

Cork Cordon Survey Report 2023

Report on Inbound People Movements Across the Cork City Cordon

List of Abbreviations and Definitions

JTC:

• Junction Turning Counts

LGV:

• Light Goods Vehicle. LGV includes the following vehicle types: Van, Pick-Up, Car Delivery Vans, Minibus, Commercial Vehicles < 3.5 tonnes (single rear tyres)

M/C:

• Motorcycle. M/C includes the following: Motorcycles, Motor Scooters, Mopeds, Three-wheel motorcycles

NTA:

• National Transport Authority

OGV1:

• Ordinary Goods Vehicle 1. OGV1 includes the following vehicle types: 2-Axles Rigid Truck, 3-Axles Rigid Truck and Commercial Vehicles > 3.5 Tonnes (single rear tyres)

OGV2:

• Ordinary Goods Vehicle 2. OGV2 includes the following vehicle types: 4 or more Axles Rigid Truck, 3 Axle or more Articulated Truck, Vehicles in Category OGV1 towing trailer

P/C:

• Pedal Cycle

PED:

• Pedestrian

PSV:

• Public Service Vehicle, excluding private / non-scheduled service vehicle

BUS:

 Includes all public (PSV) / private, single / double deck, scheduled / non-scheduled service vehicles

Executive Summary

The Cork City Cordon is a cordon of traffic survey locations that encloses Cork City. Classified Junction Turning Counts and Pedestrian surveys were undertaken at 20 locations to determine the traffic flows crossing the Cork City Cordon inbound during the key traffic periods for a typical weekday, i.e. AM (07:00 - 10:00), Lunch Time (10:00 - 13:00), School Run (13:00 - 16:00), PM (16:00 - 19:00) and 12hr (07:00 - 19:00).

Vehicle occupancy surveys were undertaken at 13 sites. In addition to this, Bus Occupancy surveys were undertaken at 12 bus stops to determine the number, occupancy and frequency of bus services crossing the Cork City Cordon. Passenger numbers from the Annual Rail Census (Iarnród Éireann) were also used to determine the passengers travelling across the Cork City Cordon inbound. Based on the analysis of the 2023 survey data, the key results are:

• In terms of overall people movements, 42,179 (20%) of a total of 209,123 people travelling inbound towards the City between 07:00 and 19:00 used sustainable modes of travel, i.e. Pedal Cycle, Pedestrian, Bus and Rail (as shown in the figure below).



People Movements by Mode over a 12-hour Period

- The total number of vehicles, pedestrians and cyclists that crossed the Cork Cordon inbound was 140,370 on the day of the survey.
- The busiest time period for vehicles and cyclists was the AM peak with 40,627 crossing the Cork City Cordon inbound towards the city. The busiest time period for Pedestrians was the PM peak with 1,627 crossing the Cork City Cordon inbound.
- Between the hours of 07:00 and 19:00, cars were recorded to have the highest vehicular traffic split, with 81% of the total inbound flows. Light Goods Vehicles (LGVs) recorded 9%, Ordinary Goods Vehicles 1 (OGV1) recorded 2%, Ordinary Goods

Vehicles 2 (OGV2) recorded 1% and taxis recorded 2%. The remaining vehicle classifications recorded 2% or less of the total flows.

• Between 07:00 and 19:00, 53% of buses were at 25-49% capacity. Approximately 16% of buses were at 0-24%. 20% were at 50-74% capacity, 8% were at 75-99% capacity and 3% were at 100% capacity.

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1 Introduction

The Cork City Cordon is a closed cordon of traffic survey locations that encloses Cork City. This report presents the findings of traffic surveys along the cordon, which were undertaken in November 2023 and captured the traffic movements crossing the Cork City Cordon inbound towards the city.

The structure of this report is set out as follows:

- **Chapter 2** provides a definition of the Cork City Cordon and sets out the methodology for the data collection;
- Chapter 3 outlines
 - The traffic flows crossing the Cork City Cordon inbound by vehicle classification;
 - The occupancy of the vehicles crossing the Cork City Cordon in terms of the number of occupants per vehicle. Each vehicle type has been analysed per peak time periods and for the duration of the survey period.
- **Chapter 4** outlines the total number of people movements crossing the Cork City Cordon inbound towards the city; and
- **Chapter 5** provides a summary of the key observations from the surveys.

