

11-2015

# Airport Drop-Off and Pick-Up Charges in Great Britain: Will They Come to the United States?

Emma Nix

*University of Missouri - St. Louis*

Ray A. Mundy

*University of Missouri - St. Louis*

Follow this and additional works at: [http://lib.dr.iastate.edu/intrans\\_reports](http://lib.dr.iastate.edu/intrans_reports)



Part of the [Civil Engineering Commons](#)

---

## Recommended Citation

Nix, Emma and Mundy, Ray A., "Airport Drop-Off and Pick-Up Charges in Great Britain: Will They Come to the United States?" (2015). *InTrans Project Reports*. Paper 194.

[http://lib.dr.iastate.edu/intrans\\_reports/194](http://lib.dr.iastate.edu/intrans_reports/194)

This Report is brought to you for free and open access by the Institute for Transportation at Digital Repository @ Iowa State University. It has been accepted for inclusion in InTrans Project Reports by an authorized administrator of Digital Repository @ Iowa State University. For more information, please contact [digirep@iastate.edu](mailto:digirep@iastate.edu).

# Airport Drop-Off and Pick-Up Charges in Great Britain: Will They Come to the United States?

**Final Report**  
**November 2015**

---

**Sponsored by**  
Midwest Transportation Center  
U.S. Department of Transportation  
Office of the Assistant Secretary for  
Research and Technology



## **About MTC**

The Midwest Transportation Center (MTC) is a regional University Transportation Center (UTC) sponsored by the U.S. Department of Transportation Office of the Assistant Secretary for Research and Technology (USDOT/OST-R). The mission of the UTC program is to advance U.S. technology and expertise in the many disciplines comprising transportation through the mechanisms of education, research, and technology transfer at university-based centers of excellence. Iowa State University, through its Institute for Transportation (InTrans), is the MTC lead institution.

## **About InTrans**

The mission of the Institute for Transportation (InTrans) at Iowa State University is to develop and implement innovative methods, materials, and technologies for improving transportation efficiency, safety, reliability, and sustainability while improving the learning environment of students, faculty, and staff in transportation-related fields.

## **ISU Non-Discrimination Statement**

Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. veteran. Inquiries regarding non-discrimination policies may be directed to Office of Equal Opportunity, Title IX/ADA Coordinator, and Affirmative Action Officer, 3350 Beardshear Hall, Ames, Iowa 50011, 515-294-7612, email [eooffice@iastate.edu](mailto:eooffice@iastate.edu).

## **Notice**

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the information presented herein. The opinions, findings and conclusions expressed in this publication are those of the authors and not necessarily those of the sponsors.

This document is disseminated under the sponsorship of the U.S. DOT UTC program in the interest of information exchange. The U.S. Government assumes no liability for the use of the information contained in this document. This report does not constitute a standard, specification, or regulation.

The U.S. Government does not endorse products or manufacturers. If trademarks or manufacturers' names appear in this report, it is only because they are considered essential to the objective of the document.

## **Quality Assurance Statement**

The Federal Highway Administration (FHWA) provides high-quality information to serve Government, industry, and the public in a manner that promotes public understanding. Standards and policies are used to ensure and maximize the quality, objectivity, utility, and integrity of its information. The FHWA periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.

**Technical Report Documentation Page**

<b>1. Report No.</b>	<b>2. Government Accession No.</b>	<b>3. Recipient's Catalog No.</b>	
<b>4. Title and Subtitle</b> Airport Drop-Off and Pick-Up Charges in Great Britain: Will They Come to the United States?		<b>5. Report Date</b> November 2015	
		<b>6. Performing Organization Code</b>	
<b>7. Author(s)</b> Emma Nix and Ray A. Mundy		<b>8. Performing Organization Report No.</b>	
<b>9. Performing Organization Name and Address</b> Center for Transportation Studies University of Missouri—St. Louis 240 JC Penny North, One University Boulevard St. Louis, MO 63121-4400		<b>10. Work Unit No. (TRAIS)</b>	
		<b>11. Contract or Grant No.</b> DTRT13-G-UTC37	
<b>12. Sponsoring Organization Name and Address</b> Midwest Transportation Center 2711 S. Loop Drive, Suite 4700 Ames, IA 50010-8664		<b>13. Type of Report and Period Covered</b> Final Report	
		<b>14. Sponsoring Agency Code</b>	
<b>15. Supplementary Notes</b> Visit <a href="http://www.intrans.iastate.edu">www.intrans.iastate.edu</a> for color pdfs of this and other research reports.			
<b>16. Abstract</b> As transportation network companies (TNCs) like Uber and Lyft drive a change in modern transport behaviors, fewer passengers pay for services such as parking or commercial vehicle drop-off at airports, meaning that what once was a primary revenue source for airports now has a tenuous future. Therefore, airports must find a way to counterbalance the revenue losses created by these changes.  One such solution has been on the rise in Great Britain. With airport drop-off and pick-up charges, private vehicles must pay for the convenience of loading or unloading passengers at the airport entrance. Not only does this practice have the potential to generate millions of dollars in annual revenue, but it also offers a remedy for other maladies such as congestion and safety issues on airport roads. This report examines the effects that drop-off and pick-up charges have had in Great Britain and explores what US airports might expect should they too adopt the practice.			
<b>17. Key Words</b> airport charges—airport economics—airport operations—airport revenue sources—airport traffic volume—drop-off charges—pick-up charges		<b>18. Distribution Statement</b> No restrictions.	
<b>19. Security Classification (of this report)</b> Unclassified.	<b>20. Security Classification (of this page)</b> Unclassified.	<b>21. No. of Pages</b> 36	<b>22. Price</b> NA



# **AIRPORT DROP-OFF AND PICK-UP CHARGES IN GREAT BRITAIN: WILL THEY COME TO THE UNITED STATES?**

**Final Report  
November 2015**

## **Principal Investigator**

Ray A. Mundy

John Barriger III Professor for Transportation Studies and Director  
Center for Transportation Studies, University of Missouri – St. Louis

## **Research Assistant**

Emma Nix

## **Authors**

Emma Nix and Ray A. Mundy

Sponsored by  
the Midwest Transportation Center and  
the U.S. Department of Transportation  
Office of the Assistant Secretary for Research and Technology

A report from  
**Institute for Transportation**  
**Iowa State University**  
2711 South Loop Drive, Suite 4700  
Ames, IA 50010-8664  
Phone: 515-294-8103  
Fax: 515-294-0467  
[www.intrans.iastate.edu](http://www.intrans.iastate.edu)



## TABLE OF CONTENTS

ACKNOWLEDGMENTS .....	vii
EXECUTIVE SUMMARY .....	ix
AIRPORT DROP-OFF CHARGES ACROSS GREAT BRITAIN .....	1
CONTINUED RISE OF CHARGE .....	4
REASONS FOR THE DROP-OFF CHARGE .....	5
Minimize Congestion and Maximize Spatial Use .....	5
Promote a Healthier Environment .....	6
Encourage Use of Public Transportation .....	6
Generate New Revenues .....	8
ESTIMATED REVENUE FROM CHARGE .....	9
REACTION TO THE CHARGE.....	15
WHAT CHARGES WOULD LOOK LIKE IN THE UNITED STATES .....	16
BARRIERS TO IMPLEMENTATION .....	21
CONCLUSION.....	21
REFERENCES .....	23

## LIST OF FIGURES

Figure 1. Rise of UK airports with drop-off charges .....	2
Figure 2. Percent of passengers arriving by public transit at London airports .....	7
Figure 3. Percent of passengers arriving to airport by public transit .....	8
Figure 4. Upper bound annual drop-off charge revenue estimate by British airport .....	11
Figure 5. Upper bound annual pick-up charge revenue estimate by British airport .....	12
Figure 6. Upper bound annual drop-off and pick-up charge revenue estimate by British airport .....	13
Figure 7. Total estimated revenue per non-connecting passenger by British airport .....	15
Figure 8. Approximate annual drop-off and pick-up charge revenues by US airport .....	18
Figure 9. Approximate revenue per passenger by US airport.....	19
Figure 10. Estimated annual drop-off and pick-up charge revenue if charge equals taxi gate fee.....	20

## LIST OF TABLES

Table 1. Pricing schedules for airport drop-off and pick-up zones* .....	3
Table 2. Changes in pricing schedules.....	4
Table 3. Figures used for British airport revenue estimates* .....	10
Table 4. Estimated drop-off revenue (USD).....	11
Table 5. Estimated pick-up revenue (USD).....	12
Table 6. Estimated total drop-off and pick-up revenue (USD).....	14
Table 7. Figures used for US airport revenue estimates .....	17
Table 8. Estimated total revenues if both drop-off and pick-up charges equal \$1 (USD).....	18
Table 9. Estimated total revenue if drop-off and pick-up charge equals taxi gate fees (USD) .....	20

## **ACKNOWLEDGMENTS**

The authors would like to thank the Midwest Transportation Center and the U.S. Department of Transportation Office of the Assistant Secretary for Research and Technology for sponsoring this research.



## **EXECUTIVE SUMMARY**

As transportation network companies (TNC) like Uber and Lyft drive a change in modern transport behaviors, fewer passengers pay for services such as parking or commercial vehicle drop-off at airports, meaning that what once was a primary revenue source for airports now has a tenuous future. Therefore, airports must find a way to counterbalance the revenue losses created by these changes.

One such solution has been on the rise in Great Britain. With airport drop-off and pick-up charges, private vehicles must pay for the convenience of loading or unloading passengers at the airport entrance. Not only does this practice have the potential to generate millions of dollars in annual revenue, but it also offers a remedy for other maladies such as congestion and safety issues on airport roads. This report examines the effects that drop-off and pick-up charges have had in Great Britain and explores what US airports might expect should they too adopt the practice.



## **AIRPORT DROP-OFF CHARGES ACROSS GREAT BRITAIN**

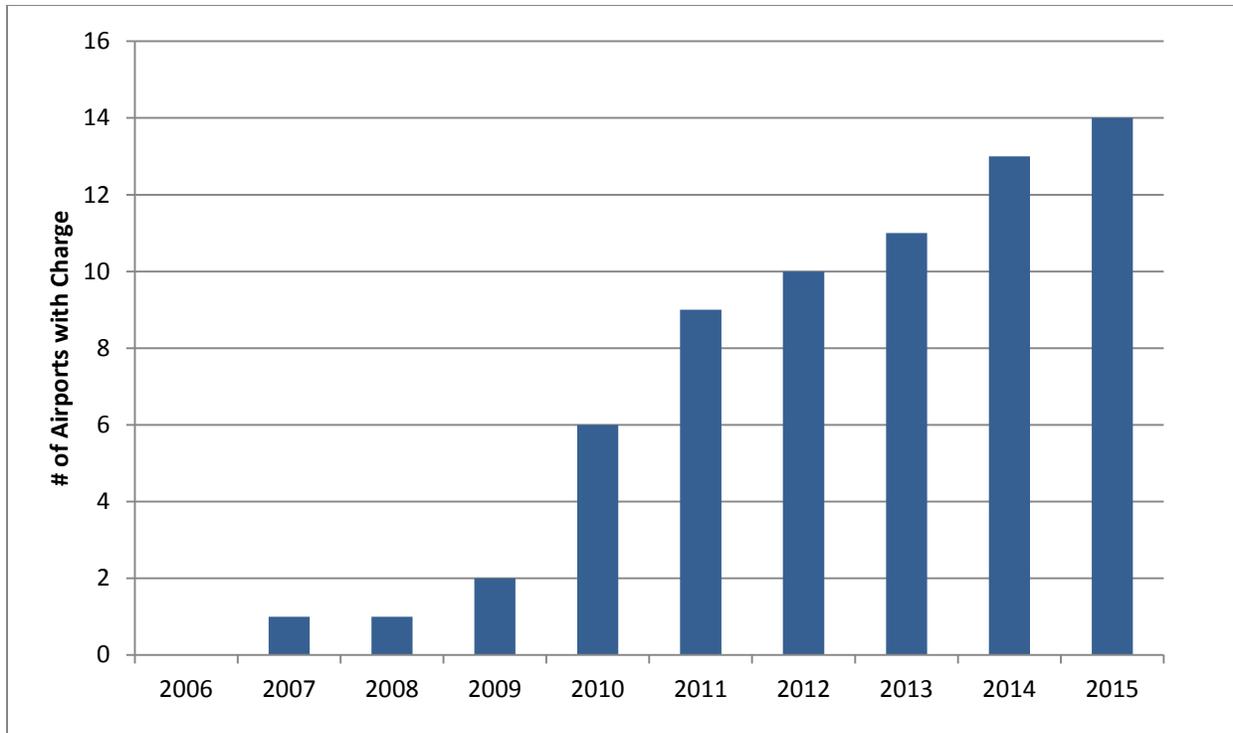
On January 7, 2015, Scotland's Aberdeen Airport joined the growing trend among British airports to charge for drop-off services (Aberdeen International Airport 2015). Also known as the "kiss and drop" charge, under this system, private vehicles must pay a premium for the convenience of unloading passengers in front of the airport. (Exemptions are offered for some vehicles. Blue badge holders are permitted to enter and remain in the zone free of charge for a specified amount of time.)

