

Taxi-Transit Integration in the Atlanta Region

Review of Taxi/Transit Trips in
the 1990 Onboard Transit
Ridership Survey Data

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INTRODUCTION

Between July 22, 2000 and August 4, 2000, Dr. Randall Guensler of Trans/AQ, Inc. worked with the Georgia Regional Transportation Authority to assess taxi/transit trip integration in the Atlanta region. One sub-component of the study was to obtain a copy of the 1990 onboard transit ridership data and examine the differences between traditional transit trips and those that used taxis as either a transit access or departure mode.

Obtaining the original ridership data and summary reports proved difficult. The Atlanta Regional Commission was able to provide the 1990 Household Travel Study: Final Report prepared in December of 1993. However, ARC staff could not locate the original data. Nor could ARC provide the final report summarizing the onboard transit surveys. Staff indicated that the data had been missing for a number of years. Similarly, the planning staff at the Georgia Department of Transportation was unable to locate a copy of the onboard transit summary report and indicated that they had never had copies of the original data set. Thelma Purnell of the Metropolitan Atlanta Rapid Transit Authority (MARTA) was able to provide a copy of the October 1990 report by George Hoyt and Associates entitled Final Report: On-Board Bus and Rail Survey (RFP #135). Both written reports are appended to this document.

At the end of July, Mr. Robert Thomas of the Metropolitan Area Regional Transit Administration was able to locate the original ridership data files on an old backup disk. Mr. Thomas provided these original ridership data to Randall Guensler. The data were pre-formatted (with appropriate data labels) as a SPSS data file for statistical analysis. The file contains all relevant data definitions and appropriate labels for coded variables. Mr. Thomas provided two data files, one that contained the ridership survey data, and one that contained the "address" information of the respondents. The variable RSERNUM serves as the common variable between the files. These files are appended to this report as a CD-ROM. Until reaching Mr. Thomas, all agencies had consistently indicated that the original data had been missing for more than seven years.

This report first summarizes the general goals of the onboard ridership surveys. The second part of this report summarizes the basic frequency analysis and identifies differences in trip characteristics and demographic characteristics between the taxi-transit riders and traditional transit riders. Very few taxi/transit trips are included in the data set. Hence, it was not possible to perform many of the potential cross-classification analyses that could have provided additional insight into the trip making patterns of various Atlanta sub-populations (e.g. stratified by income and geographic location, etc.). The final section of the report summarizes the issues raised during the analytical review, provides research conclusions, and identifies recommendations for future onboard surveys designed to improve the capture of taxi-related variables.

1990 TRANSIT DATA COLLECTION AND ANALYSES

The goal of the February 1990 onboard transit ridership survey effort was to "learn travel characteristics, patterns, needs, and prevailing attitudes as they relate to MARTA's current level of service." The survey was designed to determine the demographic and socioeconomic characteristics of MARTA riders and to identify the factors important in their decisions to make transit trips. Researchers cannot glean such relationships through standard household travel

diary survey efforts because too few trips are made by transit modes. The major emphasis of the survey effort was rail tripmaking, as opposed to bus transit trips. George Hoyt & Associates conducted four surveys during their research effort: 1) an onboard rail survey, 2) an onboard bus survey, 3) a station survey to determine arrival mode, and 4) a station survey to determine attitudes regarding transit service and cost. The researchers collected both weekday and weekend data. Approximately 73% of the onboard rail surveys were conducted on weekdays, 15% on Saturdays, and 12% on Sundays.

Table 1 outlines the stated research goals and objectives of the 1990 study. A large number of the data elements were associated with payment methods, transfer activity, and usage of TransCard technologies (presumably due to the MARTA focus at that time on implementing new payment schemes). Questions were designed to collect information on "passenger movement patterns, with special emphasis on within and between mode transfers and origin/destination data..." In addition to the data elements necessary to evaluate the objectives outlined in Table 1, the 1990 survey team undertook 'mode of arrival surveys' at rail stations to determine mode of access by time of day. The survey focused on automobile, bus, and pedestrian arrivals, but the taxi mode was included in the survey as a mode choice.

The 1990 survey plans called for the conduct of 10,000 onboard surveys. The On-Board Bus and Rail Survey report (Hoyt & Associates, 1990) indicates that 8,806 surveys were conducted. However, the data set provided by MARTA contains 8,842 survey results. This mismatch means that the analyses presented in this paper cannot hope to match the figures presented in the final Hoyt report. Unfortunately, there is no way to determine which surveys Hoyt removed from the data set used for the 1990 analyses. Because the survey collected information on the entire transit trip, from origin to destination, the survey data contain multiple entries from some individuals associated with each transit leg (bus route, and or transit leg) of the trip. More than 16,000 individual transit trip links (bus/rail and rail/bus combinations) are represented in the data. Figure 1 presents a copy of the onboard survey questionnaire. The question responses recorded in the database flow directly from the specific questions contained in this survey form.

