

The Environmental Impacts of  
Major Cycling Events:  
**Reflections on the UK Stages  
of the Tour de France**





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# Executive Summary

Governments, other agencies and authorities actively encourage cycling for transport and leisure, as it is considered to offer significant environmental and health benefits.

However, how 'green' is cycling when it becomes the focus of the largest annual sporting event in the world?



This study aims to help answer this question by assessing the economic and environmental impacts of the 2007 Tour de France Grand Depart in London and Kent (South East of England).

The research involved conducting face-to-face surveys with over 1,400 spectators who attended the Grand Depart at key locations in London and Kent. The survey was used to collect information on spectators' duration of visit, travel and spending on a range of items and activities.

Transport for London estimated that 2.85 million spectators attended the various Grand Depart events. As the Grand Depart is a multi-stage event, taking place over three days in different locations, it is likely that some spectators attended more than one event. This estimate was adjusted for double-counting in order to avoid overestimating impacts.

## The main findings from the research are:

- The largest spectator spending was on food and drink, transport and accommodation. The (net) direct spectator spending impact on the UK was estimated to be almost £80m.
- The total economic impact of the event on the UK economy was estimated to be almost £150m, and 2,000 (full-time equivalent) jobs.

- The environmental impact of the event was estimated by calculating its 'ecological footprint'. This is the land area required to support the resource demands and consumption patterns of the spectators, and is measured in terms of 'global hectares'. The total Footprint was estimated to be 57,990 global hectares. This is equivalent to 143 times the area of London's Olympic Park.
- The ecological footprint of the average spectator at the Grand Depart was almost 2.2 times greater than if they had not attended the event and gone about their regular everyday activities at home.
- The main contributor to the ecological footprint was travel. The average spectator travelled 734 kilometres to watch the event. Almost 59% of the total distance travelled was by air (largely international air travel), which added significantly to the overall Footprint. Other key contributors were rail, coach and car travel.

This research highlights that there were significant economic impacts associated with the Grand Depart. However, the consumption patterns of spectators at the event were found to be significantly different to behaviours whilst at home, and so also generated large environmental impacts. The research enabled the 'big hitters' in

terms of environmental impact to be identified, and so provide policy relevant information which could be used to help target and minimise the environmental impacts of future events. The study provides a more holistic appreciation of the impacts that can result from major events, and we recommend that this type of evaluation should feature more regularly in event impact and evaluation studies.







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# The Environmental Impacts of Major Cycling Events: Reflections on the UK Stages of the Tour de France

## Introduction

Major sporting events are a key part of economic and tourism strategies for cities, regions and countries across the world. One reason behind this increased attention is based on a presumption that they can generate a significant number of economic benefits, prestige and media coverage. The UK has a wealth of experience in bidding for and hosting major events. Recent examples include the 2000 Rugby World Cup, Ryder Cup, Commonwealth Games (Manchester and Glasgow), 2012 Summer Olympic and Paralympic Games.

**Cycling is considered to offer significant environmental and health benefits, but how 'green' is it when it becomes the focus of the largest annual sporting event in the world?**

Major sport events can generate economic impacts, however the consumption behaviours of spectators can also result in significant environmental impacts. For example, how spectators travel to an event, the type of food and drink they purchase, the length of time that they stay, their preferred choice of overnight accommodation, whether or not they choose to recycle, or undertake other activities during their visit. Typical spectator activities at an event can in turn result in an 'environmental' as well as 'economic' impact. There are challenges in examining the environmental footprint of major events. This report aims to understand the scale of an event environmental footprint and its key contributors. In planning major events, UK stakeholders need to better understand the comparative scale of the economic and environmental

impact. In particular, this study aimed to investigate the following:

- What are the economic effects associated with spectators attending a major event?
- What are the environmental impacts associated with spectators attending a major event?
- What consumption behaviours of spectators have the largest environmental impacts?
- How significant is spectator travel in terms of the overall environmental impact of an event?

The research presented in this report focuses on the case of the 2007 Tour de France Grand Depart. However, the findings provide insights into the types of economic and environmental impacts which can result from hosting major events.