Although the majority of airports with the charge do still offer free parking options farther away, for the purpose of this study, participation in the scheme is defined as charging private vehicles to drop off or pick up passengers in the closest area available to the airport entrance. In the case of Aberdeen, the airport now charges vehicles £1 to drop passengers for up to 10 minutes in the forecourt area (Aberdeen International Airport 2015). As the full impacts of the system are realized, British airports continue to adopt drop-off charging schemes, suggesting that the practice of dropping off and picking up passengers for free in Britain could someday become a thing of the past.

Beginning with Birmingham Airport in 2007 (Clark 2013), a total of fourteen airports across the United Kingdom have now instituted a drop-off charge. However, airports imposing this scheme differ in both pricing and the amount of time vehicles are allowed in the drop zone. Generally, the charge allots approximately 10 to 20 minutes in the drop-off site, with either an increasing payment scale for additional minutes or a hefty fine for staying beyond the given period. For example, Edinburgh's pricing scale increases more quickly than most, charging £1 for 5 minutes and £3 for 10 minutes, with the price continuing to climb thereafter (Edinburg Airport Limited 2015). In contrast, London Luton charges £2.50 for 15 minutes, yet imposes an £80 fine on drivers for exceeding the time limit (London Luton Airport 2015).

Several airports provide free drop-offs, but with strict time limits to prevent vehicles from idling in the drop-off area. For instance, Inverness permits vehicles to remain in the zone for 20 free minutes but charges £3 for stays up to one hour (Highlands & Islands Airport 2015). Likewise, Glasgow Prestwick only allows private vehicles 5 free minutes, with a £1.50 charge if the car remains in the zone for 6 to 15 minutes and £3.50 for stays of up to 30 minutes (Glasgow Prestwick Airport Limited 2015).

Figure 1 illustrates the increasing popularity of drop-off charges at British airports since 2007.



Dates are approximated from news articles regarding the implementation of the charge. The airports and source citations for each year are as follows:

2007: Birmingham (Clark 2013)

2009: London Luton (Luton Today 2013)

2010: Belfast (BBC 2010, June 30), East Midlands (BBC 2010, July 5), Edinburgh (O’Leary 2014), Newcastle (Nichol 2010)

2011: Bournemouth (BBC 2011, April 6), Exeter (BBC 2011, July 26), Leeds Bradford (BBC 2011, October 6)

2012: London Stansted (BBC 2012, November 6)

2013: Bristol date inferred (Smith 2013)

2014: Liverpool (Davies 2014), Robin Hood date inferred (Smith 2013)

2015: Aberdeen (Aberdeen International Airport 2015)

**Figure 1. Rise of UK airports with drop-off charges**

It is important to note that the figure exclusively details drop-off charges. Airports with a pick-up charge but a free drop-off window are not included. As can be observed, new airports have adopted the system every year since 2009.

In addition to the drop-off charge, an even higher number of airports—19 in total—require drivers to pay to pick up passengers, often having private vehicles park in short-stay lots rather than collecting passengers at the curb. One such example is London Heathrow Airport, where drivers can drop off passengers for free, yet must pay £3.50 to remain in the Short Stay Car Park for up to 30 minutes when collecting passengers (Heathrow Airport Limited 2015). Similarly, while East Midlands charges £1 to drop off for 10 minutes, drivers picking passengers up must pay £2.40 for 30 minutes in the Short Stay Lot (East Midlands International Airport Limited 2015). Many airports do, however, allow pick-ups and drop-offs in the same area, charging identical rates for both services. Bristol and Newcastle International Airports are two such

examples (Bristol Airport 2015, Newcastle International Airport 2015). Pricing schedules for airports that impose either a drop-off or pick-up charge are detailed in Table 1. Airports that offer a free-time window for both pick-up and drop-off are not included in the table.

**Table 1. Pricing schedules for airport drop-off and pick-up zones\***

<b>Airport</b>	<b>Drop-Off</b>	<b>Pick-Up</b>
Aberdeen	£1 for 10 minutes	£1 for 15 minutes
**Belfast International	£1 for 10 minutes, £3 for 20 minutes, £5 for 60 minutes	£1.50 for 15 minutes
Birmingham	£1 for 10 minutes	£4 for 1 hour
**Bournemouth	£2.50 for 30 minutes, £4.60 for 1 hour	£2.50 for 30 minutes, £4.60 for 1 hour
**Bristol	£1 for 20 minutes, £3 for 40 minutes, £5 for 1 hour	£1 for 20 minutes, £3 for 40 minutes, £5 for 1 hour
Cardiff	Free for 10 minutes, £5 for every 10 minutes thereafter	£1 for 20 minutes
East Midlands	£1 for 10 minutes	£2.40 for 30 minutes
Edinburgh	£1 for 5 minutes, £3 for 10 minutes, £5 for 20 minutes, £7 for 60 minutes	£3.50 for 15 minutes, £4.90 for 30 minutes, £6.90 for 60 minutes
Exeter International	£1 for 30 minutes	£1 for 30 minutes
**Glasgow	Free	£1.50 for 10 minutes, £2 for 20 minutes
Leeds Bradford International	£3 for 30 minutes, £9 for 60 minutes	£3 for 30 minutes, £9 for 60 minutes
Liverpool John Lennon	£2 for 20 minutes	£2 for 20 minutes
**London Gatwick	Free	£3.50 for 30 minutes, £7 for 60 minutes
**London Heathrow	Free	£3.50 for 30 minutes, £6.50 for 60 minutes
London Luton	£2.50 for 15 minutes, £5 for 20 minutes	£2.50 for 15 minutes, £5 for 20 minutes
London Stansted	£2.50 for 10 minutes, £2.50 every minute thereafter	£2.50 for 10 minutes, £2.50 every minute thereafter
**Manchester	Free	£3 for 30 minutes
Newcastle	£1 for 10 minutes, £3 for 30 minutes, £4.50 for 45 minutes, £6 for 60 minutes	£1 for 10 minutes, £3 for 30 minutes, £4.50 for 45 minutes, £6 for 60 minutes
Robin Hood	£1 for 10 minutes, £5 for each additional 15 minutes	£1 for 10 minutes, £5 for each additional 15 minutes

\* All prices current as of July 20, 2015. Pricing schedules were obtained from the official website of each respective airport (Aberdeen International Airport 2015, Belfast International Airport 2015, Birmingham Airport 2015, Bournemouth International Airport Limited 2015, Bristol Airport 2015, Cardiff International Airport Limited 2015, East Midlands International Airport Limited 2015, Edinburgh Airport Limited 2015, Exeter International Airport 2011, Glasgow Airport Limited 2015, Leeds Bradford Airport Limited 2015, Liverpool John Lennon Airport 2015, Gatwick Airport Limited 2015, Heathrow Airport Limited 2015, London Luton Airport 2015, London Stansted Airport 2015, Manchester Airport 2015, Newcastle International Airport 2015, Robin Hood Airport 2015).

\*\* Does not offer a free parking alternative farther away.

For drivers wishing to avoid the charge entirely, most airports do still offer a free parking alternative farther from the terminals. In these lots, the length of time private vehicles may remain varies. Vehicles are allowed one hour for free in the Mid-Stay Lot at Leeds Bradford while Exeter drivers only have 10 minutes in Car Park 4 (Leeds Bradford Airport Limited 2015, Exeter International Airport 2011). Often, these free zones are located in the mid- or long-stay car parks and require a walk or a shuttle to reach the airport. Passengers running late or traveling with excess baggage are more heavily burdened by this alternative.

Participating airports frequently use a license plate recognition system as a means of monitoring the charging area (Smith 2015). As vehicles enter the zone, the system records the license plate number and time of entry. This method allows traffic to flow naturally into the area so that drop-offs are not delayed due to queues when entering the zone. After unloading passengers, vehicles must stop at either electronic or manually operated ticketing stations that match the vehicle with the license plate in the system and deal the appropriate charge.

## CONTINUED RISE OF CHARGE

Not only is the prevalence of the charge becoming more common in the UK, but the price of the charge is increasing as well. From January 2015, when the data for this study was initially collected, to July 2015, five airports have already increased their pricing schedules for either drop-off or pick-up services. (All prices in this report reflect the schedules current as of July 20, 2015.) This finding suggests that the airports perceive either a strong benefit from the charge or a low cost to increasing it. Table 2 indicates the recent changes.

**Table 2. Changes in pricing schedules**

	January 2015	July 2015
Edinburgh	£3 for 30 minutes (Pick-Up)	£3.50 for 30 minutes (Pick-Up)
London	£3 for 30 minutes (Pick-Up)	£3.50 for 30 minutes (Pick-Up)
Gatwick		
London	£2 for 15 minutes (Drop-Off and Pick-Up)	£2.50 for 15 minutes (Drop-Off and Pick-Up)
Luton		
London	£2 for 10 minutes (Drop-Off and Pick-Up)	£2.50 for 10 minutes (Drop-Off and Pick-Up)
Stansted		
Manchester	£2.90 for 30 minutes (Pick-Up)	£3 for 30 minutes (Pick-Up)

Beyond the 2015 increases, other airports have modified their pricing schedules since implementation. For example, in 2010 Newcastle International charged £1 for 20 minutes in the drop-off zone (Nichol 2010), yet by 2015 this time period had halved to just 10 minutes for the same price (Newcastle International Airport 2015). Additionally, though London Luton originally charged £1 for 10 minutes in the Priority Set Down Area, the charge increased to £2 for 15 minutes in 2013 (Luton Today 2013). Coupled with the even more recent price hike to £2.50 for 15 minutes (London Luton Airport 2015), Luton’s customers have seen a 250% increase in price since 2009 just to enter the Priority Set Down Area. In fact, research on the topic has uncovered only one instance when the charge has lowered.

