



Spatial dynamics of tour bus transport within urban destinations



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HIGHLIGHTS

- Spatial dynamics of tour bus operations have long presented challenges for urban destinations.
- Normative evaluation is used to assess tour bus operations. ArcGIS tools are used for mapping and spatial analysis.
- A total of 1457 buses were documented over eight days of data collection, representing an estimated 37,265 passengers.
- Common infractions were specific to time violations, percentage of empty buses and use of non-designated areas.
- The methodology and range of solutions are generalizable to any urban tourism destination reliant on tour bus transport.

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ABSTRACT

Spatial dynamics of tour bus operations have long presented challenges for urban destinations, with visitor feedback rather than systematic onsite bus documentation typically used to identify problems. Applying normative evaluation and innovative capacity, tour bus operations were assessed in the National Mall and Memorial Parks in Washington, District of Columbia (USA) to determine how best to respond to ongoing challenges associated with traffic congestion, safety and air quality. A total of 1457 buses were documented over eight days of data collection, representing an estimated 37,265 passengers. Findings suggest in order for communities to successfully affect innovative change, they must include endogenous (solutions generated from within the agency) and exogenous (solutions generated from outside the agency) management strategies. The methodology employed and range of solutions discussed are generalizable to any urban tourism destination reliant on tour bus transport.

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1. Introduction

Policy makers in tourism destinations are confronted with the unenviable task of setting forth consistent and reasonable transportation regulations that enforcement agencies implement. Stakeholders such as destination marketing organizations assist in the creation and dissemination of transportation educational campaigns to mitigate the fallout from disgruntled visitors and frustrated service providers.

Whether transportation guidelines are kept within the confines of “reasonable” is a subject of great debate, with operators, users, policy makers and enforcement agents consistently at odds with

one another. Because road traffic is the most significant contributor to urban air pollution (e.g., [Pettersson, 2013](#); [Wall, Felstead, Richards, & McDonald, 2008](#)), transport policies have focused on reducing the number of individual vehicles entering a destination ([Gronau & Kagermeier, 2007](#); [Nanaki et al., 2017](#)). However, group transportation services, with tour buses of particular interest in this study, are not impact free. For instance, heavy-duty diesel engines have higher emissions of particulate matter and nitrogen oxides than gasoline engines, leading to adverse effects on human health and the physical environment ([Hertel, Hvidberg, Ketzel, Storm, & Staugaard, 2008](#); [Schimek, 2001](#); [US Environmental Protection Agency, 2013](#)). Additional conflicts with onsite tour bus operations include traffic congestion, residential neighborhood disruptions, excessive noise and the obstruction of view corridors and major landmarks. Spatial innovation can decrease disruptions and exposure to emissions while improving tourist transport flows

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(Hall, 1999; Hertel et al., 2008; Nagatani, 2006).

As transportation service quality significantly impacts overall destination satisfaction and loyalty, with ease of use being particularly important (Ratanavaraha, Jomnonkwao, Khampirat, Watthanaklang, & Iamtrakul, 2016; Thompson & Schofield, 2007), planners in urban tourism destinations should be particularly cognizant of the spatial influences of transportation. The purpose of this study is to analyze the spatial dynamics of tour buses at loading and unloading zones within the National Mall and Memorial Parks (National Mall) in Washington, District of Columbia (DC), with a particular focus on operational issues that impact congestion, safety and air quality, in order to inform transport innovation planning and policy in popular urban tourism destinations.

Ongkittikul and Geerlings (2006) propose a framework that classifies transport innovation into two broad categories: endogenous and exogenous. Endogenous innovations are operator based, involving technical advancements and competence development (e.g., Jomnonkwao & Ratanavaraha, 2016) while exogenous innovations are external factors that are authority based such as the requirement for each carrier to provide standard travel information (Ongkittikul & Geerlings, 2006). The relative degree of participation from the operator and the authority will influence transport innovative capacity within the areas of infrastructure, vehicle and service as well as the likelihood of successful reform. The authors suggest the use of a characteristics approach to define operator and authority involvement within a long-term reform period.

An innovative capacity model can be combined with normative evaluation to improve the spatial dynamics of tour bus transport. When considering transportation policy analysis, Richardson and Haywood (1996) argue for the use of normative evaluation (i.e., evaluating observed behaviors through a societally accepted lens of correctness) as superior to a strict comparison of objectives and outcomes because, while transport infrastructure is not easily reversible, the normative method provides room for policy review and adjustment in examining processes and environments.

