



Spoke airports, intentional and unintentional ground travel, and the air travel decision-making process



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ABSTRACT

For air travelers originating from the spokes of the US hub-and-spoke air network, price, flight frequency, and aircraft type are all known factors in their travel decision-making process. Less well known, however, is the extent to which different elements of ground travel enter into these travelers' air journeys. Based on 51 interviews at four universities at spokes surrounding O'Hare International Airport, this article describes how considerations such as vehicle availability, individual driving ability, localized weather, and unanticipated ground travel are fundamentally part of the air travel decision-making process for spoke travelers.

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1. Introduction

The now-familiar hub-and-spoke pattern of air travel developed as a way to increase airline efficiency after the deregulation of the US air transportation system in the late 1970s. Based on temporal as well as spatial concentration, the hub-and-spoke network brings in a wave of planes, allows one to two hours for connecting passengers to be redistributed to their outbound flights, and sends them on their way. Though the temporal aspect has been downplayed in recent years, the strong spatial concentration of flights in and out of key hubs has intensified, particularly with airline mergers that have reduced the number of so-called legacy carriers to three (at the time of writing). After nearly forty years, the advantages and disadvantages of the hub-and-spoke system have been well studied (e.g., [Button, 2002](#); [Goetz, 2002](#); [Goetz and Sutton, 1997](#); [Goetz and Vowles, 2009](#); [Kanafani and Ghobrial, 1985](#)). The main advantage for the traveler is that more destinations can be reached from a single origin, even if it is more likely there will be an unwanted stop along the way. On average, airfares have decreased as a result of deregulation, though due to the monopoly or near-monopoly of service in both large hubs and small spokes, flying may be more expensive in these types of cities. Travelers in large metropolitan areas may be able to overcome this additional expense when they have more than one airport from which to choose.

However, less is known about travelers from spoke cities (here termed "spoke travelers"). Work on "leakage," the term for the phenomenon of one "airshed" losing travelers to another, usually concludes that it is a matter of price, especially for leisure travelers ([Suzuki et al., 2003](#)), or the desirability of a higher frequency of flights or greater airline choice. These are the "pockets of pain" that Goetz identified as experiencing inflated airfares due to lack of competition ([Goetz, 2002](#)). Spoke travelers who are within an hour's flight from a hub generally have three available options for long-distance travel: (1) fly from the home airport and connect through the hub; (2) travel by ground to the hub to eliminate the air connection

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and perhaps achieve cheaper airfares; or (3) drive to medium-sized cities with more flights than the spoke but fewer than the hub. Beyond the known tradeoffs of cost, travel time and scheduling, frequent flyer status, and personal preference, ground travel becomes an element of this travel decision-making process in a variety of ways. This includes the cost and availability of airport parking, the journey to the airport itself (and perhaps more importantly, the journey home), household characteristics, the value of one's time, and objects that are needed as part of the trip. Unlike travelers in multi-airport regions, who are choosing to fly from their home region and are merely deciding between airports within that region (Fuellhart et al., 2013; Harvey, 1987; Hess and Polak, 2006; Hess et al., 2007; Ishii et al., 2009; Pels et al., 2003), spoke travelers are choosing between flying from their small home airport or adding a significant amount of ground travel to position themselves differently within airline networks (Fuellhart, 2007; Matisziw and Grubestic, 2010; Suzuki et al., 2003; Tierney and Kuby, 2008; Zhang and Xie, 2005). Rather than considering multi-airport regions and their shadow effects (Alkaabi and Debbage, 2011; Graham and Guyer, 2000; Taaffe, 1956; Vowles, 2001), then, this paper considers multi-regional air travel.