Table 1
Objectives of the 1990 Transit Ridership Survey (Hoyt & Associates, 1990)

- Identify general ridership characteristics
 - Fare payment method, trip purpose, trip frequency, demographics, attitudinal and psychographic data, mode of access, and mode of egress
- Undertake rail entry analysis
 - Average rail trip length, percent rail-to-rail transfer, and percent rail-to-bus transfer
- Determine total TransCard bus boardings
 - Percent TransCard rail-bus transfers outside stations and percent TransCard bus-bus transfers outside stations
- Determine TransCard bus-rail transfers outside stations as a proportion of TransCard faregate entries
- Determine percent bus-bus transfers to total bus linked trips
- Stratify rail trips by:
 - Trip purpose, income, mode of access to rail station, station of entry, station of egress, mode of egress from rail station
- Undertake origin and destination analysis:
 - Trip length frequency and sub-corridor trip movements by income
- Elderly and handicapped analysis, proportion of total system patronage, percent of cash fares
- TransCard analysis
 - Ratio of TransCard transactions to cash-fare transactions by boarding
- Free intermodal pass-thru analysis (inbound and outbound)

Figure 1 1990 Onboard Transit Survey

No 29491

Dear MARTA Passenger:
Please take a minute to help us plan for your transit needs by filling out this survey.
Place the completed card in the special box located near the exit door of this vehicle or drop it in any mailbox, no postage necessary.

Please fill out this survey even if you filled one out before. THANK YOU FOR YOUR HELP.

- ▶ **WHERE DID YOU COME FROM BEFORE THIS ONE-WAY TRIP? (Check only one)**
- | | | |
|-------------------------------------|--|---|
| <input type="checkbox"/> 1 Work | <input type="checkbox"/> 4 Meal | <input type="checkbox"/> 7 Social, Church, or Personal Business |
| <input type="checkbox"/> 2 Home | <input type="checkbox"/> 5 Medical Appointment | <input type="checkbox"/> 8 Grade/High/Vocational School |
| <input type="checkbox"/> 3 Shopping | <input type="checkbox"/> 6 College | <input type="checkbox"/> 9 Other (describe) _____ |

▶ **WHERE IS THAT PLACE?**

Address, Nearest Street Corner, or Building Name _____ City NE NW SE SW Zip Code _____

- ▶ **HOW DID YOU PAY FOR THIS ONE-WAY TRIP? (Check only one)**
- | | | |
|--|---|----------------------------------|
| <input type="checkbox"/> 1 Token | <input type="checkbox"/> 4 Senior or Handicapped Pass | <input type="checkbox"/> 7 Other |
| <input type="checkbox"/> 2 Weekly Transcard | <input type="checkbox"/> 5 Cash | |
| <input type="checkbox"/> 3 Monthly Transcard | <input type="checkbox"/> 6 Cobb County Transfer | (describe how) _____ |

- ▶ **HOW DID YOU GET TO YOUR FIRST BUS OR TRAIN? (Check only one)**
- | | | |
|---|---|---|
| <input type="checkbox"/> 1 Walked or rode a bike | <input type="checkbox"/> 3 Drove a car | <input type="checkbox"/> 5 Was dropped off by someone |
| <input type="checkbox"/> 2 Rode with someone who parked | <input type="checkbox"/> 4 Rode in a taxi | |

- ▶ **WHAT BUSES AND TRAINS DO YOU USE ON THIS ONE-WAY TRIP?**
Describe each part of this trip in order from beginning to end on a separate line.
Write down the route number of every bus and each place you change buses or trains.

1. First, I ride 1 a train 2 bus route _____ from _____
Station, Address, Nearest Street Corner, or Building Name
2. Then, I ride 1 a train 2 bus route _____ from _____
Station, Address, Nearest Street Corner, or Building Name
3. Then, I ride 1 a train 2 bus route _____ from _____
Station, Address, Nearest Street Corner, or Building Name
4. Then, I ride 1 a train 2 bus route _____ from _____
Station, Address, Nearest Street Corner, or Building Name
5. Then, I ride 1 a train 2 bus route _____ from _____
Station, Address, Nearest Street Corner, or Building Name

▶ **WHERE WILL YOU GET OFF YOUR LAST BUS OR TRAIN?**

Station, Address, Nearest Street Corner, or Building Name _____ City NE NW SE SW Zip Code _____

- ▶ **HOW WILL YOU LEAVE THAT PLACE? (Check only one)**
- | | | |
|---|---|--|
| <input type="checkbox"/> 1 Walk or ride a bike | <input type="checkbox"/> 3 Drive a car | <input type="checkbox"/> 5 Be picked up by someone |
| <input type="checkbox"/> 2 Ride with someone who parked | <input type="checkbox"/> 4 Ride in a taxi | |

