period from March 2008 to April 2009 with regular update meetings with the steering committee: Ballyfermot/Chapelizod Partnership, Northside Partnership, Dublin City Development Board and Dublin City Council Social Inclusion Unit.



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2. The Evidence Base – The Present Situation

A comprehensive analysis of social inclusion at a local community level within partnership areas is dependent on the existence of a suitable evidence base. Traditionally this evidence base has consisted of the census data delivered to partnerships at the Electoral Division (ED) level. While this approach has helped inform policy making and the delivery of programmes, it can be significantly improved in two main respects. First, since 2002 the Central Statistics Office (CSO) have released statistical data at a more detailed spatial scale, the Enumeration Area (EA), for five county borough areas (Dublin, Cork, Limerick, Galway and Waterford). In addition, a new statistical geography is to shortly be rolled out – the Small Area (SA). Providing statistical profiles of areas with as little as 65 households, SAs enable a much better understanding of local communities and their needs. Second, there is potentially significantly more data that can be used as part of the evidence base to inform policy, much of it already spatially referenced and others that are relatively easily geo-coded. Allaying census data with health, welfare, employment and service provision data will provide a much richer understanding of a population within a locale. Given that much of this data is collected with a much greater frequency than census data (every five years), it can be used to monitor how an area changes over time on a monthly, quarterly or yearly basis.

2.1 The Statistical Geography of Ireland

2.1.1 Electoral Divisions (EDs)

There are 3441 legally defined Electoral Divisions (ED's) in

the Republic of Ireland. The digital boundaries are digitised from 1:5,000 large scale data by the OSi and act as the primary statistical reporting spatial unit for the CSO. The CSO does not, however, report census data for all 3441 EDs. In the 2006 Census there were 32 ED's with very low populations, which for reasons of confidentiality have been amalgamated into neighbouring ED's giving a total output of 3409 EDs. The total number of output EDs for 2002 was 3421.

While the advantage of using EDs is the relative stability of their boundaries and longevity of use, making comparative time-series analysis possible, ED's are highly variable in spatial extent and in population size. Rural EDs can have total population counts below 100 whereas some urban ED's have population counts in excess of 20,000, with the highest being the Blanchardstown-Blakestown ED with a population of 32,288. The average 2006 population per Dublin partnership ED is 3,570. The larger the population within an ED the more that variation amongst that population is masked through the effects of aggregation. As a consequence a small pocket of high deprivation can be masked by the relative wealth of the population surrounding it rendering it invisible in any analysis. Within the 12 Dublin partnerships, the Canals Partnership consists of the lowest number of ED's with a total of 6. The two pilot study areas of Ballyfermot/Chapelizod and Northside partnerships have 8 and 40 ED's respectively (Table 1). The spatial distribution of ED's within the Dublin partnerships is detailed in Figure 1.

2.1.2 Enumeration Areas (EAs)

EA areas constitute the area/workload assigned to each Census enumerator. The geographical extent of each area is limited, restricted on average to 330 households. EA areas

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Figure 1. Dublin Partnership Electoral Divisions (EDs)

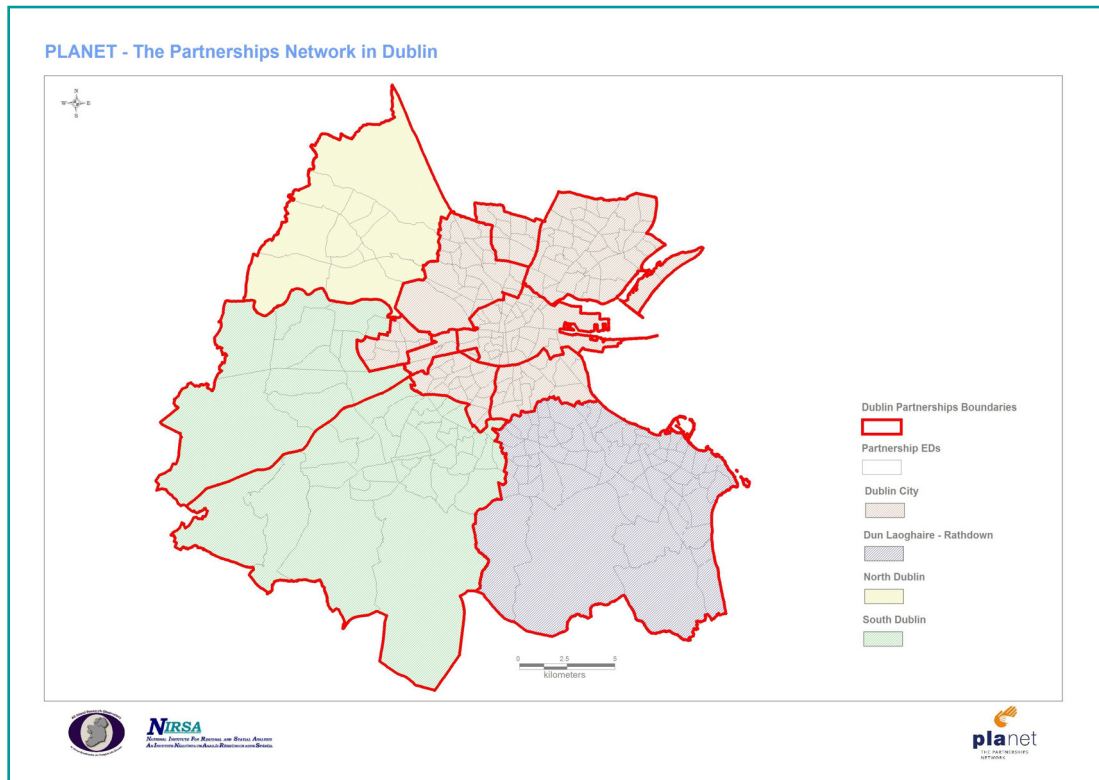
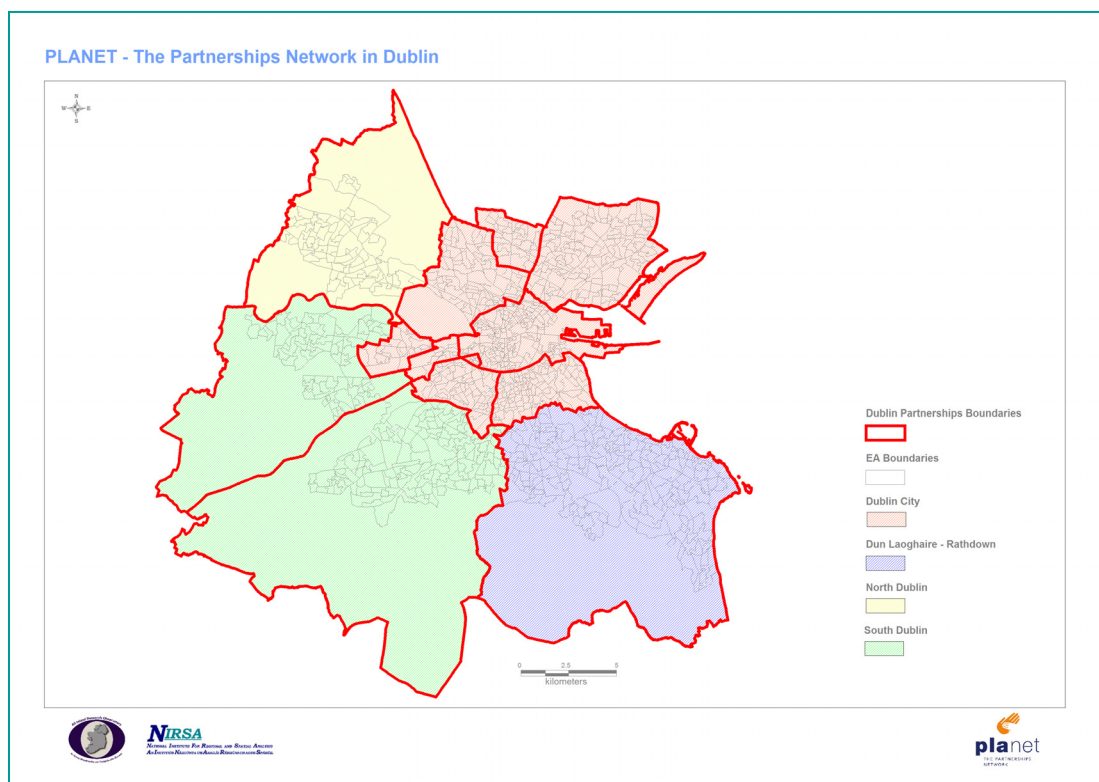


Figure 2. Dublin Partnership Enumerator Areas (EAs)



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therefore present the opportunity to undertake census analysis at a much finer spatial resolution than the ED scale (see Figure 2) and to ameliorate the effects of aggregation on the masking of local variation (Figure 3). EA data are available for both the 2002 and 2006 Census, but only for the five county borough areas of Dublin, Cork, Galway, Limerick and Waterford and their suburbs, which may be located in surrounding counties. There are 1131 EAs within the Dublin partnerships with the average population per EA of 905.

There are however some drawbacks to using EA spatial units. First, there is no ability to undertake a time series analysis as the spatial units are not stable and change over time. The CSO released data for 1131 EA spatial units in 2006 and 1096 in 2002 that had a varying geography. Second, EAs are created independently of ED spatial units and the former do not nest neatly into the latter, therefore there is considerable overlap in some areas. Third, as EAs are only released for county boroughs and suburbs, not all partnerships in Dublin have a complete coverage. Blanchardstown, CPLN, Dodder Valley and Southside Partnerships do not have EAs in their less densely populated peripheral areas (see Figure 2). Despite these issues, given that EAs enable a much finer resolution of analysis for much of Dublin City, it is somewhat surprising that the analysis undertaken presently for partnerships is undertaken at ED as opposed to EA level.

Within the 12 Dublin partnerships, the Canals Partnership has the lowest number of EAs with a total of 18. The two pilot study areas of Ballyfermot/Chapelizod and Northside partnerships have 26 and 136 EAs respectively (Table 1).

2.1.3 Small Areas (SAs)

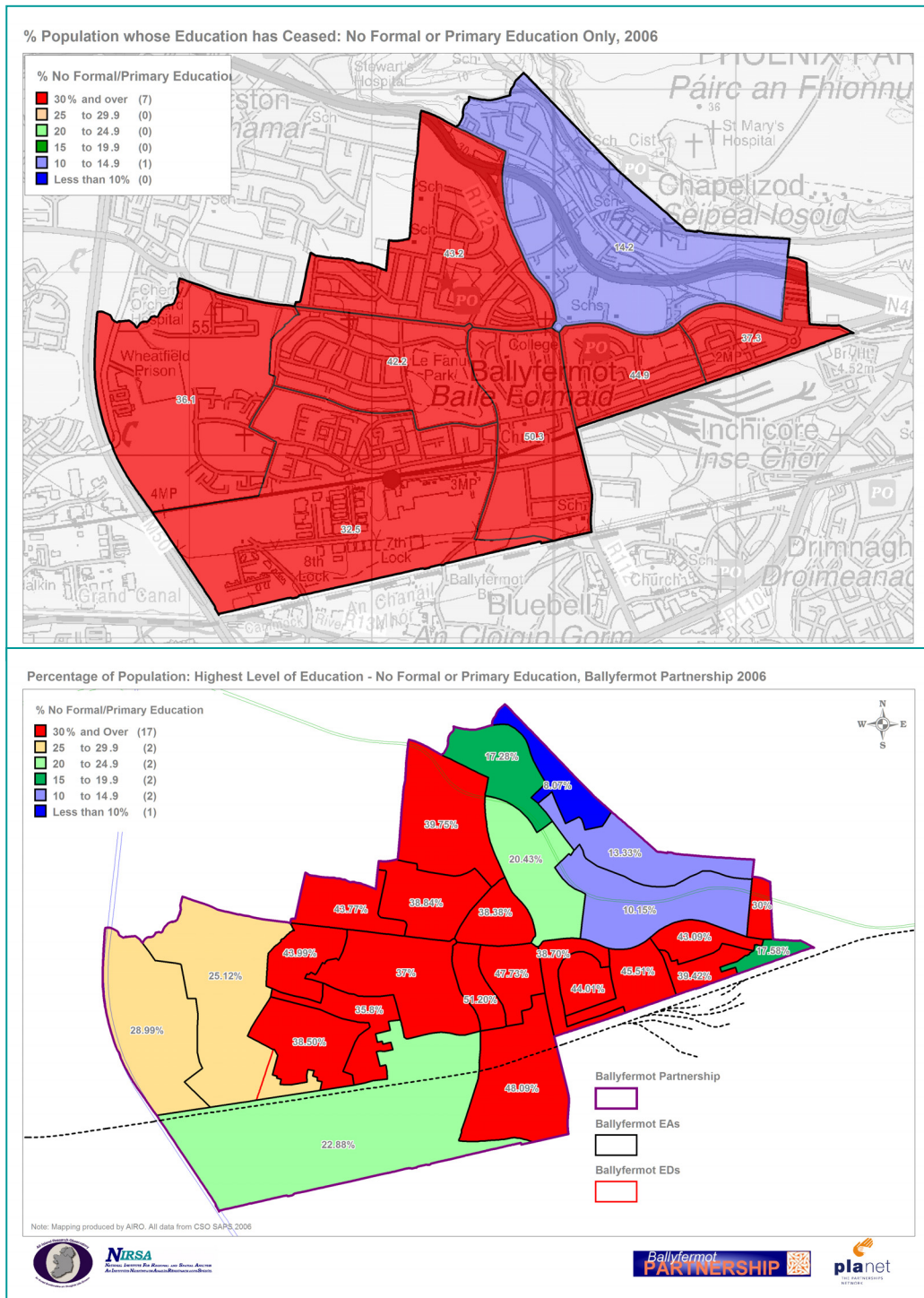
The creation of the new Small Areas has been undertaken by

National Centre for Geocomputation at NUI Maynooth on behalf of Ordnance Survey Ireland (OSi). The aim was to create a new statistical geography for Ireland with a spatial resolution comparable to the finest scales available in many European countries. These new spatial units are subject to certain constraints. First, each Small Area should contain a minimum of 65 households (for the purposes of confidentiality). Second, Small Areas should nest into townland, ED and county boundaries. Third, boundaries should follow natural features such as rivers, major roads, tracks and railways wherever possible. Fourth, boundaries in urban areas should follow land parcel boundaries. There will be approximately 17,000 Small Areas covering the whole country when the boundaries are released for use. This new geography will allow researchers to map census and other data at much higher finer resolution than has been possible to date (see Figure 4). The CSO will be releasing the 2011 Census at the new Small Area level, it is also hoped that the 2006 Census will be back-fitted to these new spatial units. The CSO are presently geocoding the 2006 Census forms in an attempt to achieve this. Once this process is complete a number of checks will undertaken to verify the validity of the aggregations to Small Area units. As yet the CSO do not have a projected release date for this data and it is also unclear whether they will release all census variables at this spatial scale or impose restrictions on the data.

For the purpose of this project the research team were provided access to a beta version of the Small Areas. Table 1 details the increased spatial detail made available with the introduction of the Small Areas. The two pilot study areas of Ballyfermot/Chapelizod and Northside partnerships have 81 and 425 Small Areas respectively, with a proposed average number of households of 100-120 per Small Area.