Cardiff Airport, along with Belfast International and London Luton, was owned by Albertis Infraestructuras, S.A. until 2013 (Albertis Infraestructuras, S.A. 2013). At the time, Cardiff charged private vehicles £1 for 10 minutes in the Priority Drop and Go (Hocken 2010). However, after Albertis withdrew from the airline industry, selling Cardiff Airport to the Welsh government in March 2013 (Albertis Infraestructuras, S.A. 2013), the airport's charge disappeared. Customers at Cardiff now enjoy a free 10 minute grace period in the Priority Drop and Go before paying a charge of £5 for each 10 minute period thereafter (Cardiff Airport Limited 2015). Interestingly, Belfast International and London Luton, which were both sold to private companies in the summer of 2013 (Albertis Infraestructuras, S.A. 2013), retained their charges. While Luton's prices doubled that year (Luton Today 2013), Belfast's have remained unchanged.

## **REASONS FOR THE DROP-OFF CHARGE**

The “kiss and drop” charge could add a number of benefits for airports and customers alike. For example, when asked about the justifications for the charge, the managing director at Edinburgh emphasized that the practice allowed the airport to “reduce congestion, improve air quality, provide a safer environment, and encourage drivers to think about public transport” (BBC 2010, October 29). In addition to these motives, the following section explains the potential benefits gained from the charging scheme.

### **Minimize Congestion and Maximize Spatial Use**

One of the primary goals of the charge is to help control traffic on roads around the entrance to the airport. Congestion in these areas can pose several problems. First, more vehicles in the drop-off area will slow movement through the zones. When facing scheduled departures and potential lines inside the buildings, delays outside of the airport could impose detrimental time constraints for passengers catching departing flights. Second, having more vehicles also decreases safety as drivers rush to unload their passengers. Although no airport has reported experiencing instances of safety concerns within the drop-off zones prior to implementing the charge, in the case of Aberdeen, the airport considers the policy a precautionary measure to deter any future issues (Smith 2015). Moreover, by instituting a charge, drivers will be able to weigh the benefit of curbside drop-off against the cost of entering the zone. In this way, it is expected that overall traffic through the zone will decrease as some drivers opt to drop passengers in lots farther from the terminals or passengers choose alternative means of travel.

In addition to reducing congestion, freeing up areas near the entrances will give airports more room for expansion as the annual number of airline passengers increases. Edinburgh's managing director noted how the charging system would allow the airport “to cope with the predicted growth in passengers in coming years” (BBC 2010, October 29).

## **Promote a Healthier Environment**

From an environmental perspective, minimizing congestion also helps reduce the congestion emissions generated by both airport and non-airport-related vehicles. It then follows that reduced vehicular travel through the area will lead to improved air quality in and around the airport. Nearly all British airports include in their master plans a section dedicated to promoting a healthier environment by decreasing vehicle journeys to and from the airport. For drivers unwilling to pay the charge, a free parking option farther from the terminal can help decentralize the sources of emissions. Alternatively, passengers can choose other modes of transportation to arrive at the airport, which will also result in fewer vehicle journeys, thereby curbing some of the deleterious effects on air quality.

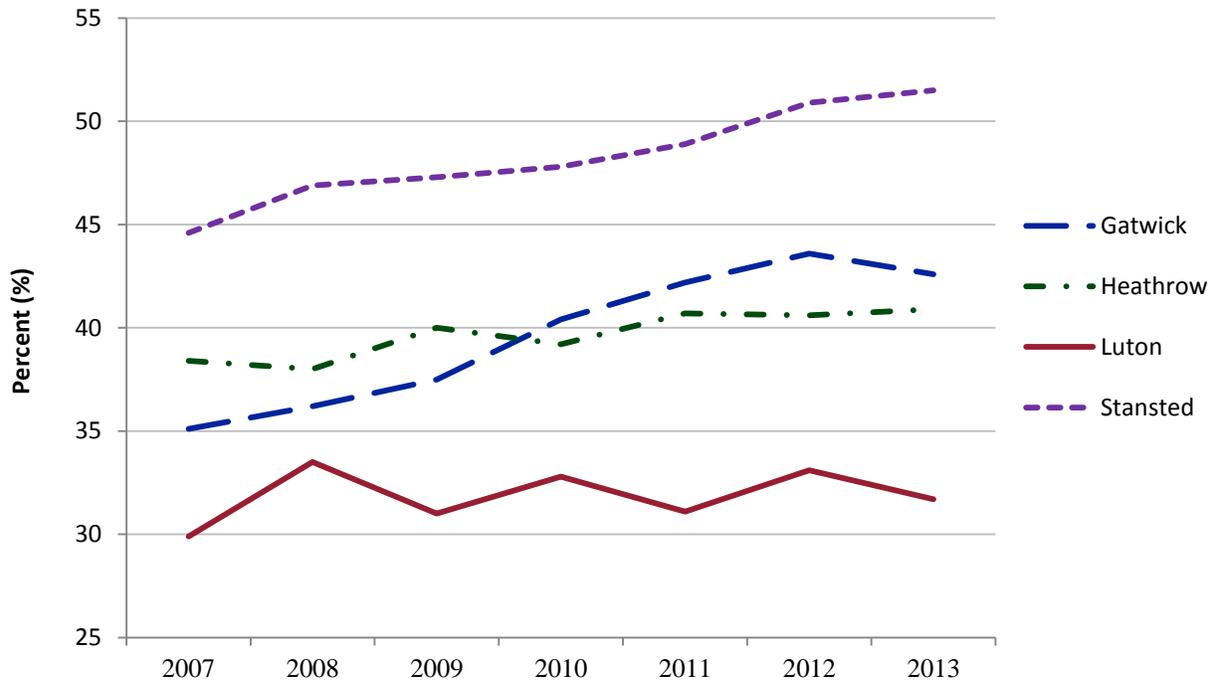
Additionally, airport noise pollution is also a consideration when seeking to promote a healthier environment. Because fewer vehicles means less noise, a congestion charge has the potential to alleviate some noise pollution in and around the airport.

On a side note, considering the exceedingly large amount of emissions generated by planes compared to motor vehicles at airports, air quality improvements from the charge would be minimal at best. While promoting a healthier environment is a goal to which many businesses and consumers strive, supportive data is required to qualify this goal as a realistic expectation rather than a trope.

## **Encourage Use of Public Transportation**

Promoting public transport is another common goal of the drop-off charge. Master plans published by airports often describe the goal of encouraging public transportation in order to decrease the percent of passengers arriving by private vehicle. The UK Civil Aviation Authority (CAA) conducts an annual survey at varying airports across the UK that prompts departing passengers to state their arrival mode to the airport—this includes public transit and being dropped off in a private vehicle.

Interestingly, public transport use has generally increased across most British airports, regardless of whether the drop-off charge exists, particularly in London. For instance, London Gatwick's public transit use was 35.1% in 2007 and steadily rose to 42.6% in 2013 (CAA 2015). However, drop-off continues to remain free at Gatwick. Similarly, London Stansted, which does impose a drop-off charge, saw a steady rise from 44.6% to 51.5% during the same time period (CAA 2015). Figure 2 illustrates the general rise in public transit use for London airports from 2007 to 2013.

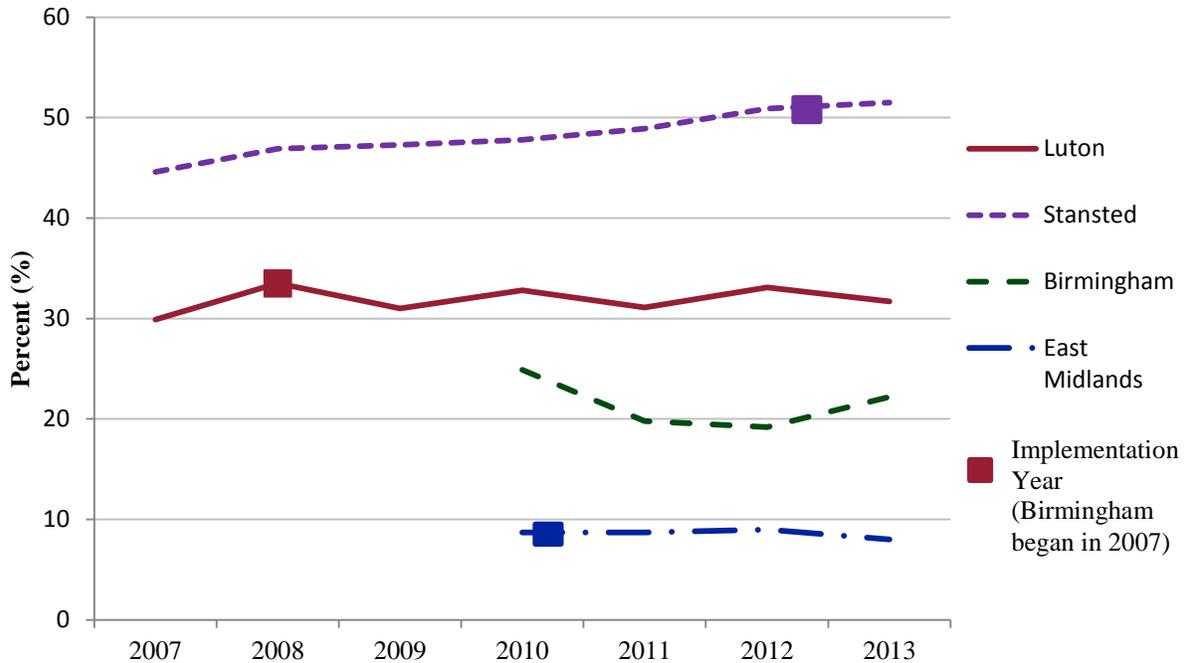


Source: Civil Aviation Authority

**Figure 2. Percent of passengers arriving by public transit at London airports**

It is important to note that Heathrow and Gatwick do not impose a drop-off charge, but they both have relatively steep pick-up charges of £3.50 (Heathrow Airport Limited 2015, Gatwick Airport Limited 2015). While the rise in public transit use for these London airports could be a reaction to the charge, it is more likely a result of investment in public transit infrastructure, especially following the improvements for the 2012 Olympics.

Compared to the other London airports, Luton has experienced varying levels of public transportation use. Though arrival by public transit was at its lowest—29.9%—in 2007, Luton experienced its highest level—33.5%—the following year, yet this occurrence predates the charge. Since implementing the practice in 2009, public transit arrival has stagnated between 31% and 33% (CAA 2015). Figure 3 shows the percent of passengers arriving to the airport by public transportation each year for available airports.



Only airports that currently operate impose a drop-off charge and have CAA data available for more than two years from 2007 to 2013 are included in the figure. Airports with a pick-up charge but no drop-off are not included. Squares represent implementation years for the drop-off charge at each airport, except for Birmingham, which had no CAA data for its 2007 implementation year.

Source: Civil Aviation Authority

**Figure 3. Percent of passengers arriving to airport by public transit**

The figure indicates no clear trend of increased public transit use after the charge began for any airport. Stansted’s public transit use did increase, but that had already been a trend for the five years prior to the charge. However, the percent of passengers arriving to the airport by public transit seems to have generally decreased for both Birmingham and East Midlands Airports since implementation.

While the CAA data does not directly support the theory that a drop-off charge incentivizes public transport use, other factors could influence the observed trends. For instance, if bus and rail lines have been improved, ridership on those transport modes would be expected to increase regardless of a drop-off charge or lack thereof.

