

# Monitoring the effects of road user charging in Durham: UG346

## Summarised Saddler Street Road User Charge Monitoring Report

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## Introduction

The Peninsula area of Durham City is made up of Durham Cathedral and Castle (which are designated World Heritage Status) Chorister School, several colleges of Durham University, and some private residences. The only public vehicular access to the Peninsula is through the busiest shopping and tourist area of Durham City, The Market Place and Saddler Street.

Vehicles wishing to access the University, Cathedral and Castle must travel along a narrow single carriageway on which traffic signals control the previous flows of up to 3,600 vehicles per day. Although such flows may seem low compared to other City Centres they occurred in a narrow, confined space occupied by up to 17,000 pedestrians per day. This resulted in conflict between high volumes of traffic and pedestrians in a confined area.

Plans to restrict access to the Market Place and Peninsula have been under consideration since early 90s. A survey was conducted in 1991 in order to assess pedestrian, servicing and general traffic behaviour on the Peninsula Area. Following this survey Durham County Council introduced The County of Durham (Peninsula Area, Durham City) (Traffic Management) Order, 1994. This order introduced several restrictions. These included Weight Restrictions on Saddler Street, Disabled Parking Places and Loading Areas to the Market Place, Prohibition of Coaches, and Prohibition of Waiting and Loading.

These restrictions served mainly to regulate traffic and did not deter all non-essential vehicles from entering the Peninsula. The restrictions did however successfully reduce traffic from 3600 a day to 2000. Although a step reduction of 45% was achieved the remaining vehicles continued to present a significant hazard to pedestrians.

The Introduction of the Transport Act 2000 provided the opportunity to deliver an effective solution to the traffic problem through Road User Charging, the primary objectives of which were to:

- Improved pedestrian safety.
- Improved access for the disabled.
- Enhance the World Heritage Site, whilst
- Preserving the viability of the Peninsula as a working part of the City Centre.

Following consultation with the public a £2 charge for vehicles using Saddler Street and the Market Place during a defined period of 10 am and 4 pm Monday to Saturday was introduced. This was considered to be a sufficient deterrent when considering that the main area for vehicle reduction lies within those undertaking short duration shopping or commercial activities. This period was chosen as it coincided with peak pedestrian flows. It was also agreed that, to allow ease of use of permits by visitors, and to ensure no build up of congestion occurred at the access point, the control and payment collection should be on exit rather than on entry.

The previous loading arrangements in the Market Place and Saddler Street were amended to reflect the expected change in access patterns. Previously the Loading Restrictions on Saddler Street had been Monday-Saturday 10.00am till 11.00pm and at any time on Sundays. These were relaxed to a Monday to Saturday 8.00am till 10.00am and 3.00pm till 6.00pm and Sundays 8.00am till 1.00pm restriction. In addition disabled parking was removed from the Market Place and replaced with Loading Bays for use at any time. The revised restrictions are less restrictive than previous.

Free access to both the Market Place and Saddler Street could be gained outside the restricted period.

In order that access for pedestrians and public transport users was improved, a previously under utilised bus service into the area was extended and enhanced (The Cathedral Bus).

The scheme was introduced in October 2002.

## Choice of Methods

As discussed above the objectives of the scheme are to:

- Improved pedestrian safety,
- Improved access for the disabled,
- Enhance the World Heritage Site, whilst
- Preserving the viability of the Peninsula as a working part of the City Centre.

In order to ascertain if the primary objectives of the scheme have been achieved several surveys have been conducted. These are:

- Exit Method Survey.
- Vehicle Usage Log.
- Bollard Collision Data.
- Pedestrian Counts.
- Cathedral Bus Usage.
- Accident Data.
- Questionnaires.

In order to identify meaningful trends from the data obtained using the above survey methods it is important to consider external data. Detailed below are tourist information figures for Durham City and its main attraction, the Cathedral. Also included are retail sales figures. It should be noted that the fluctuation in use of the Peninsula and variations in activities related to education, religious and retail use present difficulties in assessing survey data gathered over a short period of time. Several years of analysis are required to fully determine the affects of the Road User Charge.

## Tourist Information Survey

	UK Residents	% Trips	Overseas Residents	% Trips
	2001	2000	2001	2000
Jan, Feb, Mar	18	19	24	20
Apr, May, June	23	30	18	25
July, Aug, Sept	28	26	34	29
Oct, Nov, Dec	31	25	23	25

Figure 1 (Source: UK Residents: United Kingdom Tourist Survey, Overseas Residents: International Passenger Service)

Attraction	Location	Visits 2001
Durham Cathedral	Durham	478,097

Figure 2 (Source: Key Facts of Tourism for Northumbria 2001)

## Retail Information Survey

### Monthly Volumes of Retail Sales



[Appendix1Saddler.pdf](#)

(1 page - 240kb)

Whilst considering the results of the surveys undertaken, reference may be made to the above data.