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Figure 3. Comparing ED and EA outputs



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Figure 4. Dublin Partnerships Small Areas (SAs)

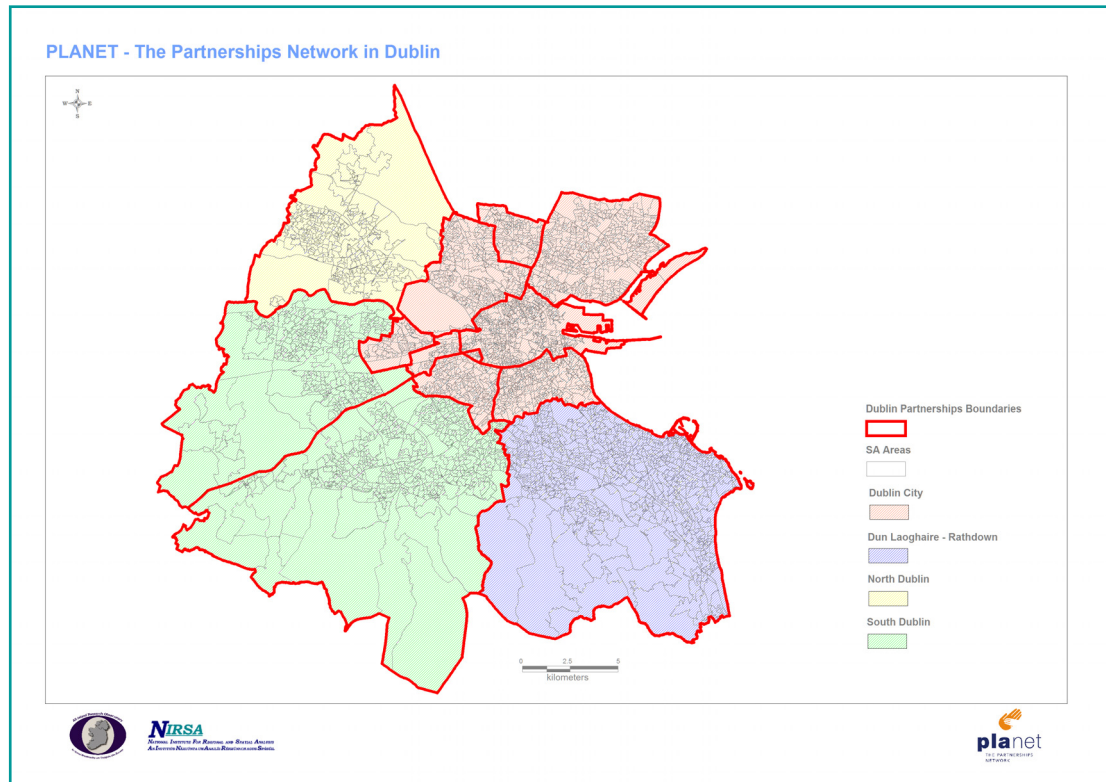


Table 1. Spatial units within Dublin Partnerships

Partnership	Electoral Division	Enumeration Area	Small Area
Ballyfermot/Chapelizod	8	26	81
Ballymun/Whitehall	9	33	106
Blanchardstown	12	77	268
Canals	6	18	53
CPLN	12	75	507
Dublin Inner City	39	172	507
Tolka Area	25	87	282
KWCDT	18	57	183
Northside	40	136	425
Rathmines	17	102	277
Southside	69	194	686
Dodder Valley	37	130	469

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2.2 Availability of Geo-referenced data

Many official datasets that contain information potentially useful for the analysis of social inclusion, such as the Quarterly National Household Survey (QNHS), Labour Force Survey, Survey on Income and Living Conditions, are generally released at a spatial scale less fine than an EDs and provide an indication of trends at county or regional levels only. As a consequence, area-based partnerships are predominantly reliant on census data released at the ED level, collected every five years. This information is provided to each partnership by the administering body of the Local Development and Social Inclusion Programme (LDSIP) through a series of statistical tables and mapped outputs.

The census Small Area Population Statistics (SAPS) disseminated to partnerships provides detailed information on nine sub-themes. Within each theme there are a number of tables detailing the relative strengths and weakness of particular variables across the partnership EDs. The data is provided as both raw figures and in a percentage format. Each ED variable is also contextualised with respect to national, NUTS II regions (BMW, S&E), Dublin County and Dublin City. The majority of the data is provided for 2006 alone, although a number of variables are provided in a time-series manner to enable the tracing of changes from 1996 to 2006 (Table 2). The PLANET partnerships also receive a series of pre-defined maps detailing the spatial distribution of census variables across the partnerships. These maps are at both the partnership and Dublin City scale.

While these maps are useful, many of them have been created using thematic ranges that fit the data distribution for the entire country. While this enables comparison to the national profile, it can also mask local internal variation that becomes apparent

when the same data is mapped at a city or local scale. For example, Figure 5 shows Northside partnership data at ED level mapped in relation to the national profile and to the local profile.

In addition to the census variables released at ED level, the partnerships have access to the Haase and Pratschke Index of Deprivation through the LDSIP administrators. Indexes of deprivation seek to provide a standardised scale measure, composed of multiple variables, designed to highlight overall levels of deprivation in an area. The Haase and Pratschke index provides an analysis of changes in deprivation in Ireland from 1991 to 2006. Using ED census data the index is based on three dimensions of affluence/disadvantage:

- demographic profile
- social class composition
- labour market situation

Absolute and relative deprivation scores are available. The absolute score tracks the overall change in deprivation score from 1991 to 2006. Unsurprisingly the score has increased in most areas due to the significant improvements in the Irish economic situation between the 1991 and 2006 census. The relative score shows the position of any ED relative to all other ED's for each particular time period and is useful for understanding how neighbouring areas are faring with respect to each other. The ED deprivation scores at each particular census are rescaled to have a mean of zero and a standard deviation of ten. For ease of analysis and for descriptive purposes the relative scores are broken down into eight categories:

- Extremely Affluent

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- Very Affluent
- Affluent
- Marginally above average
- Marginally below average
- Disadvantaged
- Very Disadvantaged
- Extremely disadvantaged

More recently the Haase and Pratschke Index of Deprivation has been extended to EA level using a combined ED and EA dataset for 2006^[5].

The Small Area Health Research Unit (SAHRU) at Trinity College Dublin also produce a national deprivation index at ED level for 2002 and more recently for 2006. This index is intended to reflect material (not social) deprivation. Using the complete set of EDs for 2002 or 2006 the index ranks each ED on a relative decile scale with an index value of 10 representing the most deprived and 1 being the least deprived. The SAHRU index is calculated using a formula with the following inputs:

- proportion of economically active population (15 years or older) unemployed or seeking a first time job;
- proportion of population (social classes 1 to 6) in social class 5 or 6;
- proportion of permanent households with no car;
- proportion of permanent private households rented from a local authority, or in the process of being acquired from a local authority.

Also available, though not presently utilised in their analysis of social inclusion by partnerships, is the Place of Work Census of Anonymised Records (POWCAR).

^[5] The Changing Face of Dublin's Inner City

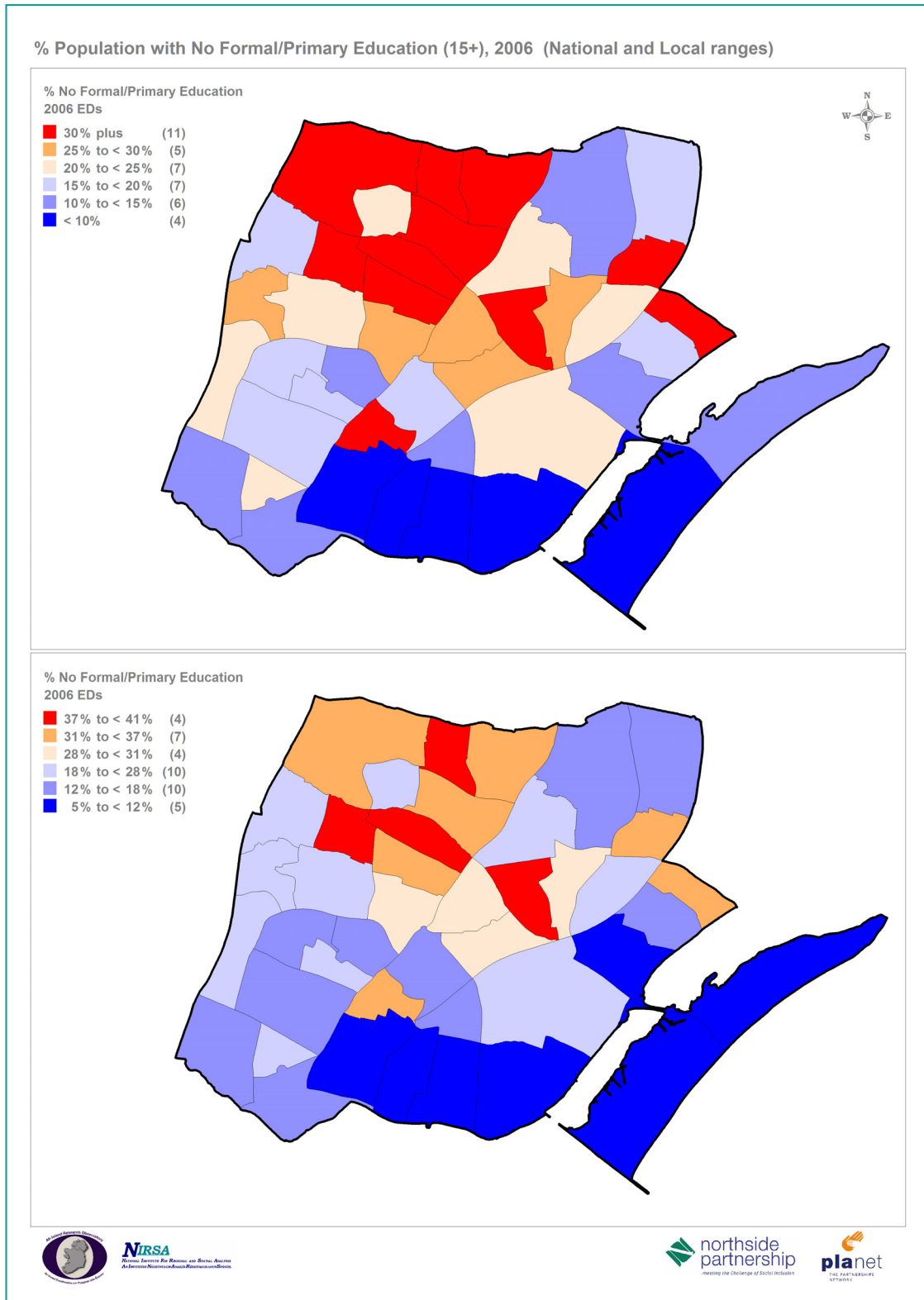
POWCAR provides detailed records relating to persons at work for the whole country for 2002 (15% sample) and 2006 (full sample) and are available through the CSO subject to permission. The availability of data on both the residential address and workplace address allows a detailed and sophisticated level of analysis to be undertaken (Figure 6). The dataset contains details on the following:

- Residence (ED and EA level)
- Number of residents per household
- Household composition (single person, lone parent w/out children, couples w/out children)
- Type of Accommodation
- Year household accommodation was built
- Nature of occupancy
- Number of cars available
- Sex
- Age (5 year age bands)
- Marital Status
- Highest level of Education
- Socio-economic Group
- Industrial Group
- Means of Travel
- Time of departure
- Journey to work (KM)
- Place of Work (ED, EA, 250M grid cell)

An analysis of this dataset can provide partnerships with a detailed profile of the work interactions of its community. For example, it can answer important questions on both the destination of the local workforce and also the level of local community access to locally based jobs, including:

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Figure 5. ED mapping using national and local data ranges



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Figure 6. POWCAR Work Interactions

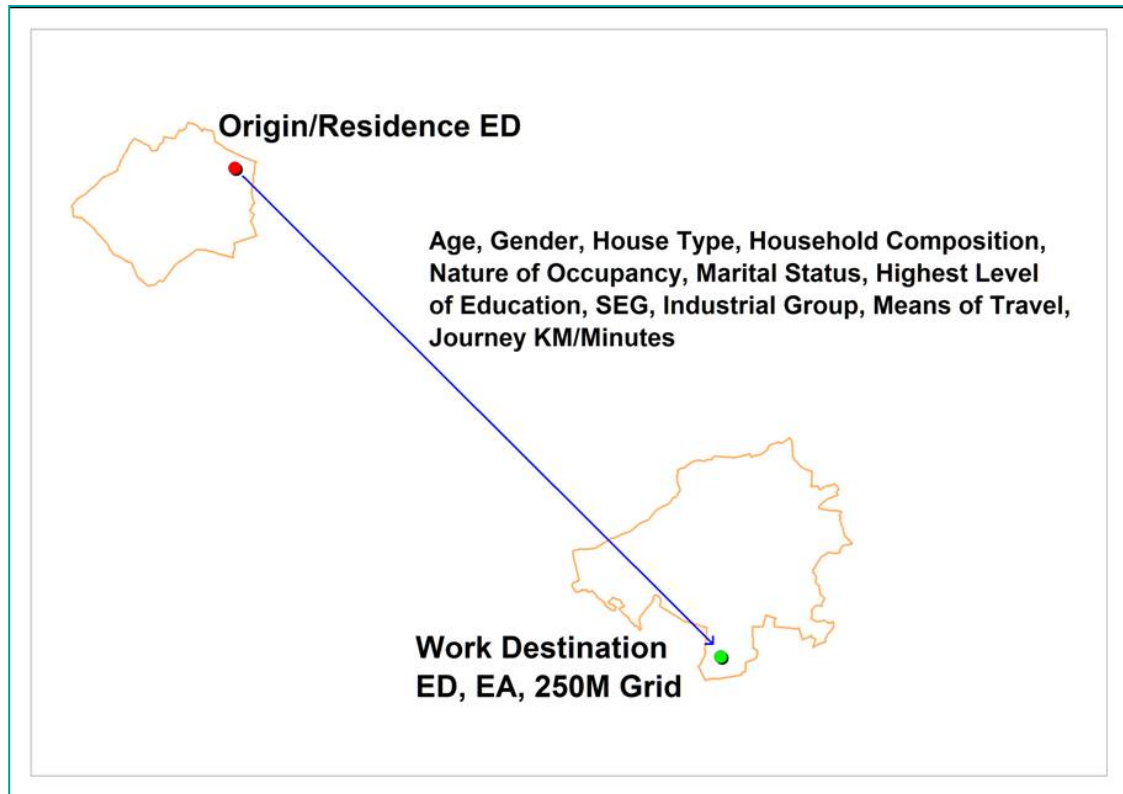


Table 2. Currently Available Census Data

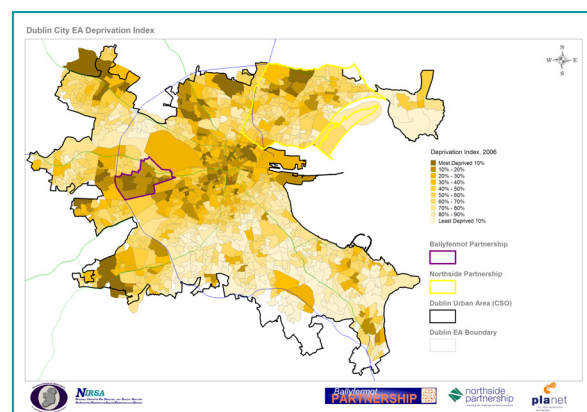
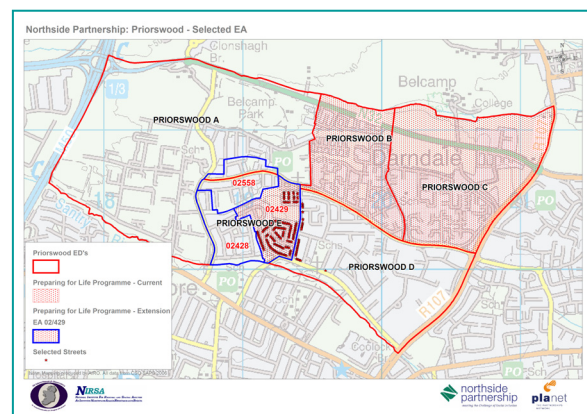
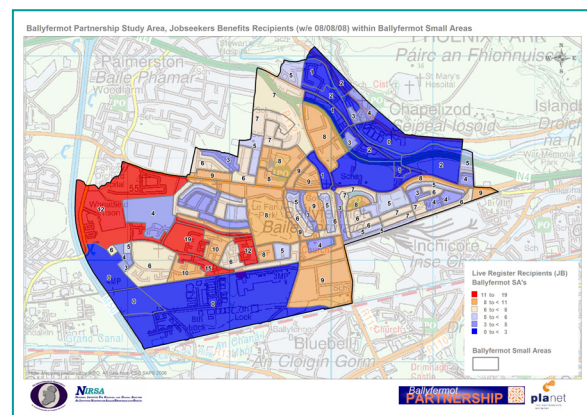
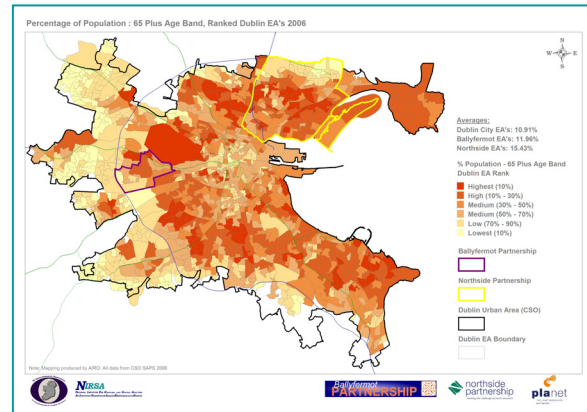
Census Data Theme	Number of Tables	Time Series '96-'06
Total Population	5	2
Age Structure	10	2
Household Structure	9	0
Education	9	0
Social Class	3	0
Economic Status/Employment	8	2
Nature of Employment/Unemployment	10	2
Travel to Work, School or College	9	0
Disability	1	0

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- What are the main employment locations for a partnership's residents within the partnership and surrounding areas?
- Are these employment locations serviced by the local community or external commuters?
- How accessible are employment locations to the local community?
- Are certain areas of the partnership more dependent on a specific type of employment?

In addition to census derived data most Local Authorities in Ireland have a geocoded inventory of public facility data. Such data can be used to calculate the level of access for populations within partnership areas to key services such as GP's, primary schools, secondary schools, post offices, supermarkets, accident and emergency units, social security offices, training and employment agencies, and many other facilities. For example, Table 3 details the geocoded public facility services that are currently available through the Dublin City public facility database. Access to services data is often used in European indices of deprivation, but at present such data is not used to assess social inclusion within Ireland.

