PROCEEDINGS OF THE 42ND ANNUAL MEETING OF THE TRANSPORTATION RESEARCH FORUM

Annapolis, MD
November 29 - December 1, 2000

Analyzing the Passenger Transportation Mode Decision Process: A Study of Business Travelers

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Accepted by Journal of the Transportation Research Forum
October 12, 2000

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Abstract: The current research examines the business traveler market segment for passenger rail transportation. Specifically, the researchers examine the role and use of Amtrak as a travel mode choice for business travelers. Research into Amtrak has important U.S. policy implications since the nationwide provider of scheduled intercity passenger rail services traditionally receives significant levels of governmental support. The current research strives to gain additional insight into the travel mode decision processes for business travelers examining 1) how individuals comprising the entire business traveler market segment differed in their views of key mode choice variables and 2) how their perceptions of these key variables impact which travel mode they utilize. The present research suggests that key differences in customers perceptions', strength of competing travel alternatives, and on-time performance all appear to influence the business rider's attitude toward Amtrak, the intention to ride again, as well as perceptions of convenience and on-board conditions.

Analyzing the Passenger Transportation Mode Decision Process: A Study of Business Travelers

INTRODUCTION

Consumer travel in the United States is characterized by a wide variety of choices. Passengers must make a transportation mode choice (air, auto, rail, etc.) and then choose between for-hire carriers (e.g., TWA, British Airways, Amtrak) and private travel (e.g., auto). Much like any other purchase decision, consumer travel decisions are influenced by both internal and external variables. As with most consumer purchases, external environmental influences are processed through individual cognitive structures. As a result, the perceptions of each individual consumer appear to serve as a basis for their transportation mode choice decision.

Individual consumers assign varying levels of importance to each decision variable, and those perceptions ultimately impact their travel mode decision process. Furthermore, each consumer's perception of how effective each mode of transportation is at addressing key decision variables may be impacted by a variety of external environmental influences. For example, the relative attractiveness of different transportation mode alternatives available to each consumer may have a major impact on the customer's transportation mode choice decision.

In addition to environmental influences, on-time performance has also been shown to have an impact on travelers transportation mode decision processes. To better assess on-time performance of Amtrak, the researchers asked business riders to indicate their perceptions of Amtrak's level of on-time performance. These data were used to determine if: 1) passengers' perceptions had an impact on Amtrak patronage, and 2) if actual on-time performance data is

consistent with customers' perceptions of on-time performance.

BACKGROUND

One travel alternative with important U.S. policy implications is the role and use of Amtrak for intercity travel. Amtrak is a nationwide provider of scheduled intercity passenger rail services which has traditionally received significant levels of governmental support (Williams and Warren 1997). The U.S. government has financially supported Amtrak since its inception. However, current plans call for the reduction of operating subsidies and/or complete privatization of some sections of passenger rail service in the near future (Andelman 1995, Barns 1995). As a result, Amtrak is faced with reducing losses or becoming a for-profit enterprise by increasing revenues and/or decreasing operating expenses.

Recently Amtrak has increased revenue through the addition of freight contracts, postal contracts, and high-speed passenger rail (Wilner 1997; Wilner 1998; Machalaba 1999). As a result of pursuing additional markets, in each of the last three years Amtrak has shown growth in the number of Americans relying on Amtrak services (Clinton 2000). While many believe Amtrak has made strides towards profitability, it is still critically important for Amtrak to consider additional ways of increasing revenues in existing market segments by better defining, targeting, and understanding these current market segments.

Passenger rail serves two different functions in the US market. In the long distance rail travel market (500+ miles), passenger rail primarily serves the needs of the leisure traveler. Amtrak long distance rail service encompasses several travel routes including New York to Miami and Chicago to Los Angeles. While long distance trains are an important segment of Amtrak business, several short distance rail corridors are also critical to Amtrak revenues.

Short distance rail service (under 500 miles) is common in several locations around the United States including the northeast, Michigan, Illinois, Wisconsin, Missouri, and California. In these corridors, passenger rail serves a function similar to mass transit - moving travelers from one location to another to relieve some of the pressure from other transportation alternatives (Spychalski 1997). Previous research has indicated many of these short distance passenger rail travelers are commuters or non-overnight travelers (Drea et. al. 1996). As a result of frequent usage by commuters, the volume of passengers traveling on some of Amtrak's short distance trains makes a significant contribution to total revenues. Research has also shown that several of Amtrak's short distance corridors currently enjoy a significant market share with considerable growth

potential (Middleton 1996).