### Generate New Revenues

Financial reasons also offer justification for the charge. When Bournemouth Airport began the practice in 2011, the airport’s manager declared the move towards the drop-off charge a “commercial decision brought about by the worldwide recession and the subsequent downturn of the aviation industry” (BBC 2011, April 6). Likewise, when Exeter Airport started charging for

drop-offs, the managing director stated that “we can no longer subsidize the free use of that [drop-off zone] when we’re having to spend large amounts of money for upkeep and technology” (BBC 2011, July 26). In fact, considering that a majority of airports began this charging system between 2009 and 2012, when the economy was still struggling from the effects of the global recession, making up for financial losses could be an additional motive for the scheme. Incidentally, Bournemouth did begin the charge a year after constructing a new £45 million departures terminal designed to accommodate an influx of passengers (BBC 2011, April 6).

Another financial argument arose when the owners of Belfast International Airport justified the charge as a response to investment in the drop-off area following new government regulations regarding the allowed distance between the curb and airport building (BBC 2010, June 30). After the Glasgow Airport bombing in June 2007, British authorities expanded the required distance of the terminal from the road in order to increase public safety (BBC 2010, June 30). Thus, the initial intent of the charge at Belfast was to regain construction costs lost from the project. Many other airports also adopted the charging scheme shortly after costly infrastructure projects, which were not necessarily related to changes in government regulations.

Considering the high cost of flying, however, a comparatively small drop-off charge is not likely to impact the total number of customers at the airport. This is especially true when passengers can arrive using any number of modal choices. In this way, airports should not expect to experience a decrease in passengers as a result of the drop-off charge. Rather, airports will more likely witness a redistribution in the modal choice for arrival to the airport. Thus, in terms of its potential negative consequences on overall business, airports stand to lose very little by enforcing a drop-off charge. Perhaps a better way to analyze the drop-off charge is to look at what airports stand to gain from the scheme.

## **ESTIMATED REVENUE FROM CHARGE**

Although British airports do not disclose the revenues generated from the charging scheme, an estimate can be calculated using the percent of non-connecting passengers dropped off at each airport in a private vehicle. To describe non-connecting passengers, the CAA uses the term “terminating passengers,” which is defined as any passengers who join or leave a flight at an airport. It does not include connecting passengers who arrive to the airport by layover. Passenger drop-off percentages are provided for various airports by the CAA (CAA 2014). The estimation process requires several key assumptions:

1. Non-connecting passengers are split evenly between arrivals and departures.
2. Individuals use the same mode of transport to and from the airport.
3. Vehicles using the drop-off zone carry an average of 1.2 passengers per trip. The figure for average number of passengers per vehicle is taken from a 2010 Transportation Research Board (TRB) and Airport Cooperative Research Program (ACRP) report (Fisher2010).
4. Drop-off zone use will not change in reaction to the charge.

Because some passengers will use a free lot—if available—or alternative mode of transport in lieu of paying the charge, as a result of the fourth assumption, the figures provided in this section

can be interpreted as upper bound estimates only. They reflect the maximum annual revenue each airport could potentially gain from the charging system. Revenues are estimated for both drop-offs and pick-ups for airports with available data and use the most recent non-connecting passenger estimates. Terminating passenger estimates are for the year 2013 for all airports, except Bristol, which uses 2012. Estimates are taken from the *CAA Annual Survey Report 2013*, Table 7.1 Modes of transport used at the 2013 survey airports (CAA 2013). The equation for calculating the upper bound revenue estimate for drop-off or pick-up charges is as follows:

$$R_i = \frac{[p_i(T_i/2)]c_i}{v} \quad (1)$$

where  $R_i$  is the estimated annual drop-off or pick-up charge revenue for each airport  $I$ ,  $T_i$  is the 2013 total number of non-connecting passengers for each airport,  $p_i$  is the percent of non-connecting passengers who are dropped off in a private vehicle at each airport,  $c_i$  is the cost of the drop-off or pick-up charge for each airport, and  $v$  is the average number of passengers dropped off per vehicle, for which the estimate of 1.2 passengers per trip is used.

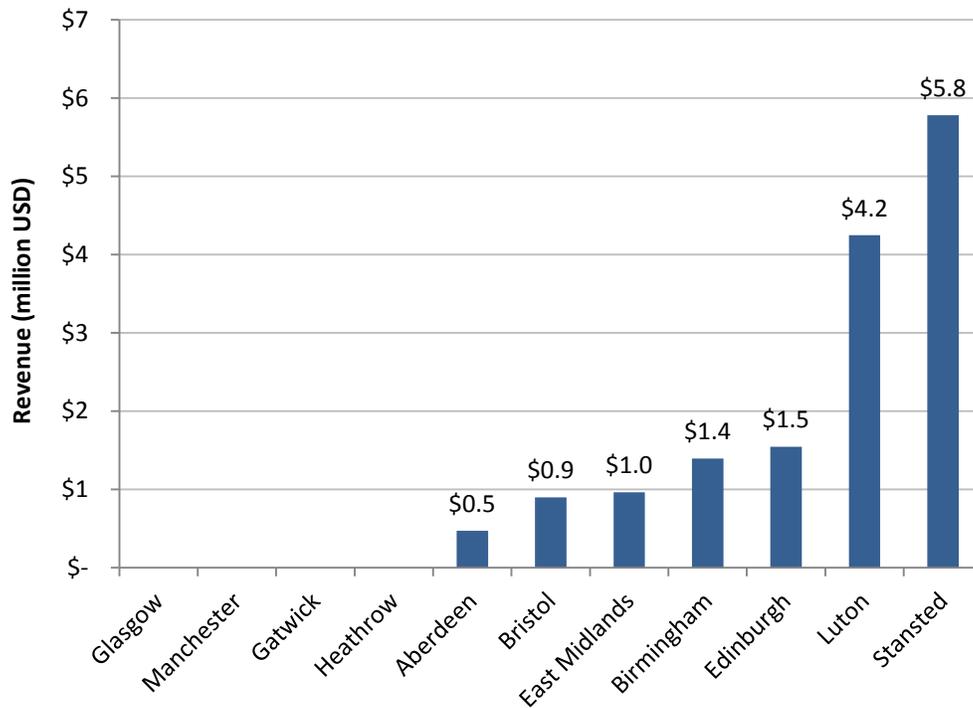
Because individuals will try to minimize costs, the lowest charge is used for airports with increasing pricing scales. For example, because Birmingham airport charges £1 for 10 minutes and £2 for 20 minutes, the £1 figure is used in the estimate. Table 3 details the figures used to calculate revenue estimates [ $R_i$ ] for each airport.

**Table 3. Figures used for British airport revenue estimates\***

<b>Airport</b>	<b>Total Non-Connecting Passengers (000s) [<math>T_i</math>]</b>	<b>% Dropped Off in Private Vehicle [<math>p_i</math>]</b>	<b>Drop-Off Charge [<math>c_i</math>]</b>	<b>Pick-Up Charge [<math>c_i</math>]</b>
Heathrow	45,563	15	£ --	£ 3.50
Gatwick	32,306	16	£ --	£ 3.50
Manchester	19,786	29	£ --	£ 3.00
Stansted	17,051	21	£ 2.50	£ 2.50
Edinburgh	9,578	25	£ 1.00	£ 3.50
Luton	9,399	28	£ 2.50	£ 2.50
Birmingham	8,656	25	£ 1.00	£ 1.00
Glasgow	6,860	36	£ --	£ 1.50
Bristol	5,805	24	£ 1.00	£ 1.00
East Midlands	4,262	35	£ 1.00	£ 2.40
Aberdeen	2,529	29	£ 1.00	£ 1.00

\* Blanks indicate no charge.

Figure 4 illustrates the upper bound estimate for annual drop-off charge revenue at each British airport in U.S. dollars (USD). (As of July 13, 2015, £1 British pound was equal to \$1.55 USD.)



**Figure 4. Upper bound annual drop-off charge revenue estimate by British airport**

Data are provided in tabular format in Table 4.

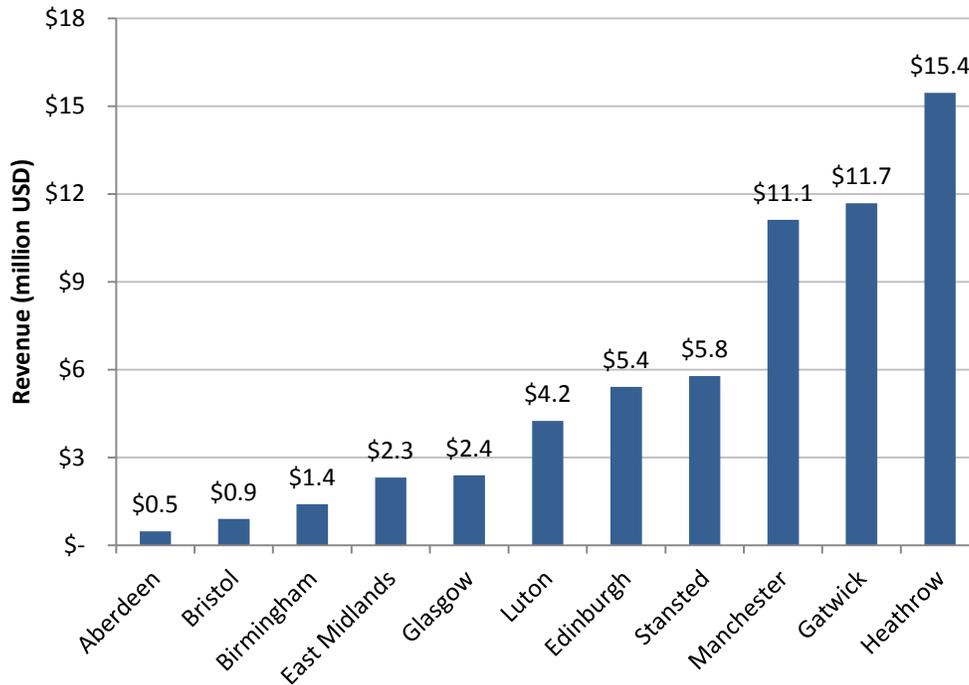
**Table 4. Estimated drop-off revenue (USD)**

<b>Airport</b>	<b>Revenue (\$)</b>
Stansted	\$ 5,781,355
Luton	\$ 4,249,131
Edinburg	\$ 1,546,448
Birmingham	\$ 1,397,583
East Midlands	\$ 963,390
Bristol	\$ 899,775
Aberdeen	\$ 473,661
Gatwick	\$ --
Glasgow	\$ --
Heathrow	\$ --
Manchester	\$ --

\*£1 British pound = \$1.55 USD. Blanks indicate no charge revenue.

Unsurprisingly, airports with the steepest rates earn the most revenue from the charging scheme. London Stansted, with a £2.50 charge, could gain nearly \$5.8 million annually from drop-offs alone. In contrast, Aberdeen, with a £1 charge and a lower passenger count, still stands to earn \$474 thousand annually from the charge.

Considering the number of airports that charge more for pick-ups than drop-offs, the estimates for pick-up revenues are understandably higher, as indicated in Figure 5.



**Figure 5. Upper bound annual pick-up charge revenue estimate by British airport**

Data are provided in tabular format in Table 5.