## Exit Method Survey - Data Collection

National Car Parks (NCP) manages the Saddler Street Bollard on behalf of Durham County Council. NCP have maintained detailed logs of the methods by which a driver of a vehicle successfully exits the controlled area. Information for the period October 2002 to July 2003 has been analysed for the purpose of this report. The varying methods by which a driver of a vehicle may exit the peninsula are detailed below.

### Paying

Drivers of vehicles exiting the controlled area are met with a payment machine mounted on an island in the centre of the carriageway adjacent to St. Nicholas' church. Drivers can pay a £2 charge at the payment machine. Payment will facilitate the lowering of the automatic bollard located in the centre of the outbound carriageway.

### Non - Payment

Drivers of vehicles who are unable to or do not wish to meet the charge are permitted to proceed through the bollard system. An intercom integrated in the traffic indicator column provides a direct link to the NCP Parking Shop where the bollard can be lowered manually. Drivers failing to meet the charge will be issued with a £30 charge notice if payment is not received during the working day.

### General Exemptions

Some Service providers are exempt from the charge. These include Emergency Service vehicles, City Council Livered vehicles, Public Utility vehicles on emergency duty, Bullion Vehicles, Royal Mail and Recovery Vehicles. These vehicles are not issued with exemption permits and must identify themselves through the intercom system.

### Cathedral

The Dean and Chapter of Durham Cathedral are issued with a limited number of exemption permits.

### Residents

Permanent residents on the Peninsula are issued with exemption permits.

### University

Universities are issued with a limited number of exemption permits for issue to staff or service vehicles. Parents of the youngest children at the Chorister School are issued with exemption permits, as their school day must finish at 3:30pm.

### Transponders

A limited number of Autotag transponders have been issued for attachment to vehicles with high frequency use. The transponder device is attached to the windscreen of a vehicle. When a vehicle with a transponder approaches the bollard it detects the transponder and lowers automatically. Some University staff, Cathedral staff and residents are issued with transponders. In addition the Cathedral Buses are also fitted with a transponders.

## Exit Method Survey - Data Analysis

Please refer to Chart 1 below for details of the average monthly number of vehicles exiting Saddler Street expressed as a percentage from each category.



[Chart 1.pdf](#)

Please refer to the attachment below for a line graph showing the average daily number of users per month from each category.



[Chart 2.pdf](#)

The most popular exit method is payment at the machine. This makes up 39% of all exit methods. On average 2203 vehicles per month chose to pay. This generates an average monthly income of £4406. The busiest paying period recorded is December. This coincides with the peak retail period. During December an average of 129 vehicles per day paid to use Saddler Street. This is in contrast to the least busy period of May where an average of 70 vehicles per day chose to pay. Although this is a relatively average retail period it is the weakest tourist and quietest university period.

University and Cathedral use follow largely the same pattern. University use is responsible for 17% of all exit methods. Cathedral use is responsible for 18% of all exit methods.

University use peaks in June and July. This may be due to end of term exams and the passing out of graduates, which takes place at the Cathedral. Cathedral use peaks in March, which coincides with Lent and Easter.

The passing out parade for university graduates is conducted at the Cathedral. University end of term events occur in both June and July.

The number of persons exempt from the charge has remained relatively steady since introduction of the scheme. Minor fluctuations are due to the exemption of statutory undertakers undertaking emergency repairs of apparatus within the Peninsula area.

The number of vehicles electing not to pay each month has dropped from 57 in October 2002, to 13 in June 2003. The vast majority of those electing not to pay are unable to do so due to lack of correct change for the payment machine. Approximately +90% of drivers failing to pay at the machine make payment before the end of the working day in order to avoid incurring an additional £30 fine.

The overall busiest months have been December, March and June.

The average number of vehicles from all categories per month using Saddler Street is 5732. This is an average of 239 vehicles per day.

A survey conducted on Friday 13th December 1992 recorded a total of 3600 vehicles using Saddler Street. A total of 547 vehicles were recorded using Saddler Street on Friday 13th December 2002. This is a reduction of 3053 vehicles per day, an 85% reduction. See Chart 3.