On short-distance corridors, Amtrak serves three primary market segments - business travelers, leisure travelers, and student travelers. In a recent study of Illinois intrastate Amtrak riders, customers traveling for business/job-related reasons constituted the second largest segment of Amtrak riders (behind leisure riders). These business travelers have been identified as a particularly attractive market segment for Amtrak for a variety of reasons. First, these riders have been found to be less price sensitive than leisure or student riders (Hanna and Drea 1998, Drea et. al 1996). Second, business travelers utilize Amtrak during weekdays, when unused capacity exists on many intrastate trains. Third, the frequency of travel is high when compared to leisure and student travelers. Given these factors, Amtrak's ability to preserve the number of riders in the business traveler market while simultaneously attracting new passengers from this market segment may be directly linked to increased revenues, significantly enhanced asset utilization, and a reduction in government subsidies.

As a result of policy implications and the unique attributes of the business market segment, the current research strives to gain additional insight into the travel mode decision processes

for business travelers. Researchers had a two-fold mission in conducting the study. First, researchers wanted to examine how individuals comprising the entire business traveler market segment differed in their views of key mode choice variables and how their perceptions of these key variables impact which travel mode they utilize. This portion of the research, referred to as phase one of the research, addressed the following research questions:

RQ1: What factors are important to business travelers selecting between transportation modes?

RQ2: How do business travelers compare travel by auto, air, and train (Amtrak) along the dimensions of cost, comfort, convenience, and personal productivity?

RQ3: How do business travelers' perceptions of cost compare to actual costs?

Characteristics of Passenger Rail Corridors

As previously mentioned, Amtrak's Illinois market contains four "corridors." Each corridor connects Chicago (Amtrak's mid-western hub) with one of four mid-western cities: Carbondale (located in southern Illinois); Quincy (located in western Illinois); St. Louis, Missouri; and Milwaukee, Wisconsin. (See Table 1, which examines the relative strengths and weaknesses of Amtrak by corridor by examining the available auto and air travel options.).

Table 1: A Comparison of Characteristics and Key Competitors on Illinois Passenger Rail Corridors

	Chicago-Quincy	Chicago-St. Louis	Chicago-Carbondale	Chicago-Milwaukee
Distance (miles)	289	299	328	90
Scheduled Amtrak Travel Time	4 hours 23 minutes	5 hours 30 minutes	5 hours 30 minutes	1 hour 32 minutes
Estimated Average Speed	65.9 MPH	54.5 MPH	59.6 MPH	58.7 MPH
Communities Served	Quincy, Macomb, Galesburg, Kewanee, Princeton, Mendota, Plano, Naperville, LaGrange Road, Chicago	St. Louis, Alton, Carlinville, Springfield, Lincoln, Bloomington-Normal, Pontiac, Dwight, Joliet, Summit, Chicago	Carbondale, DuQuoin, Centralia, Effingham, Mattoon, Champaign-Urbana, Rantoul, Gilson, Kankakee, Homewood, Chicago	Milwaukee, Sturtevant (Racine), Glenview, Chicago
Competition from *Auto*	*Weak*. Primarily two lane highways which do not parallel the Amtrak corridor.	*Strong*. An interstate highway (I-55) parallels the Amtrak corridor.	*Strong*. An interstate highway (I-57) parallels the Amtrak corridor.	*Moderate*. One interstate highway (I-94) plus secondary roads, but heavy traffic during peak periods.
Competition from *Air Travel*	*Weak*. Two airports with limited scheduled service (Quincy and Galesburg)	*Strong*. Frequent departures from St. Louis, plus scheduled service from Springfield and Bloomington-	*Weak*. Two airports with scheduled service (Carbondale and Champaign-Urbana)	*Weak*. Major airports are available, but commuting distances from airports to downtown make air travel impractical.

		Normal.		
Overall Strength, Amtrak Compared to Competitors	*Strong* advantages over auto and air travel.	*Weak* compared to auto and air travel.	*Weak* compared to auto and air travel.	*Moderately strong* advantages over auto and air travel.

Notes:

1. Each of the corridors is also served by longer distance, *interstate* trains. The *Empire Builder* (Chicago-Seattle corridor) also serves Chicago-Milwaukee riders with one additional daily train. The *City of New Orleans* (Chicago-New Orleans corridor) provides an additional daily train for all cities on the Chicago-Carbondale corridor. The *Texas Eagle* (Chicago-San Antonio) provides an additional train three days per week on the Chicago-St. Louis corridor. Finally, a limited number of cities on the Chicago-Quincy corridor are also served by the *Southwest Chief* (Chicago-Los Angeles) and the *California Zephyr* (Chicago-San Francisco), which provides two additional daily trains.

2. Departure and arrival schedules for trains on the Chicago-Quincy and Chicago-Carbondale corridors are primarily geared to facilitate travelers from these downstate locations to travel to Chicago, rather than Chicago travelers going downstate. Schedules on the Chicago-St. Louis and Chicago-Milwaukee corridors feature multiple trains every day, and are equally appropriate for travelers heading to or from Chicago.

Environmental Similarities and Differences

Most aspects of Amtrak service are consistent across each of the four corridors. Each corridor uses the same model of equipment (cars, locomotives), seating, maintenance procedures, primary destination point (Chicago), and personnel trained and evaluated through the same system. With the exception of no café car service on the Chicago-Milwaukee corridor, the four corridors are similar in most respects with the exception of their competitive environment.