This research was carried out by Andrea Collins, Annette Roberts and Max Munday with the support of the ESRC BRASS Research Centre at Cardiff University. This report provides a summary of the key findings from that research. A detailed description of the research methodology and the research findings was published in the Journal of Travel Research in 2012. (see Collins et al, 2012).





# Tour de France: The World's Most Popular Annual Sporting Event



The Tour de France began in 1903 as an amateur cycling competition. Since then it has become the most well-known and prestigious annual global sporting event, attracting riders and teams from around the world. The Tour is currently owned and organised by Amaury Sport Organisation (ASO) (part of the French media group Éditions Philippe Amaury), who also organise a number of other sporting events including the Paris-Nice professional cycling road race, the Dakar Rally, Paris Marathon, gold French Open and a number of equestrian events.

The Tour is a free public and non-ticketed event, and annually attracts an estimated 2 billion spectators. A unique aspect of the event is that it does not take place in a stadium, nor does it require any new permanent infrastructure, a prerequisite of successful bids to stage events such as the Olympic Games.

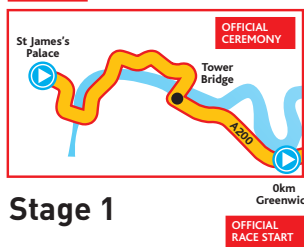
The Tour is an itinerant event and moves between towns and cities. It typically lasts 3 weeks, covers over 3,500km, and has racing and time trial stages. The Tour largely takes place in France, but stages have previously been undertaken in neighbouring countries such as Belgium, Germany, Ireland, Luxembourg, Monaco, Netherlands, Spain and Switzerland. Prior to the 2007 Grand Depart, the Tour had visited the UK twice. The first in 1974 was a relatively low key stage in Plymouth, while the second visit in 1994 attracted an estimated 3 million spectators along a route between Dover and Portsmouth.

**There is strong competition to host a stage of the Tour de France, and several UK cities and regions are bidding to host stages in the future.**

Although a host pays ASO a significant sum for the privilege to host a stage<sup>1</sup>, there are a number of expected benefits including prestige, economic benefits and media coverage. For example, Desbordes (2007) estimated that the city of Digne (France) in hosting the 12th stage of the 2005 Tour injected some 326 000 Euros into the local economy. However, this reported figure of economic impact is likely to be an underestimate as it did not account for all areas of spectator consumption, nor did it include the additional economic benefits that were generated by raising the city's profile through the increased media attention.

<sup>1</sup>For example, Reims (France) paid ASO €88,000 to host the arrival of Stage 3 of the Tour in 2002.





Stage 1

# London's Bid to Host the 2007 Tour de France Grand Depart

In January 2006, Ken Livingstone the Mayor of London, announced that London and Kent would play host to the start of the 94th Tour de France between 6-8th July 2007. Hosting the Grand Depart had somewhat of a novelty factor attached to it as after the Tour Finale in Paris, the Grand Depart is considered the second highest profile stage of the event. This would lend itself to generate greater profile and media coverage opportunities compared to previous UK Tour de France visits. Furthermore, the timing of the Grand Depart would make it the largest major sporting event to be held in London prior to the 2012 Summer Olympic and Paralympic Games.

There were three key reasons behind London's decision to bid to stage the Grand Depart. First, it would provide an opportunity to showcase the capital and demonstrate its suitability as a location for staging world-class sporting events. Second, it was considered that the event would attract visitors to London and generate additional expenditure. In a report to the London Assembly in November 2006 – 6 months ahead of the Tour – the Mayor of London reported that an estimated 2 million spectators from across the world would visit London and Kent to watch the Tour and generate 'an estimated £115 million boost in tourism revenue' (Ken Livingstone, 2006 page 2).

The third and final objective was to lever 'legacy' environmental benefits from the competitive aspect of the sport event by 'making London a city where people of all ages and abilities have the incentive, confidence and

facilities to cycle whenever it suits them' (SRA, 2007, page 2) and encourage cycling and promote London as a cycle-friendly city.

ASO in awarding London the right to host the Grand Depart were reportedly not only attracted by London being one of the world's major capital cities, but also that its local organisers planned to leverage environmental benefits from the event:

*"We are proud that you have chosen such an important event as the Tour to encourage people to become cyclists - not necessarily champions - but users of this marvellous instrument of transport and pleasure that is a symbol of freedom"*

(Jean Marie Leblanc, Deputy Director of ASO, 9 February 2006).