2 Definition and Methodology

2.1 Definition of the Cork City Cordon

A map of the Cork City Cordon is presented in Figure 1, and highlights the locations along the Cordon where JTC and pedestrian data has been collected on the movement of people into the city. It also shows the locations where the ATC surveys were conducted.

The Cork City Cordon has been chosen to ensure, as far as possible, that any traffic flow (including cyclists and pedestrians) entering the city must pass through one of the locations where the surveys have been undertaken.

The data, as presented in this report, refers to movements in one direction only (i.e. inbound towards the city) across the various cordon points.

2.2 Data Sources

To establish the movement of people across the Cork City Cordon, a bespoke data collection exercise was carried out, comprising of the following surveys:

Junction Turning Counts (JTC):

- The JTC surveys were recorded in 15-minute intervals over a 12-hour period at 20 sites between 21/02/2023 and 25/02/2023. They were undertaken using telescopically mounted video cameras and were recorded for Car, LGV, OGV1, OGV2, Motorcycle, Pedal Cycle, Taxi and Bus.
- Vehicle Occupancy counts were also undertaken at survey points along the Cork City Cordon. Vehicle Occupancy counts were carried out by a manual enumerator between 07:00 and 19:00. All information was recorded in hourly intervals.

Bus Occupancy Surveys

• Bus Occupancy surveys were undertaken at 12 bus stops inside the Cork City Cordon on the day of the survey in order to record the number of people travelling inbound into the city via bus. Manual enumerators recorded both occupancy of the bus at the bus stop, and the number of passengers boarding and alighting. These surveys also recorded the number of public and private buses passing the bus stop and the type of bus.

Heavy Rail Data:

 Since 2012, Iarnród Éireann has undertaken a census of passengers boarding and alighting on all services passing through all stations on the national rail network. The 2023 survey was undertaken on 09/11/2023. While this rail survey was not commissioned as part of the multi-modal cordon surveys, results from the rail census were used to supplement the surveys.

Additional Two Weekly Vehicle Counts/Speed Surveys:

• Automatic Traffic Counts (ATCs) were carried out over a continuous two-week period (between 20/02/2023 and 03/06/2023) in order to gather longer term data on daily movements at key points on the radial routes leading into the cordon.

Figure 2 show the locations where JTC, ATC, Bus Occupancy and Taxi Occupancy Surveys were carried out.



Figure 1-1:JTC and Pedestrian Site Locations



Figure 2-2: ATC Site Locations and Bus Occupancy Stop Locations

2.3 Time Periods Analysed

Surveys were recorded at either 15-minute or one-hour intervals, or, in the case of public transport services, when the bus or train was at a specific stop or station. Therefore, it is possible to understand trends throughout the day from the data. As such, the data has been analysed for the following time periods:

- **AM:** 07:00 10:00
- Lunch Time (LT): 10:00 13:00
- School Run (SR): 13:00 16:00
- **PM:** 16:00 19:00
- **12hr:** 07:00 19:00

3 Cork City Cordon

3.1 Traffic Flow Surveys

3.1.1 Overview

This section outlines the classified vehicle, pedestrian and cycle flows crossing the Cork City Cordon inbound, towards the city centre. This information was collected from the JTC traffic survey sites for Car, LGV, OGV1, OGV2, Motorcycle, Pedal Cycle, Taxi and Bus, as well as pedestrian survey sites. It should be noted that these surveys count the number of vehicles, cyclists and pedestrians crossing the cordon. However, the figures presented below do not include the number of people in each vehicle (vehicle occupancy). Therefore, these figures are not representative of the mode share. Total passenger flows and mode share are discussed in sections 4.4 and 4.5 of this report.

Table 3-1 presents the observed flows by vehicle classification crossing the Cork City Cordoninbound during the time periods recorded in the 2023 survey.

	AM	LT	SR	РМ	12hr
Vehicle	07:00-	10:00-	13:00-	16:00-	07:00-
Classifications	10:00	13:00	16:00	19:00	19:00
Car	34,488	24,089	26,843	28,454	113,874
LGV	3,820	3,309	3,032	2,535	12,696
OGV1	650	704	557	261	2,172
OGV2	301	383	290	107	1,081
Motorcycle	118	91	116	171	496
Pedal Cycle	243	123	128	192	686
Тахі	684	664	769	595	2,712
Bus	323	315	291	285	1,214
Pedestrian	1,268	1,145	1,399	1,627	5,439
Total	41,895	30,823	33,425	34,227	140,370

Table 3-1: Movements Across the Cork City Cordon Inbound

Figure 3 illustrates the overall flows for all vehicle types across the Cork City Cordon per key time period. It is evident that the AM time period has the highest volume of traffic movements, with a total of 41,895 inbound crossings.