- ▶ **WHERE ARE YOU GOING AFTER THIS ONE-WAY TRIP? (Check only one)**
- | | | |
|-------------------------------------|--|---|
| <input type="checkbox"/> 1 Work | <input type="checkbox"/> 4 Meal | <input type="checkbox"/> 7 Social, Church, or Personal Business |
| <input type="checkbox"/> 2 Home | <input type="checkbox"/> 5 Medical Appointment | <input type="checkbox"/> 8 Grade/High/Vocational School |
| <input type="checkbox"/> 3 Shopping | <input type="checkbox"/> 6 College | <input type="checkbox"/> 9 Other (describe) _____ |

▶ **WHERE IS THAT PLACE?**

Address, Nearest Street Corner, or Building Name _____ City NE NW SE SW Zip Code _____

- ▶ **HOW MANY DAYS A WEEK DO YOU MAKE THIS KIND OF TRIP ON MARTA?**
- | | | | |
|--------------------------------|----------------------------------|---------------------------------|--|
| <input type="checkbox"/> 1 One | <input type="checkbox"/> 3 Three | <input type="checkbox"/> 5 Five | <input type="checkbox"/> 7 Seven |
| <input type="checkbox"/> 2 Two | <input type="checkbox"/> 4 Four | <input type="checkbox"/> 6 Six | <input type="checkbox"/> 8 Don't go every week |

▶ **WHERE ARE YOU LIVING NOW?**

Address, Nearest Street Corner, or Building Name _____ City NE NW SE SW Zip Code _____

- ▶ **HOW MANY PEOPLE LIVE WITH YOU? (include yourself)** _____
- ▶ **HOW MANY WORKING MOTOR VEHICLES ARE THERE?** _____

- ▶ **COULD YOU HAVE MADE THIS TRIP ANOTHER WAY?**
- 1 No 2 Yes, I could have driven 3 Yes, I could have ridden with someone

- ▶ **I AM:** 1 Male 2 Female

- ▶ **I AM:** 1 Black 2 White 3 Hispanic 4 Aalen 5 Other

- ▶ **MY AGE IS:** 1 Under 18 3 25 - 30 5 60 - 64
- 2 16 - 24 4 40 - 59 6 65 or over

- ▶ **THE COMBINED TOTAL INCOME OF EVERYONE LIVING AT MY HOME IS:**
- | | | |
|--|--|--|
| <input type="checkbox"/> 1 Less than \$5,000 | <input type="checkbox"/> 3 \$10,000 - 14,999 | <input type="checkbox"/> 5 \$25,000 - 34,999 |
| <input type="checkbox"/> 2 \$5,000 - 9,999 | <input type="checkbox"/> 4 \$15,000 - 24,999 | <input type="checkbox"/> 6 \$35,000 or more |

- ▶ **HOW LONG HAVE YOU BEEN USING MARTA?**
- 1 Under 1 month 2 1 - 6 months 3 7 - 12 months 4 Over 12 months

Thank you again. If you need help, ask the person who handed you this card.

1990 SURVEY DATA DICTIONARY

The data dictionary for the onboard survey data follows the coding outline established on the survey itself. The survey contains elements for trip activity data and demographic data.

Trip Data

Trip origin activity

- 1 = Work
- 2 = Home
- 3 = Shopping
- 4 = Meal
- 5 = Medical Appointment
- 6 = College
- 7 = Social, church, or personal business
- 8 = School (grade, high, vocational)
- 9 = Other

Origin street address (need GIS coding)

Payment method

Access mode to first transit trip in chain of trips

- 1 = Walk/bike
- 2 = Passenger in a car that parked
- 3 = Drove a car
- 4 = Taxi
- 5 = Passenger dropped off by a car

Transit trip links

Data for up to five buses and rail lines ridden between origin and destination

- 1 = train, 2 = bus, bus route, boarding location

Location of final transit stop

Departure mode at end of trip

- 1 = Walk/bike
- 2 = Passenger in a car that had parked
- 3 = Drove a car
- 4 = Taxi
- 5 = Passenger picked up by a car

Trip destination activity (same codes as above)

Destination street address

Number of days per week this trip is made

Demographic Variables

Home street address

Household size

Vehicle ownership

Transportation alternatives for the trip

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Gender

- 1 = Male
- 2 = Female

Race

- 1 = Black
- 2 = White
- 3 = Hispanic
- 4 = Asian
- 5 = Other

Age group

- 1 = 0 - 15 years
- 2 = 16 - 24 years
- 3 = 25 - 39 years
- 4 = 40 - 59 years
- 5 = 60 - 64 years
- 6 = 65+ years

Income group

- 1 = \$0 - \$4,999.00
- 2 = \$5,000.00 - \$9,999.00
- 3 = \$10,000.00 - \$14,999.00
- 4 = \$15,000.00 - \$24,999.00
- 5 = \$25,000.00 - \$34,999.00
- 6 = \$35,000.00+