## Vehicle Usage Log - Data Collection

Survey & Marketing Services Ltd (SMS) were commissioned to conduct vehicle surveys prior to and following introduction of the road user charge. Prior to introduction surveys were conducted which recorded the overall number of vehicles entering Saddler Street within 6 categories. These were Pedal Cyclist, Motor Cyclists, Cars, Light Goods, Heavy Goods, and Buses. The survey was conducted between the hours of 8.15am and 6.00pm

SMS conducted a further survey following introduction of the charge. This consisted of a registration number survey of vehicles entering and leaving Saddler Street. Vehicles were classified into three categories. These were Cars, Light Goods and Heavy Goods. From the results of the survey it is possible to evaluate overall vehicle activity on the peninsula as well as parking duration. The survey was conducted between the hours of 9.00am and 5.15pm.

## Vehicle Usage Log - Data Analysis

A comparison of the total number of vehicles recorded prior to introduction and following the introduction of the charge can be seen in the chart below:



[Chart 3.pdf](#)

Chart 4 below shows peninsula occupancy levels during the day on a typical Thursday, Saturday and Sunday following introduction of the charge. It can be seen that activity levels peak during lunchtime on weekdays and are higher during the morning period on weekends.



[Chart 4.pdf](#)

Overall activity is higher on a weekday than on the weekend. Sunday has a significantly lower occupancy rate than Saturdays although activity patterns remain the same. This is unusual as the charge is not applicable on Sundays.

A total of 202 Light Goods vehicles (LGV) and Heavy Goods vehicles (HGV) entered Saddler Street between 9.00am and 5.15pm in 2001. A total of 97 LGV/HGV's entered Saddler Street between 9.00am and 5.15 pm in 2003.

A total of 35 LGV/HGV's entered Saddler Street between 9.00am and 10.00am in 2001. A total of 38 LGV/HGV's entered Saddler Street between 9.00am and 10.00am in 2003.

Although the overall number of LGV/HGV's entering Saddler Street throughout the day has reduced, the number of LGV/HGV's entering Saddler Street before 10.00am has remained similar.

It is considered that LGV's and HGV's entering the peninsula will be on delivery duties.

Chart 5 shows a comparison between the percentage of LGV's and HGV's entering Saddler Street before 10.00am, before and after introduction of the charge.



[Chart 5.pdf](#)

Chart 6 shows a comparison between the percentage of LGV's and HGV's leaving Saddler Street before 10.00am, before and after introduction of the charge.



[Chart 6.pdf](#)

Chart 7 shows the number of LGV's entering Saddler Street at various times throughout the day.



[Chart 7.pdf](#)

Chart 8 shows average stay lengths for LGV's, which have entered Saddler Street throughout the day.



[Chart 8.pdf](#)

In 2001 31% of delivery vehicles entered Saddler Street before 10.00am. In 2003 this figure has increased to 79%. The number of LGV/HGV leaving before 10.00am has not seen such dramatic change. In 2001 56% of LGV/HGV left before 10.00am. This figure has seen a moderate increase to 60% in 2003. It should be noted that the survey data does not cover the early morning periods before 9.00am. It is reasonable to assume that a large proportion of deliveries take place before 9.00am. Further surveys will need to be undertaken to confirm this. The results of the survey show that there has been a significant change in delivery patterns.

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[Chart 9.pdf](#)



[Chart 10.pdf](#)

Due to the low number of HGV's entering the Peninsula it is impossible to identify any meaningful pattern.

Chart 11 shows the number of cars entering Saddler Street at various times throughout the day.



[Chart 11.pdf](#)

Chart 12 shows average stay lengths for cars, which have entered Saddler Street throughout the day.



[Chart 12.pdf](#)

The peak numbers of cars entering Saddler Street occurs at 9.00am and 3.45pm. Cars entering at 9.00am stay on the peninsula for an average of 230 minutes. It is considered that these cars will be made up of Cathedral, University and retail staff as well as parents taking children to the Chorister School (25% of cars stay for less than 15 minutes).

Those cars arriving at 3.45pm remain on the peninsula for an average of 20 minutes. These vehicles are considered to be parents of children of the Chorister School. The average stay of 20 minutes means parents are leaving following the lowering of the bollard at 4.00pm.

There is a significant increase in vehicles leaving the peninsula following lowering the bollard at 4.00pm.

## **Pedestrian Count - Data Collection**

As discussed earlier in the report it should be noted that the fluctuation in use of the Peninsula and variations in activities related to education, religious and retail use present difficulties in assessing survey data gathered over a short period of time. Therefore, in order to successfully analyse pedestrian survey data prior to and following introduction of road user charging it is necessary to compare surveys conducted over exactly the same periods.

