

# Research Bulletin 18/5 | The movement of people across the Northern Ireland - Republic of Ireland border

Andrew Doherty, Analytical Services, Department for the Economy

September 2018

---

## Summary

The Common Travel Area (CTA) came into being in 1952. It is a collection of legal provisions which enable UK and Irish nationals to be treated almost identically within both states. This means that people can travel freely between one country and the other for work, education, shopping or other purposes in the pursuit of their daily lives. This paper provides additional analysis and information on people movements across the Northern Ireland (NI) - Republic of Ireland (ROI) border by NI and ROI residents. It is estimated that there are between 100 and 110 million person border crossings each year. Proximity to the border matters and the people who live closest to the border make seven times more crossings than those who live further from the border. Over 80% of cross border trips start or end in Local Government Districts (LGDs) next to the border. People are more likely to cross the border for social and leisure purposes than work, with almost two thirds of trips made for social and leisure purposes.

---

## Introduction

This paper brings together the analysis on the number of people crossing the border between Northern Ireland (NI) and the Republic of Ireland (ROI). It has been produced to inform discussions in relation to the Common Travel Area (CTA). This paper draws on two DfE papers<sup>i</sup> <sup>ii</sup> which were published in March 2018. In addition, it reports the results from DfE commissioned research conducted by Citi Logik<sup>iii</sup>. They used the anonymised information from a Mobile Network Operator (MNO) to consider the extent of the aggregate movements of people across the NI-ROI border.

The following sections provide an overview of the methodology and present the results of the analysis in terms of:

- Total cross border movements
- Origin and destination of cross border movements
- Purpose for cross border travel
- Frequency of cross border travel

## Methodological overview<sup>iv</sup>

DfE commissioned research to examine if it was possible to measure the aggregate number of border crossings between NI and ROI using data from mobile phones. This analysis was conducted by Citi Logik who are a partner to one of the UK MNOs. The analysis used data that had been both anonymised and aggregated to ensure customer privacy. The approach to data processing and analysis was GDPR compliant. DfE were provided with the analysis of

this aggregated and anonymised data to look at the general trends in cross border movements and not the behaviour of individuals.

Mobile phone customers communicate their positions with their networks of cells every time they use their mobile phones to text or make a call and through ad-hoc events generated when changing local area code (LAC) or through applications running on smart phone devices, such as web searching, location services etc. Each such communication is registered by one of the network cells as an 'event' with a unique and anonymous user ID, a timestamp, a local area code (LAC) and the cell's ID being attributed to it. These events provide the location and movement data that were subsequently aggregated and analysed by Citi Logik.

The results were expanded to be representative of the NI total population. This process involved using the mid-year population estimates per super output area for NI, and a comparison between the mobile phone ownership per age group based on the MNO sample of customers, with the mobile device ownership per age group for the UK based on the census count for each corresponding geographical location. Expansion factors were assigned to each location and they were expanded to be representative of the NI population. The analysis was conducted using data for a four week period in October 2017.

## Total cross border movements

The analysis provides an estimate of the number of cross border movements between NI and ROI per annum for NI and ROI residents.

### Border crossings by NI residents

Table 1 shows that there were on average 172,000 crossings between NI and ROI each weekday. At the weekend the average number of crossings per day was 11% lower at 153,000 crossings. The number of crossings between NI and ROI by NI residents<sup>v</sup> was almost symmetrical.

**Table 1: Average number of NI ROI border crossings per day, NI residents**

Crossing direction	Weekday	Weekend
NI -> ROI	86,000	76,000
ROI -> NI	86,000	77,000
<b>Total</b>	172,000	153,000

Source: MNO Analysis, 2018

Note: The figures are rounded to the nearest 1,000.

### Border crossings by ROI residents

The average number of weekday crossings between NI and ROI by ROI residents was 38% lower than the corresponding figure for NI residents. The number of crossings made by ROI residents at the weekend was 9% higher than on a weekday (Table 2)<sup>vi</sup>.

**Table 2: Average number of NI ROI border crossings per day, ROI residents**

Crossing Direction	Weekday	Weekend
NI -> ROI	59,000	66,000
ROI -> NI	48,000	51,000
<b>Total</b>	<b>107,000</b>	<b>117,000</b>

Source: MNO Analysis, 2018

Unlike the data for NI residents, the border crossings for ROI residents are not symmetrical, with 56% of total crossings going from NI to ROI and 44% of trips going from ROI to NI. The reasons it that there can be a delay in some roamer devices connecting to the UK MNO when they cross the border, which means that those devices are not included in the totals for ROI residents crossing into NI. However, they are included in the figures for ROI residents going from NI to ROI.