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# The 2007 Tour de France Grand Depart



capital's historic landmarks, including the Houses of Parliament, Buckingham Palace, Hyde Park and Tower Bridge.

Stage 1 of the Tour was held on Sunday 8th July, and involved a 203 km course with the *peloton*<sup>3</sup> departing from Westminster, passing through South East London (closely following the route of the London Marathon), then via Maidstone and Royal Tunbridge Wells, with the finish in Canterbury (Kent).

In addition to the competitive race itself, a number of fringe events were organised in London and Kent prior to and during the week of the Grand Depart. These were designed to complement the Tour de France, promote cycling more generally and appeal to a range of interests and age groups. One such event was a free public Cycling Festival that was held in London's Hyde Park following the departure of the peloton at Stage 1 in London.

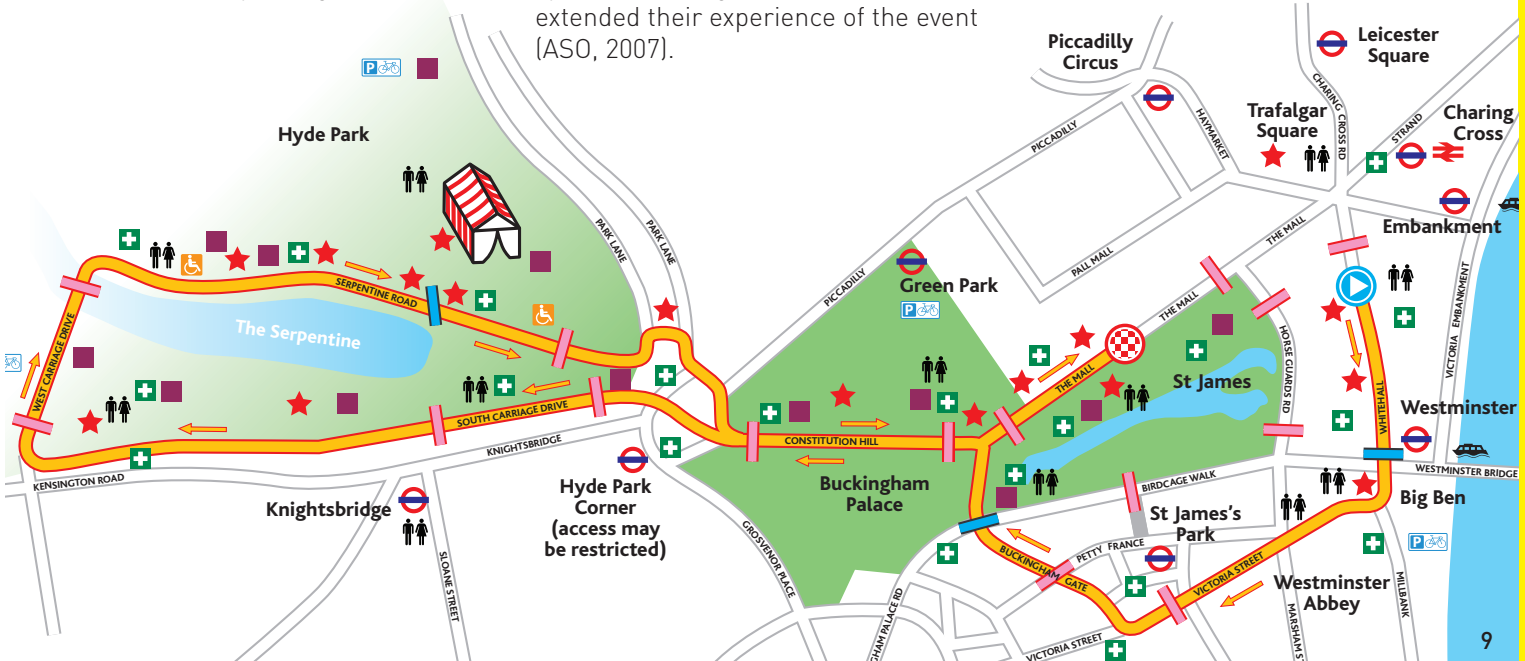
The Grand Depart of the 2007 Tour de France was held in London and Kent on 7th and 8th July. The race was preceded by an Opening Ceremony in London on Friday 6th July. This was a free public event at London's Trafalgar Square to celebrate the Tour's arrival in London and promote cycling.