**Table 5. Estimated pick-up revenue (USD)**

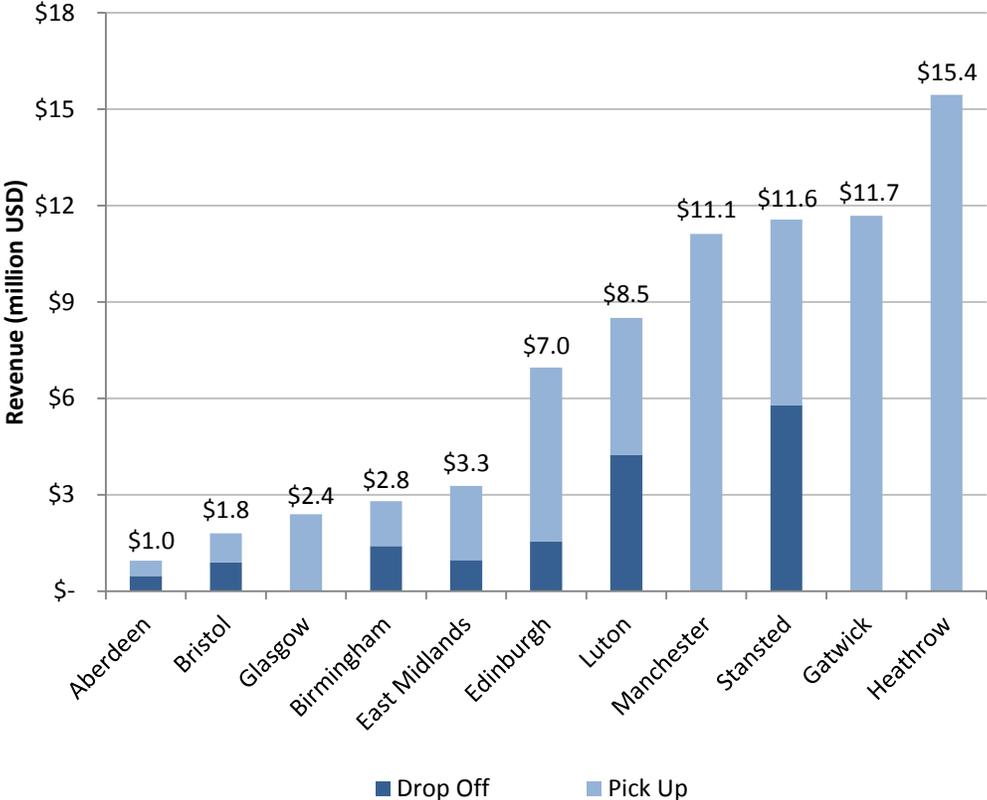
<b>Airport</b>	<b>Revenue (\$)</b>
Heathrow	\$ 15,448,705
Gatwick	\$ 11,684,003
Manchester	\$ 11,117,259
Stansted	\$ 5,781,355
Edinburgh	\$ 5,412,568
Luton	\$ 4,249,131
Glasgow	\$ 2,392,425
East Midlands	\$ 2,312,135
Birmingham	\$ 1,397,583
Bristol	\$ 899,775
Aberdeen	\$ 473,661

\*£1 British pound = \$1.55 USD

With its sizeable passenger count and £3.50 pick-up charge, London Heathrow could potentially see \$15.4 million per year from pick-up revenues. Aberdeen, again, stands to earn the least at \$474 thousand. However, combined with drop-off revenues, Aberdeen could gain nearly \$1

million each year from the practice. Though a modest amount compared to some of the larger airports, this estimate still represents one million potential real dollars that Aberdeen can apply to the operating and maintenance costs of the airport.

Interestingly, three of the five airports with the greatest pick-up revenue potential do not impose a drop-off charge. Rather, they offer free drop-off services while charging upwards of £2 to pick up a passenger. Geography could be a contributor to this finding. Of the top five airports, three are located in London. Being a major international city, London suffers from heavily congested roads but boasts an extensive public transit system. These attributes combined, it is logical why some London airports may offer free drop-offs yet impose the steepest prices for pick-up. For instance, passengers trying to catch a departing flight are under stricter time constraints than passengers arriving to the airport. As such, a free drop-off zone at the entrance will help mitigate potential delays for passengers caused by traffic or commuting from alternative lots. In contrast, because the passenger is expected to be under fewer time restrictions upon landing, London airports may want to encourage alternative transport modes as a means of assuaging congestion on airport roads. Figure 6 details the total upper bound revenue estimates for combined drop-off and pick-up charges.



**Figure 6. Upper bound annual drop-off and pick-up charge revenue estimate by British airport**

From the graph, it is easy to observe how pick-up charges comprise the majority of the total potential revenues for airports.

Data are provided in tabular format in Table 6.

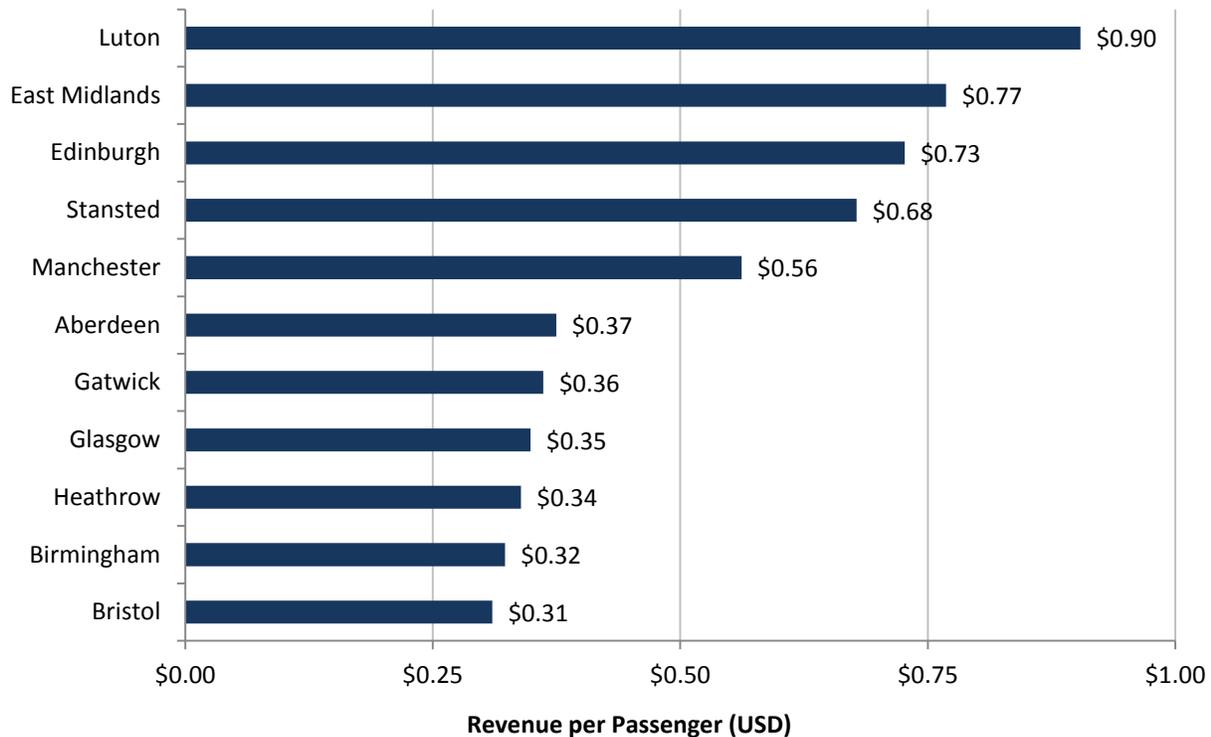
**Table 6. Estimated total drop-off and pick-up revenue (USD)**

<b>Airport</b>	<b>Revenue (\$)</b>
Heathrow	\$ 15,448,705
Gatwick	\$ 11,684,003
Stansted	\$ 11,562,709
Manchester	\$ 11,117,259
Luton	\$ 8,498,263
Edinburgh	\$ 6,959,016
East Midlands	\$ 3,275,525
Birmingham	\$ 2,795,167
Glasgow	\$ 2,392,425
Bristol	\$ 1,799,550
Aberdeen	\$ 947,321

\*£1 British pound = \$1.55 USD

Overall, the estimates in Figure 6 suggest that the range of upper bound potential earnings could span from approximately \$1 million to over \$15 million annually. However, this does not factor in the size of each airport. Considering that Heathrow services 45,600 non-connecting passengers per year compared to Aberdeen's 2,500, perhaps a better way to analyze the charge is to control for passenger count.

Figure 7 shows the total upper bound revenue per non-connecting passenger for each airport. The differences here are less severe, with the busiest airports—Heathrow and Gatwick—bringing in the lower per passenger revenues. However, the airport standing to earn considerably more per passenger than the others is Luton at 90¢ per passenger, 13¢ more than East Midlands, which has the second highest potential revenue per passenger. This finding could contribute to the possible reasons why Luton consecutively ranks the lowest in customer satisfaction among all British airports (Gallagher 2014).



**Figure 7. Total estimated revenue per non-connecting passenger by British airport**

Another way to interpret the high per person estimate for Luton is that the airport operates in a more competitive market than many of the other airports in the study. With multiple airports in London, passengers often have more options when deciding which establishment to patronize. Heathrow and Gatwick control such a majority share of the total London air passengers that the remaining local airports may have to raise prices in order to invest in projects that allow them to compete with the industry goliaths. Similarly, the operating and maintenance costs for smaller airports may be relatively higher per passenger compared to the smaller airports outside of London, meaning that a higher per person revenue is required to satisfy those costs. In this way, it is logical that the largest airports require lower per person revenues.

## **REACTION TO THE CHARGE**

As a whole, the public has not responded favorably to the drop-off charge. Although rolled out under the optimistic veil of increased safety and a healthier environment, many British citizens feel put-off by the scheme. For instance, confusion ensued when Newcastle International Airport first began the charging system. Drivers complained that the signs directing vehicles toward the charging area were too small, and many were unaware the charge even existed (Nichol 2010).

Similarly, at the airports offering a free alternative drop-off area, passengers complain about the traveling distance from the lot to the terminal. Especially for those traveling with heavy luggage, the extra distance covered by shuttle or on foot can be particularly cumbersome. Passengers at Liverpool John Lennon Airport exclaimed that while the walk from the free lot is not bad in the

summer, in the winter it could be an inconvenience. Others called it “outrageous” and a “rip-off,” accusing the airports of nickel-and-diming their customers (Davies 2014).

The inconvenience is even greater for vehicles picking up passengers than for dropping them off. Considering that arrival times are often delayed, coupled with wait times for checked luggage and shuttle commutes, knowing the exact moment a passenger will be ready for pick-up is more of a guessing game than a science. Cars entering the zones at the scheduled time of flight arrival will almost assuredly overstay any free-time window. Thus, even with the availability of a free lot, airports will often profit from private vehicles collecting airport customers, a fact that leaves many members of the public disgruntled.

Another complaint about the drop-off charge is that the argument for increased safety requires further review. For example, the time limits imposed within the zone may cause drivers to rush when unloading passengers. In order to exit the zone before a steeper charge accrues, drivers might try to move more quickly through the zone than safety permits. Further sources of aggravation could come when speedy drop-off is hindered by passengers who do not move as quickly through the area. Drivers trying to avoid a higher fee must wait for these individuals to clear the pedestrian crossings before exiting the zone. Particularly in the case of Edinburgh Airport where the charge rises after five minutes, any sort of delay within the zone could result in a higher cost for drivers (Edinburgh Airport Limited 2015).

The public also cites the unfair disadvantage for private vehicles transporting elderly passengers (O’Leary 2014). Because these individuals will not unload as quickly in the zone, the vehicles’ average times in the drop-off area will likely be higher than the mean.

Moreover, drivers wishing to avoid the charge may illegally drop their passengers without entering the charge zones, resulting in passengers walking through areas not designed for pedestrian use. However, stricter enforcement for misuse of airport roads could mitigate this problem. In the case of London Luton, the airport imposes an £80 fine for any vehicle stopping to drop off or pick up passengers in an unauthorized area (London Luton Airport 2015).

Without further study, the actual impacts of the drop-off charge on safety remain ambiguous.