Analysis of traffic flow data undertaken by NISRA<sup>vii</sup> shows that cross border traffic flows between NI and ROI are typically symmetrical. It is assumed this analysis applies to both NI and ROI residents. The analysis for NI residents supports this finding. Table 3 presents the border crossings for ROI residents on a symmetrical basis, with the number of ROI to NI crossings increased to match the level of the NI to ROI crossings.

**Table 3: Average number of NI ROI border crossings per day adjusted for symmetry, ROI residents**

Crossing Direction	Weekday	Weekend
NI -> ROI	59,000	66,000
ROI -> NI	59,000	66,000
<b>Total</b>	<b>118,000</b>	<b>132,000</b>

Source: MNO Analysis, 2018, DfE Analysis

The figures for NI and ROI residents indicate there are on average 290,000 border crossings each weekday and 285,000 crossings on each day at the weekend. The weekday average was 2% higher than the weekend average in the MNO analysis. In the NISRA traffic flow analysis the weekday counts were 12% higher than the weekend, but this traffic analysis does not take account of the different occupancy rates for different modes of transport and for different purposes of travel.

## An estimate of total annual cross border person movements

The average number of crossings were extrapolated (using Table 1 and Table 3) to give annual estimates for weekday and weekend crossings<sup>viii</sup>. Table 4 gives a total estimate of just over 105 million border crossings per annum. 58% of total crossings were made by NI residents. 72% of crossings by NI residents were on weekdays and 28% were on the weekend. 69% of crossings by ROI residents were made on weekdays.

**Table 4: Extrapolated NI ROI border crossings per annum, NI and ROI residents<sup>ix</sup>**

Crossing Direction,	Weekdays	Weekends	Total
<b>NI Residents</b>			
NI -> ROI	22,446,000	7,904,000	30,350,000
ROI -> NI	22,446,000	8,008,000	30,454,000
<b>Total</b>	<b>44,892,000</b>	<b>15,912,000</b>	<b>60,804,000</b>
<b>ROI Residents</b>			
NI -> ROI	15,399,000	6,864,000	22,263,000
ROI -> NI	15,399,000	6,864,000	22,263,000
<b>Total</b>	<b>30,798,000</b>	<b>13,728,000</b>	<b>44,526,000</b>
<b>All</b>	<b>75,690,000</b>	<b>29,640,000</b>	<b>105,330,000</b>

Source: MNO Analysis, 2018

The total number of crossings by NI residents is the equivalent of each person in NI making an average of 32.5 crossings per annum (i.e. 16 return trips)<sup>x</sup>. This equates to 2.7 crossings per person each month, or 0.3 return trips each week. The comparable figure for ROI residents<sup>xi</sup>, is 9.3 crossings per person per annum (i.e. almost 5 return trips). This equates to less than 1 crossing per person each month or 0.1 return trips per week. Given the larger number of border crossings made by NI residents it is not surprising that the average number of crossings for a NI resident is 3.5 times higher than for an ROI resident.

## Comparison with existing estimates of cross border people movements

These 105 million annual crossings are of the same order of magnitude as the estimates from other analyses. The number of cross border person movements was estimated to be 110 million crossings per annum based on analysis from the NI Transport model<sup>xii</sup>. Analysis based on the research conducted in the NI Life and Times Survey (NILT)<sup>xiii xiv</sup> concluded that an annual figure of 100 million person crossings was reasonable. It was noted that this figure could even be an underestimate due to the conservative assumptions that underpin the extrapolation of the data. Based on the three studies it can be concluded that the total number of people border crossings is in the region of 100 – 110 million per annum.

## Origin and destination of cross border movements

The origin and crossing zone for NI residents travelling from NI to ROI and the crossing zone and destination for ROI residents travelling from ROI to NI were examined. Due to restrictions in network coverage, it is not possible to determine the ultimate destination for NI residents going from NI to ROI, nor to determine the exact journey starting point for ROI residents travelling from ROI to NI.

### The origin and crossing zone for cross border travel on weekdays for NI residents

The MNO analysis examined the origin and crossing zones for travel from NI to ROI by NI residents. The analysis was conducted using the old 26 Local Government Districts (LGDs). Table 5 reports the origin and crossing zones for NI residents when they travel from NI to ROI.

