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Understanding travel behaviour change during mega-events: Lessons from the London 2012 Games



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ABSTRACT

This paper presents results from a longitudinal study of the travel behaviour change associated with the London 2012 Olympic and Paralympic Games (the 'Games'). The research examines commuter travel behaviour through a panel approach enabling an understanding of individual behaviour across three waves (before, during and after), with the study utilising unique access to a Transport for London panel study (n = 1132). The findings indicate that a substantial amount of change occurred during the Games (54% made at least one change), with reducing or re-timing journeys being the most likely adaptations made. A key objective of this work was to advance the discussion about the theoretical constructs that are most applicable in the study of behaviour change associated with disruptive events, which was done through the application and critical evaluation of the Transtheoretical Model. The insights from the stages of change element of the model were relatively limited but the analysis shows significant differences in the underlying factors explaining change according to the type of change made (reduce, re-time, re-mode and re-route). Whilst the long-term behavioural impacts of events like the Games appear small, the study has uncovered a need to consider these behavioural choices as distinct rather than under the collective term of "travel behaviour change", as is current practice.

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1. Introduction

Mega-events are events that draw substantial numbers of individuals to a location, placing the local environment and infrastructure under great pressure, and bringing disruption to residents. The Olympic and Paralympic Games are one of the most prominent examples of such events, a category which also includes, amongst others, Presidential inaugurations, the Football World Cup, and Papal visits (Ritchie, 1984). The characteristics of a mega-event, in particular the significance of their scale, mean that whilst they occur over only a few weeks, the preparation for them takes place over a number of years. A broad range of stakeholders contribute to these preparations, with a need to balance the desire of showcasing the city whilst maintaining as much continuity as possible for the resident population. A core element of this continuity involves the maintenance of the transport system to ensure the effective movement of goods and people around the city.

This paper presents a case study of the London 2012 Olympic and Paralympic Games to examine the travel behaviour impacts such a mega-event had on commuters. To counter the pressures facing the London transport network the organisers developed an extensive transport strategy, which included travel behaviour change measures, increased capacity, and traffic management improvements (Currie et al., 2013). Despite the improvements to infrastructure and services, as with all

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mega-events, there remained a substantial number of locations across the network where demand could significantly exceed capacity at certain times of the day during the Games in the absence of a change to the underlying behaviour of residents and commuters (these were known as 'travel hot-spots'). Therefore the interventions of the organisers focused, in part, on efforts to reduce the demand on the network at peak periods of the day at these travel hot-spots. These changes focused in particular on 'reducing, re-timing, re-routing, or re-moding journeys' ('reducing' includes working from home, working elsewhere, or taking annual leave) (TfL, 2013).

This paper provides a clear step forward in understanding the travel behaviour change of individuals in response to disruptive events. The availability of longitudinal panel data is unique in this context and enabled the authors to advance further than previous studies of Olympic and Paralympic Games (Brewer and Hensher, 2001; Giuliano and Prashker, 1986) in the understanding of travel behaviour of individuals in such contexts. In so doing, the work also reveals implications for the wider field of travel behaviour change in the conditions necessary to support the different response options.

As Section 2 of this paper will discuss, the pre-planned nature of this event meant that TfL sought to engage with the public and businesses to understand the pre-planning and preparation for change they were undertaking. Working with TfL provided an opportunity to apply and critically evaluate the Transtheoretical Model (TTM) (Prochaska and DiClemente, 1982, 1983), which focuses on a staged approach to behavioural change, and to understand the importance of various psychological constructs to understand the change processes. This is important if understandings of the behavioural insights from different mega-events are to be shared more effectively. The scale of the disruption meant that even those with no predisposition to change their usual journey to work were potentially faced with a need to do so. Studying the behaviour before, during, and after the Games meant that a greater understanding could be garnered about how individuals changed, what psychological factors helped them to do so, and whether a pre-disposition to change influenced the longevity of change observed.

By utilising the TfL classifications of behaviour change for the Games (reduce, re-time, re-route, re-mode), this paper is also able to report on an investigation of the importance of the differences between factors explaining the types of behavioural adaptations adopted. This is important in moving beyond a simple 'behaviour change' message as the behaviours are quite distinct.

This paper will first present, in Section 2, a critique of what is currently understood with regards to the behaviour change impacts of disruptive events and targeted interventions. The remainder of this section then provides a detailed overview of the London 2012 Olympic and Paralympic Games. The application of the TTM in this research, and the methodological approach that was taken, are then discussed in Sections 3 and 4 respectively. Section 5 presents the findings of this research, initially with a discussion of the travel behaviour changes observed both in the short and longer-term. The findings related to the application of the TTM are then presented and the insights gained from this are discussed. Finally, the conclusion section will draw together the key findings from this research and discuss the implications of this for both the behaviour change potential of mega-events (and other types of disruptions) and the methodological approaches that can be used in the study of them.

2. Travel behaviour change and disruptive events

2.1. The behaviour change impacts of disruptive events and targeted interventions

Mega-events and other planned disruptive events (e.g. prolonged road closures, public transport strikes, etc.) present instances where the usual context within which transport journeys are made is drastically altered (Marsden and Docherty, 2013). The evidence shows that substantial changes in behaviour are achievable during the short period over which the event takes place. In Los Angeles during the 1984 Olympic Games, for example, 23.3% of commuters departed their homes earlier in response to the potential disruption and 10.0% changed their route to and from their workplace (Giuliano and Prashker, 1986). At the Sydney 2000 Games over 26.7% of those in employment took leave from work during the Games, many to avoid the anticipated disruption to travel (Brewer and Hensher, 2001). Such changes are notable but it is unclear how temporary these may be. Such events appear to only exhibit temporary changes but the lack of study in this area is such that the evidence remains very limited.

Other disruptive events, both planned and unplanned, have also been studied for their impacts on the transport system. Pnevmatikou et al. (2015) reported on a prolonged (5-month) closure of a metro line in Athens, Greece, demonstrating that certain factors (in this case: disposable income, gender, and fixity of work schedules) helped determine alternative mode choice in response to the disruption. The study of an 8-day freeway closure (Fujii and Gärling, 2003; Fujii et al., 2001) demonstrated how pre-existing travel behaviour can be associated with the type of change an individual might make in response to a disruption. For example, a higher frequency of car commuting was shown to be associated with a lower frequency of changing to public transport modes during the closure (Fujii et al., 2001).

The disruptive events described show how travel behaviour change at the time of the event can be extensive but there is also further interest in how particular disruptions generate changes afterwards. Walsh et al. (2015) studied a range of unplanned disruptive events (or 'wildcard events') which had consequential impacts on significant transport infrastructures. The authors highlight such events as opportunities for significant learning and improvement in infrastructure, and also for behavioural change. Shires et al. (2016) studied behaviour following the closure of the Forth Road Bridge in Edinburgh,

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