MARTA use history

- 1 = 0 - 1 months
- 2 = 1 - 6 months
- 3 = 7 - 12 months
- 4 = 12+ months

Date and Time

Unfortunately, the survey form and the survey data did not contain data entry elements for the specific date and time of each interview. The database coding is such that each record indicates whether the researchers collected the survey on a weekday, Saturday, or Sunday. The time-period of each interview is coded as indicated below:

Time period of interview

- 0 = Not computed
- 1 = Weekday AM peak
- 2 = Weekday base
- 3 = Weekday PM peak
- 4 = Weekday other
- 5 = Saturday
- 6 = Sunday

ANALYSIS OF ONBOARD SURVEY DATA FOR RAIL TRIPS

For this project, all reported data for onboard rail trip surveys were re-analyzed (7713 of the 8,842 survey results in the database). Less than 1% of reported trips originated with a taxi mode trip (59 trips) and less than 1% ended via taxi mode (74 trips). The small sample of taxi trips makes meaningful statistical analyses impossible across the large number of demographic variables available. This section reports the results from the basic statistical analyses conducted across each important trip-related and socioeconomic variable. The appendices report the frequencies for all recorded transit trips, then for trips originating by taxi, then for trips ending by taxi. The various report subsections that follow provide the findings from the frequency analyses.

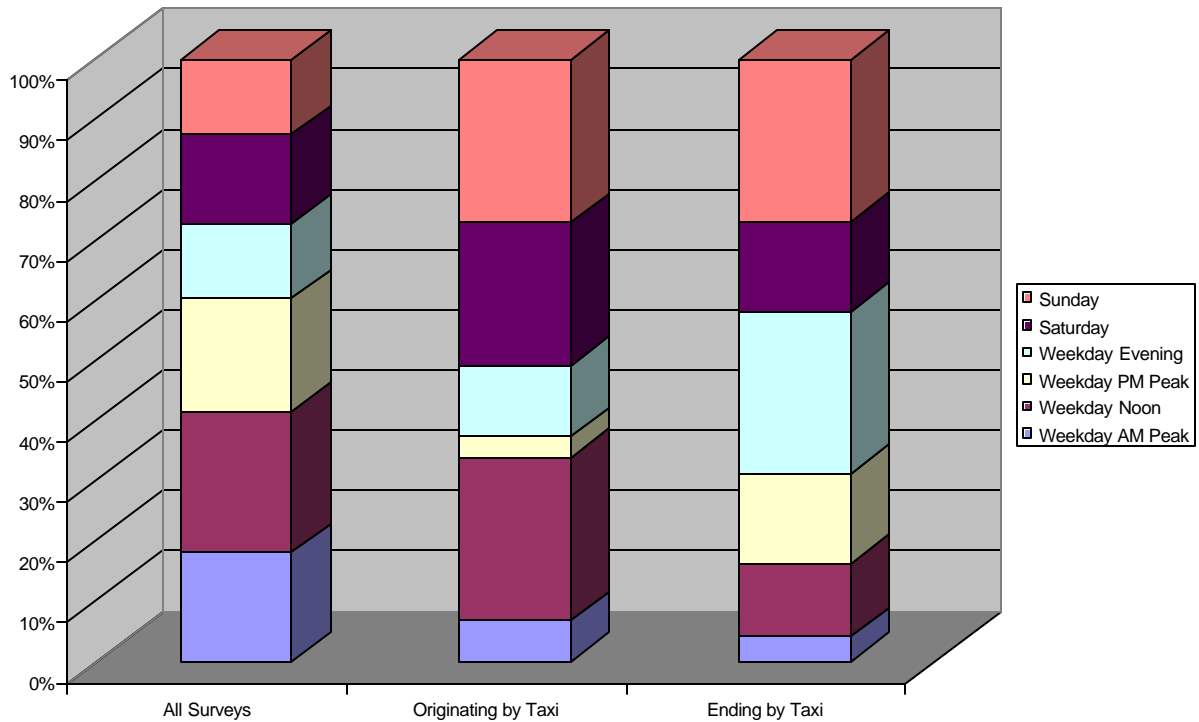
Direction of Travel

Nearly 70% of the sampled trips were inbound transit trips, while 30% were outbound. It is unclear at this time whether the imbalance between inbound and outbound trips should be this large. It appears that there may have been a significant bias in survey data collection, but this issue cannot be resolved without undertaking more detailed temporal and directional MARTA tripmaking pattern analysis. This imbalance has the potential to affect all of the statistical analyses reported in the 1990 summary report and in this document. Trips originating or ending by taxi reflected even higher inbound fractions than were noted in the overall transit data. Nearly 85% of recorded trips originating by taxi were inbound, and more than 70% of trips ending by taxi were inbound. This is in direct contrast to field reviews of taxi operations, which indicated that the vast majority (perhaps 80%) of all taxi/transit trips at suburban rail stations are outbound trips. Sampling in 2001 should ensure that appropriate sampling ratios are employed both in the overall transit rider and station samples, but also when examined by access/egress mode.