Extracts for the Live Register at the individual office level (e.g., Ballyfermot local social welfare office) are available to those interested in monitoring social inclusion indicators on a weekly and monthly basis and provide details on the numbers in receipt of social welfare payments. This data provides an indication of the welfare trends within an area, but there is however no specific catchments assigned to individual social welfare offices. For instance, extracts from the Ballyfermot local office do not just relate to those residing in the Ballyfermot/Chapelizod Partnership area but can also include persons residing in other partnerships such as CPLN. As a result, mapping such data with any accuracy is difficult.



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Table 3. Dublin City Public Facility Database[6]

Category	# of Classes	Total	Ballyfermot	Northside
Education	9	914	120	192
Sport	17	1854	91	530
Recreation	3	284	19	45
Transport (Train only)	1	107	1	5
Health	14	597	30	131
Local Government	7	105	9	8
Government and Legal	10	176	6	7
Business and Professional Services	4	128	3	28
Churches	11	124	6	24
Libraries	3	70	2	15
Citizen Information	1	68	7	7
Bring Centres	1	107	6	31
Community	11	314	25	30
Residential	1	49	0	2
Arts and Entertainment	7	102	0	2

[6] The # of classes relates to the number of sub-categories. For instance, Education is sub-divided to represent Childcare, Primary Schools and Primary Gaelscoil, Secondary Schools, Third level, Community/Technical Schools, Private Colleges, Crèches and Special Needs schools.

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3. Improving the Evidence Base – The Pilot Project

The overall objective of the pilot project was to explore ways to improve the evidence base of the area-based partnerships in six main respects:

1. to increase the spatial resolution of analysis;
2. to make available data and analysis little used with respect to deprivation;
3. to utilise new forms of analysis;
4. to generate and analyse new kinds of spatial data;
5. to examine ways to make the data and outputs easily available to a non-expert audience;
6. to illustrate the utility of an improved evidence base.

To that end the project was divided into four phases, each examining one or more of these objectives:

1. Creating a census atlas of Dublin at ED and EA scales
2. Using POWCAR data to examine labour markets
3. Examining deprivation indices and access to services
4. Utilising the Small Areas to examine geo-coded welfare data

Each of these phases involved fundamental research into the nature of the data and issue at hand, followed by a case study applying and testing the knowledge gained with respect to the pilot areas of Ballyfermot/Chapelizod and Northside partnerships.

3.1 Creating a census atlas of Dublin at ED and EA scales

The partnerships already receive census maps of their areas at ED level standardised against the national average. The project sought to supplement this analysis in four respects. First, by providing a set of ED level maps for both Dublin as a whole and for each of the two pilot areas standardised against the Dublin city as a whole to complement those standardised against the national profile. Second, to do this for the 1991, 1996, 2002 and 2006 censuses to enable a time-series comparison for these years. Third, by mapping a number of variables related to social inclusion at EA level for both Dublin and the two pilot areas. Fourth, to make all these data available via an online mapping facility that would enable non-expert users to be able to study and interact with the data.

In the context of delineating and comparing social deprivation in Dublin city it is useful to standardise the data with respect to the city and not simply the national average. Taking this approach enables a relative analysis of census variables across the city, without the masking that occurs using a national standard that places many areas in the same classes despite having a profile often quite different to their neighbours (see Figure 5). As a consequence we have reproduced the maps provided to the partnerships by LDSIP using a Dublin standard for 1991, 1996, 2002 and 2006 for 80 census variables and made accessible through Instant Atlas (see below and Table 4).

As already noted, analysis at the EA scale provides a much more detailed spatial resolution of the trends at a local community level. Census ED maps for Ballyfermot plot the data into 8 EDs. Mapping the same data into EAs means

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Figure 7. EA Mapping for Partnership Areas

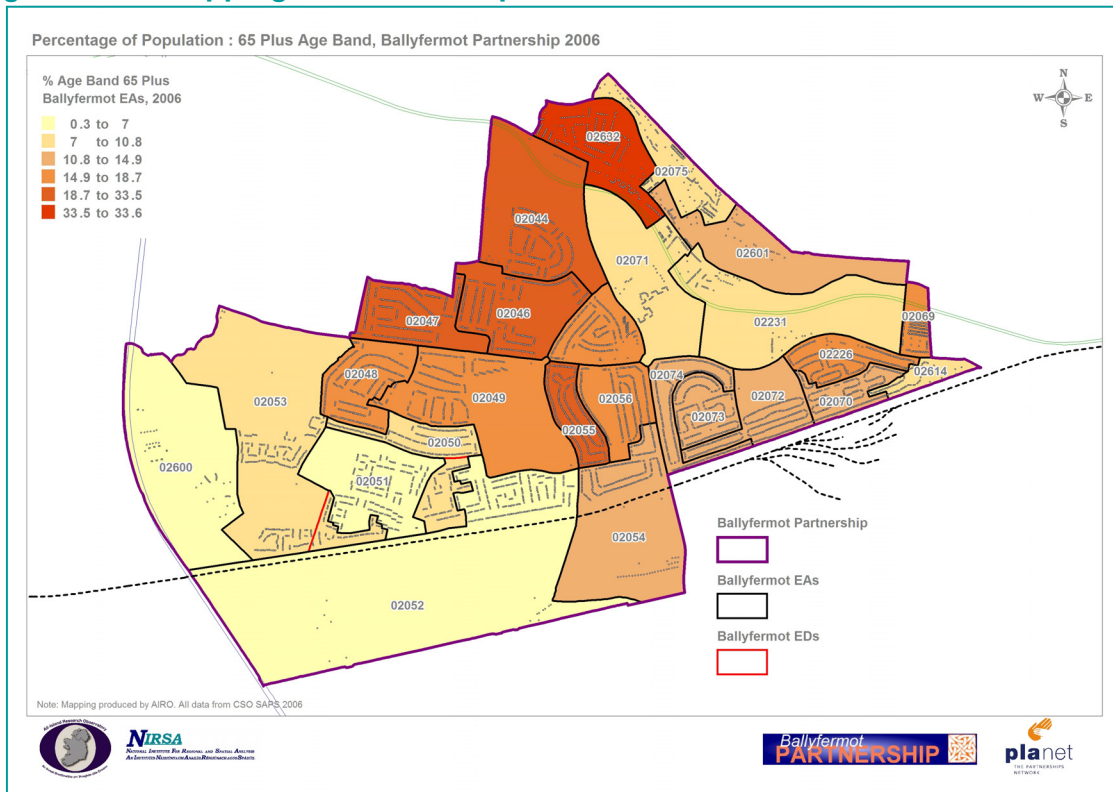
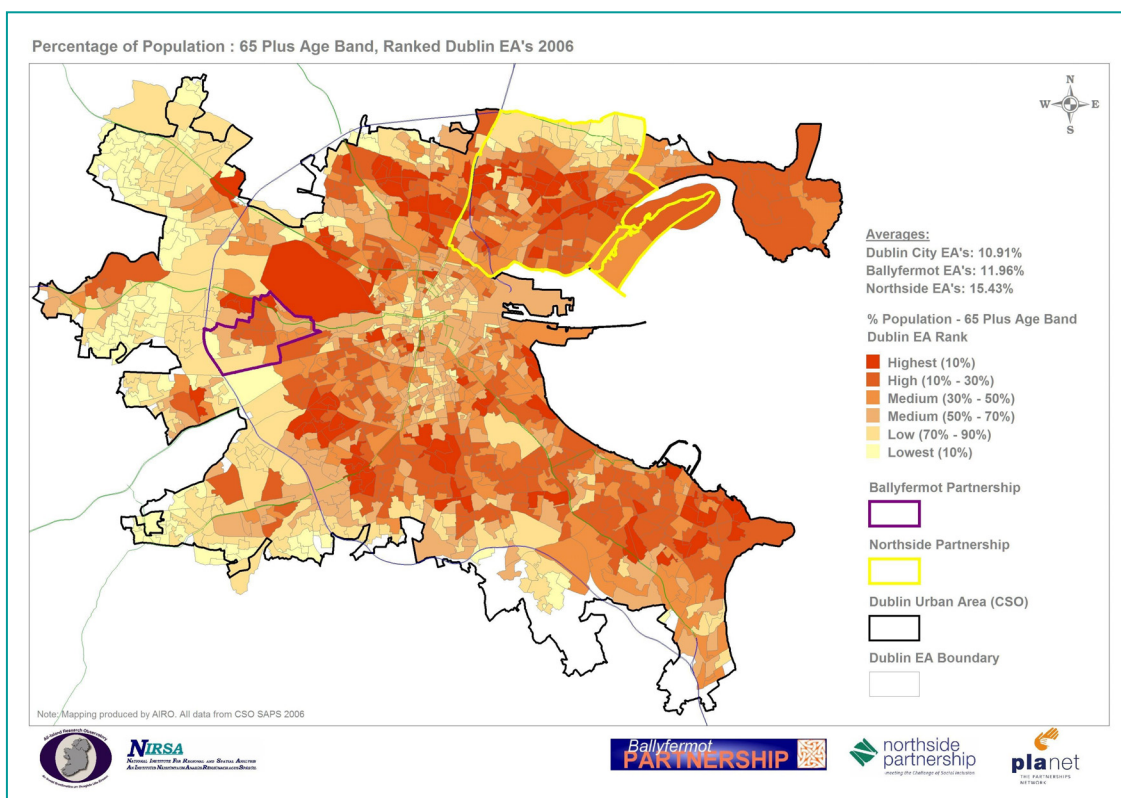


Figure 8. City EA Mapping



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plotting the same data into 26 spatial units. Likewise, EA mapping for Northside Partnership increases the spatial resolution from 40 EDs to 136 EAs. We have produced maps for the same 80 census variables for 2006 only for the two partnership areas and made them available through Instant Atlas (see Table 4). In addition, we created city level maps for 12 variables with particular resonance to deprivation:

- Population Density
- % Population 0-14 Age Band
- % Population 65+ Age Band
- Age Dependency Ratio
- Unemployment Rate (Total, Male and Female)
- Highest level of Education (No Formal/Primary)
- Car Ownership levels
- % Socio-Economic Group: skilled and unskilled
- Housing Tenure: Buying or Renting from LA
- Social Class: skilled and unskilled

Each partnership map has been divided into 6 class intervals based on natural breaks within the data distribution^[7]. This provides an output that represents that data within the partnership alone (see Figure 7). Each map also contains a tag for individual EAs, this tag is a look-up for an accompanying database containing all the relevant EA SAPS data for each partnership. The city mapping is produced using a different thematic grouping method designed to reveal the relative position of an area on a fixed scale. Each EA is ranked and thematically mapped using a predefined scale - the highest 10% of EAs, the lowest 10% of EAs and 4 intermediate groups each representing 20% of the EAs (see Figure 8).

While static census maps are useful to partnerships one of the prime objectives of the pilot project was to explore ways of

making data more accessible and interactive. To that end, the project team evaluated a number of online mapping packages and selected Instant Atlas for the purpose of demonstrating the utility of this approach. Essentially, Instant Atlas, developed by GeoWise, is an online GIS (Geographic Information System) that maps statistical data and has an easy to use interface. Its inputs are relatively straightforward - geographical boundary sets (EDs, EAs or Small Areas) and a database of accompanying statistical data. The software allows users to select the specific variable of interest and thematically map it into the boundary set chosen. Users can also select and compare different EDs/EAs/Small Areas within an area, monitor change over a number of different time periods, and produce a user defined map for inclusion in reports and publications (Figure 9).

For the purposes of the pilot project two interactive censuses were produced, one for Ballyfermot and one for Northside Partnerships. Over 80 individual Census variables were uploaded into Instant Atlas for both partnerships. These variables are available for the 1991, 1996, 2002 and 2006 Census at the ED scale, and the 2006 census for the EA scale (see Table 4).

^[7] A natural break classification uses a statistical formula (Jenks optimization) to calculate classes of data based on distribution of data values wherein it seeks to reduce variance within classes and maximize variance between classes. In other words, it seeks to put data that is most like each other in the same data class.

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Figure 9. ED Mapping for Partnership Areas

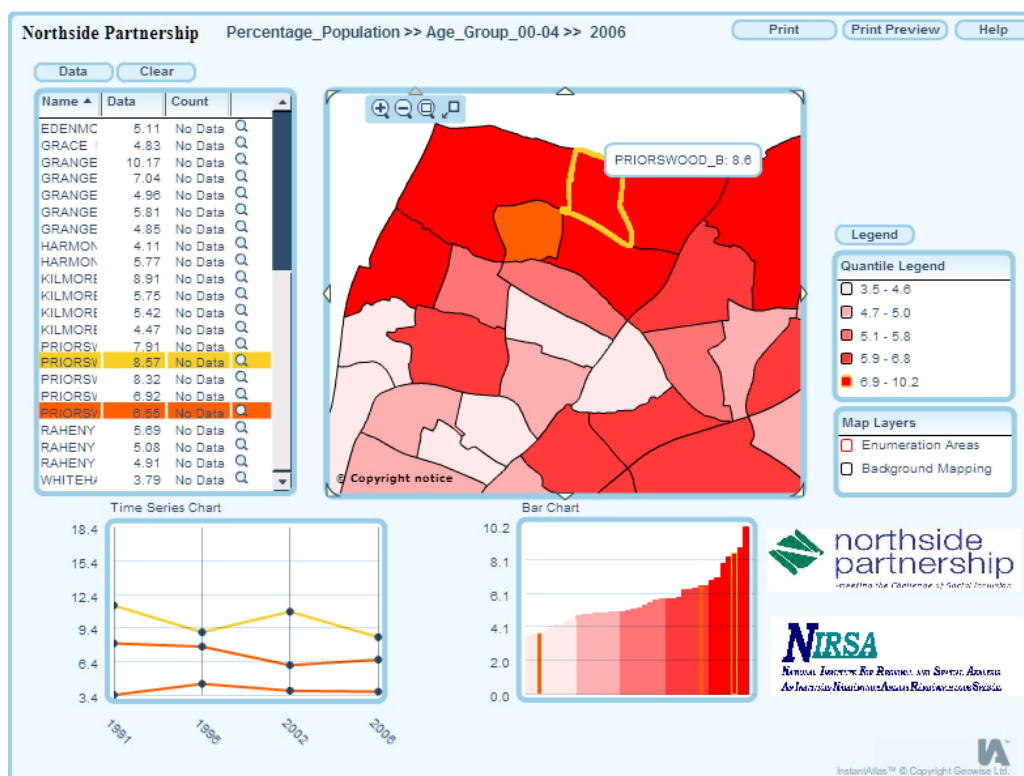


Table 4: Partnership Census data at ED and EA level – 91,96,02 and 06

Theme	# of Variables	ED Year	EA Year
Population (raw)	21	1991,1996,2002,2006	2006
Population (percentages)	21	1991,1996,2002,2006	2006
Economic Status (raw)	9	1991,1996,2002,2006	2006
Economic Status (percentages)	9	1991,1996,2002,2006	2006
Education (raw)	10	1991,1996,2002,2006	2006
Education (percentages)	10	1991,1996,2002,2006	2006
Social Class (raw)	8	1991,1996,2002,2006	2006
Social Class (percentages)	8	1991,1996,2002,2006	2006
Socio-Economic Group (raw)	24	1991,1996,2002,2006	2006
Socio-Economic Group (percentages)	24	1991,1996,2002,2006	2006
Housing Tenure (raw)	4	1991,1996,2002,2006	2006
Housing Tenure (percentages)	4	1991,1996,2002,2006	2006
Car Ownership (raw)	5	1991,1996,2002,2006	2006
Car Ownership (percentages)	5	1991,1996,2002,2006	2006

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Case Study 1: Enumerator Area Analysis in Northside Partnership

The case study was designed to highlight the utility of conducting analysis at the EA scale, as opposed to ED scale, and focused on the 'Preparing for Life Programme' in Northside Partnership. The Northside Preparing for Life Programme (PFL) is an early intervention plan that focuses on outcomes for children by providing additional support to parents, so they can bring up children who will be more prepared for school by the time they reach 5 years of age. The PFL works by recruiting families into the programme who are expecting children or who have children aged 0-5. It was felt that over half the children in disadvantaged areas in North Dublin were not ready to start school by the age of five, and many of these children were from one-parent families, many of whom had left school by the age of 12. The PFL is a 5-year programme supporting families with children from pregnancy to school-going age, where the main activities are to promote child development and effective parenting. The Programme was developed in March 2004, and was formed by a group comprising parents, local policy makers, managers, practitioners and researchers. It is jointly funded by Atlantic Philanthropies and the Office of the Minister for Children, and is managed by the Northside Partnership.