Figure 3-1: Total Movements across the Cork City Cordon Inbound by Time Period

For further information, please refer to Appendix A, which presents additional graphs separated into the respective time periods and survey site locations.

Figure sets out the number of vehicles in each classification as recorded in the JTC surveys, as well as the number of pedestrians, over a 12-hour period (i.e. 07:00 - 19:00). This figure shows that car is the most common vehicle type, with 113,874 inbound movements in the 12-hour period, accounting for 81% of all crossings.



Figure 3-2: Total Number and Percentage of Vehicles crossing the Cork City Cordon inbound by vehicle classification over a 12 hour period

3.1.2 Vehicle Classified Traffic Flows

The following sections provide a more detailed overview of the JTC survey results by vehicle classification and survey site. Each vehicle class is analysed in turn providing information on the volume of vehicles per time period and per survey site.

Car

Figure below presents the total number of cars crossing the Cork City Cordon for each surveyed time period. Overall, it is evident that the AM time period has the highest volume of cars, with a total of 34,488 cars travelling inbound.



Figure 3-3:Total Number of Car journeys per Time Period

Figure presents a further breakdown of the total number of cars, with reference to each site location. The busiest location for cars crossing the Cork City Cordon was the South Ring Rd (N40)/Sarsfield Rd junction, with a total of 11,164 cars travelling inbound through this junction over a 12-hour period.



Figure 3-4: Number of Cars Crossing the Cork City Cordon Inbound at all Sites Per Time Period

Please also refer to Appendix A for further information on the total number of cars, with reference to each individual time period.

Light Goods Vehicle

Figure below presents the total number of LGVs crossing the Cork City Cordon for each surveyed time period. Overall, it is evident that the AM time period has the highest volume of LGVs, with a total of 3,820 LGVs travelling inbound.



Figure 3-5:Total Number of LGV journeys per Time Period

Figure presents a further breakdown of the total number of LGVs, with reference to each site location. The busiest location for LGVs crossing the Cork City Cordon was the Casey's Cross junction, with a total of 1,351 LGVs travelling inbound through this junction over a 12-hour period.



Figure 3-6:Number of LGVs Crossing the Cork City Cordon Inbound at all Sites Per Time Period

Ordinary Goods Vehicle 1

Figure below presents the total number of OGV1s crossing the Cork City Cordon for each surveyed time period. Overall, it is evident that the LT time period has the highest volume of OGV1s, with a total of 704 OGV1s travelling inbound.



Figure 3-7:Inbound OGV1 journeys per Time Period

Figure presents a further breakdown of the total number of OGV1s, with reference to each site location. The busiest location for OGV1s crossing the Cork City Cordon was the Casey's Cross junction, with a total of 240 OGV1s travelling inbound through this junction over a 12-hour period.



Figure 3-8: Number of OGV1s Crossing the Cork City Cordon Inbound at all Sites Per Time Period

Ordinary Goods Vehicle 2

Figure below presents the total number of OGV2s crossing the Cork City Cordon for each surveyed time period. Overall, it is evident that the LT time period has the highest volume of OGV2s, with a total of 383 OGV2s travelling inbound.



Figure 3-9:Total Number of OGV2 journeys per Time Period

Figure presents a further breakdown of the total number of OGV2s, with reference to each site location. The busiest location for OGV2s crossing the Cork City Cordon was the Kinsale Rd junction, with a total of 210 OGV2s travelling inbound through this junction over a 12-hour period.



Figure 3-10: Number of OGV2s Crossing the Cork City Cordon Inbound at all Sites Per Time Period

Motorcycle

Figure below presents the total number of motorcycles crossing the Cork City Cordon for each surveyed time period. Overall, it is evident that the PM time period has the highest volume of motorcycles, with a total of 171 motorcycles travelling inbound.



Figure 3-11: Total Number of Motorcycle journeys per Time Period

Figure presents a further breakdown of the total number of motorcycles, with reference to each site location. The busiest location for motorcycles crossing the Cork City Cordon was the Well Rd/Douglas Rd junction, with a total of 57 motorcycles travelling inbound through this junction over a 12-hour period.