Time Period of Interview

The 1990 research effort collected data across the weekday morning peak, weekday afternoon, weekday afternoon peak, weekday evening, Saturday, and Sunday. The first column of Figure 2 illustrates the data collected for all transit trips. The second and third columns provide the same information for transit trips originating by taxi and trips completed by taxi. Smaller fractions of the taxi-related trips occur in the morning peak. Taxi activity that start a transit trip increases after the morning peak. While taxi service ending a trip increases in the evening after the afternoon peak. In addition, a greater fraction of taxi related trips occur on weekends. None of these findings come as a great surprise.

Figure 2
Transit Trip Data by Time of Day



Trip Origin Location

Fewer than 2% of transit riders in the overall survey reported their origin or destination zip codes. Hence, there is no valid basis for examining relationships between home or work destinations and frequency of taxi mode usage. Researchers cannot analyze spatial tripmaking patterns without at least a zip code data element for the trip origin and destination. Researchers should correct this problem in conducting the 2001 transit survey.

Rail Entry Station

Rail transit trips surveys provided well-dispersed rail entry station data throughout the urban area. The largest fraction of the reported rail trips began at the Five Points station (nearly 13%). The Avondale, Chamblee, Lenox, Hightower stations approached or exceeded 9% of the total surveys. Approximately 7% of the rail trips surveyed originated at the airport.

Not surprisingly, nearly 40% of the trips ending by taxi began at the airport transit station. However, more than 27% of the trips originating by taxi had their first transit leg starting at the airport. If these data are accurate, this indicates that a large number of the surveyed rail patrons are taking taxis to the Airport transit station to start their trip. This may be due to travel from airport hotels to the transit station. Additional research is required to determine whether this is the case, or if respondents have difficulty understanding the survey question.

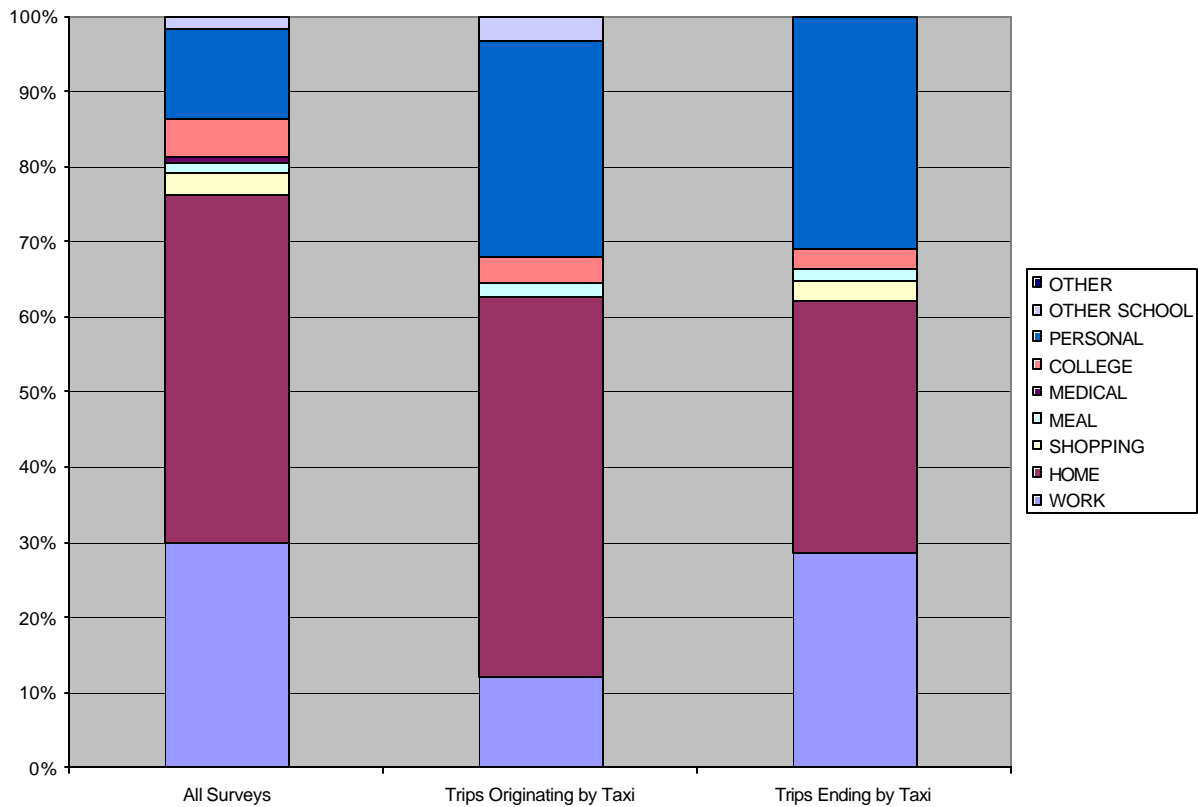
Origin Mode

The major difference between the origin mode of average transit trips and the origin mode of trips ending by taxi is a shift away from access by automobile to access by alternative modes. Trips originating by automobile driving drop from 14% to 3% when the trips end by taxi. A significantly higher fraction of trips ending by taxi mode actually began by taxi mode as well (9.5% vs. 0.8%). A slight increase in automobile drop-off trips was also noted.