The original roll-out of the programme was in the ED's of Priorswood B and C (see Figure 10). At the end of 2008, the PFL Programme had only recruited 100 families of its target of 200. It was felt by the project team that an expansion into nearby areas would help with recruiting the extra 100 families. It was proposed to expand the programme into Priorswood D and Priorswood E (see Figure 10). In order to do so an expert panel, representing the programme funder, required a demographic analysis of the proposed areas to demonstrate

that the proposed EDs had similar social deprivation characteristics to the existing area. This would be determined by analysing a series of data from the 2006 Census:

- Unemployment Rates
- Lone Parents
- Highest Level of Education: No Formal or Primary

By examining the Census 2006 ED data, the expert panel were satisfied to include Priorswood D. However, they felt that Priorswood E had a different demography, particularly in terms of unemployment and lone parents and was therefore excluded from the programme (see Figure 11). This exclusion ran counter to the in-depth street level knowledge of partnership workers who felt that many parts of Priorswood E suffered from poor levels of social inclusion similar to Priorswood B, C and D. In particular, the team felt the area around the following streets were particularly deprived: Glin Avenue, Glin Drive, Glin Park, Glin Road, Glin Close, and Greencastle Road (within EA 02/429). Examining socio-economic census data at the EA scale for the Priorswood area does in fact reveal that these streets are significantly more disadvantaged than other parts of Priorswood E and meet the required profile for the PLF (see Figure 12). In effect, this pocket of deprivation, visible at the EA scale, had been masked by an averaging effect at the ED scale.

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Figure 10: Preparing for Life Programme, Original and Proposed Extension of Study Area

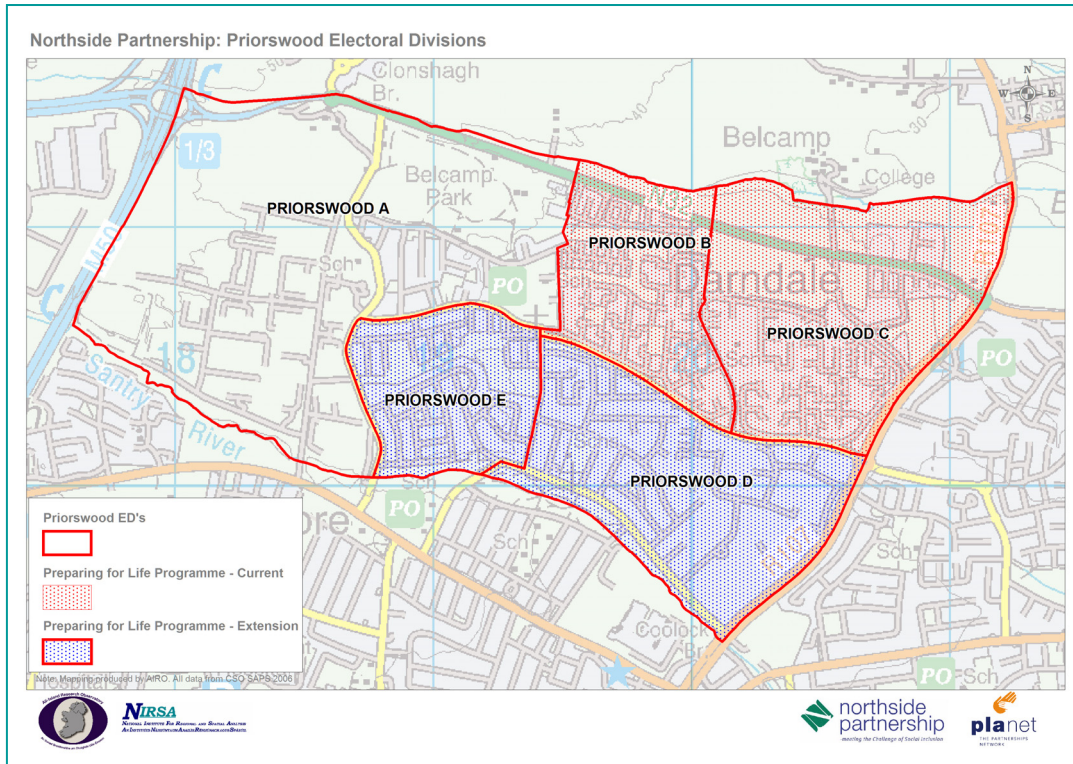
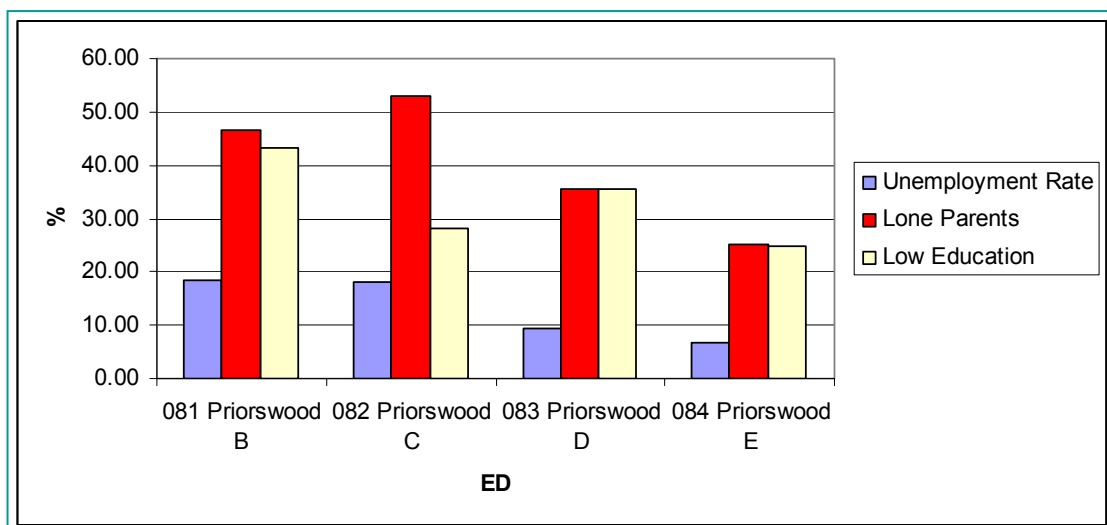


Figure 11. Preparing for Life Programme – Census Variables at ED level



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Figure 12: Preparing for Life Programme – Census Variables at ED and EA level

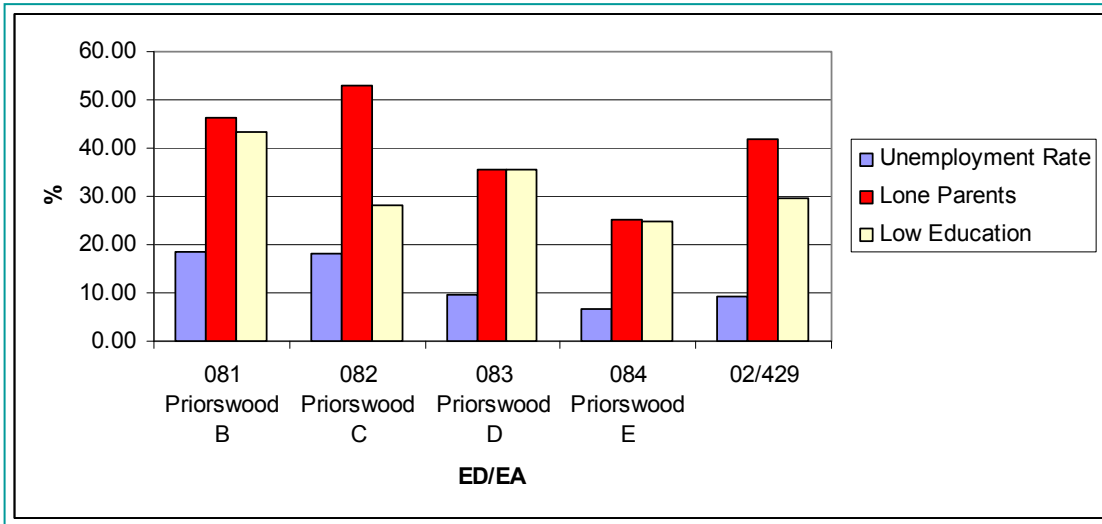
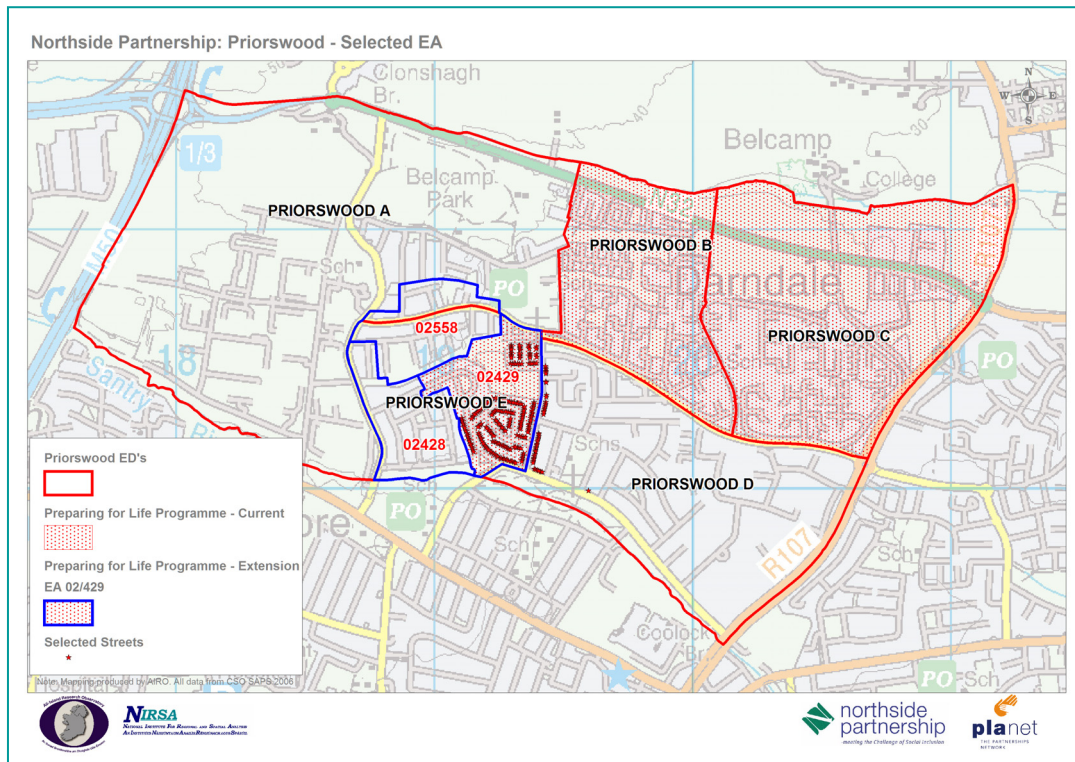


Figure 13. Preparing for Life Programme, Original and Proposed Extension of Study Area



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3.2 Using the POWCAR data to examine labour markets

A key aspect of deprivation is access to waged employment. To date there has been little spatial analysis in Ireland of access to work at highly localised scales and partnerships have not been provided with such data. The pilot project sought to rectify this situation using the Place of Work Census of Anonymised Records (POWCAR), undertaking an analysis of travel to work patterns for those 'at work' within both partnerships.

The POWCAR raw dataset is very detailed and contains in excess of 1.8 million records which can be simplified to provide aggregate ED to ED/EA interactions, along with associated data (e.g. socio-economic group, industrial group, means of travel, time of departure, age group and highest level of education). The pilot project created two excel databases focusing on the travel to work interactions for the population living and working in each partnership. Essentially the databases reveal where people living within the partnership EDs worked and where people working within partnership EDs lived. Using this data a series of ED maps were created detailing the commuting patterns for each partnership, tailoring the analysis to focus on particular groups within the workforce or the mode of transport used and so on.

For example, Figures 14 and 15 detail the work destination of Northside workers who are living in Clontarf West D and Priorswood B EDs. The two maps show a very different spatial distribution with workers in Clontarf West D having a higher concentration within the city centre and Priorswood B having a higher distribution within the north of the partnership area. Figure 16 highlights the widespread distribution of Ballyfermot

workers who use private transport (car, car passenger) as the main mode of transport to work. In contrast, Figure 17 highlights the narrow spatial pattern of workers using the public transport system.

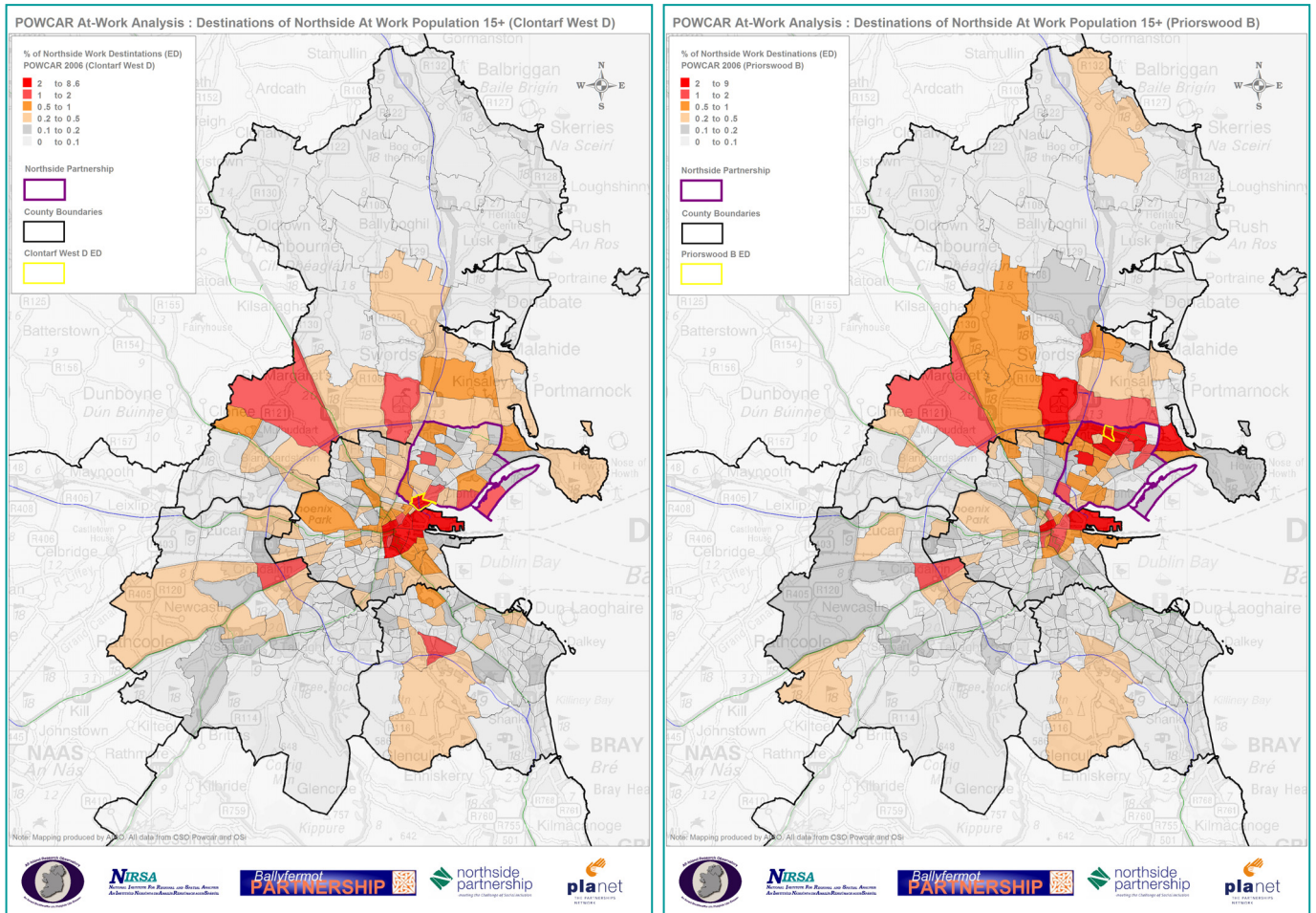
Case Study 2: POWCAR analysis in Ballyfermot – Public Transport Access to Blanchardstown and Muhuddart Job Pools

The POWCAR case study focused on analysing the work destinations of the population living within Ballyfermot/Chapelizod Partnership and in particular their level of access to the large labour pools of Liffey Valley Shopping Centre and Blanchardstown Shopping Centre/Mulhuddart Industrial Park. Both locations are outside the Ballyfermot/Chapelizod Partnership area but are regarded as having significant employment potential for the Ballyfermot community given their geographic proximity. Although Liffey Valley is well served with public transport from the Ballyfermot area it was felt within the partnership that the lack of adequate direct public transport to the Blanchardstown area was acting as a barrier to employment opportunities. There was, however, little evidence available to support this view.