The first day of the Tour (*the 'Prologue'*) took place on Saturday 7th July<sup>2</sup>. This was a 7.9km time trial which featured a flat course around London, starting at Whitehall and passing many of the

Along the route of the Prologue and Stage 1, large screens were constructed at key points for spectators to watch the build up to and the actual race. The Tour '*caravane*' which preceded the race involved 200 vehicles advertising various brands (such as Skoda, Haribo, T-Mobile, The Laughing Cow, and Sea France) and distributed an estimated 15 million free commercial samples to spectators along the route which extended their experience of the event (ASO, 2007).

<sup>2</sup>This was the same day as the Wimbledon Championship Finals, Live Earth Concert at London's Wembley Arena, and the second anniversary of the bombing attacks on London's Underground.

<sup>3</sup>The term *peloton* comes from the French word meaning 'little ball', and in cycling terms refers to the main group of riders in a road cycling race.



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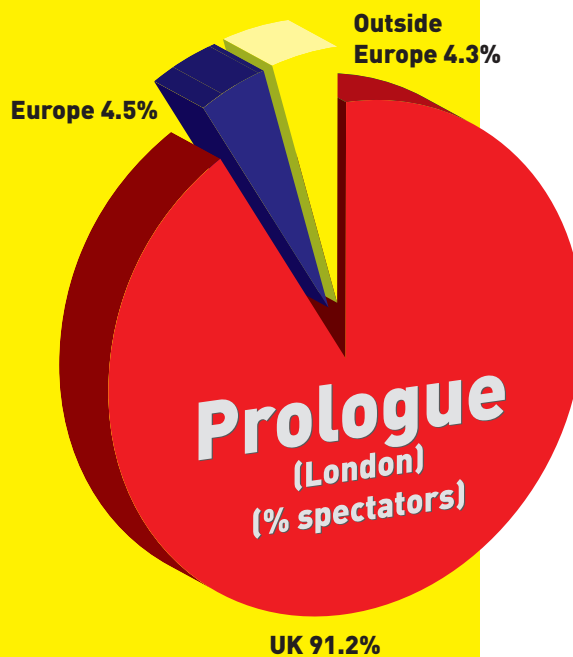
## The Research

The aim of our research was to provide an estimate of the economic and environmental impacts of spectator expenditure and physical consumption associated with the 2007 Tour de France Grand Depart. The assessment considered both the local and global environmental impacts.

Data used to calculate these impacts were based on a survey of over 1,400 spectators at the event. Spectators were surveyed at the Prologue (London) and Stage 1 (Kent)<sup>4</sup>. Results from both these locations were used to inform estimates of spectator expenditure and consumption patterns at the Opening Ceremony and Stage 1 in London. The survey covered a number of issues including: purpose of visit and duration, travel details (to and from and during the event), and details of spending on a range of items and activities during the visit. The following table shows the home location of spectators that took part in the survey.

The Grand Depart was a free public and non ticketed event. Establishing total spectator numbers is always difficult at such events. An estimate of spectator numbers was provided by Transport for London - who estimated that there were 2.85 million spectators at the Opening Ceremony, Prologue and Stage 1, with an estimated two-thirds of this figure viewing Stage 1 in London and Kent (SRA, 2007).

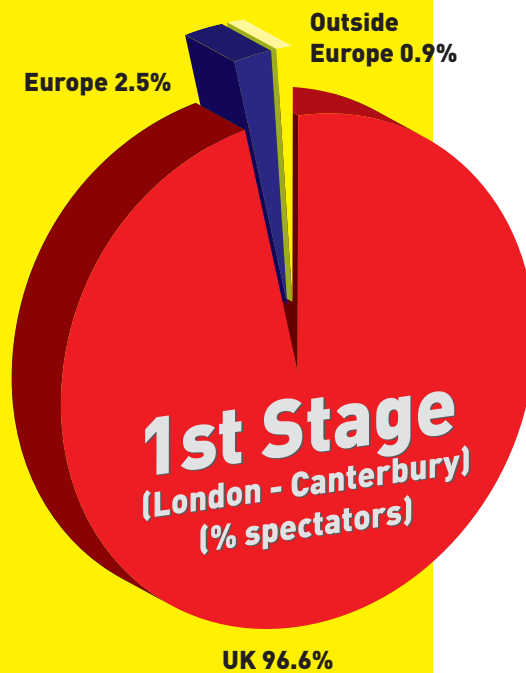
However, as the Grand Depart and the Opening Ceremony was a multi-stage event and took place over three days in different locations, it is likely that spectators attended more than one of the key events. This issue was accounted for in the analysis in order