Pedestrian surveys were undertaken by SMS over the same weekly period prior to introduction of the charge in 2002 and following introduction in 2003. (Week beginning 15th September 2002 and week beginning 14th September 2003. Sunday, Monday and Thursday)

## **Pedestrian Count - Data Analysis**

Chart 13 shows the total number of pedestrians recorded on each of these days.



[Chart 13.pdf](#)

Comparisons between pedestrian numbers in 2002 and 2003 show an overall increase in activity of 10% following introduction of the charge.

It will be necessary to conduct further surveys in order to ascertain if pedestrian activity continues to be similarly affected throughout the year.

## **Cathedral Bus Usage - Data Collection**

The Cathedral Bus is operated using two state of the art Optare Alero minibuses. These buses are able to kneel by lowering the front suspension to provide easily accessible transport for wheelchair users and parents with buggies.

Management of the Cathedral Bus is undertaken by Public Transport section. Records of revenue from fares and patronage are recorded on a weekly basis.

All journeys cost a flat fare of 50p or 25p for senior citizens and children less than 14 years.

The Cathedral Bus operates every 20 minutes between Cathedral, Market Place Milburngate, North Road Bus Station, Rail Station and Walkergate Coach Park and Car Park.

## **Cathedral Bus Usage - Data Analysis**

Chart 14 shows the total number of passengers and revenue per week on the Cathedral Bus following its introduction.



[Chart 14.pdf](#)

Chart 15 shows the monthly revenue on the Cathedral Bus following its introduction.



[Chart 15.pdf](#)

The Cathedral Bus has seen usage reduce from September to November 2002. There was a minor uplift in passenger numbers in December, followed by further reductions in January. February to June has seen steady increases in passengers. This is considered to be due to steady increases in both tourism and advertising of the service.

Peaks in patronage occurred in September 2002 with 1267 passengers (£435 revenue) and June 2003 with 1275 passengers (£434 revenue). Passenger levels can increase whilst revenue remains the same due to the various fare types and the ability of passengers to use the service multiple times with the same ticket.

Use of the Cathedral Bus appears to be seasonal at this early stage. Levels of use appear to be affected by both seasonal changes in tourism and retail. Steady overall increase in patronage is expected as shoppers become more familiar with the service.

## **Accident Statistics including Bollard Collisions - Data Collection**

Police Stats 19 data provides information on vehicular and pedestrian accidents, which have resulted in personal injury. At the request of Durham County Council Council damage only information is no longer provided. However, bollard collision data is recorded by NCP and an analysis of this data is shown below.

An examination of the accident data from the Police Stats 19 files shows that there were very few incidents prior to or following the introduction of the charge. Therefore, it is difficult to identify any meaningful trends with any accuracy. Additionally it is suspected that there are many unreported minor incidents. It is recommended that follow up analysis of accident data be undertaken at 3 years post introduction.

## **Accident Statistics including Bollard Collisions - Data Analysis**

Chart 16 shows the number of bollard collisions each month.



[Chart 16.pdf](#)

A member of NCP staff was available during the first 6 months of operation in order to address any difficulties drivers may have in using the system. This facility was removed in April 2003 but re-introduced soon after following operational difficulties with the bollard system.

The majority of bollard collisions occur due to vehicles tailgating. Sensors on the bollard prevent the bollard from rising beneath a vehicle, however this does not prevent tailgating vehicles colliding with the bollard as it attempts to rise between them.

Increases in the number of collisions in June and July 2003 are the result of amendments to the bollard operating system. Traffic detection loops were reconfigured to allow tailgating vehicles to pass through the congestion charge unhindered. It was hoped that this would prevent further collisions occurring. However, this proved unsuccessful and traffic detection loops have since been returned to their original configuration.

It should be noted that the number of bollard collisions is low by comparison to similar systems currently in operation.

## **Questionnaires - Data Collection**

SMS questioned both pedestrians and business in 2001 prior to introduction of the charge and following introduction of the charge in 2003. A sample of the questionnaire used on both occasions is shown in Appendix 2. The results of the surveys are shown in Charts 16 to 29 below.



[appendix2.pdf](#)

## Questionnaires - Data Analysis

Most people (53%) travel into Durham City by car, either as driver or passenger. This is a slight increase upon 2001 figures where 49% of people travelled by car. Fewer people are using other modes of transport, such as buses, trains and cycles. The number of people walking into Durham has increased slightly from 20% to 23%.