**Table 5: The origin for cross border travel and the crossing zone for NI to ROI border crossings, NI residents (weekday, %)**

	Origin for cross border travel for NI residents (%)	Crossing zone for border crossings (NI to ROI) for NI residents (%)
<b>Derry</b>	35.6%	40.2%
<b>Fermanagh</b>	14.6%	14.9%
<b>Newry and Mourne</b>	14.0%	19.6%
<b>Strabane</b>	7.9%	9.5%
<b>Dungannon</b>	6.6%	7.9%
<b>Armagh</b>	6.6%	7.3%
<b>Limavady</b>	2.3%	0.5%
<b>Omagh</b>	2.2%	-
<b>Belfast</b>	1.9%	-
<b>Banbridge</b>	1.1%	-
<b>Down</b>	0.9%	-
<b>Craigavon</b>	0.9%	-
<b>GB</b>	0.8%	-
<b>Lisburn</b>	0.8%	-
<b>Coleraine</b>	0.6%	-
<b>Antrim</b>	0.6%	-
<b>All other LGDs<sup>xv</sup></b>	2.5%	-
	100%	100%

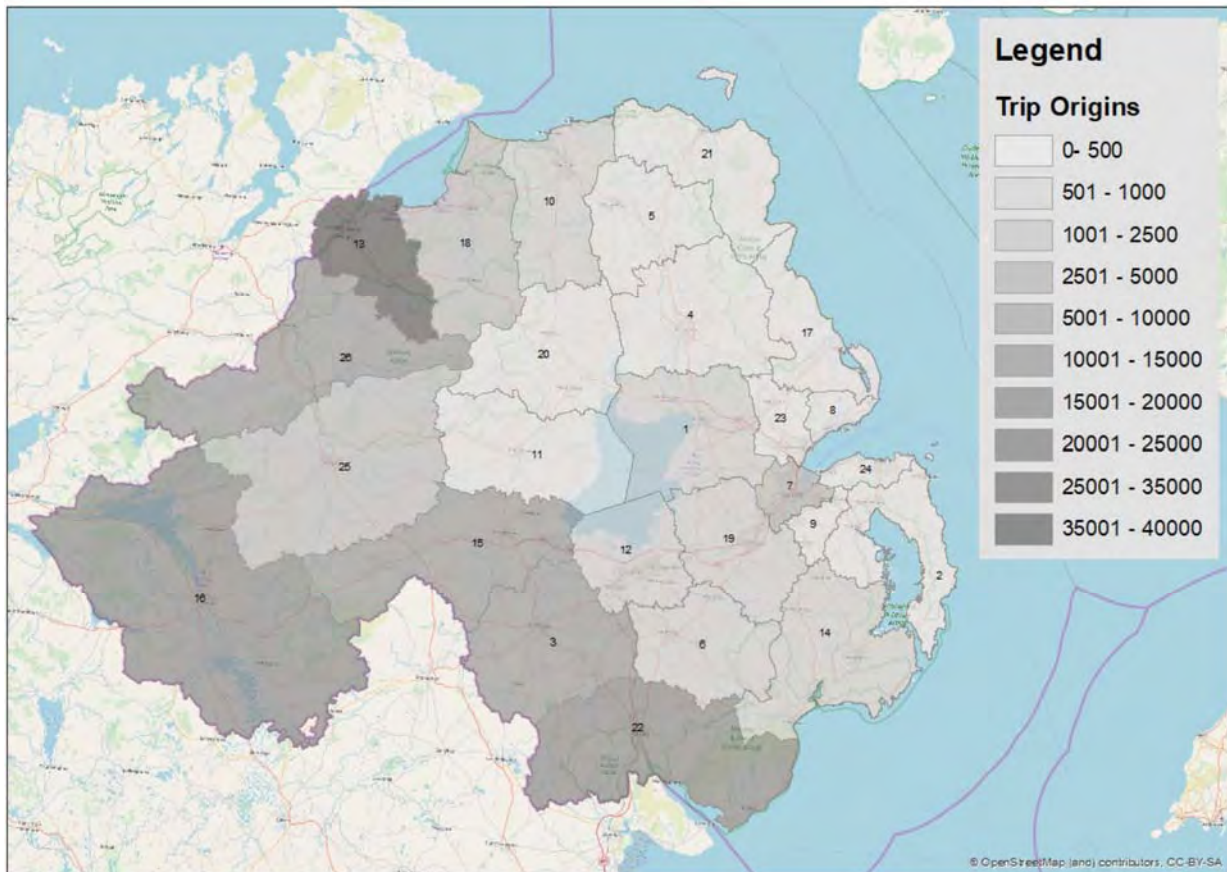
Source: MNO Analysis, 2018

Note: The average weekday flows are rounded to the nearest 100.