Figure 3-12: Number of Motorcycles Crossing the Cork City Cordon Inbound at all Sites Per Time Period

Pedal Cycle

Figure below presents the total number of pedal cycles crossing the Cork City Cordon for each surveyed time period. Overall, it is evident that the AM time period has the highest volume of pedal cycles, with a total of 243 pedal cycles travelling inbound.



Figure 3-13: Total Number of Pedal Cycle journeys per Time Period

Figure presents a further breakdown of the total number of pedal cycles, with reference to each site location. The busiest location for pedal cycles crossing the Cork City Cordon was the Well Rd/Douglas Rd junction, with a total of 94 pedal cycles travelling inbound through this junction over a 12-hour period.



Figure 3-14: Number of Pedal Cycles Crossing the Cork City Cordon Inbound at all Sites Per Time Period

Ταχί

Figure below presents the total number of taxis crossing the Cork City Cordon for each surveyed time period. Overall, it is evident that the SR time period has the highest volume of taxis, with a total of 769 taxis travelling inbound.



Figure 3-15: Total Number of Taxi journeys per Time Period

Figure presents a further breakdown of the total number of taxis, with reference to each site location. The busiest location for taxis crossing the Cork City Cordon was the North City Link Rd/Watercourse Rd junction, with a total of 307 taxis travelling inbound through this junction over a 12-hour period.



Figure 3-16: Number of Taxis Crossing the Cork City Cordon Inbound at all Sites Per Time Period

Bus

Figure below presents the total number of buses crossing the Cork City Cordon for each surveyed time period. Overall, it is evident that the AM time period has the highest volume of buses, with a total of 323 buses travelling inbound.



Figure 3-17: Total Number of Bus journeys per Time Period

Figure presents a further breakdown of the total number of buses, with reference to each site location. The busiest location for buses crossing the Cork City Cordon was the Lower Glanmire Road junction, with a total of 169 buses travelling inbound through this junction over a 12-hour period.



Figure 3-18: Number of Buses Crossing the Cork City Cordon Inbound at all Sites Per Time Period

Pedestrians

Figure presents the total number of pedestrian movements crossing the Cork City Cordon per surveyed time period. Overall, it is evident that the PM period has the highest volume of pedestrians, with a total of 1,627 pedestrians travelling inbound.





Figure presents a further breakdown of the total number of pedestrian movements, with reference to each site location. The busiest location for pedestrians crossing the Cork City Cordon was the Model Farm Rd/Inchigaggin Ln, with a total of 1,370 pedestrians travelling inbound through this junction over a 12-hour period.

Please also refer to Appendix A for further information on the total number of pedestrian movements, with reference to each individual time period and the classified pedestrian types (i.e. adult, OAP, child < 5, child < 16 and mobility impaired).



Figure 3-20: Total Pedestrians at all Sites per Time Period

3.1.3 Daily Movements Across the Cork City Cordon

ATCs recorded traffic flows at 15-minute intervals at 12 sites on the main radial routes into and around the city for a period of two weeks to understand daily two-way traffic movements. These surveys were primarily used to provide insight into the variation in demand across the week. The results from these surveys show that the day with the highest number of vehicles travelling inbound is Friday, as can be seen in Figure.



Figure 3-21 : Average Daily Traffic at ATC Sites
3.2 Vehicle Occupancy Data

3.2.1 Taxi Occupancy

In order to obtain accurate data reflective of a neutral weekday, taxi occupancy surveys were recorded in hourly intervals, over a 12-hour period (i.e. 07:00-19:00) on the day of the survey.

Figure, Figure, Figure, Figure and Figure display the observed vehicle occupancy for taxis crossing the Cork City Cordon inbound towards the city during the respective time periods. Please note these graphs display both the absolute values and the percentage occupancy for each time period.

During the 12-hour period (07:00 and 19:00) 57% of Taxis crossing the Cork City Cordon had one occupant, 30% had two occupants and 6% had three occupants.



Figure 3-22: Taxi Occupancy: 12 Hour



Figure 3-23: Taxi Occupancy: AM



Figure 3-24: Taxi Occupancy: LT



Figure 3-25: Taxi Occupancy: SR



Figure 3-26: Taxi Occupancy: PM

Taxi Occupancy per site

Figure, Figure, Figure, Figure and Figure display the vehicle occupancy for taxis crossing the Cork City Cordon during the respective time periods, with further reference to each individual site location.