## **WHAT CHARGES WOULD LOOK LIKE IN THE UNITED STATES**

Currently, American airports do not charge private vehicles to drop-off or pick-up passengers. However, the increasing expansion of the practice in Britain could foreshadow what will soon be common in the US. Like British airports, American airports stand to generate sizeable revenues should they choose to implement the practice.

Applying the same assumptions to US airports as were used for their British counterparts, it is possible to estimate the total upper bound charge revenue should charges be implemented in the US. One difference from the British data, however, is that US airports often do not report passenger totals in terms of non-connecting passengers. Therefore, 2013 total annual passenger

figures are used, as well as available percentages of non-connecting passengers and available percentages of dropped-off passengers for large airports throughout the US. In total, estimates were generated for 12 US airports. Table 7 provides the information used to calculate those estimates.

**Table 7. Figures used for US airport revenue estimates**

<b>Airport</b>	<b>Total 2013 Annual Passengers (.000s) **</b>	<b>Non- Connecting Passengers (%) ***</b>	<b>Dropped Off (%)</b>	<b>Taxi Gate Fee ****</b>
Atlanta	94,431	35	25	\$ 1.50
O'Hare	66,883	45	22	\$ 4.00
LAX	66,702	62	37	\$ 2.50
JFK	50,424	65	25	\$ --
Miami	40,563	55	45	\$ 2.00
Newark	35,016	60	35	\$ --
Boston Logan	30,236	90	28	\$ U*
LaGuardia	26,722	78	19	\$ --
Midway	20,491	73	27	\$ U*
Portland	15,029	85	36	\$ 2.50
Oakland	9,743	95	42	\$ 3.00
San Jose	8,783	91	49	\$ --

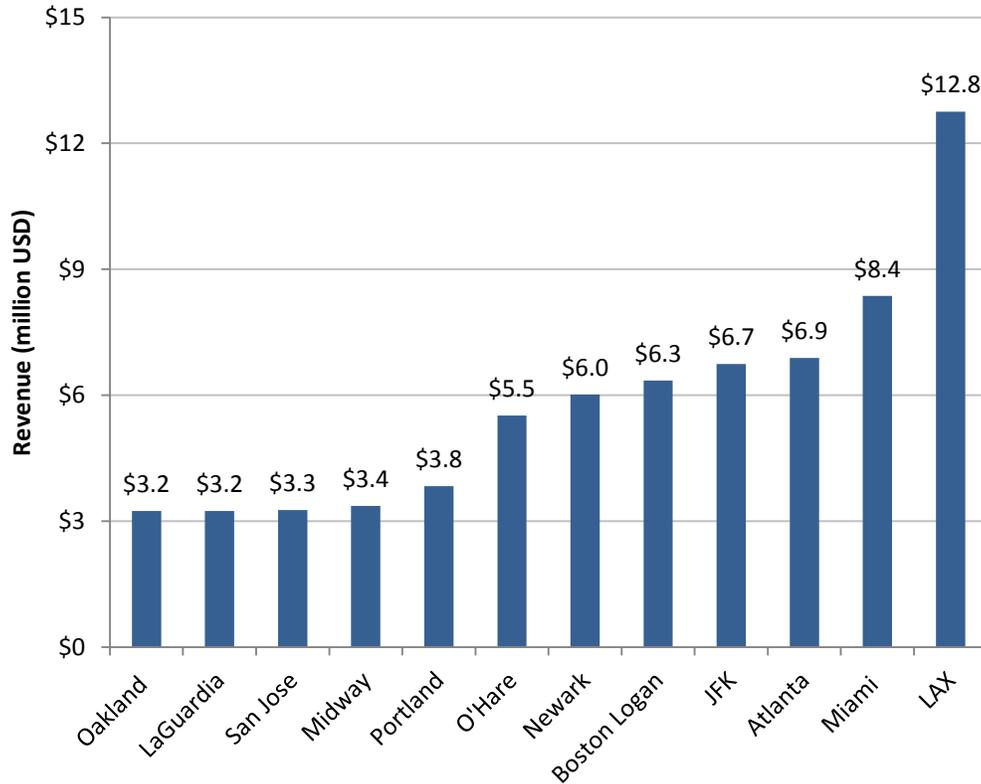
\* U indicates unknown taxi gate fees, blanks indicate no fees.

\*\* All annual passenger figures are from the 2013 *Airport Traffic Report* by the Port Authority of New York and New Jersey.

\*\*\* Data for the percent of non-connecting passengers and percent of passengers dropped off in private vehicles come from different sources for each airport: LaGuardia, Newark, and JFK from Port Authority of New York and New Jersey (2013), Oakland, San Jose, Midway, Portland, O'Hare, Atlanta, and Miami from Gosling (2008), Boston Logan from Steer Davies Gleave (2013), LAX from Unison Consulting Inc. (2011).

\*\*\*\* Gate fees are taken from *AGTA Taxi Fees and Fares Survey Results 2014* (Fransiska and Mundy 2014).

Figure 8 illustrates the total upper bound estimated revenue from drop-off and pick-up charges should each charge be initially set at \$1.



**Figure 8. Approximate annual drop-off and pick-up charge revenues by US airport**

Data are provided in tabular format in Table 8.

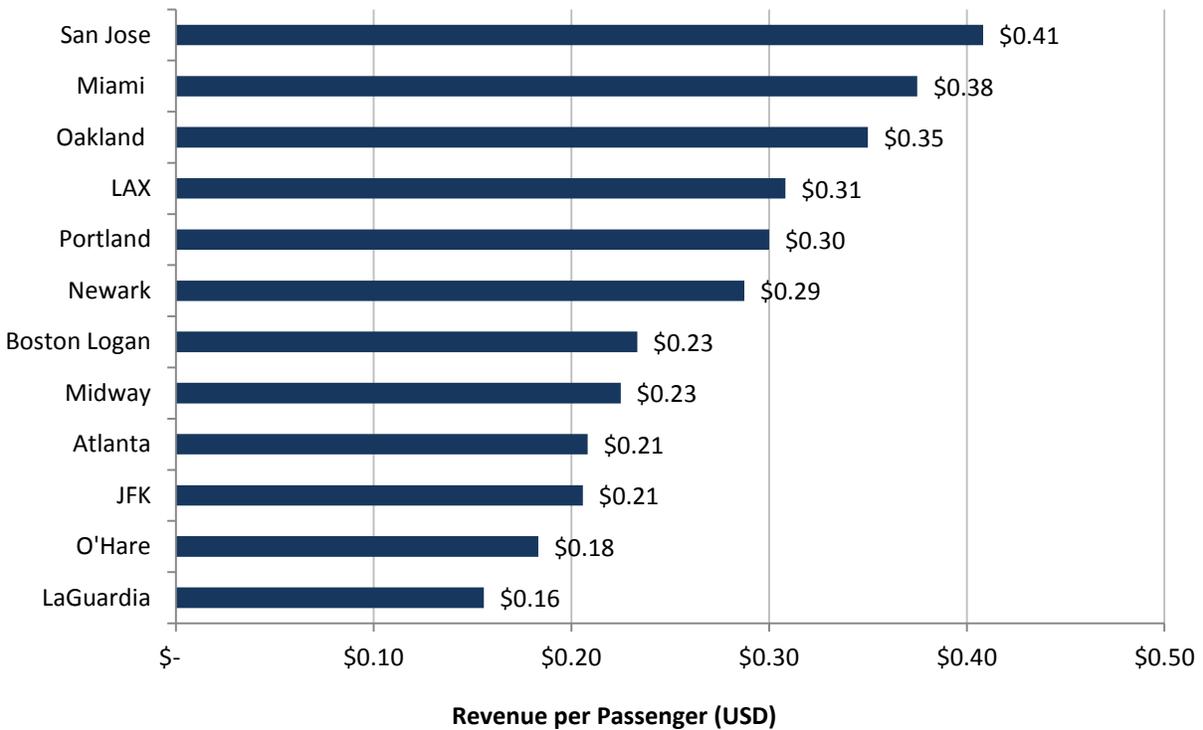
**Table 8. Estimated total revenues if both drop-off and pick-up charges equal \$1 (USD)**

<b>Airport</b>	<b>Revenue (\$)</b>
LAX	\$ 12,751,247
Miami	\$ 8,366,133
Atlanta	\$ 6,885,578
JFK	\$ 6,746,280
Boston Logan	\$ 6,349,602
Newark	\$ 6,020,166
O'Hare	\$ 5,517,870
Portland	\$ 3,832,445
Midway	\$ 3,365,716
San Jose	\$ 3,263,735
LaGuardia	\$ 3,243,917
Oakland	\$ 3,239,510

The estimates show that the potential US revenue benefits are comparable to the British estimates. LAX could gain the most from the scheme at nearly \$12.8 million annually. While this is less than Heathrow's \$15.4 million per year, the LAX figure is generated using only a \$1 pick-

up and \$1 drop-off charge, compared to Heathrow’s higher average charge of £1.75—£0 for pick-up and £3.50 for drop-off—per trip (Heathrow Airport Limited 2015). Moreover, considering the strength of the British pound to the U.S. Dollar, the LAX revenues of \$12.8 million will go farther than Heathrow’s \$15.4 million relative to each airport’s respective economy. (As of July 13, 2015, £1 British pound equals \$1.55 USD). Therefore, US airports are in a position to earn significant revenues should the charge be enacted.

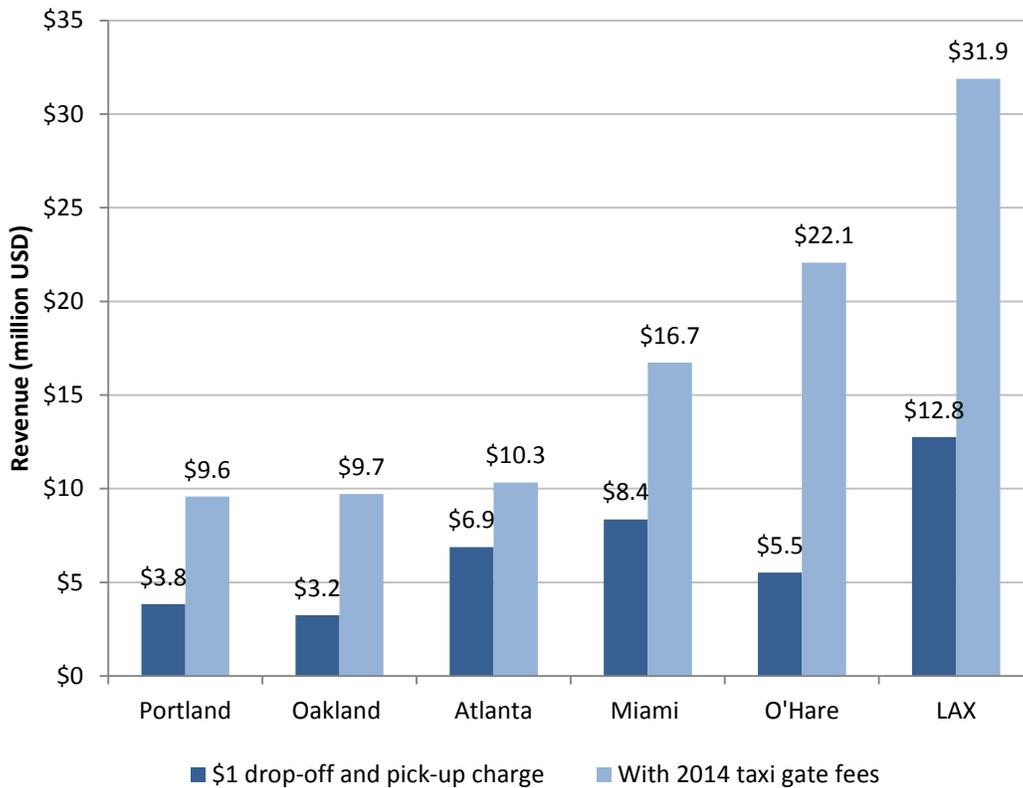
These estimates are further broken down in Figure 9, where the revenue is calculated per non-connecting passenger. As can be seen in the figure, the cities better known for their public transit systems, New York and Chicago, are expected to take in the least revenue per non-connecting passenger. Here, LaGuardia sees only 19¢ per passenger, compared to San Jose, which sees 41¢.