36% of crossings originated in Derry LGD and 40% of the border crossings by NI residents to ROI went through the Derry crossing zone. This was 34,600 crossings each weekday. Almost 20% of crossings by NI residents went through Newry and Mourne, but only 14% of those crossings started there, with residents from other LGDs using that crossing zone as a route to ROI.

Figure 1 illustrates the origin of NI to ROI crossings by NI residents. The darker shaded areas in the map highlight the LGDs where most crossings start from. It was found that 88% of crossing by NI residents started in border LGDs. In this analysis the border LGDs are Armagh, Derry, Dungannon, Fermanagh, Limavady<sup>xvi</sup>, Newry and Mourne, and Strabane.

**Figure 1: The origin of NI to ROI border crossings, NI residents (average weekday)**



Source: MNO Analysis, 2018

Almost 2% of crossings had Belfast as a starting point. Apart from Omagh, which is very close to the border, this was the largest share of crossings starting outside of the border LGDs.

### The crossing zone and destination for cross border travel on weekdays for ROI residents

The crossing zones and destinations for ROI residents travelling from ROI to NI are reported in Table 6. The most popular crossing zone for ROI residents when they enter NI is Newry and Mourne, with 27% of crossings, followed by Fermanagh with 25% of crossings. Just over 6% of border crossings by ROI residents had GB as the end destination. Almost 90% of these crossings ended in England.

**Table 6: The crossing zone and end destination for ROI to NI border crossings, ROI residents (weekday, %)**

	Crossing zone for cross border travel (ROI to NI) for ROI residents (%)	Destination for cross border travel (ROI to NI) for ROI residents (%)
<b>Fermanagh</b>	24.6%	22.2%
<b>Newry and Mourne</b>	26.7%	22.0%
<b>Derry</b>	17.2%	15.3%
<b>Armagh</b>	11.4%	9.7%
<b>Dungannon</b>	9.7%	7.4%
<b>GB</b>	-	6.1%
<b>Strabane</b>	5.9%	5.4%
<b>Limavady</b>	4.5%	3.7%
<b>Omagh</b>	-	1.6%
<b>Craigavon</b>	-	1.4%
<b>Belfast</b>	-	1.3%
<b>Banbridge</b>	-	0.9%
<b>Lisburn</b>	-	0.6%
<b>All other LGDs<sup>xvii</sup></b>	-	2.3%
<b>Grand Total</b>	100.0%	100.0%

Source: MNO Analysis, 2018

**Figure 2: The destination for ROI to NI border crossings, ROI residents (average weekday)**



Source: MNO Analysis, 2018

It is estimated that 86% of all crossings end in border LGDs. The most popular destinations are Fermanagh (22%), Newry and Mourne (22%) and then Derry (15%). This is illustrated in Figure 2.

### **Comparison with existing origin and destination analysis of cross border people movements**

The results of the MNO analysis are in line with the other studies. The NI Transport model provided analysis of the origin and destination of border crossings by different types of vehicles. The analysis showed that 86% of crossings made by NI residents in cars and light good vehicles ended in destinations next to the border. North Donegal was the most popular destination for crossings from Northern Ireland. The main destinations of HGV crossings to ROI, were Dublin, the South East and Dundalk, which accounted for almost half of all crossings at 47%.

The main destinations for ROI residents in cars and light goods vehicles were Derry, Fermanagh, Newry and Mourne and Strabane, accounting for 75% of all such crossings. Belfast was the fifth most popular destination with 5% of ROI resident crossings ending there. The main destinations for HGVs from ROI to NI were Belfast, Newry and Mourne, Lisburn, Dungannon and Enniskillen accounting for 59% of all HGV crossings.

The NILT survey in 2016 included the question "How often do you yourself cross the border between Northern Ireland and the South of Ireland?" The survey data was analysed on a geographic basis with the 11 District Councils of Northern Ireland re-classified to comprise three groups: District Councils in NI along the border with the ROI; Belfast District Council; and all other District Councils to the east of Northern Ireland.