Figure 3-27: Taxi Occupancy per Site: 12 Hour



Figure 3-28: Taxi Occupancy per Site: AM



Figure 3-29: Taxi Occupancy per Site: LT



Figure 3-30: Taxi Occupancy per Site: SR



Figure 3-31: Taxi Occupancy per Site: PM

3.2.2 Bus Occupancy

Bus occupancy information was obtained from 12 bus stop survey locations, recorded at hourly intervals over a 12-hour period (i.e. 07:00 - 19:00) on the day of the survey.

Figure, Figure, Figure, Figure and Figure display the recorded bus occupancies crossing the Cork City Cordon inbound towards the city during the respective time periods. The bus occupancies are displayed in terms of 5 different capacity bands (0-24%, 25-49%, 50-74%, 75-99% and 100%). Please note that these graphs display both the absolute values and the percentage occupancy for each time period. The figure below shows that, over the full 12hour survey period, approximately 16% of buses were at less than 25% capacity, 53% were at between 25% and 49% capacity, 20% were at between 50% and 74% capacity, 8% were at between 75% and 99% capacity and approximately 3% were full.



Figure 3-32:Bus Occupancy: 12 Hour



Figure 3-33: Bus Occupancy: AM



Figure 3-34:Bus Occupancy: LT



Figure 3-35: Bus Occupancy: SR



Figure 3-36: Bus Occupancy: PM

Bus Occupancy per Site

Figure, Figure, Figure, Figure and Figure display the vehicle occupancy for buses crossing the Cork City Cordon during the respective time periods, with further reference to each individual bus stop location.



Figure 3-37: Bus Occupancy per Site: 12 Hour



Figure 3-38: Bus Occupancy per Site: AM



Figure 3-39: Bus Occupancy per Site: LT



Figure 3-40: Bus Occupancy per Site: SR



Figure 3-41: Bus Occupancy per Site: PM

4 People Movements

4.1 Methodology

Chapter 3 provided details on the number of vehicles, pedestrians and cyclists crossing the Cork City Cordon. In order to convert these to total person trips crossing the cordon, it is necessary to estimate the occupancy of each vehicle type. Further details on how this was done is outlined below.

- Road Passenger Movements were calculated in the following ways:
 - As there are no car occupancy surveys, person movements were calculated by applying an occupancy factor of 1.42, derived from the National Household Travel Survey, to the number of vehicles at each equivalent site from the JTC surveys. This value is comparable to the value of 1.38 from table 6.11.34 of the TII Project Appraisal Guidelines¹.
 - Taxi people movements were calculated by taking the number of taxis in the JTC surveys and multiplying these by a site-specific occupancy factor that was calculated by dividing the number of passengers by the number of vehicles. Where no equivalent site survey was available, an average factor from all sites was used.
 - Total bus passenger movements were calculated by applying average bus occupancy factors (as outlined in Appendix B) to the number of buses observed in the bus occupancy surveys.
 - Cyclist and pedestrian people movements were taken directly from the JTC surveys.
- Rail Passenger Movements were calculated using the following methodology:
 - Rail movements include passengers crossing the cordon inbound from the National Rail Census, which is a boarding and alighting survey conducted by Iarnród Éireann on a single day each year at every rail station throughout the country. The most recent survey was performed on 09/11/2023. While this is different to the dates of the other surveys, the Rail Census is considered representative of rail movements.

The resulting people movements by mode are discussed in detail in the following sections of this Chapter.

4.2 Road Movements

Figures 4-1 to 4-5 below, show the number of people trips crossing the Cordon by car over the 12-hour survey period and each of the time periods analysed.

¹ <u>https://www.tiipublications.ie/advanced-search/results/document/?id=3276</u>



Figure 4-1: Road Passenger Movements per Mode per Site: 12 Hour



Figure 4-2:Road Passenger Movements per Mode per Site: AM



Figure 4-3: Road Passenger Movements per Mode per Site: LT



Figure 4-4: Road Passenger Movements per Mode per Site: SR



Figure 4-5: Road Passenger Movements per Mode per Site: PM

4.3 Rail Passenger Movements

4.3.1 Heavy Rail Passenger Movements

The National Rail Census is a survey carried out by larnród Éireann every year which records the number of people boarding and alighting at every rail station in the country. In 2023 the survey was undertaken on a the 9th of November. This report has extracted the number alighting passengers at Cork City Cordon from that survey in order to estimate the number of passengers crossing the Cork City Cordon by rail.