[Chart 17.pdf](#)

Most popular areas for people to park are the Prince Bishops or Milburngate Multi-Storey Car Parks. Between the two surveys there appears to have been a small shift with people choosing to park around Elvet (University and Elvet) instead of around the River Wear (Walkergate, Riverside and Market Place).



[Chart 18.pdf](#)

Figures for the number of people who have designated parking spaces on the Peninsula have not changed significantly.



[Chart 19.pdf](#)

The majority of people visiting the city centre live within the Durham Area, with many making use of public transport facilities. As in 2001, similar numbers of people from other areas of the North East are still represented in the survey.



[Chart 20.pdf](#)

Figures for the main reasons why people visit Durham City Centre have not changed significantly. As in 2001, the most popular reason for people wishing to visit Durham city centre is for leisure purposes. There has been a slight increase (0.4%) in the number of people whose main purpose for being in Durham was to pick someone else up.



[Chart 21.pdf](#)

People are spending less time in Durham City. Only 28% of people interviewed intend to be in Durham for more than three hours. Most people (72%) intend to stay in Durham for up to two hours, which is a 14% increase upon 2001 figures.



[Chart 22.pdf](#)

Since the Road User Charge scheme has been introduced more people feel that Durham has become a safer place. Of those people who were interviewed 78% felt that Durham was now a safer place for pedestrian, which is a 10% increase upon 2001 figures.



[Chart 23.pdf](#)

There has been an increase in the number of people who are concerned about the current state of lighting and pavements. Of those people who were interviewed 42% felt that the current situation was bad, which is 14% up on 2001 figures.



[Chart 24.pdf](#)

Figures regarding how attractive people find Durham have not changed significantly.



[Chart 25.pdf](#)

Now that the Road User Charge scheme has been introduced, more people feel that the introduction of a £2 access charge was a good idea. Before the introduction of the scheme only 49% of people felt that it was a good idea, now the scheme is operational this figure has risen to 70%. There has been a 25% reduction in the number of people who feel that the scheme was and still is a bad idea.



[Chart 26.pdf](#)

Before the introduction of the charge scheme many people (56%) felt that improvements could be made to Saddler Street through pedestrianization and restricting vehicular access. Since the introduction of the scheme this figure has reduced to 7%, with more people feeling that the existing pavements should be improved.



[Chart 27.pdf](#)

Figures regarding gender, age and category of respondents has not changed significantly.



[Chart28pdf.pdf](#)



[Chart 29.pdf](#)



[Chart 30.pdf](#)

## **Business Questionnaires**

Large numbers of business (83%) have not altered their servicing arrangements following introduction of the Road User-Charging scheme. Of those companies who have been affected (17%) only one has had to change their

suppliers as the original firms have refused to deliver. One company, (3%) feels that trade has increased since the introduction of the scheme.

## Conclusion

- 85% reduction in vehicular traffic
- 10% increase in pedestrian activity
- 48% reduction in the number of delivery vehicles entering Saddler Street between 9.00 am and 5.15pm.
- Steady increases in use of Cathedral Bus
- 10% increase (to 78%) in number of people who consider Durham City Centre to be a safe place to visit.
- 21% increase (to 70%) in number of people who believe the Road User Charge is a good idea.
- 83% of businesses have not altered their servicing arrangements following introduction of the Road User Charge.

The Durham City Forum consisting of members of Durham County Council, City Council, Chamber of Trade, University, and Cathedral, agreed an aim 'to significantly reduce its vehicular and pedestrian conflict by removing a substantial proportion of existing traffic' In doing so the outcome must include:

- Improved Pedestrian Safety
- Improved access for disabled
- Enhancement of the World Heritage site
- Preservation of the viability of the Peninsula as a working part of the City Centre

Since introduction of the scheme on 1st October 2002, the aim set out by the forum has been achieved and the objectives delivered. Decreases in vehicular activity lead to reductions in vehicle emissions, noise and visual intrusion enhancing the World Heritage Site, Cathedral and Castle. Environmental improvement has encouraged a 10% increase in pedestrian activity since introduction of the Road User Charge.

Public perception of the scheme has improved significantly following its introduction. This is in line with the experiences at other sites around the world where Road User Charging has been introduced. ' public opinion towards Road User Charging tends to soften after implementation. For example, in Trondheim, Norway, negative responses to the toll ring during attitudinal surveys fell markedly after implementation of the scheme' \*\* Urban Road User Charging Scheme Design Principles - A Preliminary Scheme Design Guide

Further monitoring will be necessary before the overall long-term affects of Road User Charging in Durham can be clearly identified. However, early indications are that the scheme is having positive benefits for Durham City Centre.