However, an analysis of the competitive positions of Amtrak

suggests that riders are likely to possess differential views of Amtrak based on environmental influences. Two of the four corridors (Chicago-St. Louis and Chicago-Carbondale) possess auto transportation as a strong competitor, and the Chicago-St. Louis corridor also features strong air travel competition. Previous research has indicated that current Amtrak business riders consider air travel, auto travel, and Amtrak in their evaluation set of travel alternatives within the Illinois market (Drea et. al. 1996). Thus, while the on-board environment is relatively constant across each of the four Illinois corridors, the environmental influences are distinctly different. These differences may be related to how riders interpret their attitudes toward Amtrak and serve as a basis for a niche marketing strategy organized by corridor.

Marketing by Corridor

By targeting narrower customer groups with more homogenous needs, it becomes possible to create products and services which deliver a perceived superior level of value by tailoring the offering to the specific needs of the corridor. Marketing by corridor can parallel a differentiation focus strategy, in which an organization seeks to provide superior value along a dimension that is highly valued by a segment of customers (Porter 1985). One means for developing a marketing strategy by corridor for Amtrak in Illinois is through a focus on the effects of environmental influences.

In the present research, business travelers along each corridor are presented with relatively similar on-board travel experiences, with the primary difference being available competitive alternatives. Researchers hypothesized that Amtrak riders with strong competitive alternatives to Amtrak are more likely to experience doubt or uncertainty about the decision to ride Amtrak. As a result, Amtrak patrons confronted with attractive transportation mode alternatives are more likely to modify their transportation mode choice and chose another transportation mode. Since many objective Amtrak criteria are consistent across corridors (e.g., seating, on-board environment), it is suggested that it is the external environment

that triggers a change in mode choice behavior. Therefore, Amtrak may be able to tailor their marketing strategy to each corridor and capitalize on passengers perceived differences by corridor.

Once business travelers' perceptions of key variables were better understood and clear distinctions could be drawn between air, train, and auto travelers, phase two of the research was initiated. Phase two focused solely on Amtrak business riders. The focus of this phase of the research was to determine if business travelers' perceptions of key environmental variables differed by corridor. Specifically this phase of the research examined the impact of competing modes of travel on Amtrak's ability to attract and retain business riders. Therefore, the following research question and hypotheses were formulated to help complete phase two of the research.

RQ4: What is the relationship between Amtrak and its competition? More specifically, how is the Amtrak business rider market impacted by the intensity of competing travel alternatives? Specifically tested

hypotheses include:

H_1: The *on-time* performance of Amtrak impacts the business passenger mode selection process.

H_2: The *behavioral intention* for business riders to ride Amtrak again will be greater on those corridors where competing alternatives are weaker.

H_3: *Attitude toward Amtrak* (A_{Amtrak}) will be more favorable among business riders on those corridors where competing alternatives are weaker.

H_4: Perceptions of the convenience of Amtrak travel among business riders will become more positive as competing travel alternatives become weaker.

H_5: Perceptions of Amtrak's on-board environment among business riders will become more positive as competing travel alternatives become weaker.

When examining the first three research questions (phase one), a sample of business travelers was assembled. These business travelers consisted of both Amtrak riders and non-riders who traveled for business purposes. Both riders and non-riders were examined since the focus of phase one of the research was to better understand how both business riders and non-riders differed in their perceptions of different travel mode alternatives. When addressing phase two of the research, only business travelers using Amtrak were surveyed since the basis of this portion of the research was to compare the impact of competing travel alternatives on the decision processes of Amtrak

business riders.

METHODOLOGY AND RESULTS, PHASE ONE

Phase One Sample

During phase one of the research, a two-stage sampling process was used. First, a survey instrument was completed by 406 business representatives. Subjects for this portion of the sample were obtained through members of chambers of commerce and small business development centers (SBDC) at fifteen Illinois locations outside Chicago. The authors removed from the sample any respondents who had not traveled to/from Chicago on business during the last year, leaving 292 business traveler subjects. Secondly, identical questions were used on a survey instrument administered to 2,479 passenger train riders on-board intrastate Amtrak trains in Illinois during the same time period. Of these respondents, 521 classified themselves as business travelers by indicating their present trip to be job-related. Forty-five of these surveys were deemed un-useable for this phase of the research, leaving a sample of 476 subjects collected from on-board passenger trains. Thus, a total sample of 768 business travelers (i.e., 292 business travelers + 476 business travelers on Amtrak) was collected.

Subjects were asked to identify the number of trips made to/from Chicago during the last 12 months by each transportation mode (air, train, auto.) Subjects were then assigned to categorize themselves as primarily an "air traveler," "auto traveler," or "train traveler," depending upon which had been the subject's most common mode of travel to/from Chicago during the past 12 months. The results are shown in Table 2.