UK	91.2
England	93.8
London	33.3
Wales	3.8
Scotland, N Ireland, IoM and Ci's	2.4

Europe	4.5
France	25.0
Holland	19.4
Germany	11.1
Spain	5.6
Belgium	5.6
Other European Countries	33.3

Outside Europe	4.3
US	64.7
South Africa	0.0
Canada	0.0
Australia	29.4
Other	5.9



UK	96.6
England	97.6
London	-
Wales	1.8
Scotland, N Ireland, IoM and Ci's	0.6

Europe	2.5
France	14.3
Holland	28.6
Germany	14.3
Spain	21.4
Belgium	7.1
Other European Countries	14.3

Outside Europe	0.9
US	40.0
South Africa	40.0
Canada	20.0
Australia	0.0
Other	0.0

to avoid double counting and overestimating both the economic and environmental impacts of the event.

<sup>4</sup>A total of 827 spectators were surveyed in London on Saturday 7th. Locations included the start and finish line, Whitehall, Parliament Square, Buckingham Palace, Constitution Hill and Hyde Park. A total of 578 spectators were surveyed in the County of Kent on Sunday 8th July. Locations included Tunbridge Wells, Tenterden, Ashford and Canterbury.





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# The Findings



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## The Findings

### Economic Impacts

The spectator survey was the key information source used to estimate the economic impacts of the Grand Depart. The table below provides a summary of the results for the two survey locations. Spending on travel is split by UK and non-UK visitors, as there are significant differences in spending on travel between these groups.

#### Average Spectator Spending by Selected Category at the Surveyed Tour de France Events<sup>1</sup>

	Prologue (London)	1st Stage (Kent)
<b>Travel (amount per visit)</b>		
<b>UK Spectators</b>		
Travel to the event	£20.40	£9.79
Travel within London (per day)	£5.16	-
<b>Non-UK Spectators</b>		
Travel to the UK	£412.85	£291.64
Travel to event (UK travel)	£11.87	£62.69
<b>Accommodation (amount per night)</b>		
<b>UK and Non-UK Spectators</b>		
Average per spectator (London)	£64.66	£70.43
Average per spectator (outside London)	£22.66 <sup>2</sup>	£50.49
<b>Food and Drink (amount per day)</b>		
<b>UK and Non-UK Spectators</b>		
Breakfast	£5.55	£5.20
Evening Meal	£16.36	£14.29
<b>Other Items (amount per visit)</b>		
<b>UK and Non-UK Spectators</b>		
Leisure and tourist activities	£45.52	£33.90
Merchandise	£19.01	£14.70
Retail shopping	£55.40	£26.09

<sup>1</sup>The results presented in this table relate to the average amount spent by spectators who purchased those items. For some spectators, a number of the spending categories would be zero. A London resident, attending one or more of the events, may have walked or cycled around London, taken their own food and not bought any merchandise. As a consequence, the all or full sample averages (used for grossing-up purposes) were considerably lower than the figures shown in this table.

<sup>2</sup>A number of surveyed visitors who were staying outside London on the Saturday evening reported that they would be camping or caravanning.





For the Prologue in London, UK spectators spent an average of £20.40 on travel to London, and a further £5.16 on travel within London. Average spending on travel to London by non-UK spectators was an estimated £412.85. This is an average of the various expenditures on air travel, boat, train, and cars etc. Whilst in London for the Prologue, non-UK spectators spent an average of £11.87 on travel.

Accommodation spending for both events is shown for stays inside and outside London. As expected, accommodation spending within London is significantly higher than that outside of London.