By utilising the POWCAR dataset it was possible to map the destinations of all Ballyfermot workers. This distribution was then filtered to focus attention on the destinations within the Liffey Valley and Blanchardstown areas. Figure 18 details the location of all workers who are employed within Liffey Valley across Dublin City. The majority of workers live within the surrounding areas of Clondalkin, Lucan, Palmerstown and Ballyfermot. In excess of 220 Liffey Valley workers reside

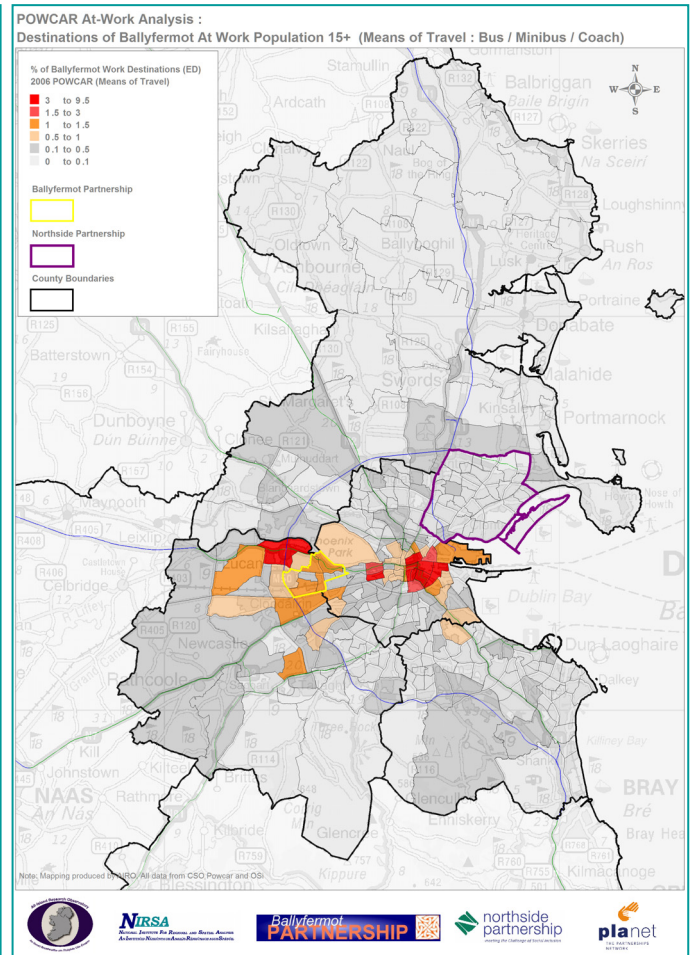
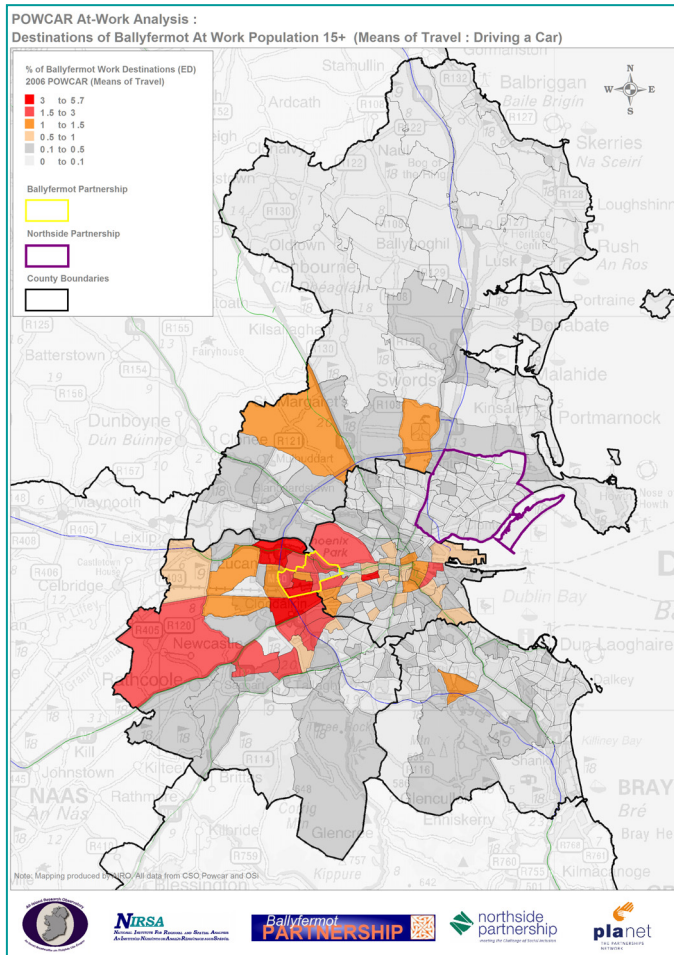
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Figure 14 and 15: Clontarf West 'D' and Priorswood 'B' Work destinations, POWCAR 2006



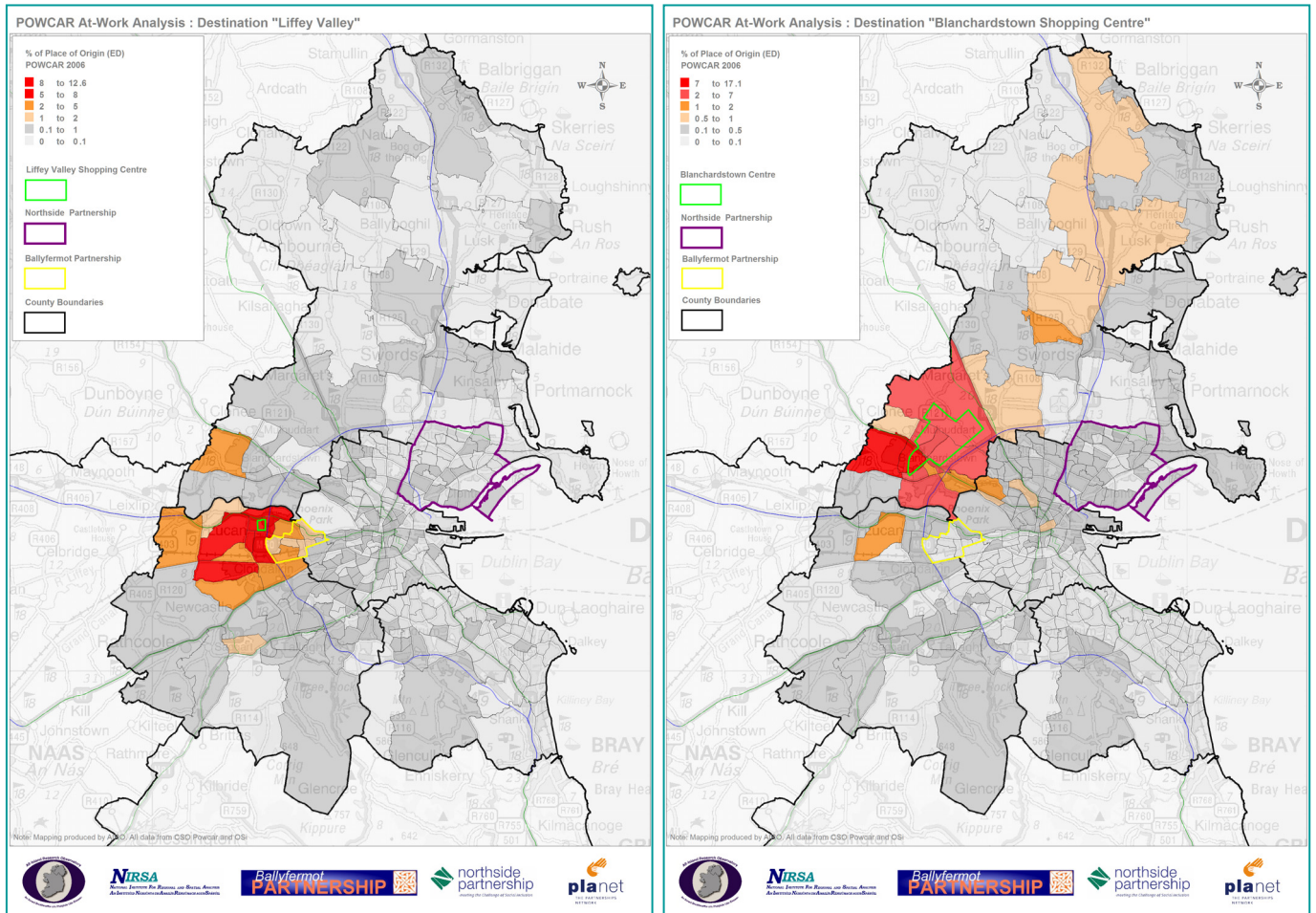
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Figure 16 and 17: Ballyfermot Travel to Work patterns (Private v Public),
POWCAR 2006



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Figure 18 and 19: Origin of Workforce in Liffey Valley and Blanchardstown/Mulhuddart Industrial Park



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within the Ballyfermot/Chapelizod Partnership area. Of these, 47% use public transport as their main mode of transport to work and 42% use private transport. Figure 19 highlights the spatial distribution of the home location of the Blanchardstown study area workers across the city. Again the majority of workers reside in the surrounding areas, although only a small number (85) reside in the Ballyfermot/Chapelizod Partnership area. Of these, only 11% use public transport as their main mode of transport to work, with in excess of 80% being dependent in private transport. Clearly, the evidence demonstrates that a lack of frequent, direct public transport to Blanchardstown from Ballyfermot is acting as a significant barrier to employment.

3.3 Examining deprivation indices and access to services

At present the partnerships receive Haase and Pratschke Index of Deprivation at ED and ED/EA scale. The project sought to add to this information in three main ways.

First, the SAHRU Index was extended to the EA scale. Following a broadly similar methodology to that used for the SAHRU Index the project mapped this decile index for all Dublin EAs (Figure 20). As with the Haase and Pratschke index, producing the SAHRU index at this scale negates some of the effects of averaging evident at the ED scale, revealing pockets of deprivation that would have otherwise been hidden.

Second, we examined deprivation indices used by other countries, and in particular Northern Ireland, England, Scotland and Wales, to see if it was possible to extend them to Ireland. Whilst there are many similarities between the Haase and

Pratschke and SAHRU Index and the indices used in the UK, notably the use of similar census variables, there are also a number of differences (see Table 5). These differences are principally the use of non-census data such as incidence of crime (e.g., violent crimes, drugs offences, etc), employment/unemployment and benefit data (e.g. levels of income support, disability benefit, etc) and access to services (e.g. distance to primary schools, GPs, supermarkets, etc). The lack of geocoded data in Ireland, extremely varied and sub-standard levels of address collection within government agencies, and the subsequent inability to quickly and accurately geo-code such address information, means that it is presently difficult to include any non-census variables in any index of deprivation or even use them individually as measures of social inclusion.

Third, to try and provide some access to services data that might be used to construct a new deprivation index we calculated and mapped access to key public services using the Dublin City public facility database on a city and partnership scale (see Table 3).

Case Study 3: Access to Public Services

To date there has been little analysis of geographical access to services at either a local or national level due to the lack of geocoded data. This lack of data relates to both the siting of facilities and workplaces but also residential addresses. In theory since the release of An Post/GeoDirectory it has been possible to map precisely the location of every residential and commercial property in Ireland. In practice, this is difficult to

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Figure 20: SAHRU Deprivation Index at EA Level

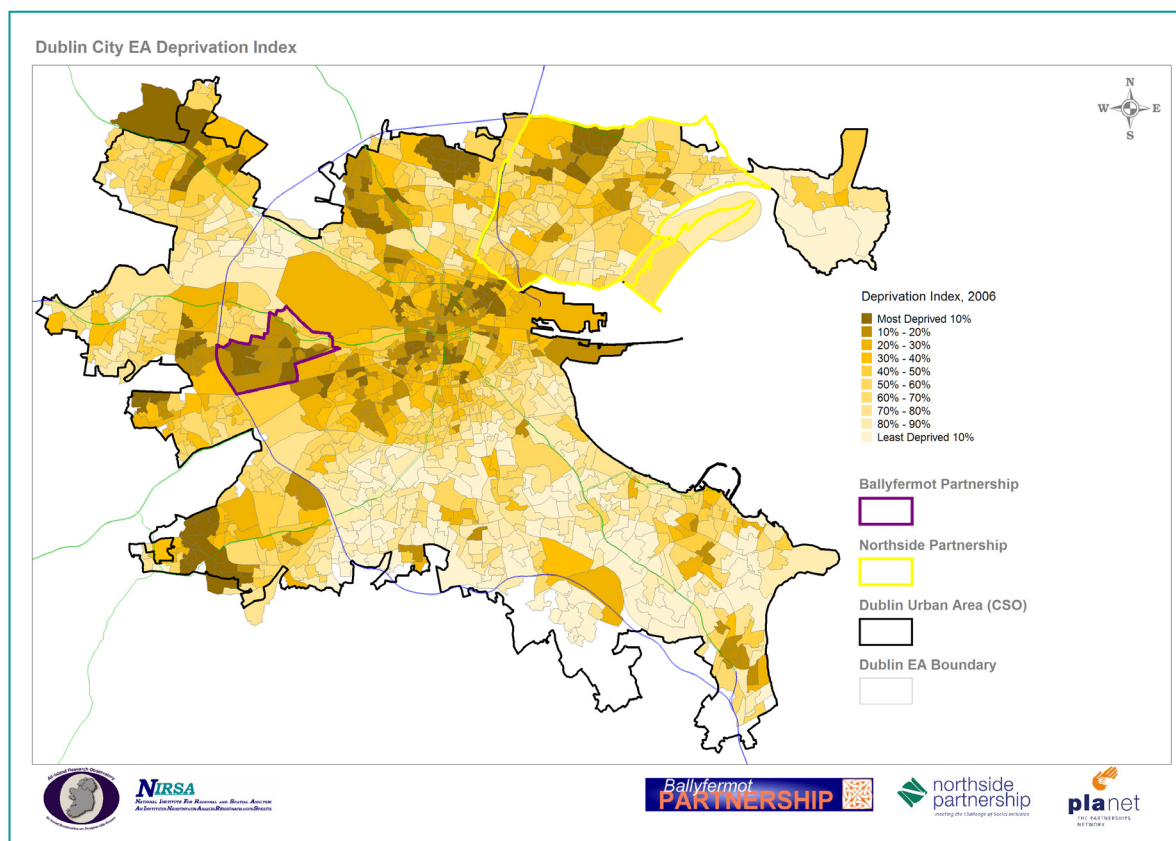


Table 5. Deprivation Index variables in Ireland and the UK

Rep of Ireland		Northern Ireland	Scotland	Wales	England
Hasse&Pratsche	SAHRU				
Demographic Decline (4)	Unemployment (1)	Income (4)	Income (5)	Income (5)	Income (2)
Social Class Disadvantage (3)	Low Social Class (1)	Employment (3)	Employment (4)	Employment (4)	Employment (4)
Labour Market Deprivation (3)	No Car (1)	Health (5)	Health (7)	Health (4)	Health (4)
	Rented Accommodation (1)	Education, Skills and Training (6)	Education (5)	Education, Skills and Training (4)	Education (4)
		Proximity to Services (8)	Access to Services (8)	Access to Services (4)	Access to Services (4)
		Housing (3)	Housing (2)	Housing (3)	Living Environment (4)
		Social Environment (8)	Crime (5)		Crime (4)

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achieve due to an address matching issue. Put simply, due to issues such as non-unique addressing, while we might know the location of a property we do not necessarily know its identity. As a result, creating a map of all GPs, schools, garda stations, libraries, and so on, for Ireland is not a simple exercise and involves a substantial amount of data preparation. In the case of this project, the address matching work for public facilities had already been undertaken by Dublin City Council and their database was made available to the project team. The team also had access to the full Geodirectory database and the NAVTEC roads database and thus the residential addresses across the Dublin region and their position on the road network.

A variety of different techniques can be used to measure basic accessibility to key services such as:

- road distance (from geographical unit centroid) to nearest facility
- road distance (from every residential address point) to nearest facility
- Euclidean (crow flight) distance to nearest facility
- public transport distance/time to nearest facility

In this case, two separate techniques were used. At the Dublin scale, levels of access were calculated using the Euclidean distance (as the crow flies) from each residential address point to the nearest service. At the partnership scale a more detailed network analysis was undertaken, each residential address was linked to the nearest node on the road network and the network distance was calculated to the nearest public facility (GP, school etc)

The result was a set of maps detailing the spatial distribution of

a number of services across the study area (see Figure 21 for the location of GP's, secondary schools and primary schools) and an accessibility surface indicating relative ease of access in distance terms to key services (see Figure 22). An individual partnership analysis was then undertaken to determine which areas had good or bad access to services (see Figure 23).

3.4 Utilising the Small Areas to examine geo-coded welfare data

Government departments routinely collect data about their work and the constituents they serve. Much of these data are potentially of use in the monitoring of social inclusion including welfare, health, education, and housing data. However this information is generally poorly geocoded and typically only made available at a national, regional, or county levels. One of the primary objectives of the pilot study was to encourage government departments to make such datasets available for analysis at the EA and Small Area level in order to highlight the data's utility with regards to their own work and policy formulation, but also the wider social inclusion agenda. This is also essential work if Ireland is to become compliant with the EU INSPIRE directive that requires data holders to conform to specific standards by 2014. The aim of the INSPIRE directive is to improve data collection, address format protocols, and gaps in data availability to make it easier for planners and policy makers to identify, access and use relevant information from the local to EU scales.