Table 2: Sample by Dominant Mode of Travel

Dominant Mode of Travel	Sample (%)
Automobile	400 (52.1%)
Train	280 (36.5%)
Air	78 (10.2%)
Other (i.e., bus)	10 (1.3%)

Phase One Results: Importance Criteria, Choosing a Mode of Travel

On of the issues to be addressed was the relative importance of five key attributes (categorized into four key criteria) for selecting between alternative transportation modes. The four categories of criteria were identified through a series of six

focus groups conducted by the researchers. The four categories were: 1) Perceived Cost, 2) Perceived Comfort, 3) The ability to be productive while traveling, and 4) Perceived Convenience. The fourth criteria, Perceived Convenience, was defined by each travelers ability to travel *when* they want and *where* they want.

Subjects were asked to evaluate the importance of each of these criteria on a five-point scale, anchored by important/unimportant. Responses were uniformly high (between 4.2 and 4.4 out of five) for four of the five criteria (the ability to be productive while traveling was evaluated as less important). This suggests that while the appropriate criteria had been identified, the raw importance ratings would not have sufficient variance for useful discrimination. To overcome this issue, the ratings were ipsatized (i.e., standardizing each respondent's ratings around his/her own mean rating - see Cunningham, Cunningham, and Green 1977, and Gurwitz 1987.) The numerical results can be seen in Table 3 with Table 4 displaying a ranking of key variables by mode of travel.

Table 3: Means, Importance Ratings by Dominant Mode of Travel

Dominant Mode of Travel	Importance of Cost	Importance of Comfort	Importance of *When* I Want to Travel	Importance of *Where* I Want to Travel	Importance of the Ability to be Productive While Traveling
Auto	0.0951	0.1802	0.4000	0.4332	-1.1135
Train	-0.0412	0.2309	0.1126	0.0922	-0.3937
Air	0.08592	0.1845	0.2386	0.2690	-0.8190
Total	0.04297	0.1996	0.2805	0.2885	-0.8122

Note: Numbers greater than 0 indicates a criteria that is more important, while negative numbers indicate criteria that are of lesser importance.

Table 4: Criteria Important to Travelers, by Order of Importance

Auto Travelers	Train Travelers	Air Travelers
1) Traveling *where* I want	1) Comfort	1) Traveling *where* I want
2) Traveling *when* I want	2) Traveling *when* I want	2) Traveling *when* I want
3) Comfort	3) Traveling *where* I want	3) Comfort
4) Cost	4) Cost	4) Cost
5) Being productive while traveling	5) Being productive while traveling	5) Being productive while traveling

Once important criteria to business travelers were identified and ranked (See Tables 3 and 4), the researchers used an analysis of variance (ANOVA) to determine if significant differences between travel mode groups could be detected.

Table 5: Comparison of Business Travelers Perceptions of Comfort

Variable Examined	**F-ratio (significance)**	**Mean[1], Auto Travelers**	**Mean[1], Train Travelers**	**Mean[1], Air Travelers**

Amtrak Comfort	3.404 (.034)	4.3104	4.4231	4.2817
Auto Comfort	13.530 (.000)	4.0184	3.6160	3.6667
Air Comfort	3.879 (.021)	3.6006	3.3256	3.5270

[1] = 1-5 scale, where 1 = "bad" and 5 = "good"

The results from phase one of the research yield some interesting conclusions. Clearly business travelers' perceptions of comfort differ between travel mode groups (See Table 5). Perhaps not surprisingly Amtrak comfort was rated highest by passenger train riders while automobile comfort was rated highest by business travelers using the automobile as their primary mode of transportation. Amtrak riders also differed from the other two groups in their perceptions of airline comfort levels. In summary, Amtrak riders appear to perceive the train to be more comfortable and air to be less comfortable when compared to auto or air travelers. Conversely, auto travelers perceive auto travel to be more comfortable than the other business travel mode groups.

Table 6: Comparison of Business Travelers Perceptions of Cost

Variable Examined	F-ratio (significance)	Mean[1], Auto Travelers	Mean[1], Train Travelers	Mean[1], Air Travelers
Amtrak Cost	3.340 (.036)	3.6537	3.6493	4.0000
Auto Cost	12.373 (.000)	4.1267	3.7540	4.0000
Air Cost	9.520 (.000)	2.2029	1.9585	2.6892

[1] = 1-5 scale, where 1 = "bad" (i.e., high cost to the traveler) and 5 = "good"

Table 6 illustrates differences in the business travelers perceptions' of cost of the different travel modes. Interestingly, when compared to other travel mode groups, air travelers perceive Amtrak to be more cost effective. Stated another way, air travelers have a better perception of Amtrak cost when compared to auto and train travelers. Conversely, auto travelers perceive auto travel to be cheaper than the other travel mode groups and Amtrak riders perceive the automobile to be significantly more expensive than those utilizing other modes of travel. While all of the respondents rated air travel as being less reasonably priced, air travelers perceive air travel to be comparatively more reasonable than respondents in the other travel mode groups.