Origin Trip Purpose (Activity)

The complete data set indicates that approximately 30% of surveyed transit trips originated at work, 47% from the home, and 12% from personal trip activity. For trips originating by taxi, a significant shift is noted from the work category (drops to 12%) to the personal trip category (increases to 29%). For trips ending by taxi, a significant shift is noted from the home origin category (drops to 34%) to the personal trip category (increases to 31%). Figure 3 illustrates these findings. This may be evidence that taxis provide flexibility for commuters to make non-routine shifts in work-home travel patterns.

Figure 3
Origin Trip Purpose



Trip Destination Location

Fewer than 2% of transit riders in the overall survey reported their origin or destination zip codes. Hence, there is no valid basis for examining relationships between home or work destinations and frequency of taxi mode usage. Researchers cannot analyze spatial tripmaking patterns without at least a zip code data element for the trip origin and destination. Researchers should correct this problem in conducting the 2001 transit survey.

Rail Departure Station

The largest fraction of rail trips in the overall survey ended at the Five Points station (17%). A significant fraction of rail trips also ended at Lenox, Peachtree Center, and Avondale (more than 6% each). In 1990, these fractions were apparently never compared could with ongoing ridership and alighting counts to validate the survey data. In future efforts, researchers should compare rail survey results with ongoing count data to ensure that representative samples were procured. For trips originating by taxi and then ending at a rail station, Five Points station remains the most prominent (27%), but the airport increases from less than 5% to nearly 14%. Lindbergh center also increases to more than 8%. For trips that ended with a taxi ride, the last MARTA station before this ride was predominantly Lindbergh (19%), followed by Avondale (13%), Chamblee (12%), Peachtree Center (7%), and the Airport (7%). Given the limited data, it is impossible to evaluate whether the presence of taxi stands at these MARTA station locations helps to generate the larger taxi mode activity. It may be that the heavier demand for taxi service has led to implementation of a greater number of taxi stands.

Destination Mode

The destination mode upon arrival at a transit station is predominantly walking (77%). Only 1% of total surveyed transit passengers indicated that their final mode of travel from the rail station would be by taxi. Transit riders that started their trip by taxi have a much higher probability (9%) of completing the last leg of their projected trips by taxi. This may indicate a propensity by regular taxi users to use taxis on both ends of their trips. However, this cannot be adequately evaluated given the limited data collection.

Destination Trip Purpose (Activity)

"Going to work" trips that originate in a taxi are higher than the overall average for work destination transit trips (41% vs. 31%), while "going to work" trips that end by taxi are similarly lower than the average. Trips to the home are a much higher percentage of trips ending by taxi (57% vs. 41%), while home destination trips are a lower percentage of trips originating by taxi (36% vs. 41%). This direction of the difference is not surprising, given taxi driver interviews that indicated that four to five times as many taxi trips are made from rail stations to the home versus from the home to the stations. What is of interest is that the difference in the reported data is not very large. Given taxi driver statements, the survey appears to significantly underestimate outbound trips from transit stations to the home by taxi. In the 2001 transit ridership survey, additional care may need to be taken to ensure that the "stated" final departure mode actually matches the respondents final transportation mode. Survey data should be combined with mode departure observations at rail stations to ensure that stated modes are accurate.

Weekly Frequency of MARTA Ridership

Fewer of the MARTA patrons that use a taxi at the beginning or the end of the trip are classified as "weekly transit riders" compared to the overall survey respondents. A larger fraction (34% vs. 21%) of the taxi/transit group make only one MARTA trip per week. However, a larger fraction of taxi users also make more than 12 of these types of transit trips per week (26% to 35% vs. 20%). This indicates that both high volume MARTA users and low volume MARTA users (e.g. airport travelers) link transit and taxi trips.

Household Size

Fewer taxi riders are from single person households than the average surveyed transit patron. A slightly higher fraction of taxi/transit patrons may come from 2-person households. However, data are sparse in this area and no significant conclusions can be drawn.

Vehicle Ownership

The survey data do not contain a zero value to indicate the absence of vehicle ownership. Hence, it was not possible to be assured that missing values solely represent zero vehicle households (and not in part some households that refused to report auto ownership). The 1990 report appeared to assume that missing values indicate zero vehicle ownership. If this is the case, the data indicate that a larger fraction of transit/taxi users who originated a trip by taxi own zero vehicles (and a larger fraction own only one vehicle) compared to the average rail transit users. Those trips ending by taxi were on par with the overall sample for zero vehicle ownership, but tended to have higher representation of single vehicle owners. However, there are too few data points to draw any solid conclusions in this regard.

Gender

No significant gender differences were noted across the samples.