We corresponded and met with a number of organisations to discuss the possibility of geocoding their data for mapping at the Small Area scale. While discussions were often positive only one government department decided to work with us for the pilot

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Figure 21: Location of GP's, Secondary and Primary Schools in Dublin

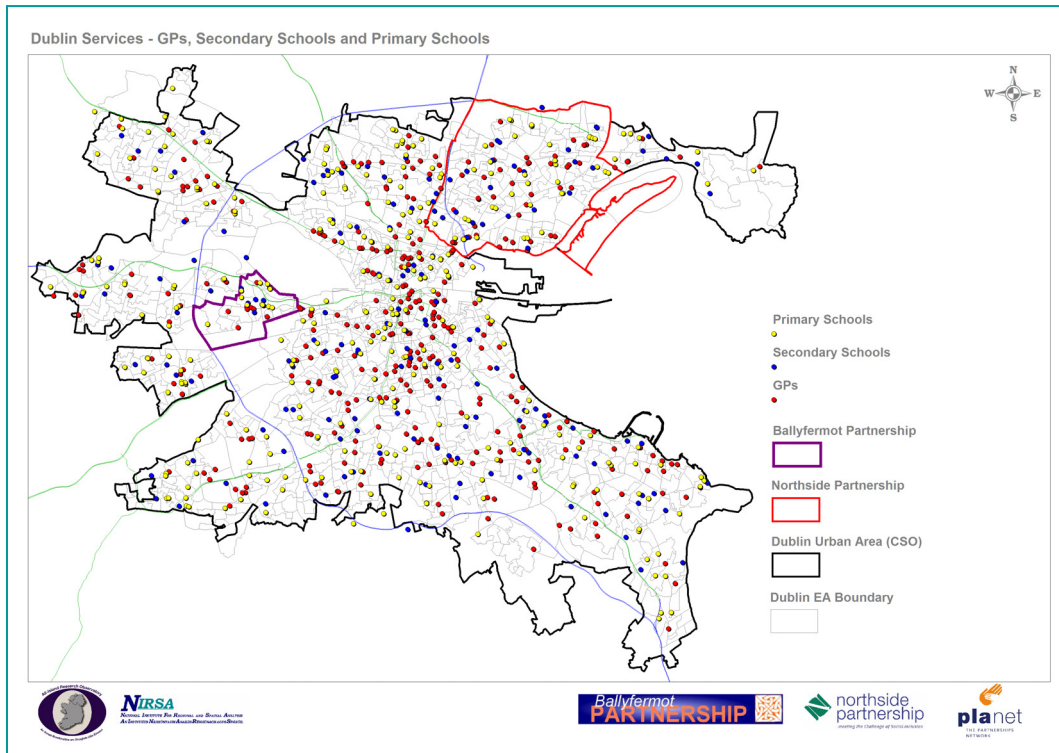
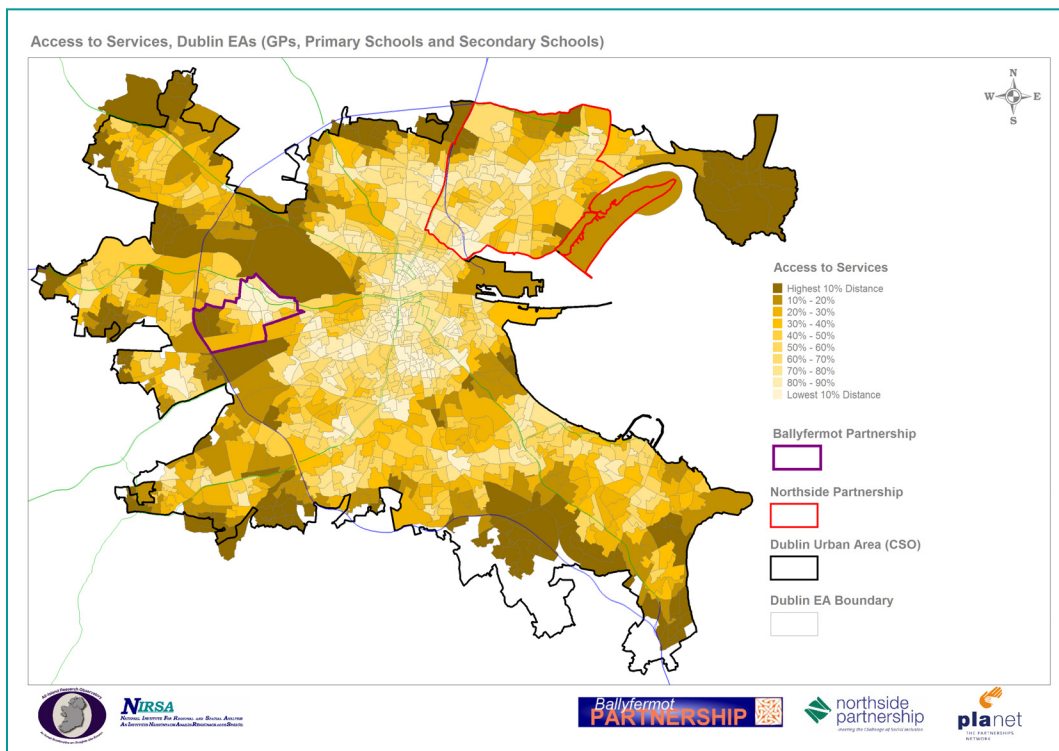
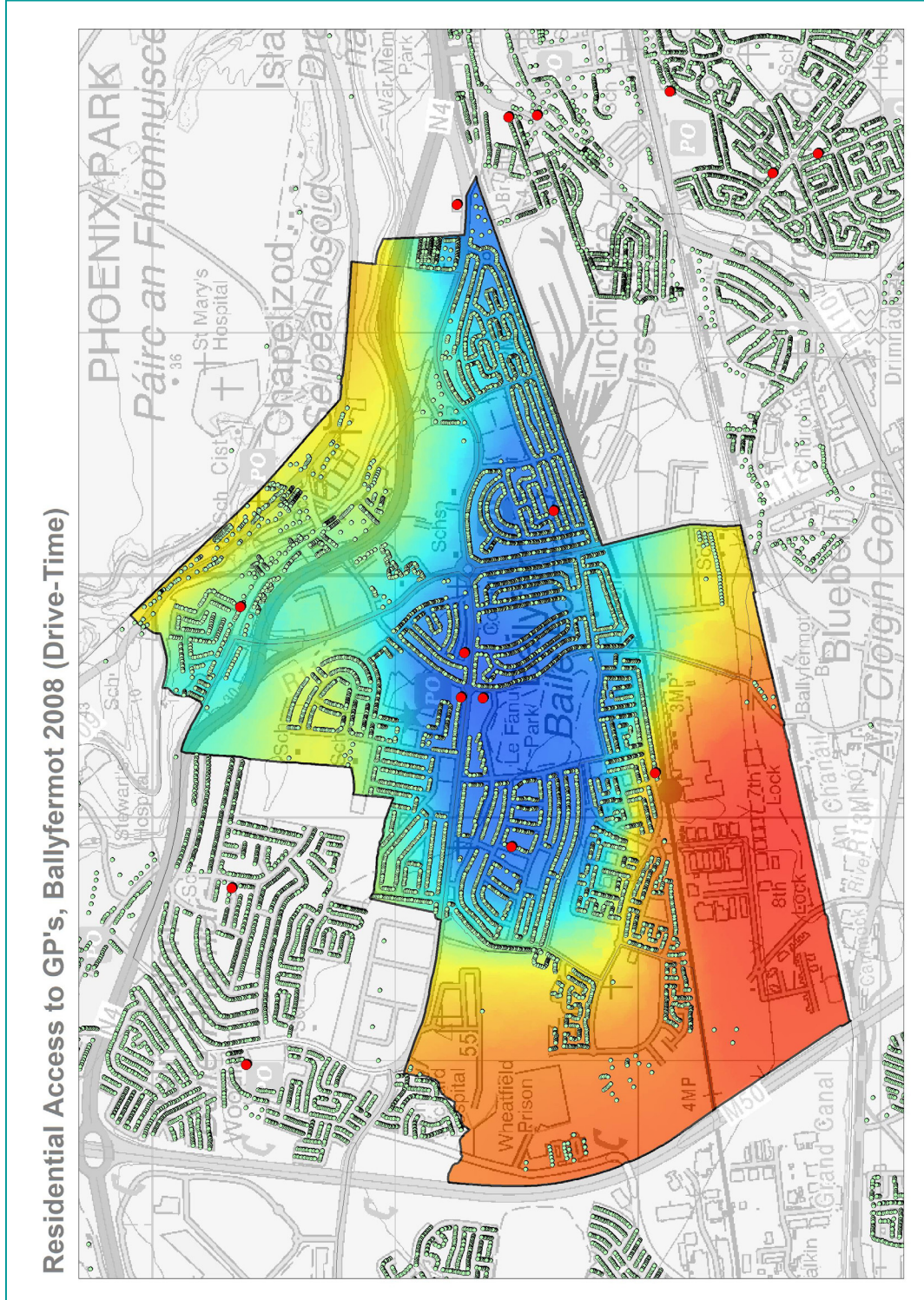


Figure 22: Accessibility to Services (GP's, Secondary and Primary Schools) in Dublin Urban Area



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Figure 23: Residential Access to GP's within Ballyfermot/Chapelizod Partnership



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project – the Department of Social and Family Affairs (DSFA). The project team worked closely with the DSFA to geocode, map and analyse welfare data at the sub-ED level, whilst also addressing and conforming to data protection and confidentiality issues.

Welfare recipient information is of key concern to those responsible for addressing issues of social inclusion because it provides a much more timely barometer of what is happening in their areas than the census can provide. At present, partnerships depend on weekly or monthly extracts from the various social welfare offices. These extracts provide details on the number of recipients of social welfare payments that are registering at each office. As noted previously, there are no specific catchment areas defined for each office, which include several EDs, therefore it is impossible for partnerships to fully understand the spatial distribution of welfare claims.

Clearly, the use and mapping of personal information raises concerns with respect to issues of data confidentiality and security. In order to undertake the research, specific guidance was requested from the Data Protection Commissioner. The Data Protection Commissioner confirmed that there is an exemption within the Data Protection Act (Section 2(1, 5a and 5b)) that allows the use of personal information for “*statistical, research or scientific purposes carried out by the data controller itself*” provided there are “*no disclosures of personal data to 3rd party*” and “*no damage or distress is likely to be caused to the individual*”. The project qualified to such conditions given that it focused on determining the steps necessary to geocode DSFA data, address confidentiality issues, and ways to analyse and map such data for use by the DSFA and others. As NUIM was acting as a third party data processor the Data Protection Commissioner suggested that

suggested that the DSFA would have to follow a specific set of guideline in this regard:

- The Data Controller (DSFA) would formally appoint NUIM as a Data Processor and put in place an appropriate data controller to data processor contract as per Section 2C(3)
- The contract would
 - set out the strict confidentiality and security obligations
 - lay down clear conditions on use of data
 - stipulate that the data could not used for further purposes and no personal information could be published
 - data must be returned to data controller at completion of Research
- The Data Controller remains responsible for the actions of the researcher in processing the personal data under their control and producing anonymised output information
- Physical access to the personal data take place in the office of the Data Controller

Through consultation with the Data Protection Commissioner the project thus identified a robust and secure procedure for the appropriate handling, geocoding and outputting of sensitive data held by state agencies, creating a model that can be used in future research.

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Case Study 4: Dependence on the Social Welfare System in Ballyfermot

Working to the Data Commissioners recommendations, the project worked with DSFA to geocode two extracts from the short-term social welfare system (see Table 6) for the Ballyfermot Area in order to demonstrate the power of mapping these data at the Small Area scale. Each extract detailed social welfare recipients with a home address in the Dublin 10 and Dublin 20 postcodes. Within each extract a number of key variables were available to enable a detailed analysis of the type and level of dependence on the social welfare system in local community areas:

- Claim Code (Jobseekers Benefit, Jobseekers Allowance, One Parent Families, Back to Work, etc)
- Claim Start Date
- Previous Occupation Code
- Number of Child Dependents
- Personal Rate
- Child Dependent Rate
- Adult Dependent Rate
- Total Payment
- Means Deducted
- Net Flat Payment
- Gender
- Date of Birth (Year Only, full date of birth deleted)
- Marital Status
- Country Code
- Address 1 - House Number
- Address 2 - Street Name
- Address 3 - Local Area
- Address 4 - Postcode

Table 6: DSFA Social Welfare Extracts

	August 08/08/08	February 09/02/09
Extract Total (Dublin 10 and 20)	2651	3627
Mapped to Ballyfermot/Chapelizod Partnership	2258	2962

In order to geo-code each recipient it was necessary to match the address held within the social welfare database with GeoDirectory. This process was automated and replaced the formal address of each recipient with a code representing the ED, EA and Small Area within which it resided.

ID_2642 * Landen Road, Ballyfermot, Dublin 10**

ED EA Small Area

ID_2642 Decies, 02072, 268057008, Ballyfermot, Dublin 10

There were some initial concerns relating to confidentiality given the availability of a house number as part of the address structure. Attempts were made to accurately address match the August extract without using the house number, however this resulted in a poor level of accurate matching (see Figures 24 and 25) due to the length of some roads such as "Ballyfermot Road" which crossed several area boundaries. The use of the house number allows the matching software to accurately assign the address to the correct ED, EA and Small Area code. Once each address had been assigned to a specific ED, EA and Small Area it was possible to map the entire database and for the first time visualise the spatial distribution of social welfare dependence at a fine spatial resolution across the Ballyfermot/Chapelizod Partnership area. Because the

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Figure 24: Allocating address information with an address “Ballyfermot Road”

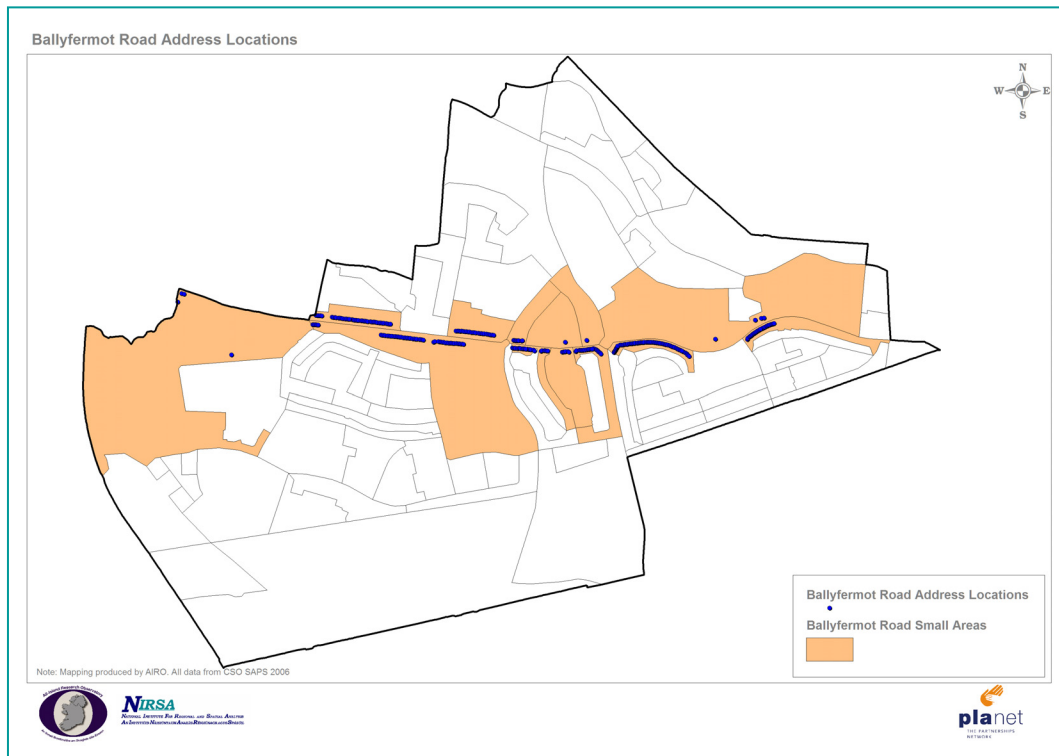
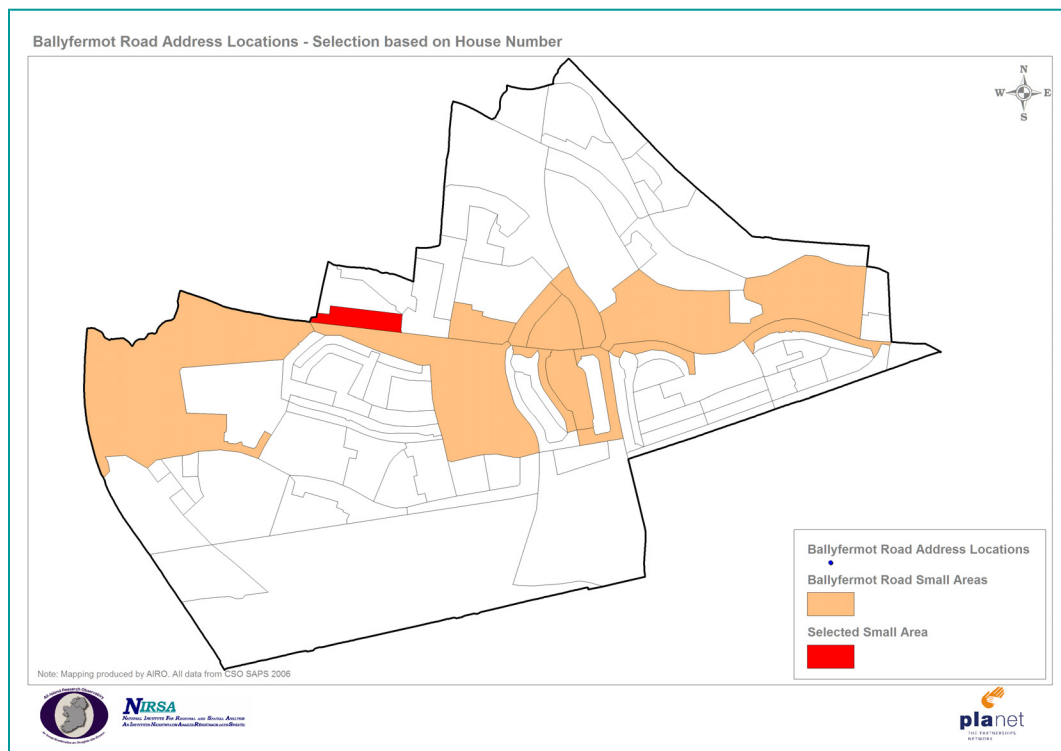