Table 7: Comparison of Business Travelers Perceptions of Convenience

Variable Examined	F-ratio (significance)	Mean, Auto Travelers	Mean, Train Travelers	Mean, Air Travelers
Importance of traveling *when* I want[1]	6.779 (.001)	4.5320	4.3035	4.3857
Can travel *when* I want on train[2]	8.131 (.000)	2.9083	3.2689	2.8451
Can travel *when* I want in auto[2]	3.620 (.027)	4.7798	4.6505	4.6761

Can travel *when* I want on air[2]	11.406 (.000)	2.8333	2.8519	3.5211

[1] = 1-5 scale, where1= unimportant and 5 = important
[2] = 1-5 scale, where 1= bad and 5 = good

Table 8: Comparison of Business Travelers Perceptions of the Importance of Personal Productivity

Variable Examined	F-ratio (significance)	Mean, Auto Travelers	Mean, Train Travelers	Mean, Air Travelers
Importance of getting work done while traveling	26.123 (.000)	3.0000	3.7838	3.2817

The results presented in Tables 7 and 8 indicate that business travelers differ in the importance of two key attributes. The importance of traveling when the traveler wants to travel tends to be more important for the respondents using the automobile as their dominant mode of transportation. This variable closely approximates frequency of service while also measuring the level of perceived convenience by each passenger. Clearly passengers perceptions' of train and airline schedules have an impact on what mode of transportation is dominant among business travelers. Table 8 illustrates that the ability to work while traveling is much more important to train travelers than it is to other groups. Perhaps not surprisingly being able to work while traveling was rated as least important by business travelers utilizing the automobile as their primary mode of transportation.

METHODOLOGY AND RESULTS, PHASE TWO

The preceding ANOVA results provide a basis for understanding the business traveler segment of passenger

transportation. In phase two, researchers focused specifically on *Amtrak* business travelers to examine if their perceptions of key decision variables varied based on the corridor they were utilizing. The researchers believed additional analysis was needed to determine if perceptions were uniform among all Amtrak business riders or if external variables impacted the perceptions of business travelers utilizing Amtrak. If differences between corridors exists, one could logically conclude transportation alternatives and competition in the marketplace ultimately impact business travelers mode choice decisions. If differences in key mode choice decision variables could be identified and traced to specific corridors, Amtrak could adjust their market strategy on a corridor by corridor basis to attract and retain business travelers and help maximize efficiency and revenues.

Phase Two Sample

Phase two data were obtained directly from passengers on-board Amtrak trains on each of the Illinois corridors. Phase two of the research yielded 521 respondents, all business riders on-board Amtrak trains in Illinois over a three-week period (see Table 10). Surveys were distributed to all riders on-board over the age of 16. Business riders were identified by asking

respondents the purpose of their current trip (job-related, to/from school, personal/leisure, etc.) In exchange for completing the survey, respondents were provided with a $5 discount coupon for their next Amtrak ticket within Illinois.

Table 10: Sample Size Per Corridor, Phase Two

	Chicago-Quincy	Chicago-St. Louis	Chicago-Carbondale	Chicago-Milwaukee	Total
Amtrak Business Riders	n = 59	n = 174	n = 38	n = 250	N = 521

The researchers elected to examine Amtrak business travelers on nine variables considered to be important to the overall mode choice decision. Two of the nine variables, attitude towards Amtrak (A_{Amtrak})and *behavioral intention to ride Amtrak again* were measured through the use of a three item, seven point semantic differential scale. A_{Amtrak} was anchored by good/bad, strongly like/strongly dislike, pleasant/unpleasant, while *behavioral intention to ride Amtrak again* was anchored by likely/unlikely, probable/improbable, possible/impossible. The other seven variables examined (convenience to the station, parking availability, Amtrak comfort, seat comfort, ride, seating area cleanliness, and courtesy of on-board staff) were all five point.

single item measures anchored by excellent/poor. All scale items were assessed for face validity by the researchers and a technical review panel of representatives from the Illinois Department of Transportation and Amtrak. In addition, a pre-test (n=82) was conducted with a broader pool of scale items and subsequently refined to those used.

Phase Two Results: Differences in Competitive Influences

On-time performance is believed to be a significant factor in the transportation mode selection decision processes of travelers. Table 11 shows business travelers' perceptions of Amtrak on-time performance, actual on-time performance as reported by Amtrak officials from June 1994 to May 1996, and actual variance between scheduled and actual arrival times.

H_1: The *on-time* performance of Amtrak impacts the business passenger mode selection process.