Food and drink spending on breakfast and evening meals (and on lunch and snacks, not shown in the table) was fairly consistent between the two events, whilst spending on other items (merchandise, tourism, and

particularly retail shopping) was higher in London than in Kent.

Using Transport for London estimated spectator figures (adjusted for double-counting) in conjunction with the survey data (using the all-sample averages, see note 1 to the earlier Table, an estimate was obtained of gross spectator spending within the UK (spending by non-UK spectators on travel to the UK was assumed to have accrued outside of the UK economy). Gross spectator spending was an estimated £110.4m. The table below shows that spectators' largest spending was on food and drink, transport and accommodation. Before the economic impacts could be assessed it was necessary to further adjust the gross figure to deduct spending leakages from the economy. These leakages (imports and taxes) are estimated to be £30.62m, and the final row of the table then shows that the (net) direct spending estimate within the UK was almost £80m.

The next stage of the economic impact estimation process is to incorporate this spending information within an economic model of the UK economy. This allows the indirect or multiplier impacts of this spending to be estimated. An Input-Output (I-O) model of the UK economy was used, as this enables the impacts of spending to be traced through various sectors of the economy and multipliers to be estimated. In addition, by using information on employment for each UK industry, the employment impacts (direct and multiplier) of spectator spending were estimated.

### Gross and adjusted spectator spending by item, £m.

Item	Spending (£m)
Transport	25.09
Accommodation	20.38
Food and drink	25.69
Leisure and tourism	12.34
Merchandise	11.39
Shopping	15.48
<b>Gross spending total</b>	<b>110.37</b>
Imports and taxes	30.62
<b>Total direct spending</b>	<b>79.75</b>



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## The Findings Economic Impacts

The Figure shows the direct spending total of £79.75m in the first circle. This direct spending, results in a range of indirect or multiplier impacts, as this money circulates around the economy, being passed from supplier to supplier. The indirect impact is an estimated £67.77m, and when added to the direct spending figure gives a total of £147.52m. This almost £150m of economic impact was estimated to be associated with just over 2,000 (full-time equivalent, FTE) jobs. These jobs would not, in reality, be reflected in an additional 2,000 full-time workers within the UK during that year, but the number is indicative of the additional employment that would be required to support the £150m of tourism demand generated by the events. The employment effects would, in practice, be more evident through individuals working additional hours, and extra workers employed for the event period.

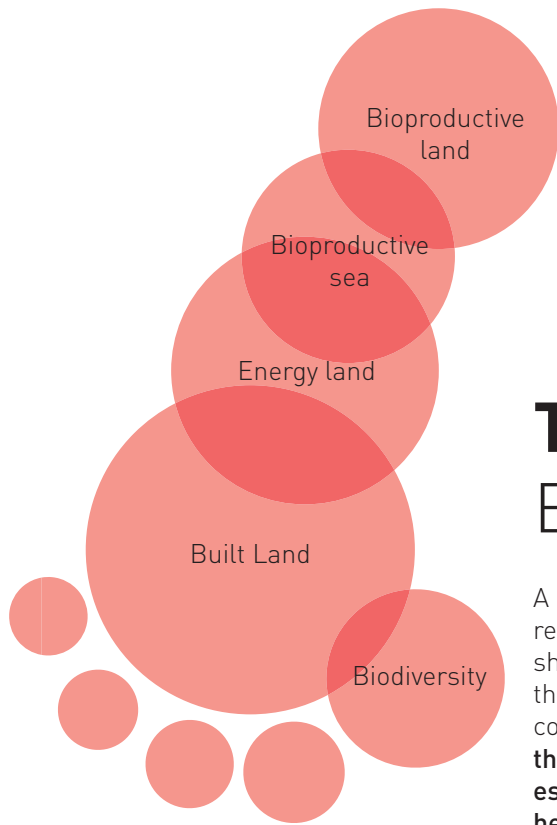
Direct spectator  
spending on UK goods  
and services (food,  
accommodation etc)  
**£79.75m**