One of the distinctive aspects of spoke city travel is that almost any frequent traveler who has lived in a spoke city for any length of time has experienced delays at the major hub, or worse yet, a cancellation of the last flight home, leading to the choice to stay near the airport and try again in the morning vs. taking some mode of ground transportation home. While all frequent air travelers will occasionally experience cancellations or major delays, the difference here is in the distances: a canceled flight from New York to Chicago means the traveler must wait for the next available flight, while a canceled flight from Chicago to Madison can be substituted with ground travel. Importantly, this choice on how to respond to a flight cancellation, and the air travel decision-making process in general, is conditioned to a large extent by the availability of (a) an automobile, whether one's own, a family member's, or a rental, or (b) public or private mass transportation. Such experiences may also condition future travel decisions, even if only from word of mouth from fellow spoke travelers. This element of the travel decision-making process is difficult to capture through traditional surveys or analyzing airline data (i.e., either stated or revealed preference data), and so this project uses interviews with spoke travelers.

In this paper, I present the results from an exploratory study on the role of ground travel—both intentional and unintentional—in the air travel decision-making process of spoke travelers based at universities in four small cities around the hub of O'Hare International Airport in Chicago: Oshkosh, WI, Madison, WI, Bloomington-Normal, IL, and Champaign-Urbana, IL. All of these cities have universities that rely on the air service provided by a small, regional airport either in the city or within a twenty-minute drive. All are also within three hours' drive of O'Hare and within one to three hours' drive of other spokes and at least one medium-sized airport (Milwaukee, Chicago Midway, or Indianapolis). The decisions that spoke travelers from these cities make on how to travel long distances are partially based on previously-studied factors such as price and scheduling. But other factors such as microclimates, road traffic, the networks and policies of individual airlines, university policies and procedures, and most importantly, the availability and characteristics of *ground* transportation, all shape their decisions as well. After a brief introduction to existing work on airports and traveler decision-making, I describe the methods and choice of cities in more detail, followed by my findings and directions for future research.

2. The hub and spoke system

As mentioned in the introduction, the major spatial impact of the deregulation of the US airline industry was to reform the air traffic network into a series of major hubs surrounded by smaller spokes. Spoke travelers can get to cities for which there would not otherwise be service (for example, Champaign-Urbana to Los Angeles), and provided there is sufficient competition, they will generally pay less than government-regulated airfares. The concentration of traffic in hubs also means airlines can offer a greater frequency of flights, something of as much interest to passengers as lower airfares (Kanafani and Ghobrial, 1985; Wei and Hansen, 2006). Lower fares and greater accessibility have translated into a rapid increase in the number of passengers per year since 1978. The number of fatal accidents has decreased as well, despite initial concerns that cost-cutting would lead to less safe travel (Goetz and Vowles, 2009). However, while the *average* fare has gone down, there is a distinct spatial pattern to where fares have decreased or increased. The Southeast and northern Great Plains have generally seen higher fares, what Goetz (Goetz 2002; Goetz and Vowles, 2009) termed "pockets of pain" where lack of competition meant that the benefits of deregulation could not be achieved. The Southwest and Florida, on the other hand, have generally benefited in terms of lower prices (Goetz and Vowles, 2009). Within all regions, the largest hubs and smallest airports are less likely to have robust competition and are thus more likely to have higher airfares. If an airport is small enough and distant enough from a large airport, it may become eligible for the Essential Air Service program, where federal subsidies are used to maintain otherwise-unprofitable air service (Grubestic and Wei, 2012; Reynolds-Feighan, 2000). All of the spoke cities studied here are able to sustain their own air traffic at this point in time.

The greatest change in the spatial distribution of air traffic occurred in the decade immediately following deregulation (Reynolds-Feighan, 2007), as did the greatest drop in airfares. Since the 1980s and 1990s, however, there have been other trends in the hub-and-spoke system that have affected travelers. Increasing mergers have reduced the number of major hubs as newly-formed airlines consolidate their networks. Both passenger surveys and aggregate demand models show a preference for frequency of flights over size of aircraft (Wei and Hansen, 2006), and so smaller aircraft such as regional jets have been introduced on even major routes such as Chicago-New York. At the same time, passenger preference for jets over slower and noisier turboprop planes has led to a shift at spoke airports to slightly larger aircraft (Wong et al., 2005). The type of aircraft can play a major role in the airport decision-making process, with a strong preference for driving a greater distance

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