Table 11: Perceived and Actual On-time Performance of Amtrak by Corridor
Summary Results for Hypothesis #1

	Perceived on-time performance[1]	Actual on-time performance[2]	Average variance between scheduled arrival time and actual arrival time[3]
Chicago-Quincy	6.2885	92.71%	4 minutes 45 seconds

Chicago- St. Louis	4.8188	60.78%	20 minutes 54 seconds
Chicago- Carbondale	5.9167	80.38%	6 minutes 27 seconds
Chicago- Milwaukee	6.1453	No data available	No data available

[1] Perception based on a 7-point Likert scale, 1= very poor and 7= very good.
[2] On-time is defined as arrival within 15 minutes of scheduled arrival time.
[3] Average variance between scheduled and actual arrival times for all trains on the corridor.

Interestingly travelers' perceptions of on-time performance are relatively accurate when comparing perceptions of on-time performance to percent of time the train arrives on schedule. Passengers' perceptions of on-time performance were lowest (4.8188 of 7) on the Chicago- St. Louis corridor and highest (6.2885 of 7) on the Chicago-Quincy corridor. Actual on-time performance on the Chicago-St. Louis corridor was 60.78% while the Chicago-Quincy corridor experienced a 92.71% on-time performance rating. There is certainly a correlation between frequency of on-time arrival and perceptions of on-time performance. However, further analysis of the data indicates that the actual on-time performance in terms of minutes from the scheduled arrival time is nearly the same for the Chicago- Quincy

corridor and the Chicago- Carbondale corridor. The average difference of less than two minutes between the Chicago- Quincy and the Chicago- Carbondale corridors should not account for such a dramatic difference business riders perceptions of on-time performance. The results of on-time performance on business travelers' perceptions are somewhat mixed, partially supporting H_1. This led the researchers to investigate further by adopting a cognitive dissonance approach to better understand passenger rail ridership.

Environmental Influences

To obtain a complete understanding of the remaining data, a two-stage data analysis methodology was implemented to examine data collected during phase two of the research.. First, an analysis of variance (ANOVA) was performed to identify whether significant differences exist between the means of variables being examined. Second, orthogonal contrasts were used to specifically identify which corridor(s) was (were) significantly different from the mean of the three other corridors (e.g., comparing business riders on Chicago-Quincy against business riders on all other corridors combined.)

H_2: The *behavioral intention for business riders to ride Amtrak again* will be greater on those corridors where competing alternatives are weaker.

Business riders were found to have significant differences (<.05 level) in *behavioral intention* to ride Amtrak again, depending upon the corridor (See Table 12).

Table 12: Summary Results for Hypothesis #2

	Means for Each Corridor						Orthogonal Contrast (t-test) [Results comparing each corridor against all others]			
Variable	Chi-Quin.	Chi-St. Louis	Chi-C'dale	Chi-Milw.	F-ratio	Prob	Chi-Quin.	Chi-St. Louis	Chi-C'dale	Chi-Milw.
Behavioral Intention	6.4259	5.9191	6.0988	6.3606	**3.334**	**.020**	**1.728**	**-2.176**	**-0.655**	**1.685**

Significant differences (.05 level) denoted by bold. t-values assume unequal variances.

Consistent with Hypothesis 2, *behavioral intention* means were high for business riders on the Chicago-Quincy (6.4259) and Chicago-Milwaukee (6.3606) corridors. Significant differences were reported between the four corridors, with the corridor with the strongest travel alternatives (Chicago-St. Louis) having a significantly lower intention to ride again than the other three corridors. In summary, the results are consistent considering

the strengths of Amtrak's competitors along each corridor. As a result, these results provide support for H_2.

H_3: *Attitude toward Amtrak* (A_{Amtrak}) will be more favorable among business riders on those corridors where competing alternatives are weaker.

H_2 suggests that riders' attitudes toward Amtrak will be more positive as the competition from other travel alternatives decreases. The initial phase of the analysis showed no significant difference between the four corridors for business riders ($F = 2.383$, $p = .069$).

Table 13: Summary Results for Hypothesis #3

	Means for Each Corridor						Orthogonal Contrast (t-test) [Results comparing each corridor against all others]			
Variable	Chi-Quin.	Chi-St. Louis	Chi-C'dale	Chi-Milw.	F-ratio	Prob	Chi-Quin.	Chi-St. Louis	Chi-C'dale	Chi-Milw.
A_{Amtrak}	6.0833	5.5734	5.7011	5.8061	2.383	.069	2.485	-1.996	-0.625	0.175

Significant differences (.05 level) denoted by bold. t-values assume unequal variances.

Consistent with the proposition that fewer viable travel alternatives leads to a higher (i.e., more positive) A_{Amtrak}.

business riders on the Chicago-Quincy corridor had the most positive A_{Amtrak} (6.0833), and this mean was significantly higher (t = 2.485) compared to the mean for other business riders on other Illinois corridors (See Table 13). However, a comparison of means for the four corridors of A_{Amtrak} was not found to be significantly different at the .05 level. As a result, H_3 is partially supported.