Race

The pool of surveyed rail transit trips yielded a racial split of approximately 53% trips by black patrons and 42% by white patrons. Trips originating by taxi were comparably distributed (however, a large number of these records did not indicate race). Trips ending by taxi appeared to exhibit a slightly higher fraction of white patrons than the average (42% black and 46% white).

Age Group

Trips originating by taxi were comparable to the average for individuals under 40 years of age (although shifted slightly upward from the 16-24 category to the 25-39 category). No other significant differences were noted. Additional detailed data and more refined age cutpoints would be required needed to examine this issue in more detail.

Income Group

Surprisingly, the breakdown of taxi/transit riders by income categories shows little difference compared to the entire sample. It is evident that individuals using taxis as a final trip mode appear to be of higher income than individuals using a taxi as the initial mode. However, the income categories are not sufficiently refined, nor are there sufficient data, to examine

differences for higher income household participation in taxi operations. Researchers should design the 2001 data collection to collect data that will help analyze these potential differences.

Tenure as a MARTA Rider

Taxi/transit users appeared to have less experience with the MARTA system than the average rider. Nearly twice as many individuals that used the taxi access mode indicated that they had less than one month's experience with using MARTA. This may indicate that many of the taxi/transit users are from out of town (but this cannot be verified without accurate home zip code data).

CONCLUSIONS

The basic analysis of limited taxi/transit data provided in the 1990 survey provide insight into a few issues that may be noteworthy in the taxi planning process:

- Taxi riders often use taxi services at both ends of their rail trips
- Few taxi riders drive to a station
- Fewer than average taxi/transit trips originate at home, but a higher fraction originate with a personal business trip
- Taxis may be providing flexibility for commuters to make non-routine shifts in work-home travel patterns (perhaps for regular carpool participants)
- The reported data indicate that larger amounts of taxi activity occur in stations with larger taxi stands (but it is impossible to evaluate whether the presence of taxi stands at these MARTA station locations helps to generate the larger taxi mode activity)
- The destination mode upon arrival at a transit station is predominantly walking (77%)
- Transit riders that started their trip by taxi have a much higher probability (9%) of completing the last leg of their projected trips by taxi
- "Going to work" trips originating by taxi are higher than the overall average for work destination transit trips (41% vs. 31%), while "going to work" trips that end by taxi are similarly lower than the average
- Trips to the home are a much higher percentage of trips ending by taxi (57% vs. 41%)
- Fewer of the MARTA patrons that use a taxi at the beginning or the end of the trip are classified as "weekly transit riders" compared to the overall survey respondents
- Frequent MARTA users as well as infrequent MARTA users (e.g. airport travelers) appear to link transit and taxi trips.
- A larger fraction of transit/taxi users who originated a trip by taxi appear to own zero vehicles (and a larger fraction own only one vehicle) compared to the average rail transit users.
- Nearly twice as many individuals that used the taxi access mode indicated that they had less than one month's experience with using MARTA (but cannot determine whether respondents are local residents of visitors)

Unfortunately, there are insufficient data to perform any meaningful cross-classification analyses to examine potential relationships across various data pools. For example, it is not possible to examine potential interactions between age, income, and day of week variables. It is also not possible to examine many interesting issues given the fact that limited address information is available in the data set. There is also a need to identify which users were using the system as

tourists and business travelers. Given limited data, it is not possible to separate out the transit-taxi trips that begin at the airport to glean why some individuals choose to take a taxi for the whole trip (while others choose to take MARTA followed by a taxi).

For the year 2001 MARTA transit ridership study, the following recommendations are based upon the review of the 1990 survey and data:

- Sampling in 2001 should ensure that appropriate inbound/outbound sampling ratios are employed both in the overall transit rider and station samples, by access/egress mode
- The transit station survey totals should be compared to routine station and passenger count data to ensure that a representative sample is collected
- The 1990 data appears to contain a mismatch in taxi/transit trip frequency data (taxi operators indicate that more than 80% of their trips are from transit stations, yet there is an equal split in the data for access by taxi and egress by taxi)
- There may be a mismatch in the stated departure mode and the actual departure mode (one reason departure trips by taxi may be understated is that respondents do not intend to take a taxi when they complete the survey, yet they end up doing so when they arrive at the station)
- Combine survey data efforts with rail station observations of departure modes to ensure that stated modes are accurate
- The carpool access mode should be included in the survey
- In addition to number of transit trips per week, a question should be added to determine the number of days that riders typically carpool to work
- The survey should be sure to collect origin and destination zip codes (or another geographic reference) so that researchers can analyze spatial tripmaking patterns
- Special attention should be given to assessing the needs of visiting business travelers (and the MARTA tenure question should be supplemented with home location to differentiate between local residents and visitors to the region)
- Include zero auto ownership as a coding choice instead of using missing values
- Refine income categories so that taxi modes can be linked back to larger income differentials

Notwithstanding the transit ridership survey suggestions provided above, a separate data collection effort associated with taxi usage should be conducted in Atlanta. It is not possible to use standard household travel diary study data to begin to understand why individuals make trips by transit. This is because there are insufficient transit trips represented in the household tripmaking data. Hence, planning organizations undertake onboard transit surveys, such as the one conducted in 1990, to provide a useful data pool for developing mode choice models. The problem with taxi tripmaking is similar. It will not be possible to use the onboard transit study data to begin to understand why individuals make trips by taxi. Again, there are insufficient taxi trips represented in the transit tripmaking data. A separate taxi mode operating study is recommended for 2001.