Cork Kent Station is served by trains on the Dublin Heuston to Cork line, trains on the Mallow to Cobh and Middleton line, as well as those originating from Limerick and Waterford, transferring at Limerick Junction. In November 2023 it was served by 14 direct trains a day from Heuston, 9 trains a day from Mallow, 31 trains a day from Midleton and 32 trains a day from Cobh. Additionally, Cork is served by 2 trains a day from both Limerick and Waterford via Limerick Junction.

Figure shows the number of passengers that alighted from a train in Cork Kent station, grouped by origin of the service. In total, 4,399 people crossed to cordon inbound and alighted at Cork Train Station over the 12-hour survey period.

Note that Limerick Junction is a key interchange station for trains serving Cork and so, passengers who interchanged at Limerick Junction (whose ultimate origin is either Waterford or Limerick) will be included in the Heuston origins in the figure below.



Appendix C presents the breakdown of heavy rail passenger movements in further detail.

Figure 4-6: Heavy Rail Services - Passengers Inbound

4.4 Total Passenger Movements

Figure and Figure display the total number of passengers crossing the Cork City Cordon by Pedal Cycle, Pedestrian, Car, Taxi, Bus and Rail for each time period.



Figure 4-7: Car, Cycle, Taxi, Pedestrian and Rail Trips Inbound Across the Cork City Cordon During Each Time Period



Figure 4-8: Trips Inbound across the Cork City Cordon: 12 Hour

4.5 Modal Split

Table 4-1 shows the number of sustainable and vehicular modes crossing the Cork City Cordon during the 12hr period.

Mode	Trips	% Trips
P/C	686	0%
Pedestrian	5,439	3%
Car	162,271	78%
Тахі	4,673	2%
Bus	31,655	15%
Rail	4,399	2%

Table 4-1:Inbound Person Trips by Mode

As can be seen from Figure-9, the mode with the highest share over a 12 hr period is Car with 78%.



Figure 4-9: Mode share of people crossing the Cork City Cordon by Sustainable and Vehicular Modes

5 Summary Results

Based on the analysis of the 2023 traffic surveys, this report demonstrates the following:

- In terms of overall people movements, 42,179 (20%) of a total of 209,123 people travelling inbound towards the City between 07:00 and 19:00 used sustainable modes of travel, i.e. Pedal Cycle, Pedestrian, Bus and Rail.
- The total number of vehicles, pedestrians and cyclists that crossed the Cork Cordon inbound was 140,370 on the day of the survey.
- The busiest time period for vehicles and cyclists was the AM peak with 40,627 crossing the Cork City Cordon inbound towards the city. The busiest time period for Pedestrians was the PM peak with 1,627 crossing the Cork City Cordon inbound.
- Between the hours of 07:00 and 19:00, cars were recorded to have the highest vehicular traffic split, with 81% of the total inbound flows. Light Goods Vehicles (LGVs) recorded 9%, Ordinary Goods Vehicles 1 (OGV1) recorded 2%, Ordinary Goods Vehicles 2 (OGV2) recorded 1% and taxis recorded 2%. The remaining vehicle classifications recorded 2% or less of the total flows.
- Between 07:00 and 19:00, 53% of buses were at 25-49% capacity. Approximately 16% of buses were at 0-24%. 20% were at 50-74% capacity, 8% were at 75-99% capacity and 3% were at 100% capacity.

Appendix A - Additional Graphs



Car Movements by Site and Period

Figure 4:Number of Car Journeys for JTC Surveys for AM per Site



Figure 5:Number of Car Journeys for JTC Surveys for LT per Site



Figure 6:Number of Car Journeys for JTC Surveys for SR per Site



Figure 7:Number of Car Journeys for JTC Surveys for PM per Site


Light Goods Vehicle Movements by Site and Period

Figure 8:Number of Light Goods Vehicle Journeys for JTC Surveys for AM per Site



Figure 9:Number of Light Goods Vehicle Journeys for JTC Surveys for LT per Site



Figure 10:Number of Light Goods Vehicle Journeys for JTC Surveys for SR per Site



Figure 11:Number of Light Goods Vehicle Journeys for JTC Surveys for PM per Site



Ordinary Goods Vehicle 1 Movements by Site and Period

Figure 12:Number of Ordinary Goods Vehicle 1 Journeys for JTC Surveys for AM per Site