H_4: Perceptions of the convenience of Amtrak travel among business riders will become more positive as competing travel alternatives become weaker.

H_3 indicates that perceptions among Amtrak riders of Amtrak convenience will increase as other viable travel alternatives decrease. To assess this hypothesis, two variables were examined to assess perceptions of convenience associated with Amtrak as a travel alternative. *Convenience getting to the boarding station* and *parking availability* were identified as relevant measures of passengers overall perceptions about the convenience of Amtrak. (These variables were identified by the authors through focus groups conducted with each group of riders prior to the development of the data collection instrument.) Significant differences between corridors were found for business riders for both *convenience getting to the station* (F = 3.415, p = .017) and

parking availability at the station ($F = 5.024$, $p = .002$) (See Table 14). Clearly the perceptions of Amtrak convenience differ between corridors.

Table 14: Summary Results for Hypothesis #4

	Means for Each Corridor						Orthogonal Contrast (t-test) [Results comparing each corridor against all others]			
Variable(s)	Chi-Quin.	Chi-St. Louis	Chi-C'dale	Chi-Milw.	F-ratio	Prob	Chi-Quin.	Chi-St. Louis	Chi-C'dale	Chi-Milw.
Convenience Getting to Station	4.5862	4.1813	4.3158	4.2672	3.415	.017	**3.003**	**-2.224**	-0.197	-1.189
Parking Availability	4.5962	3.9645	3.9655	4.0905	5.024	.002	**4.280**	**-1.921**	-1.065	-0.754

Significant differences (.05 level) denoted by bold. t-values assume unequal variances.

Business riders on the Chicago-Quincy corridor had a significantly more positive perception of Amtrak convenience in comparison to the other three Amtrak corridors, while Chicago-St. Louis business riders had a significantly lower perception of the same variable. Business riders on the Chicago-Quincy corridor perceived the *convenience getting to the station* significantly more positively ($t = 3.003$) than business riders on the other three corridors. In particular, business riders on the Chicago-St. Louis corridor had a significantly lower perception of

convenience to the station (t = -2.224). Chicago-Quincy riders also held significantly more positive perceptions of parking availability (t = 4.280) than the other three corridors. These results are consistent with the belief that weaker travel alternatives yield more positive perceptions of Amtrak as a convenient travel alternative, providing support for H_4.

H_5: Perceptions of Amtrak's on-board environment among business riders will become more positive as competing travel alternatives become weaker.

H_4 indicates that as other travel alternatives become less attractive, Amtrak riders perceptions of the environment on-board the train will become more positive. While there are many potential variables that can impact a passenger's perception of the on-board experience, the researchers selected five specific aspects of the on-board experience to comprehensively assess each passenger's perception of the overall on-board experience. The following five variables were chosen for the analysis: overall *Amtrak comfort*, *seat comfort* (on the train), *ride* of the train, *seating area cleanliness*, and *courtesy* of staff on the train (See Table 15).

Table 15: Summary Results for Hypothesis #5

	Means for Each Corridor Orthogonal

							Contrast (t-test) [Results comparing each corridor against all others]			
Variable	Chi-Quin.	Chi-St. Louis	Chi-C'dale	Chi-Milw.	F-ratio	Prob.	Chi-Quin.	Chi-St. Louis	Chi-C'dale	Chi-Milw.
Amtrak Comfort	4.2982	3.9515	4.1429	4.0765	2.404	.067	**2.002**	**-2.341**	0.163	-0.357
Seat Comfort	4.3214	4.0632	4.1316	4.0121	2.468	.061	**2.595**	-1.136	-0.005	**-2.057**
Ride	4.1964	3.8421	4.1351	3.8333	**3.999**	.008	**2.445**	**-2.416**	1.361	**-2.863**
Seating Area Cleanliness	4.5263	4.1618	4.3947	4.1741	**4.119**	.007	**3.029**	**-2.525**	0.838	**-2.539**
Courtesy, On-Board Train	4.4737	4.4535	4.4054	4.3770	0.533	.660	0.597	0.452	-0.215	-0.932

Significant differences (.05 level) denoted by bold. t-values assume unequal variances.

For each of the five variables, the highest means reported were found on the Chicago-Quincy corridor where competitive alternatives are weaker. Significant overall differences in means were reported for the variables of *ride* ($F = 3.999$, $p = .008$) and *seating area cleanliness* ($F = 4.119$, $p = .007$). The Chicago-Quincy corridor reported significantly higher means for the variables of *Amtrak comfort* ($t = 2.002$), *seat comfort* ($t = 2.595$), *ride* ($t = 2.445$), and *seating area cleanliness* ($t = 3.029$). Only the courtesy of on-board staff was not significantly higher ($t = 0.597$) in comparison to the other corridors. Thus, while equipment, seating, and staff training

procedures are nearly identical on all corridors, significantly higher levels of four of the five variables were reported by riders on the Chicago-Quincy corridor. Therefore, the results provide support for H_5, due to fewer travel alternatives on this corridor.