Building on this framework of transportation innovation is the strategic integrated approach. The co-development of urban transport policy and objectives can achieve reduced congestion, enhanced environment, greater safety, better access, improved quality of life and increased sustainability of costly infrastructure. May, Kelly, and Shepherd (2006) suggest a strategic integrated approach at both the operational and policy level of development that combines infrastructure, management, regulation, information and pricing policy; together, providing better opportunities for synergy than individual measures alone. May et al. (2006) explain that transportation policy “instruments” (e.g., regulations, laws, fines, development plans) can be integrated with: (a) different transportation modes; (b) infrastructure provision, management, information and pricing; (c) land use planning measures; and (d) health and education. Each of these four areas is discussed in turn.

1.1. Different transportation modes

When tour buses enter urban destinations, they compete with personal vehicles, local buses, taxis, circulators and other forms of transportation. Most tour buses are powered through heavy-duty diesel engines, which per unit of energy are the second largest producer of carbon emissions relative to energy capacity (US Department of Energy, 2016). Providing incentives and cooperation between large bus operators and more eco-friendly alternatives could provide better synergy while achieving the objective of reducing carbon emissions. For instance, rather than entering the urban core, tour bus companies can partner with on-site circulators or rapid transit companies (e.g., metrorail, subway, etc.) for transport from remote parking areas. This synergy would decrease

enforcement issues such as ticketing by minimizing congestion and parking conflicts. While the utilization of alternative modes of transportation is an optimal exogenous (i.e., authority) innovation, qualitative evidence suggests endogenous (i.e., operator and user) resistance to multi-modal transport (e.g., Daniels, et al., 2014).

1.2. Infrastructure provision, management, information and pricing

Presumably group transport such as a tour bus facilitates the movement of more individuals using less space and fuel, thus diminishing traffic congestion and pollution (e.g., Aftabuzzaman & Mazloumi, 2011; Guevara, Gschender, & Fuster, 2011); however, should the vehicle circulate while empty (i.e., cruise) due to lack of parking availability, these benefits are diminished (Gallo, D'Acerno, & Montella, 2011). Shoup (2006) contends that a driver is more likely to cruise if off-street parking is expensive and curb parking is cheap. As such, normative evaluation would suggest the utility of thoroughly reviewing parking policy as a contributing factor prior to making reform decisions. As noted by Boussauw and Vanoutrive, “sustainable transport rhetoric” (2017, p. 11) can and has been used to legitimize policy acts that undermine environmental sustainability.

Exogenously, increasing the price of curb parking could result in more revenue for the destination and may increase the likelihood that operators seek off-street areas to park. However, endogenously, pricing as a policy instrument must consider the cost to end users. Policies that significantly increase costs to tour bus operators are generally passed to customers in the form of higher fees for services. Alternatively, operators may elect to cruise indefinitely, resulting in worsening congestion and pollution.

Beyond (and typically separate from) parking is tour bus loading and unloading at sites of interest. Normative evaluation can allow for a review of idling laws and threshold transition points in order to minimize wait times and loading delays that lead to irregularities that create chaos within a system (e.g., Nagatani, 2006; 2008).

1.3. Land use planning

Systematic data driven land use planning is critical in ever-changing and potentially evolving communities, in part because perceptions can differ from reality. While the external perception may be that there is an extensive reliance on automobile transport, people in the United States are actually driving less and fewer young people are getting licenses (Sivak, 2013). In addition, identifying what to address within the planning model is also important. Although systematic land use planning strategies have been adopted by most urban areas, it is not always clear which components are most important to consider. Wey and Wei (2015), for example, suggest that communities often spend time focusing on issues such as building codes, regulations and emergency preparedness, all of which are important from a public health and safety perspective; however, these do not influence users' positive perceptions of urban spaces. Instead, positive perceptions are more influenced when physical components are addressed; key among these are transportation planning and parking.

In addition, without effective transportation review, communities can remain in a state of inertia. Effectiveness is certainly critical as Pflieger, Kaufmann, Pattaroni, and Jemelin (2008) suggest, explaining that overly restrictive planning strategies can be rejected by a community and innovations in and of themselves are not necessarily adequate to facilitate real change. Effective change can occur if institutions allow for new cognitive arrangements in the decision making process such as those utilized in normative evaluation.

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