Multiplier effects  
estimated using  
UK I-O Model  
**£67.77m**

Total spending impact  
**£147.52m**  
Employment Impact  
**2000 jobs (ftes)**







## The Findings

### Environmental Impacts

A summary of the ecological footprint results for the Grand Depart are shown in the following Table. Based on the analysis of spectators' physical consumption of resources at the event, **their 'footprint' (or land area) was estimated to be 57,990 global hectares. This is equivalent to 143 times the area of London's Olympic Park.**

When reflecting on the scale of the ecological footprint of such an event, it is useful to compare the figure with what spectators' footprint would have been had they not attended the event, but instead went about their regular everyday activities at home. The study found that the ecological footprint of the average spectator at the Tour was almost 2.2 times greater than if they had not attended the event. A key reason for spectators having a much

larger footprint at the event was due to them engaging in different patterns of consumption (i.e. different travel choices and food choices). These different consumption patterns were more resource and energy intensive, and so resulted in a larger footprint.

The *additional footprint* that was generated by spectators attending the Tour was 31,739 global hectares. This was calculated by subtracting what spectators' Footprint would have been if they stayed at home, from the total event footprint for each of the components listed in the Table below.

Category	Visitor Total Ecological Footprint (gha/event duration)	Visitor Additional Ecological Footprint (gha/event duration)	Visitor Ecological Footprint at home <sup>1</sup> (gha/event duration)
Food and Drink	3,903	2,084	1,819
Accommodation (energy use only)	10,368	2,497	7,871
Travel	43,719	27,158	16,560
<b>Total</b>	<b>57,990</b>	<b>31,739</b>	<b>26,250</b>

<sup>1</sup>Estimates are based on consumption figures for the average UK resident in 2006 over a three day period. Also assumed that 30% of food and drink purchased by an average UK resident is consumed outside the home (i.e. food and drink outlets).

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# The Findings

## Environmental Impacts

Our study revealed that the main contributor to spectators' total footprint was the way in which they travelled. Spectators that attended the event travelled an estimated 1.4 billion kilometres to watch the event

in London and Kent (and back home again), with the average spectator travelling an average 734 kilometres. Almost 59% of the total distance travelled by all spectators was by air, and the majority of this was

international air travel. Rail and car travel accounted for 20% and 12.5% of the overall distances travelled. The following Tables show those transport methods that were used by UK and non UK spectators to travel to the Tour.

### Transport methods used by UK SPECTATORS to travel to the Tour

Method of travel	Prologue (% spectators)		Stage 1 (% spectators)
	Travel to London	Travel in London	Travel to Kent
Air	1.7	0.0	0.2
Bicycle	2.4	4.9	5.5
Car <sup>1</sup>	22.6	0.8	40.4
Local Bus	1.4	5.1	3.4
Train	65.6	4.3	12.9
Underground	0.0	42.4	0.0
Walk	0.5	40.6	33.3
Other modes	5.8	1.9	4.3
<b>Total*</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

<sup>1</sup> Average car occupancy was 2.6 (Prologue - Travel to London) and 2.7 (Prologue - Travel in London), and 3.0 (Stage 1).

### Transport methods used by NON UK SPECTATORS to travel to the Tour

Method of travel	Prologue (% spectators)	1 <sup>st</sup> Stage (London - Canterbury) (% spectators)
Air	82.9	63.2
Bicycle	1.4	0.0
Boat	0.0	5.1
Car* <sup>1</sup>	0.0	21.1
Channel Tunnel	7.1	5.3
Coach	4.3	5.3
Train	4.3	0.0
<b>Total*</b>	<b>100%</b>	<b>100%</b>

<sup>1</sup> Average car occupancy levels was 3.0 (Stage 1)





The overall distances travelled by spectators – both to and from the event, and during the event – and the various methods of transport used produced a footprint of 43,719 global hectares (see Table below). Seventy-five percent of the travel footprint was found to be attributable to non-UK

spectator travel, and 25% to UK spectator travel. The largest contributors to the travel footprint were international air travel (45.9%) and rail (25.3%). Travel by coach and car accounted for 11.4% and 11.1% of the overall travel footprint respectively.