An unanticipated result related to H_5 was the lower scores for business riders on the Chicago-Milwaukee corridor. Respondents on this corridor evaluated seat comfort, ride, and seating area cleanliness significantly lower than respondents on the other three corridors, even though competing alternatives to passenger rail are weaker on this corridor. While outside the scope of the proposition, the results suggest that the relationships present in the data may not be linear, and that alternative modes of travel may need to be very weak before respondents alter their cognitive structures related to passenger rail. One additional explanation may be that consumers expect to "get what they pay for." As table 16 illustrates, the per mile cost of the Chicago- Milwaukee corridor is significantly more than the cost per mile of each of the other three corridors.

Table 16: Summary of Amtrak Ticket Prices

	Chicago-Quincy	Chicago-St. Louis	Chicago-Carbondale	Chicago-Milwaukee

Average Ticket Price[1]	$65*	$65	$75	$32
Distance (Miles)	289	299	328	90
Cost Per Mile	$0.225	$0.217	$0.229	$0.356

[1] at the time the research was conducted.
* Riders on this corridor can purchase a multi-ride pass and potentially reduce the cost per mile.

When examining Table 16, the cost per mile is significantly higher on the Chicago- Milwaukee route. The primary reasons for this is that business travelers along the Chicago-Milwaukee corridor are primarily comprised of commuters (frequent/ daily travelers) while business riders along the other three corridors are more traditional (less frequent) business travelers. It should be noted that during the period of this research Amtrak offered a multi-ride pass for $500 per month. Depending on the frequency of ridership, use of a multi-ride pass could result in a significantly lower average ticket price and reduce the cost per mile. However, during the time of this research Amtrak did not use a reservation system. As a result, it was impossible to accurately measure the number of rides on a multi-ride pass and calculate a reliable cost per mile. Therefore the researchers were forced to use the standard ticket price for comparison purposes.

In addition to price, other variables may help to account for the differences discovered on the Chicago-Milwaukee corridor. Auto transportation along the Chicago-Milwaukee route is likely to include traffic congestion, possible delays, daily parking difficulty, and considerable parking expense (especially if the destination is downtown Chicago). The difference in cost per mile by corridor further illustrates the impact competing travel alternatives can have on passenger rail practices. It is likely that commuters (Chicago- Milwaukee corridor) perceive the cost of Amtrak to be more reasonable because their primary travel alternative, the automobile, is not perceived to be a viable alternative due to traffic congestion and parking concerns.

CONCLUSION

For marketing by corridor to be an effective basis for the development of a strategy, there needs to be significant differences within the existing business traveler market segments that can be satisfied more efficiently and effectively by focusing on the needs of each group or corridor. The identification of such differences is a fundamental prerequisite to the development of such a strategy. Given the results of this research, it appears Amtrak is in a unique position to

develop a strategy which allows them to market to specific corridors.

When examining the business travel segment, Amtrak's two primary competitors are entire competing *industries* - the auto and air travel industries. Both of these competitors hold certain perceived advantages over Amtrak on some corridors (e.g., Chicago-St. Louis), while Amtrak holds perceived advantages on other corridors (Chicago-Quincy.) The present research suggests that these differences appear to influence the business rider's attitude toward Amtrak, the intention to ride again, as well as perceptions of convenience and on-board conditions. As a result of these differing perceptions, Amtrak has a basis for the development of marketing strategies tailored to the specific needs of each corridor.

The results presented here suggest that specifically targeted marketing campaigns by corridor is likely to serve as an appropriate basis for strategy development for business travelers in intrastate passenger rail corridors. In particular, it is appropriate to identify those markets where Amtrak holds differential advantages over competitors and use these advantages as a basis for attracting additional business riders. Broadening Amtrak's ridership base along corridors where differential

advantages exist is important from both a revenue and a political standpoint. Greater numbers of attractive business riders equates to increased revenues (since business riders are less price sensitive and ride when full capacity is typically not utilized). In addition, it is important to remember that Amtrak still depends on public funding. As a result, a broader ridership base likely produces more grassroots support for continued public support for Amtrak.

EPILOGUE

In 1997, the Illinois Department of Transportation Bureau of Railroads, Amtrak, and local elected officials began the process of creating *corridor coalitions* for each of the three downstate Illinois passenger rail corridors. The purpose of each corridor coalition is to develop and assist in the implementation of marketing strategies aimed at the specific characteristics of each corridor. The development and use of these corridor coalitions is consistent with the previous findings - Amtrak market segments have significantly different attitudes and intentions across corridors, and the development of an effective niching strategy must incorporate these different perceptions. The preceding research suggests that different perceptions of

Amtrak by business riders on each corridor appear to be a function of the differing competitive environments on each corridor. More specifically, rider attitudes and perceptions concerning Amtrak increase as competitive alternatives are weakened.

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