**Figure 9. Approximate revenue per passenger by US airport**

Furthermore, if the US charges mirror the trends seen in Britain, the initial \$1 charge will rise, and the expected revenues will increase in kind. Airports located in areas where driving personal vehicles is relatively common will particularly benefit from such an increase. For instance, Miami sees 45% of its non-connecting passengers dropped off in private vehicles, while the same figure is only 19% for LaGuardia (Gosling 2008, Port Authority of New York & New Jersey 2013). The low percentage for LaGuardia is likely a result of the extensive public transit system in New York City. In this way, should the charges for both airports double to \$2, Miami should see a greater benefit than LaGuardia. Likewise, this also suggests that passengers at airports with fewer private vehicle drop-offs may not react as negatively to the charge as they would at airports such as Miami.

Finally, another way to discuss potential revenues is to set the charge equal to the gate fee that airports already impose on commercial vehicles. When picking up and dropping off passengers, taxis already pay a gate fee, as shown for each airport in Table 7, to access the airport's roads. If this fee were applied to both private and commercial vehicles, then the revenue estimate would be considerably higher. Because airports have already set the gate fee at a level ideal for their respective operations, the benefit of using this fee rather than an arbitrary value is that each gate fee is more likely to represent the optimal charge for each airport. Figure 10 shows the revenue estimates if the pick-up and drop-off charges equaled the taxi gate fee compared to the previous \$1 charge for both services.



**Figure 10. Estimated annual drop-off and pick-up charge revenue if charge equals taxi gate fee**

Data are provided in tabular format in Table 9.

**Table 9. Estimated total revenue if drop-off and pick-up charge equals taxi gate fees (USD)**

Airport	Revenue (\$)
LAX	\$ 31,878,118
O'Hare	\$ 22,071,479
Miami	\$ 16,732,267
Atlanta	\$ 10,328,367
Oakland	\$ 9,718,530
Portland	\$ 9,581,112

Using the \$2.50 gate fee, LAX is set to earn the most at \$31.9 million, almost \$20 million more than if there were a \$1 charge. Chicago O'Hare, which has the highest gate fee at \$4.00, will potentially make \$22.1 million. Overall, for every airport operating with a taxi gate fee, setting drop-off and pick-up charges at the level of the fee will bring significant revenues.

## **BARRIERS TO IMPLEMENTATION**

Although drop-off and pick-up charges could potentially generate millions for American airports, several barriers exist to implementation in the United States. For instance, despite being increasingly common, the practice remains unpopular among the British public, leaving no reason to believe Americans would view the system more favorably. Additionally, determining a method for the US to charge private vehicles could also be problematic. While license plate recognition technology has been successful in Britain, it would be more difficult to establish in the US. For instance, the smaller size of US license plates and lack of uniformity makes positive identification harder. Although research is currently underway to improve the accuracy of these systems, a large margin of error still exists.

Furthermore, distributing fees based on license plate numbers is already an accepted practice in Britain. Since 2003, London has successfully used a license plate recognition system to enforce a congestion charge for vehicles driving within the city's central zone (Transport for London 2006). In contrast, a similar technology used for red light cameras in the United States has recently come under attack as court cases have deemed specific ordinances allowing the use of cameras to incriminate drivers illegal (Thorsen 2015). As a result, the optimal method used for introducing drop-off and pick-up charges in the United States is still to be determined.

One alternative solution to this problem does exist, however. In various parts of the US, toll road and toll bridge tags are found on many vehicles wishing to use these facilities with the convenience of not having to stop and pay at a toll booth. Some US airports currently use toll tags as a convenient method for airport parking, thereby eliminating the need for drivers to wait at the parking plaza toll booth to make a payment (DFW 2015). It is felt that these same toll tags could be used to automatically charge private vehicles for the right to pick up and drop off at the airport's most convenient curbs.

## **CONCLUSION**

Though the trend among British airports seems to be moving toward implementing the drop-off charge, each airport varies in terms of how the charge operates and what the airport stands to gain. Barring the logistical differences, however, in addition to reducing congestion, each airport could potentially gain millions from the practice. This is an unfortunate finding for a public that has not readily accepted the scheme. In fact, as airports further realize the financial benefits of the drop-off charge, the trend seems to move towards increasing the charge rather than appeasing the customers. This is likely due to the fact that, whether airports implement the charge in order to compensate for operating costs or to gain additional profits, the practice is unlikely to negatively impact business.

Even if customers are unsatisfied with the charge, given the relatively high cost of a plane ticket and a dearth of alternative airports to patronize, passenger totals are not anticipated to change. Possible effects could be that passengers find alternative transport to the airport or spend less on goods and services once inside the airport. The latter would largely be influenced by who paid the charge: the passenger or the driver. Further investigation is necessary to uncover who is the primary party responsible for the paying charge. If the drivers more frequently pay the fee, then passenger behavior once inside the airport should be expected to remain the same. Other areas requiring additional research are the safety and environmental impacts of the charge, as well as whether the charge promotes the use of public transit.

With the drop-off charges increasing in frequency and increasing revenue among British airports, the chance that the practice will come to the United States is becoming very likely. Similarly, US airports could potentially earn revenues in the millions. These numbers could help pay for the maintenance and operating costs of the parking areas, as well as generate revenues that could be applied to infrastructure projects throughout the airport. Although passengers in the US are not expected to be any more receptive of the scheme, it seems that someday in the not too distant future the practice of picking up and dropping off passengers for free in the US might also become a thing of the past.

## REFERENCES

- Aberdeen International Airport. 2015. To & From Transport and directions to and from the airport. Retrieved from [www.aberdeenairport.com/transport-and-directions/driving-to-aberdeen-airport/](http://www.aberdeenairport.com/transport-and-directions/driving-to-aberdeen-airport/).
- Albertis Infraestructuras, S.A. 2013, August 1. Albertis agrees to sell London Luton Airport to a consortium headed by Aena. Retrieved from [www.abertis.com/news/abertis-agrees-to-sell-london-luton-airport-to-a-consortium-headed-by-aena/](http://www.abertis.com/news/abertis-agrees-to-sell-london-luton-airport-to-a-consortium-headed-by-aena/).
- Belfast International Airport. 2015. Meeting and Greeting. Retrieved from [www.belfastairport.com/en/content/2/57/meeting-and-greeting.html](http://www.belfastairport.com/en/content/2/57/meeting-and-greeting.html).
- Birmingham Airport. 2015. Dropping off and Picking up. Retrieved from [www.birminghamairport.co.uk/airport-parking/dropping-off-and-picking-up/](http://www.birminghamairport.co.uk/airport-parking/dropping-off-and-picking-up/).
- Bournemouth International Airport Limited. 2015. Pick Up & Drop Off. Retrieved from [www.bournemouthairport.com/bohweb.nsf/Content/pickupanddropoff](http://www.bournemouthairport.com/bohweb.nsf/Content/pickupanddropoff).
- Bristol Airport. 2015. Express Drop Off & Pick Up. Retrieved from [www.bristolairport.co.uk/to-and-from-the-airport/drop-off-and-pick-up](http://www.bristolairport.co.uk/to-and-from-the-airport/drop-off-and-pick-up).
- British Broadcasting Company (BBC). 2010, June 30. Belfast International Airport – new £1 drop off charge. *BBC News*. Retrieved from [www.bbc.com/news/10464896](http://www.bbc.com/news/10464896).
- . 2010, July 5. East Midlands Airport Brings in £1 Drop-Off Fee. *BBC News*. Retrieved from [www.bbc.com/news/10507564](http://www.bbc.com/news/10507564).
- . 2010, October 29. Edinburgh Airport drop off charge enforced. *BBC News*. Retrieved from [www.bbc.com/news/uk-scotland-edinburgh-east-fife-11646305](http://www.bbc.com/news/uk-scotland-edinburgh-east-fife-11646305).
- . 2011, April 6. Taxi firm anger at Bournemouth Airport drop-off charge. *BBC News*. Retrieved from [www.bbc.com/news/uk-england-dorset-12985948](http://www.bbc.com/news/uk-england-dorset-12985948).
- . 2011, July 26. Exeter Airport defends new parking charges. *BBC News*. Retrieved from [www.bbc.com/news/uk-england-devon-14290027](http://www.bbc.com/news/uk-england-devon-14290027).
- . 2011, October 6. Leeds Bradford Airport taxi rank “could cost £1m.” *BBC News*. Retrieved from [www.bbc.com/news/uk-england-leeds-15198003](http://www.bbc.com/news/uk-england-leeds-15198003).
- . 2012, November 6. Stansted Airport introduces terminal drop-off charges. *BBC News*. Retrieved from [www.bbc.com/news/uk-england-esssex-20221125](http://www.bbc.com/news/uk-england-esssex-20221125).
- Cardiff International Airport Limited. 2015. To & From. Retrieved from [www.cardiff-airport.com/to-and-from/](http://www.cardiff-airport.com/to-and-from/).
- Civil Aviation Authority (CAA). 2012. *CAA Passenger Survey Report 2012*. Table 7.1 Modes of transport used at the 2012 survey airports. Last retrieved from [www.caa.co.uk/docs/81/2012CAAPaxSurveyReport.pdf](http://www.caa.co.uk/docs/81/2012CAAPaxSurveyReport.pdf).
- . 2013. *CAA Passenger Survey Report 2013*. Table 7.1 Modes of transport used at the 2013 survey airports. Last retrieved from [www.caa.co.uk/docs/81/2013CAAPaxSurveyReport.pdf](http://www.caa.co.uk/docs/81/2013CAAPaxSurveyReport.pdf).
- . 2014. Transport modes to airports (passengers departing). Retrieved from [www.caa.co.uk/docs/2921/SurfaceAccessChart\(p\).pdf](http://www.caa.co.uk/docs/2921/SurfaceAccessChart(p).pdf).
- . 2015. Annual Survey Reports. [www.caa.co.uk/default.aspx?catid=81&pagetype=90&pageid=7640](http://www.caa.co.uk/default.aspx?catid=81&pagetype=90&pageid=7640).
- Clark, R. 2013, August 2. Airport car park rip off! At £320 a fortnight, it’s more expensive than parking a plane. *Daily Mail*. Retrieved from [www.dailymail.co.uk/news/article-2383843/Airport-car-park-rip-At-302-fortnight-expensive-parking-plane.html](http://www.dailymail.co.uk/news/article-2383843/Airport-car-park-rip-At-302-fortnight-expensive-parking-plane.html).