Of these cross border trips:

- 80% were accounted for by adults living in the border District Councils of: Derry City and Strabane, Fermanagh and Omagh, Mid Ulster, Armagh City Banbridge and Craigavon, and Newry Mourne and Down;
- 6% were accounted for by adults living in Belfast District Council; and
- 14% accounted for by adults living in the remaining District Council areas in the east of Northern Ireland comprising: Causeway Coast and Glens, Mid and East Antrim, Antrim and Newtownabbey, Lisburn and Castlereagh and Ards and North Down.

The results from the transport model, the NILT survey and the MNO analysis all show that the majority of border crossings (at least for car drivers) are made from origins and to destinations in close proximity to the border.

### **Purpose for cross border travel**

The MNO analysis estimated the purpose of border crossings for NI residents using a combination of information. This includes the inferred home and work locations of mobile phone users, the journeys they make and the dwell times at different locations. The inferred home and place of work locations of mobile phone users are derived by



assumptions on the length of time spent at a fixed location overnight and by the length of time spent at its usual location during the day.

Four different journey purposes are outlined in the following paragraphs.

- **Home-Based Work (HBW)** - If a trip origin or destination refers to the 'home' location and the other end refers to 'work' location, then the trip is classified as HBW. For example, people living in Derry travelling from their home address to work in Donegal.
- **Home-Based Other (HBO)** - If a trip origin or destination refers to the 'home' location, and the corresponding trip end is not the 'work' or 'home' location, then the trip is classified as HBO. For example, a person living in Enniskillen travelling from their home to visit a relative in Donegal or Sligo.
- **Non-Home-Based Work (NHBW)** - If a trip origin or destination refers to the 'work' location, and the corresponding trip end is not the 'home' location, then the trip is classified as NHBW. For example, a person living in Newry who has travelled to work in Dundalk, but their journey started away from their home location, such as their gym.
- **Non-Home-Based Other (NHBO)** - If a trip origin and destination both refer to an 'other' location that is not either the 'home' or the 'work' location, then the trip is classified as NHBO. For example, a person from Limavady visiting friends in Donegal after they had been shopping in Derry city centre.

### Analysis of crossings for NI residents

Table 7 provides the breakdown of crossings for NI residents on weekdays. 38% of border crossings on weekdays are work related, with 62% of crossings not work related i.e. social and leisure purposes.

**Table 7: The purpose of travel for border crossings, NI residents (average weekday)**

Direction	HBO	HBW	NHBO	NHBW	TOTAL
NI - ROI	35,700	17,800	17,900	14,700	86,100
ROI - NI	35,700	17,800	17,900	14,600	86,000
<b>Total</b>	71,400	35,600	35,800	29,300	172,100
<b>%</b>	41.5%	20.7%	20.8%	17.0%	

Source: MNO Analysis, 2018

Table 8 provides the average number of border crossings at the weekend. It is 11% lower than the weekday average due to a 38% decrease in the number of work related crossings. At the weekend work related crossings accounted for 26% of all crossings.

**Table 8: The purpose of travel for border crossings, NI residents (average weekend)**

Direction	HBO	HBW	NHBO	NHBW	TOTAL
NI -> ROI	35,700	13,500	21,000	6,400	76,600
ROI -> NI	35,700	13,500	21,300	6,400	76,900
<b>Total</b>	71,400	27,000	42,300	12,800	153,500
<b>%</b>	46.5%	17.6%	27.6%	8.3%	

Source: MNO Analysis, 2018

On average 65% of cross border travel is for social and leisure purposes, with work related trips accounting for 35% of border crossings.

## Frequency of cross border travel

During the study period 322,000 NI residents made cross border trips, which was 17% of the NI population<sup>xviii</sup>. On average they made almost 2 return trips each week (Table 9).

The people living in the border LGDs each made almost 3 (2.7) cross border trips per week compared to 0.4 trips per week for people living in non-border LGDs. The analysis shows that people living closest to the border are the most frequent crossers and they account for the vast majority of such trips. 60% of people who crossed the border lived in the border LGDs and they made 92% of all crossings. The home location of the traveller is important because it shows that cross border travel is not uniform and those closest to the border make the most trips.

**Table 9: The frequency of border crossings for NI residents who have travelled between NI and ROI**

	Number of unique persons	Number of crossings over study period	Average number of cross border trips per week <sup>xix</sup>
<b>Border LGDs</b>	197,194	4,271,046	2.7
<b>Non Border LGDs</b>	124,931	393,370	0.4
<b>All LGDs</b>	322,088	4,664,416	1.8

Source: MNO Analysis, 2018

Analysis of the NILT Survey indicates that 20% of the NI population would make 2-3 return trips a month, which is line with the MNO analysis.