Figure 13:Number of Ordinary Goods Vehicle 1 Journeys for JTC Surveys for LT per Site



Figure 14:Number of Ordinary Goods Vehicle 1 Journeys for JTC Surveys for SR per Site



Figure 15:Number of Ordinary Goods Vehicle 1 Journeys for JTC Surveys for PM per Site



Ordinary Goods Vehicle 2 Movements by Site and Period

Figure 16:Number of Ordinary Goods Vehicle 2 Journeys for JTC Surveys for AM per Site



Figure 17:Number of Ordinary Goods Vehicle 2 Journeys for JTC Surveys for LT per Site



Figure 18:Number of Ordinary Goods Vehicle 2 Journeys for JTC Surveys for SR per Site



Figure 19:Number of Ordinary Goods Vehicle 2 Journeys for JTC Surveys for PM per Site



Motorcycle Movements by Site and Period

Figure 20:Number of Motorcycle Journeys for JTC Surveys for AM per Site



Figure 21:Number of Motorcycle Journeys for JTC Surveys for LT per Site



Figure 22:Number of Motorcycle Journeys for JTC Surveys for SR per Site



Figure 23:Number of Motorcycle Journeys for JTC Surveys for PM per Site



Pedal Cycle Movements by Site and Period

Figure 24:Number of Pedal Cycle Journeys for JTC Surveys for AM per Site



Figure 25:Number of Pedal Cycle Journeys for JTC Surveys for LT per Site



Figure 26:Number of Pedal Cycle Journeys for JTC Surveys for SR per Site



Figure 27:Number of Pedal Cycle Journeys for JTC Surveys for PM per Site



Taxi Movements by Site and Period

Figure 28:Number of Taxi Journeys for JTC Surveys for AM per Site



Figure 29:Number of Taxi Journeys for JTC Surveys for LT per Site



Figure 30:Number of Taxi Journeys for JTC Surveys for SR per Site



Figure 31:Number of Taxi Journeys for JTC Surveys for PM per Site



Bus Movements by Site and Period

Figure 32:Number of Bus Journeys for JTC Surveys for AM per Site



Figure 33:Number of Bus Journeys for JTC Surveys for LT per Site



Figure 34:Number of Bus Journeys for JTC Surveys for SR per Site



Figure 35:Number of Bus Journeys for JTC Surveys for PM per Site



Pedestrian Movements by Site and Period

Figure 36:Number of Pedestrian Journeys for Ped Surveys for AM per Site



Figure 37:Number of Pedestrian Journeys for Ped Surveys for LT per Site



Figure 38:Number of Pedestrian Journeys for Ped Surveys for SR per Site



Figure 39:Number of Pedestrian Journeys for Ped Surveys for PM per Site



Figure 40:Daily Movements by Hour

Total Movements by Time Period

Mode	Trips	% Trips
P/C	243	0%
Pedestrian	1,268	2%
Car	49,146	79%
Тахі	1,166	2%
Bus	8,634	14%
Rail	1,815	3%

Table 0-1:AM Period Total Movements - Cork Cordon

Mode	Trips	% Trips
P/C	123	0%
Pedestrian	1,145	2%
Car	34,327	79%
Тахі	1,149	2%
Bus	7,706	14%
Rail	742	3%

Table 0-2:LT Period Total Movements - Cork Cordon

Table 0-3:SR Period Total Movements - Cork Cordon

Mode	Trips	% Trips
P/C	128	0%
Pedestrian	1,399	2%
Car	38,250	79%
Тахі	1,333	2%
Bus	7,928	14%
Rail	766	3%

Table 0-4:PM	Period To	tal Movements	- Cork Cordon

Mode	Trips	% Trips
P/C	192	0%
Pedestrian	1,627	2%
Car	40,548	79%
Тахі	1,025	2%
Bus	7,387	14%
Rail	1,076	3%

Appendix B - Additional Bus Stop Survey Data

Bus Stop Flow Data



Figure 41:Total Buses per Time Period - Cork



Figure 42: Public Buses Total per Time Period - Cork



Figure 43: Private Buses Total per Time Period - Cork


Figure 44:Private Buses vs Public Buses - Cork



Figure 45:Number of Buses per Time Period Per Site - Cork

Bus Occupancy Methodology

The bus passenger trip numbers used throughout this report were calculated from the bus occupancy values via the following methodology.