- Davies, H. 2014, June 12. Watch: Angry motorists say new airport parking system is “ridiculous.” *Liverpool Echo*. Retrieved from [www.liverpoolecho.co.uk/news/liverpool-news/angry-motorists-say-new-liverpool-7255099](http://www.liverpoolecho.co.uk/news/liverpool-news/angry-motorists-say-new-liverpool-7255099).
- DFW. 2015. TollTag Available at DFW Airport for Parking and Pass-Through Entrances. Dallas/Fort Worth International Airport. Retrieved from [dfwairport.com/parking/tolltag/index.php](http://dfwairport.com/parking/tolltag/index.php).
- Durham Tees Valley Airport. 2014. Drop Off and Pick Up. Retrieved from [www.durhamteesvalleyairport.com/car-parking/drop-off-and-pick-up](http://www.durhamteesvalleyairport.com/car-parking/drop-off-and-pick-up).
- East Midlands International Airport Limited. 2015. Pick Up & Drop Off. Retrieved from [www.eastmidlandsairport.com/emaweb.nsf/Content/pickupanddropoff](http://www.eastmidlandsairport.com/emaweb.nsf/Content/pickupanddropoff).
- Edinburgh Airport Limited. 2015. Dropoff Zone. Retrieved from [www.edinburghairport.com/edinburgh-airport-parking/dropoff](http://www.edinburghairport.com/edinburgh-airport-parking/dropoff).
- Exeter International Airport. 2011. Car Parking. Retrieved from [www.exeter-airport.co.uk/car-parking#drop-off](http://www.exeter-airport.co.uk/car-parking#drop-off).
- Fisher, Leigh. 2010. *ACRP Report 40: Airport Curbside and Terminal Area Roadway Operations*. Table 3-1. Typical vehicle mode choice and occupancies at selected airports – originating airline passengers. Airport Cooperative Research Program, Transportation Research Board. Washington, DC.
- Fransiska, K. D., and Mundy, R. A., 2014. *AGTA Fees and Fares Survey Results 2014*. Airport Ground Transportation Association. University of Missouri – Saint Louis, Center for Transportation Studies.
- Gallagher, P. 2014, August 22. London Airport voted worst in Britain for second time running. *The Independent*. Retrieved from [www.independent.co.uk/travel/news-and-advice/luton-airport-voted-worst-in-britain-for-second-time-running-9683933.html](http://www.independent.co.uk/travel/news-and-advice/luton-airport-voted-worst-in-britain-for-second-time-running-9683933.html).
- Gatwick Airport Limited. 2015. Waving Goodbye or Saying Hello. Retrieved from [www.gatwickairport.com/parking/other-parking-options/Pick-up--drop-off/](http://www.gatwickairport.com/parking/other-parking-options/Pick-up--drop-off/).
- Glasgow Airport Limited. 2015. Picking someone up or dropping someone off at Glasgow Airport. Retrieved from [www.glasgowairport.com/im-picking-up-dropping-off/](http://www.glasgowairport.com/im-picking-up-dropping-off/).
- Glasgow Prestwick Airport Limited. 2015. Terminal Pick Up & Drop Off. Retrieved from [www.glasgowprestwick.com/to-and-from-prestwick/airport-parking/terminal-pickup-and-drop-off.html](http://www.glasgowprestwick.com/to-and-from-prestwick/airport-parking/terminal-pickup-and-drop-off.html).
- Gosling, G. D. 2008. *ACRP Synthesis 5: Airport Ground Access Mode Choice Models: A Synthesis of Airport Practice*. Airport Cooperative Research Program, Transportation Research Board. Washington, DC.
- Heathrow Airport Limited. 2014. *Taking Britain further: Heathrow’s plan for connecting the UK to growth*. Volume 1. Retrieved from [your.heathrow.com/wp-content/uploads/2014/05/TBF-Volume-1-72dpi-jm.pdf](http://your.heathrow.com/wp-content/uploads/2014/05/TBF-Volume-1-72dpi-jm.pdf).
- . 2015. Heathrow Parking Options. Retrieved from [www.heathrowairport.com/transport-and-directions/heathrow-parking-options#Pickingupanddroppingoff](http://www.heathrowairport.com/transport-and-directions/heathrow-parking-options#Pickingupanddroppingoff).
- Highlands & Islands Airports. 2015. Car Parking and Car Hire. Retrieved from [www.hial.co.uk/inverness-airport/airport-information/car-parking-and-car-hire/](http://www.hial.co.uk/inverness-airport/airport-information/car-parking-and-car-hire/).
- Hocken, L. 2010, July 1. New Drop Off and Pick Up Arrangements Introduced at Airport. *PRWeb UK*. Retrieved from [www.prweb.com/releases/cardiff-airport/drop-off\\_pick-up/prweb4209924.htm](http://www.prweb.com/releases/cardiff-airport/drop-off_pick-up/prweb4209924.htm).
- Humberside International Airport Limited. 2015. Turn Up and Park. Retrieved from [www.humbersideairport.com/car-parking/turn-up-and-park/](http://www.humbersideairport.com/car-parking/turn-up-and-park/).

- Leeds Bradford Airport Limited. 2015. Airport Parking. Retrieved from [www.leedsbradfordairport.co.uk/airport-parking?gclid=CPCy3tf22MYCFRCCaQodQF8Nqg](http://www.leedsbradfordairport.co.uk/airport-parking?gclid=CPCy3tf22MYCFRCCaQodQF8Nqg).
- Liverpool John Lennon Airport. 2015. Dropping Off & Picking Up. Retrieved from [www.liverpoolairport.com/car-parking/car-park-options/dropping-picking/](http://www.liverpoolairport.com/car-parking/car-park-options/dropping-picking/).
- London City Airport. 2015. Visiting the Airport. Dropping Off Passengers. Retrieved from [www.londoncityairport.com/visitingtheairport/page/droppingoffpassengers](http://www.londoncityairport.com/visitingtheairport/page/droppingoffpassengers).
- London Luton Airport. 2015. Drop Off and Pick Up. Retrieved from [www.london-luton.co.uk/en/content/7/173/drop-off-and-pick-up.html](http://www.london-luton.co.uk/en/content/7/173/drop-off-and-pick-up.html).
- London Southend Airport. 2015. Long & Short Stay Car Parks. Retrieved from [www.southendairport.com/parking/long-short-stay/](http://www.southendairport.com/parking/long-short-stay/).
- London Stansted Airport. 2015. Pick Up & Drop Off. Retrieved from [www.stanstedairport.com/parking/pick-up-and-drop-off/](http://www.stanstedairport.com/parking/pick-up-and-drop-off/).
- Luton Today. 2013, April 3. Airport's drop off zone fee doubles. *Luton News Herald & Post*. Retrieved from [www.lutontoday.co.uk/news/business/business-news/airport-s-drop-off-zone-fee-doubles-1-4957510](http://www.lutontoday.co.uk/news/business/business-news/airport-s-drop-off-zone-fee-doubles-1-4957510).
- Manchester Airport. 2015. Pick Up & Drop Off. Retrieved from [www.manchesterairport.co.uk/parking/pick-up-and-drop-off/](http://www.manchesterairport.co.uk/parking/pick-up-and-drop-off/).
- Newcastle International Airport. 2015. Express Car Parking. Retrieved from [www.newcastleairport.com/express-car-parking](http://www.newcastleairport.com/express-car-parking).
- Nichol, S. 2010, April 27. Anger over Newcastle Airport parking fees. *Chronicle Live*. Retrieved from [www.chroniclelive.co.uk/news/north-east-news/anger-over-newcastle-airport-parking-1414112](http://www.chroniclelive.co.uk/news/north-east-news/anger-over-newcastle-airport-parking-1414112).
- Norwich International Airport. 2015. Getting Here By Car. Retrieved from [www.norwichairport.co.uk/content.asp?pid=12](http://www.norwichairport.co.uk/content.asp?pid=12).
- O'Leary, D. 2014, August 29. Edinburgh Airport drop-off charge rise triples. *The Scotsman*. Retrieved from [www.scotsman.com/news/transport/edinburgh-airport-drop-off-charge-rise-triples-1-3525238](http://www.scotsman.com/news/transport/edinburgh-airport-drop-off-charge-rise-triples-1-3525238).
- Port Authority of New York and New Jersey. 2013. *Airport Traffic Report*. Retrieved from [www.panynj.gov/airports/pdf-traffic/ATR2013.pdf](http://www.panynj.gov/airports/pdf-traffic/ATR2013.pdf).
- Robin Hood Airport. 2015. What am I, a Taxi? Retrieved from [www.robinhoodairport.com/car-parking/dropping-off-pick-up/](http://www.robinhoodairport.com/car-parking/dropping-off-pick-up/).
- Smith, O. 2013, December 20. Airport drop off charges on the rise. *Telegraph*. Retrieved from [www.telegraph.co.uk/travel/travelnews/10529851/Airport-drop-off-charges-on-the-rise.html](http://www.telegraph.co.uk/travel/travelnews/10529851/Airport-drop-off-charges-on-the-rise.html).
- . 2015, January 12. Aberdeen is latest airport to impose “kiss and drop” charge. *Telegraph*. Retrieved from [www.telegraph.co.uk/travel/travelnews/11339566/Aberdeen-is-latest-airport-to-impose-kiss-and-drop-charge.html](http://www.telegraph.co.uk/travel/travelnews/11339566/Aberdeen-is-latest-airport-to-impose-kiss-and-drop-charge.html).
- Southampton Airport. 2015. Short Stay Parking. Retrieved from [www.southamptonairport.com/parking/short-stay-parking/](http://www.southamptonairport.com/parking/short-stay-parking/).
- Steer Davies Gleave. 2013. *2013 Logan International Airport Air Passenger Ground-Access Survey*. Massachusetts Port Authority. Retrieved from [www.massport.com/media/263543/2013-Logan-APS-FINAL-Report-1-.pdf](http://www.massport.com/media/263543/2013-Logan-APS-FINAL-Report-1-.pdf).
- Stockholm Skavsta Airport. 2015. Drop-off zone. Retrieved from [www.skavsta.se/en/content/7/108/drop-off-zone.html](http://www.skavsta.se/en/content/7/108/drop-off-zone.html).

- Telegraph and Argus. 2013, January 15. Anger at “crippling rise” for Leeds Bradford Airport drop-off fee. *The Telegraph and Arugus*. Retrieved from [www.thetelegraphandargus.co.uk/news/10161032.Anger\\_at\\_\\_crippling\\_rise\\_\\_for\\_Leeds\\_Bradford\\_Airport\\_airport\\_drop\\_off\\_fee/](http://www.thetelegraphandargus.co.uk/news/10161032.Anger_at__crippling_rise__for_Leeds_Bradford_Airport_airport_drop_off_fee/).
- Thorsen, L. 2015, August 19. Missouri Supreme Court strikes down red-light ordinances. *St. Louis Post-Dispatch*. [www.stltoday.com/news/local/metro/missouri-supreme-court-strikes-down-red-light-ordinances/article\\_f5967dba-5e9a-5e22-9682-b3cc9ed89f35.html](http://www.stltoday.com/news/local/metro/missouri-supreme-court-strikes-down-red-light-ordinances/article_f5967dba-5e9a-5e22-9682-b3cc9ed89f35.html).
- Transport for London. 2006. *Central London Congestion Charging: Impacts Monitoring*. Fourth Annual Report, June 2006. Last accessed at [content.tfl.gov.uk/fourthannualreportfinal.pdf](http://content.tfl.gov.uk/fourthannualreportfinal.pdf).
- Unison Consulting Inc. 2011. *Los Angeles International Airport 2011 Passenger Survey Results and Findings*. Retrieved from [www.lawa.org/uploadedFiles/OurLAX/pdf/LAX\\_Survey\\_Final\\_Draft\\_REPORT\\_2012\\_08\\_19.pdf](http://www.lawa.org/uploadedFiles/OurLAX/pdf/LAX_Survey_Final_Draft_REPORT_2012_08_19.pdf).