## Conclusions

### Total crossings

Extrapolating the average number of weekday and weekend crossings between NI and ROI gives an annual estimate of just over 105 million border crossings. This is supported by an estimate of 110 million person border crossings from the NI Transport model and analysis of the NILT Survey, which provides an estimate of 100 million border crossings per annum. From the three studies it can be concluded that the total number of people border crossings is in the region of 100 – 110 million per annum.

### The origin and destination of border crossing

The results from the MNO analyses, the NI transport model and the NILT survey show that the majority of border crossings start and end in locations in close proximity to the border. Between 80% and 88% of border crossings to

ROI by NI residents started in the border LGDs, while between 75% and 86% of all crossings by ROI residents to NI end in border LGDs.

### Purpose for cross border travel

38% of border crossings by NI residents on the average weekday and 26% on the average weekend day are estimated to be work related. Therefore 62% of crossings during the week and 74% at the weekend for social and leisure purposes (i.e. non work related). This means that 65% of crossings over a full week are for social and leisure purposes.

### Frequency of cross border travel

17% of the Northern Ireland population made a cross border trip over the study period. The analysis shows that people living closest to the border account for the vast majority of cross border trips. The MNO analysis found that 60% of the people who crossed the border lived in a border LGD and they made 92% of all crossings. They each made almost 3 (2.7) cross border trips per week compared to 0.4 trips per week for people living in non-border LGDs. 83% of the NI population (1.55 million people) made no cross border trips over the study period.

## Andrew Doherty

For further information or queries please contact [andrew.doherty@economy-ni.gov.uk](mailto:andrew.doherty@economy-ni.gov.uk)

---

<sup>i</sup> [Background Evidence on the movement of people across the Northern Ireland-Ireland Border](#)

<sup>ii</sup> [Cross Border Movements: Additional Analysis](#)

<sup>iii</sup> <http://www.citilogik.com/>

<sup>iv</sup> All the data used in the analysis was anonymised and care was taken to exclude data where the sample size for a location was less than 15.

<sup>v</sup> This figure could include a small number of people who are usually resident in GB, but were in NI during the study period.

<sup>vi</sup> Crossings from ROI to NI made by International visitors to ROI are not included in the ROI figures.

<sup>vii</sup> The link will be placed on this NISRA website <https://www.nisra.gov.uk/publications/eu-exit-analysis-publications>.

<sup>viii</sup> There were 104 weekend days and 261 weekdays used in the extrapolation.

<sup>ix</sup> Assumes symmetry in trips by ROI residents as presented in Table 3.

<sup>x</sup> Using the NISRA Northern Ireland mid-year population estimate for 2017 of 1.87 million.

<https://www.nisra.gov.uk/publications/2017-mid-year-population-estimates-northern-ireland>

<sup>xi</sup> The ROI population in 2017 was 4.79 million. <https://www.cso.ie/en/statistics/population/populationandmigrationestimates/>

<sup>xii</sup> [Background Evidence on the movement of people across the Northern Ireland-Ireland Border](#)

<sup>xiii</sup> The Northern Ireland Life and Times (NILT) survey, is a joint collaboration between Queen's University Belfast and Ulster University, collects information on the attitudes, values and beliefs of the people of Northern Ireland on a wide range of social and economic issues.

<sup>xiv</sup> [Cross Border Movements: Additional Analysis](#)

<sup>xv</sup> This group includes Newtownabbey, Cookstown, Magherafelt, Castlereagh, North Down, Ballymena, Ballymoney, Ards, Moyle, Carrickfergus and Larne. All of these LGDs had less than at 0.5% of crossings starting from them.

<sup>xvi</sup> Note Limavady is included due to its proximity to Donegal and operation of the Greencastle - Magiligan Ferry.

---

<sup>xvii</sup> This includes Antrim, Down, Cookstown, Coleraine, Magherafelt, Newtownabbey, Castlereagh, Ballymena, North Down, Ards, Moyle, Ballymoney, Larne and Carrickfergus. These LGDs had less than at 0.5% of crossings ending in their area.

<sup>xviii</sup> The NI population in 2017 was 1.87 million. This means that 1.55 million people in NI did not cross the border.

<sup>xix</sup> The weekly average number of trips is calculated by dividing the number of crossings by the number of unique persons (i.e. 4,664,146/322,088) and then dividing by 4 to get a weekly average and then dividing by 2 to convert crossings into trips.