First the average number of passengers for each bus type was calculated. These are standard industry bus occupancy values and are shown in the table below.

Table 0-1:Average numbe	r of	passengers	per	bus	type
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Average Occupancy of a Bus per Bus Type						
Double Decker Single Decker Single Coach Double Coach Mini Bus						
94	37	55	79	16		

Then, working back from the average number of passengers per bus type, a value was calculated which corresponds with each occupancy percentage that was recorded in the bus surveys. This was calculated by taking the maximum passenger numbers per bus type, dividing the value by 100 and multiplying by the occupancy value.

Occupancy %	Double Decker Passenger Number	Single Decker Passenger Number	Single Coach Passenger Number	Double Coach Passenger Number	Mini Bus Passenger Number
0	0	0	0	0	0
5	5	2	3	4	1
10	9	4	6	8	2
15	14	6	8	12	2
20	19	7	11	16	3
25	24	9	14	20	4
30	28	11	17	24	5
35	33	13	19	28	6
40	38	15	22	32	6
45	42	17	25	36	7
50	47	19	28	40	8
55	52	20	30	43	9

Table 0-2:Occupancy Per Bus Type

60	56	22	33	47	10
65	61	24	36	51	10
70	66	26	39	55	11
75	71	28	41	59	12
80	75	30	44	63	13
85	80	31	47	67	14
90	85	33	50	71	14
95	89	35	52	75	15
100	94	37	55	79	16

Then, using the above table, the average number of passengers per bus type and occupancy range was calculated. The below table defines the ranges and the average passenger number for each range. The passenger numbers from the above table for each range are added together and the average calculated.

Table 0-3:Average passengers per range

Average number of passengers per range							
Range	Double Decker	Single Decker	Single Coach	Double Coach	Mini Bus		
0-24%	9	4	6	8	2		
25-50%	33	13	19	28	6		
51-74%	38	15	22	32	6		
75-99%	61	24	36	51	10		
100%	94	37	55	79	16		

The same process was then carried out to calculate the lower and upper passenger bounds of each bus type. These upper and lower bounds, along with the average passenger numbers can be seen in the below tables.

Lower Bound of passengers per range							
Lower	Double Decker	Single Decker	Single Coach	Double Coach	Mini Bus		
0-24%	0	0	0	0	0		
25-50%	5	2	3	4	1		

51-74%	28	11	17	24	5
75-99%	52	20	30	43	9
100%	75	30	44	63	13

Table 0-5: Upper bound of passengers by range

Upper Bound of passengers per range								
Upper	Double Decker	Single Decker	Single Coach	Double Coach	Mini Bus			
0-24%	19	7	11	16	3			
25-49%	42	17	25	36	7			
50-74%	66	26	39	55	11			
75-99%	89	35	52	75	15			
100%	94	37	55	79	16			

Bus Passenger Trips

The following graphs indicate how many passengers crossed each cordon on a bus during each time period at each site. The data in this section was taken from the Bus Occupancy surveys, where average bus occupancy values have been used to calculate the average number of passengers on board each bus.



Figure 46:Total Inbound Journeys – Buses Per Site - Cork



Figure 47:Bus Passengers - AM - Cork



Figure 48:Bus Passengers - LT - Cork



Figure 49:Bus Passengers - SR - Cork



Figure 50:Bus Passengers - PM - Cork



Figure 51:Bus Passengers - 12hr - Cork



Figure 52:Total Passenger Trips Per Site Per Time Period - Cork

Appendix C - Heavy Rail Data

The heavy rail passenger numbers are taken from the Annual Rail Census, carried out by larnród Éireann. The Passenger numbers from these services were taken from the following stations, where the train crossed the Cork City Cordon, or the first station that the train stopped at, after crossing the Cordon.

• Cork Kent Train Station

All Rail Trips Inbound Across Cordon	Trips
AM	1,815
LT	742
SR	766
PM	1,076
12hr	4,399

Table 0-1:Rail Passengers per Time Period

Table 0-2:Rail Passengers by Origin

Origin	AM	LT	SR	PM	12hr
Heuston	165	413	470	539	1,587
Tralee	147	0	0	0	147
Mallow	223	0	0	13	236
Charleville	141	0	0	0	141
Cobh	487	126	147	305	1,065
Midleton	652	203	149	219	1,223