## Visitor Travel and corresponding Ecological Footprint results

Method of travel	Percentage of total distance travelled (%)	Percentage of travel Ecological Footprint (%)
Air (International)	58.6	45.9
Car	12.5	11.1
Rail <sup>1</sup>	20.0	25.3
Bus and Coach	5.1	11.4
Other <sup>2</sup>	3.8	6.3
<b>Total</b>	<b>1.39bn km</b>	<b>43,719 gha</b>
<b>Per average spectator/journey</b>	<b>734 km</b>	<b>0.015 gha</b>

<sup>1</sup> Includes National Rail, London Underground and Channel Tunnel.

<sup>2</sup> Includes boat, cycling, ferry, minibus, motorcycle, motor home, taxi and walking.

The next largest contributor (after travel) to the ecological footprint was related to accommodation spending. Visitors spent 2.6 million bednights in overnight accommodation in London and Kent. This was equivalent to 0.9 bednights per spectator (excluding London residents). The largest proportion of bednights were spent in hotel accommodation (41.8%), staying with friends and family (39.7%), and camping (11.6%). **Spectators staying in overnight accommodation used an estimated 101 million kilowatts of**

**energy. This is almost equivalent to four times the amount of kilowatts of electricity required to run the London underground for 4 years (26.5 million kwh)<sup>5</sup>.** Hotel accommodation can use large amounts of energy – an average of 65 kwh per bednight – for catering and the heating and lighting of bedrooms, communal areas and other facilities including swimming pools.

**Spectators purchased an estimated 2000 tonnes of food and drink during the Grand Depart.** A large proportion

of this included highly processed food and drink items from cafes, restaurants and fast food outlets. These purchases resulted in an ecological footprint of more than 3900 global hectares, and is almost two and a half times larger than what it would have been at home.

<sup>5</sup><http://www.kgbanswers.co.uk/how-much-electricity-does-it-take-to-run-the-london-underground-in-kwh-and-how-many-people-us-e-it-each-day/3343801>

## Other Findings



- Fifty percent of spectators had previously attended at least one major cycling event.
- Almost 60% of spectators regularly participated in cycling activities of some type. These included leisure and family activities (72.2%), general fitness (56.5%), travelling to work (34%) and, training and competitions (17.6%).
- The largest proportion of miles cycled by spectators were for leisure and family activities (45.6%), general fitness (22.1%), travel to work (17.3%) and training and competitions (8.75%).
- Over 90% of spectators regularly recycled waste at home, and almost 70% would recycle where possible during the Tour.
- Thirty percent of spectators stated that they did not recycle at the Tour due to a lack of easily accessible recycling facilities.





## Conclusions and Recommendations

This study set out to assess the environmental and economic impacts of the 2007 Tour de France Grand Depart. In doing so it has provided a more holistic appreciation of the impacts associated with a major event. Whilst the economic impacts were estimated to be associated with almost £150m of spending and 2,000 (fte) jobs, these must be considered alongside the environmental impacts of an event.

The nature of spectator activity, in terms of travelling, use of overnight accommodation, eating and drinking, generated an average spectator ecological footprint that was more than twice what it would have been if they had stayed at home.

A number of recommendations flowed from the research programme.

It is recommended that appraisals of major events need to give attention to the environmental as well as the economic impacts. Too often focus has been on economic benefits and claims made by organisers that they will seek to minimise environmental effects. However, this research shows that selected environmental impacts can be measured and considered

alongside more conventional economic benefits. We recommend this type of evaluation needs to be undertaken more regularly with major events.

Environmental impact assessment methods such as the 'ecological footprint' should be integrated into the planning of events, using projection of visitor numbers and forecast travel patterns. In this way steps can be taken to highlight 'big hitting' consumption behaviours in environmental terms. Fundamentally, where environmental costs can be set aside economic benefits there is the opportunity to plan to reduce them. For example, our research revealed that a significant contribution to the ecological footprint was spectator travelling patterns, and here organisers might be able to work to influence spectators' travel choices towards more sustainable options.

It is also recommended that where there are existing successful efforts to reduce negative environmental impacts, these should be used as a benchmark for future events, thereby ensuring continuous progress within the event industry.

Our final recommendation is that in addition to environmental impacts resulting from spectator consumption, attempts should also be made to consider other consumption behaviours connected to events as well. For example, this includes the environmental effects associated with team travel, media coverage, sponsorship, and pre-event organisation and infrastructure development (permanent and temporary).



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