Figure 25: Allocating address information with an address “# Ballyfermot Road”



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information is tied to specific addresses it is possible to aggregate it to any administrative or user defined spatial boundary (e.g., Health, Garda, Rapid areas, etc). In the case of the pilot project, we were particularly interested to map the data to the new Small Areas to demonstrate their potential for data reporting purposes. Comparing Figures 26, 27 and 28 it becomes immediately clear how the relatively coarse spatial resolution of ED and EAs mask the variation of welfare claims within the Ballyfermot area. For example, it looks like the area at the bottom of the map has a high number of claimants (Park West area). When mapped at the Small Area level it becomes clear that this area actually has very few recipients. As such, the Small Areas give a much more accurate picture of the geography of welfare.

By comparing the data over time it is possible to chart the evolving geography of welfare claims. For example, the two extracts reveal a 31.18% increase in Live Register recipients in the Ballyfermot/Chapelizod Partnership area from August '08 to February '09. This can be further broken down to represent those on Jobseekers Assistance (JA), Jobseekers Benefit (JB), Jobseekers Benefit Credits Only (JBCO), One Parent Families (OPF) and those on a Back To Work Allowance (BTW). The largest percentage increase from August to February can be seen in the Jobseekers Benefit category (+55.15%). Qualification for Jobseekers Benefit is based on previous PRSI contributions in the relevant tax year, it is therefore an indication of those who have recently fallen out of the workforce (see Table 7).

Figure 28 details the spatial distribution of Live Register Recipients counts across the Ballyfermot/Chapelizod Partnership. The distribution highlights that the highest number of recipients are in the Cherry Orchard, Croftwood, Le Fanu

Road and Clover Hill Road areas. There is also an additional high pocket in the Colepark area in the heart of the partnership. The northeast of the partnership, Chapelizod, has the lowest number of Live Register recipients. It is also possible to map aggregates to Small Areas for the different categories of Live Register recipients. For example, Figure 29 maps the spatial distribution of One Parent Family recipients. Figure 30 highlights areas that have seen the highest increase in Jobseekers Benefit recipients. Figure 31 outlines local areas that have seen the highest increases in Social Welfare recipients since August 2008. The trend is similar to the overall pattern in August '08, although there is an emergence of increased numbers in areas that have traditionally had very low number on the Live Register such as Chapelizod.

An availability of timely and geocoded data through the Live Register is potentially a major benefit to partnerships. Mapping such data at the Small Area scale can provide partnerships with details on the changing welfare trends at a local community level.

3.5 In Summary

To date, area-based social inclusion analysis has been overly reliant on census data generated every five years and outputted at Electoral Division level. Whilst this data has much utility it is very quickly out of date and aggregated to a relatively coarse spatial scale that masks local variations in social conditions. The four phases of research and their case studies demonstrate that it is possible to significantly improve the evidence base available for public policy analysis by providing analysis at a finer spatial resolution, using more timely data, and to make this data widely available in a form that can be used by non-mapping experts. In other words, it becomes possible to identify and target particular

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Figure 26: Mapping Social Welfare Recipients in Ballyfermot/Chapelizod ED level

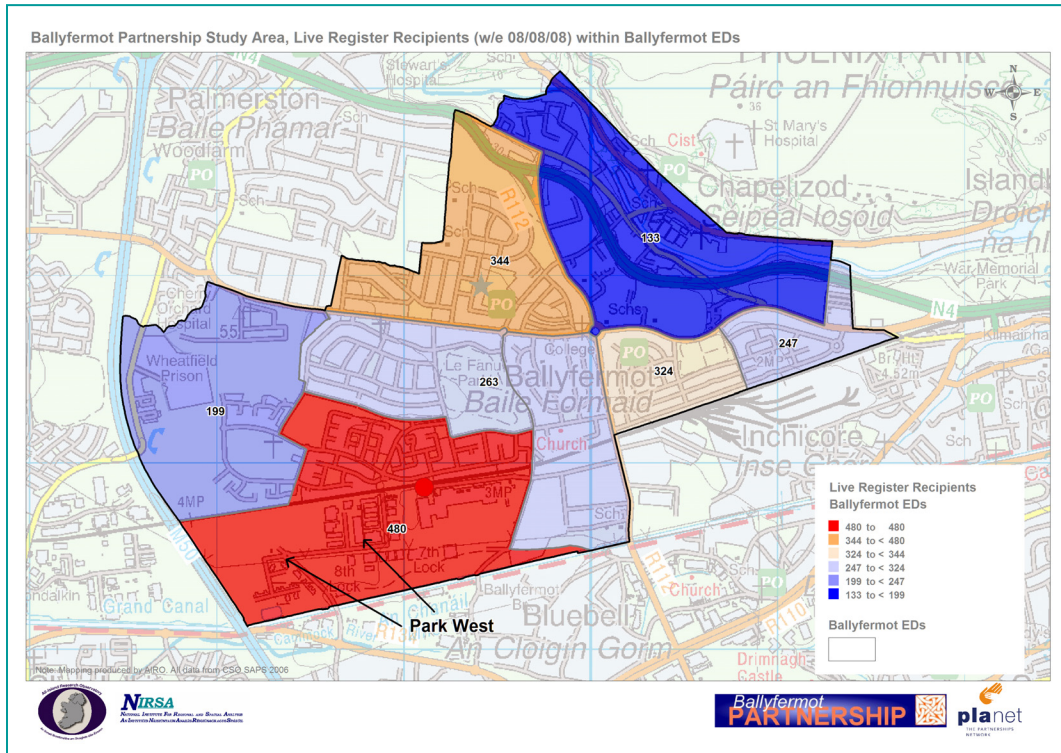
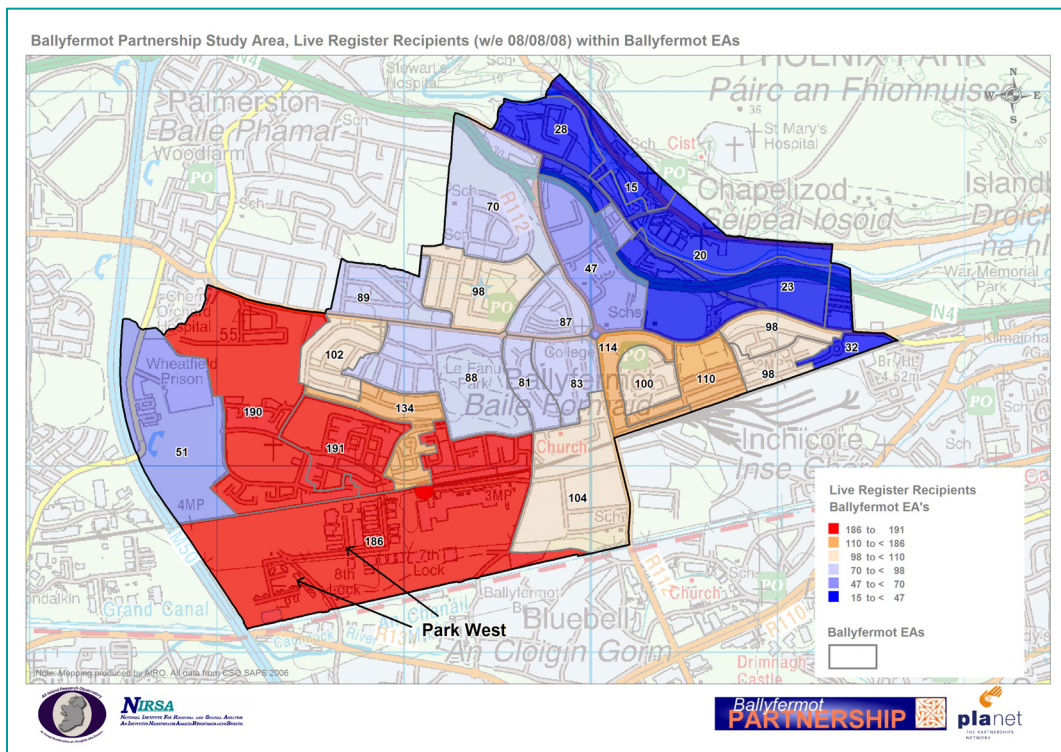
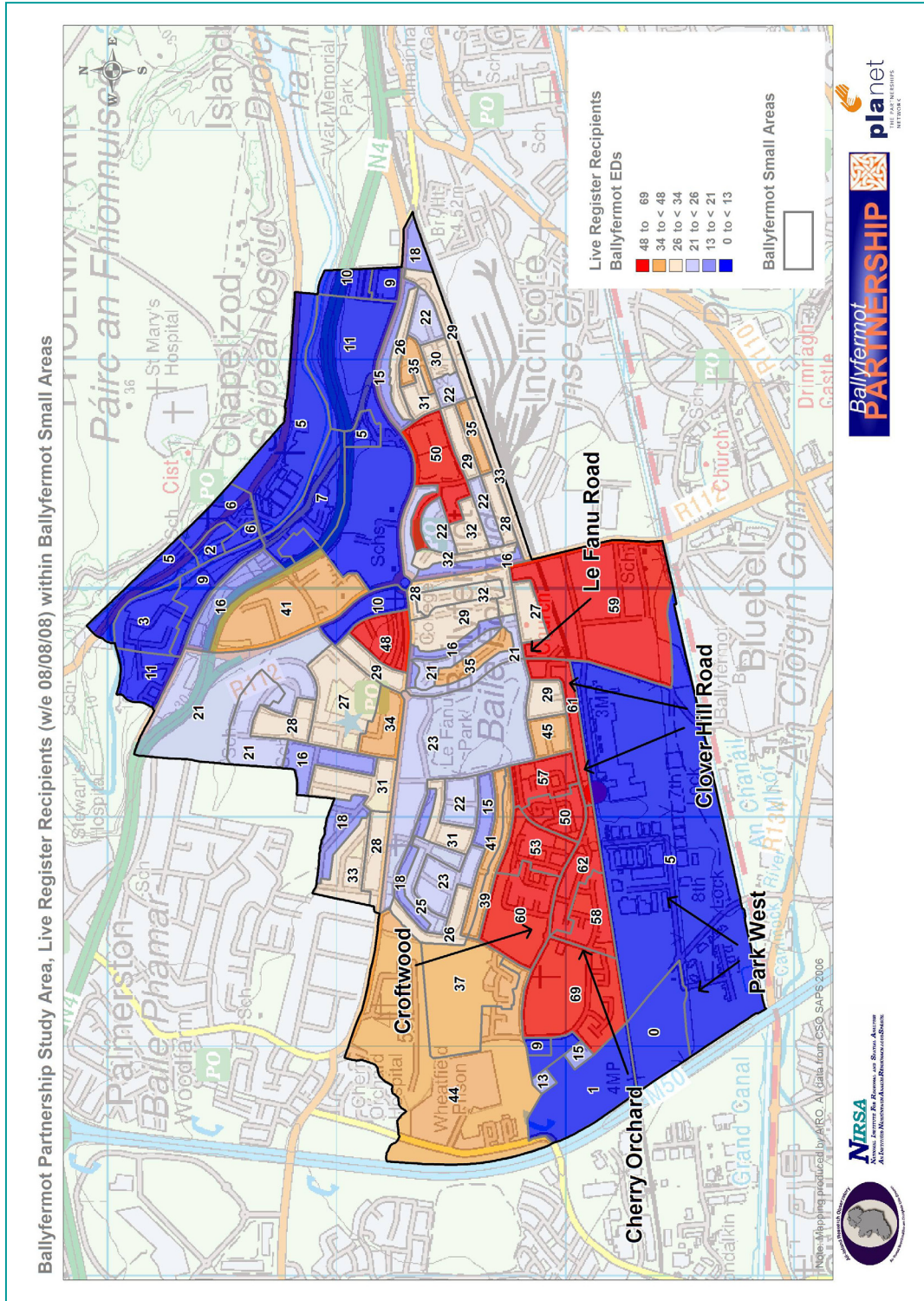


Figure 27: Mapping Social Welfare Recipients in Ballyfermot/Chapelizod EA level



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Figure 28: Mapping Social Welfare Recipients in Ballyfermot/Chapelizod Small Area level, w/e 08/08/08



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Figure 29: Spatial Distribution of Live Register Recipients (One Parent Family) in Ballyfermot/Chapelizod Partnership Small Areas, w/e 08/08/08.

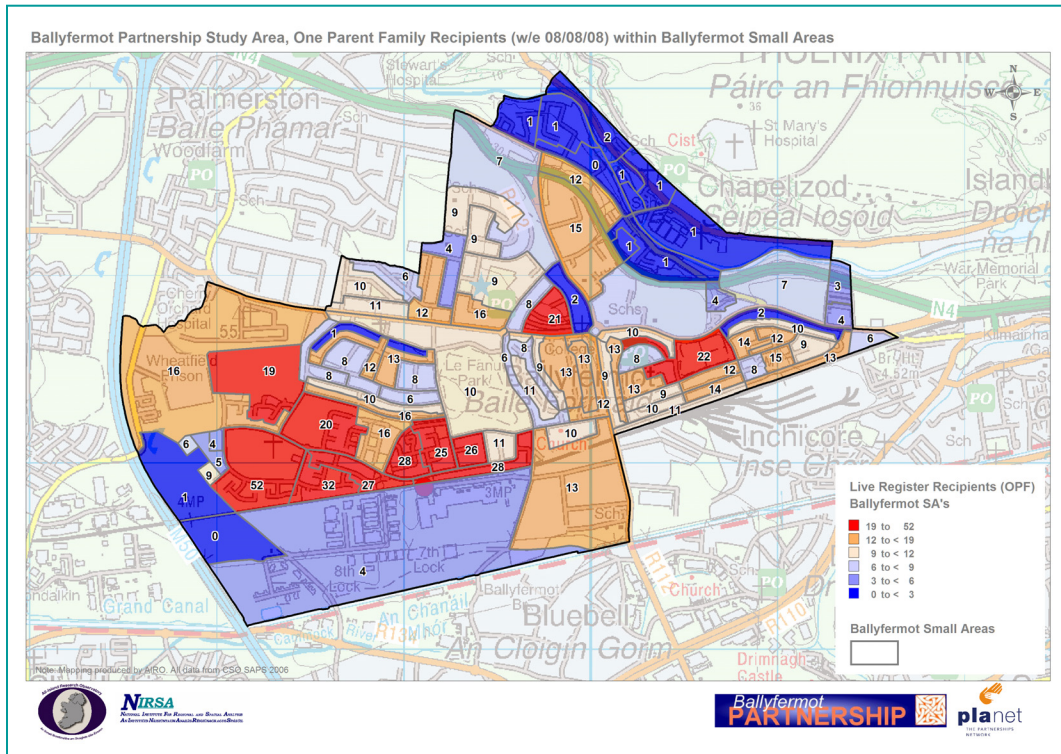
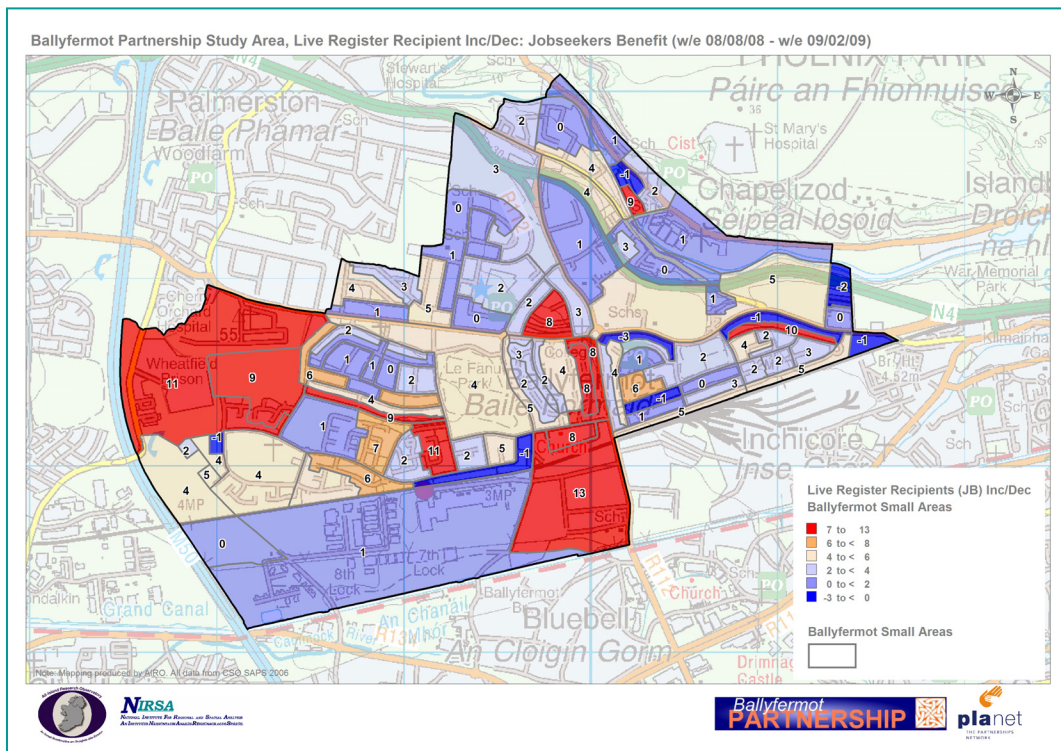


Figure 30: Spatial Distribution of Live Register Inc/Dec (Jobseekers Benefit) in Ballyfermot/Chapelizod Partnership Small Areas, w/e 08/08/08 – w/e 20/02/09.



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Figure 31: Spatial Distribution of Live Register Inc/Dec in Ballyfermot/Chapelizod Partnership Small Areas, w/e 08/08/08 – w/e 20/02/09.

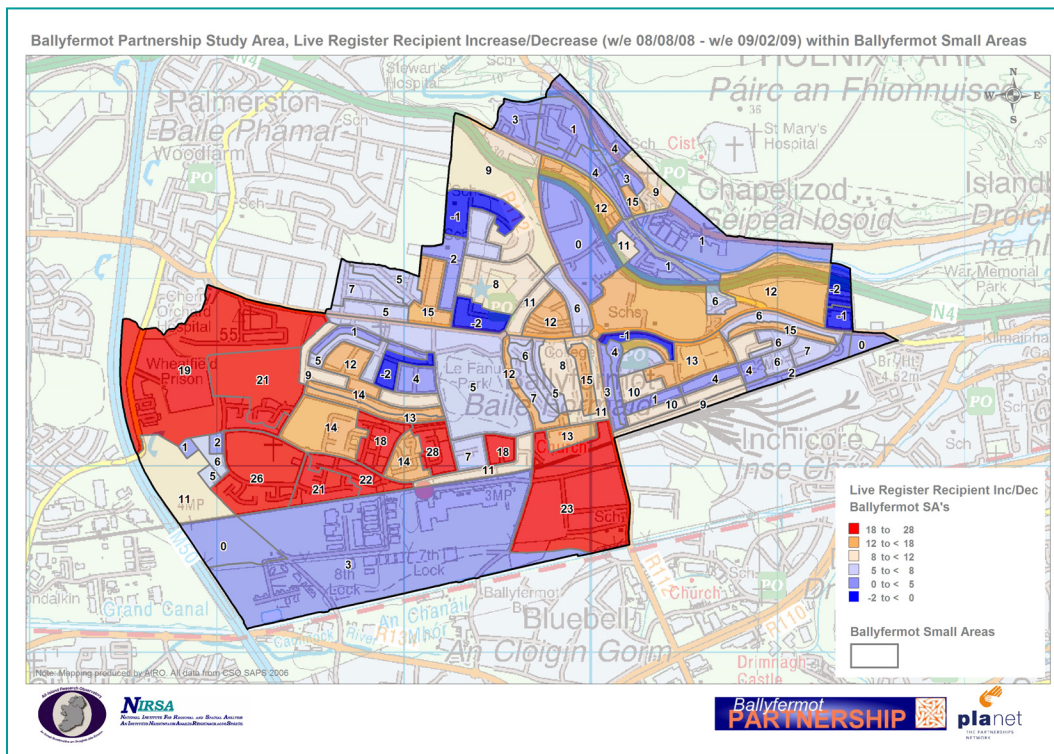


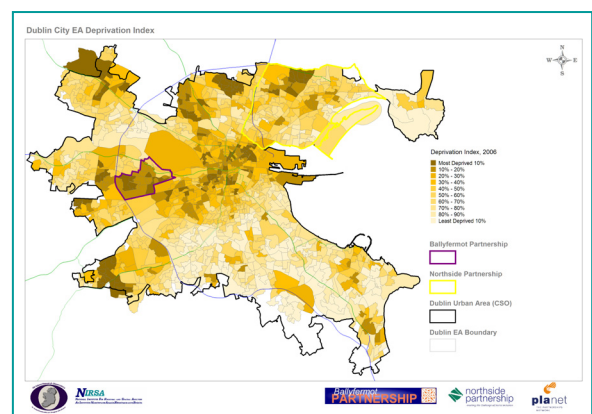
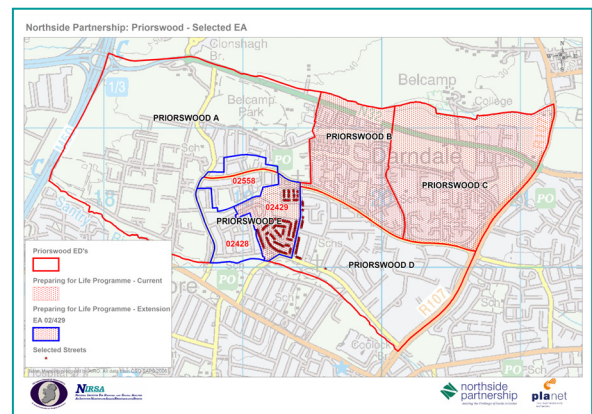
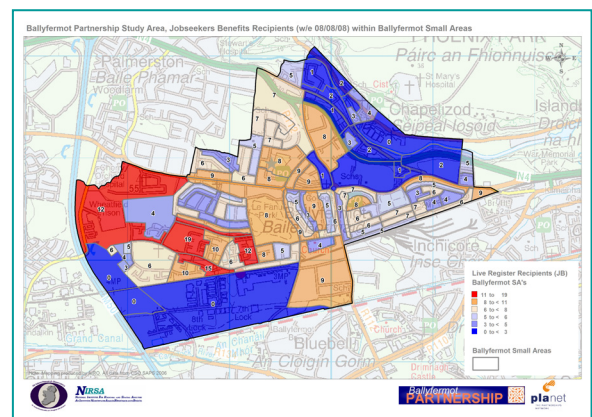
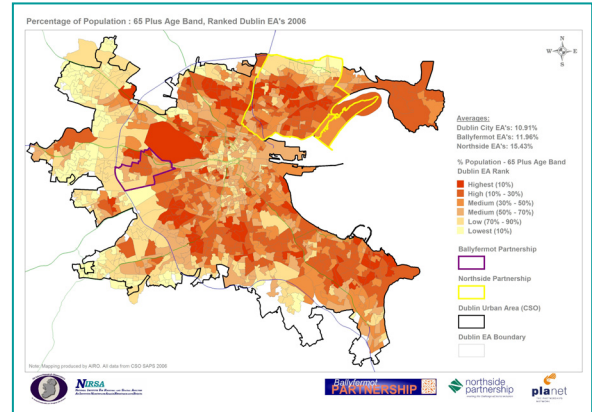
Table 7: Live Register breakdown in Ballyfermot/Chapelizod Partnership, Aug '08 – Feb '09

	w/e 08/08/08	w/e 20/02/09	Perc Inc/Dec
Total DSFA Extract	2651	3627	36.82%
Mapped to Ballyfermot	2258	2962	31.18%
JA	795	1014	27.55%
JB	495	768	55.15%
OPF	914	1123	22.87%
JBCO	22	22	0%
BTW	33	35	6.06%

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needs effectively and efficiently and to monitor and evaluate the delivery of public services.

Such an improved evidence base will be of enormous value to government and on-the-ground agencies because it will provide a much more detailed and timely understanding of types, levels and patterns of social deprivation and inclusion within local areas. The application of such data is very broad and includes analyses of poverty, employment, equality, public transport, housing, health, social services, demographics, family structure, access to key services, crime, education and training, and the inter-relationships between these issues. Adopting the approach we have taken then has the potential to transform policy needs analysis and agenda setting, decision making and prioritisation, planning, delivery, and the evaluation of government and third sector services and programmes



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4. Project Recommendations

The pilot project has clearly demonstrated that it is possible to significantly improve the evidence base used by government and the third sector for formulating social inclusion policy and monitoring and evaluating its impact over time. In undertaking the research and providing proof of concepts, the project has undertaken the necessary groundwork that would make the general rolling out of these kinds of analysis for other urban areas relatively straightforward. There are, however, a number of additional pieces of work that need to be undertaken to further improve the evidence base available, the methods used to access and analyze these data, and to enable the rollout of the methods and mapping we have detailed to the entire state, including rural areas. We therefore have a number of recommendations with regards to the next steps that need to be taken.

1. A Dublin City data strategy should be formulated and implemented to work with data holders to provide high quality data for the entire city for use in policy development and the monitoring and evaluation of programmes.
2. The project needs to be repeated for rural partnership areas and in particular the mapping of Live Register and other non-census data at the Small Area scale to ensure that the methods developed can be rolled out systematically for the entire state.
3. There is a need to examine any technical and ethical issues that may arise in mapping the 2006 census data at the Small Area scale once the CSO has geocoded and released it.

4. It is important to conduct more research into the development of a deprivation index that extends beyond census data. The pilot project has made a start in developing measures of accessibility that could become part of a new index similar in constitution to other nations. Extending this to the whole state at ED, EA and SA scales would require the geocoding of key services nationwide, a relatively manageable task. Ideally it might also be extended to include Live Register data that would make it measurable in a more timely manner, or other kinds of data such as health and housing and crime indicators.

5. There is a pressing need to extract as much value as possible from existing datasets. The project has examined the mapping of the census at EA level and the use of POWCAR data. This analysis should be extended to all county boroughs for the EA analysis and all partnership areas for the POWCAR analysis. In addition, further research is needed on how to extract most value from the POWCAR dataset, including travel to work modelling and simulation.

6. There is a need to work with DSFA and other government departments to examine how their data can be geocoded and mapped at the Small Area scale. This research would need to: chart the entire process from data collection, data entry and data storage with a view to mainstreaming geocoding at source, including a pilot structured address matching system within a social welfare office to perform a cost benefit analysis; examine further issues of confidentiality and privacy in reporting and analysis; explore how data outputted into Small Areas can be best analyzed to extract most value. At present, government departments are collecting huge amounts of data which cannot be extracted or analysed at meaningful scales – this constitutes an enormous missed

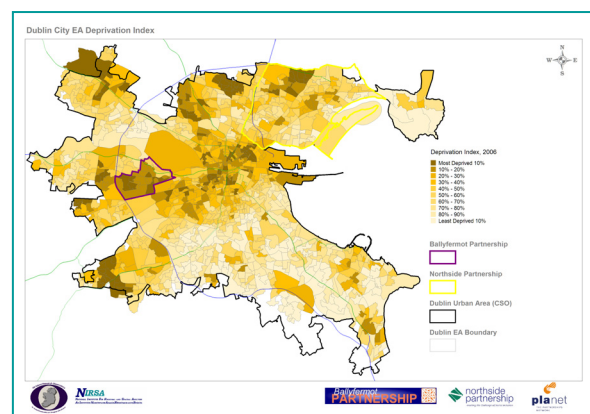
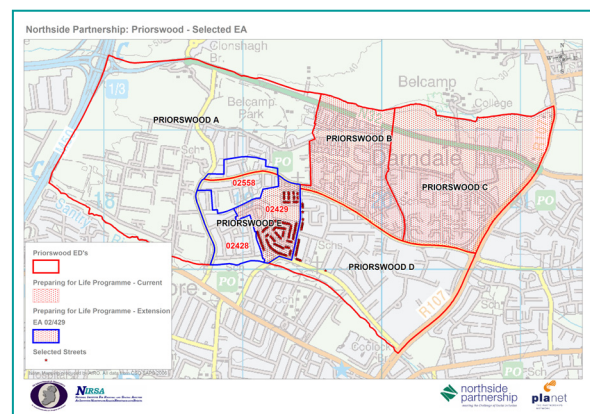
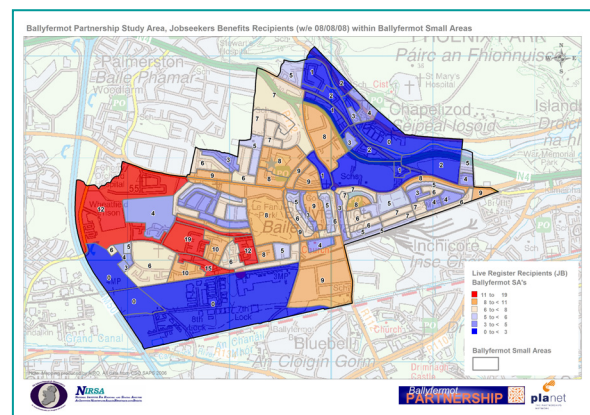
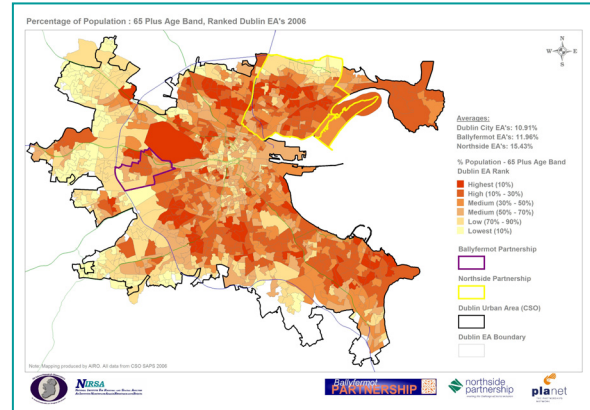
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opportunity, especially as it can be used to maximise the utility of a programme and minimise wastage. This situation needs urgent attention.

7. It would be of much benefit to examine whether it would be possible to undertake the kinds of social inclusion analysis explored in the pilot project on an all-island basis. The possibilities of cost savings and efficiencies through the sharing of services on a cross-border basis will benefit enormously from an all-island evidence base. There are at present significant issues of data interoperability and scalar incompatibilities that hinder the creation of such an evidence-base and it is necessary to find technical solutions that will overcome these difficulties.

8. A feasibility and cost benefit analysis needs to be undertaken into providing the data and analysis undertaken in the pilot project to all partnerships using a user-friendly, interactive web-based system such as Instant Atlas. The benefit of this kind of system is that it requires no expert mapping knowledge, the data can be queried and 'played with' in real time, and it is very cost effective. To maximise utility, staff training should be given on how to most effectively query and analyze mapped data.

The pilot project has taken some important initial steps in identifying how the social inclusion evidence base can be significantly improved. The benefits of an improved evidence base include the formulation of better policies more suited to their intended targets, more productive initiatives, and greater efficiencies and cost savings. It is therefore important, we feel, that the project recommendations are acted upon so these benefits can be realised for present and future generations.



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The Central Statistics Office (CSO) in the Republic of Ireland are responsible for the development of the Small Area Population Statistics (SAPS) databases. We are particularly grateful to Aidan Punch and the staff at the CSO for assisting us on this project.

The transfer from raw Census data to maps required the use of a variety of geographical boundaries files. Electoral Division (ED) and Enumerator Area (EA) boundaries were made available through the Ordnance Survey Ireland (OSi). The use of a beta set of Small Areas (SAs) was kindly provided to the project team by John O'Reilly at the OSi. We are grateful to the National Centre for Geocomputation for advice concerning the use of the Small Areas.

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Finally we would like to thank the steering group for the project – Dublin City Council, Ballyfermot/Chapelizod Partnership, Northside Partnership – for their guidance during the project.

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