APPENDICES

ANALYTICAL RESULTS FOR THE 1990 ONBOARD TRANSIT RIDERSHIP DATA

Direction of Travel

All Rail Trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	INBOUND	5289	68.4	68.4	68.4
	OUTBOUND	2442	31.6	31.6	100.0
	Total	7731	100.0	100.0	

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	INBOUND	50	84.7	84.7	84.7
	OUTBOUND	9	15.3	15.3	100.0
	Total	59	100.0	100.0	

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	INBOUND	52	70.3	70.3	70.3
	OUTBOUND	22	29.7	29.7	100.0
	Total	74	100.0	100.0	

Time Period of Interview

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WEEKDAY AM PEAK	1406	18.2	18.2	18.2
	WEEKDAY BASE	1809	23.4	23.4	41.6
	WEEKDAY PM PEAK	1445	18.7	18.7	60.3
	WEEKDAY OTHER	963	12.5	12.5	72.7
	SATURDAY	1145	14.8	14.8	87.5
	SUNDAY	963	12.5	12.5	100.0
	Total	7731	100.0	100.0	

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WEEKDAY AM PEAK	4	6.8	6.8	6.8
	WEEKDAY BASE	16	27.1	27.1	33.9
	WEEKDAY PM PEAK	2	3.4	3.4	37.3
	WEEKDAY OTHER	7	11.9	11.9	49.2
	SATURDAY	14	23.7	23.7	72.9
	SUNDAY	16	27.1	27.1	100.0
	Total	59	100.0	100.0	

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WEEKDAY AM PEAK	3	4.1	4.1	4.1
	WEEKDAY BASE	9	12.2	12.2	16.2
	WEEKDAY PM PEAK	11	14.9	14.9	31.1
	WEEKDAY OTHER	20	27.0	27.0	58.1
	SATURDAY	11	14.9	14.9	73.0
	SUNDAY	20	27.0	27.0	100.0
	Total	74	100.0	100.0	

Rail Entry Station

All rail trips

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
CHAMBLEE	732	9.5	9.5	9.5
BROOKHAVEN	190	2.5	2.5	11.9
LENOX	585	7.6	7.6	19.5
LINDBERGH	433	5.6	5.6	25.1
ARTS CENTER	264	3.4	3.4	28.5
MIDTOWN	80	1.0	1.0	29.5
NORTH AVE	276	3.6	3.6	33.1
CIVIC CTR	45	.6	.6	33.7
PEACHTREE CTR	297	3.8	3.8	37.5
GARNETT	31	.4	.4	37.9
WEST END	193	2.5	2.5	40.4
OAKLAND CITY	145	1.9	1.9	42.3
LAKESWOOD	159	2.1	2.1	44.4
EAST POINT	148	1.9	1.9	46.3
COLLEGE PARK	380	4.9	4.9	51.2
AIRPORT	530	6.9	6.9	58.1
FIVE POINTS	951	12.3	12.3	70.4
HIGHTOWER	579	7.5	7.5	77.8
WEST LAKE	126	1.6	1.6	79.5
ASHBY	63	.8	.8	80.3
VINE CITY	39	.5	.5	80.8
OMNI	82	1.1	1.1	81.9
GEORGIA STATE	246	3.2	3.2	85.0
KING MEMORIAL	26	.3	.3	85.4
INMAN PK-	64	.8	.8	86.2
REYNOLDSTOWN				
EDGEWOOD-CANDLER PK	102	1.3	1.3	87.5
EAST LAKE	115	1.5	1.5	89.0
DECATUR	250	3.2	3.2	92.2
AVONDALE	600	7.8	7.8	100.0
Total	7731	100.0	100.0	

Rail Entry Station

Trips originating by taxi

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
CHAMBLEE	12	20.3	20.3	20.3
BROOKHAVEN	2	3.4	3.4	23.7
LENOX	4	6.8	6.8	30.5
LINDBERGH	2	3.4	3.4	33.9
ARTS CENTER	2	3.4	3.4	37.3
NORTH AVE	1	1.7	1.7	39.0
EAST POINT	1	1.7	1.7	40.7
COLLEGE PARK	4	6.8	6.8	47.5
AIRPORT	16	27.1	27.1	74.6
FIVE POINTS	1	1.7	1.7	76.3
HIGHTOWER	7	11.9	11.9	88.1
WEST LAKE	1	1.7	1.7	89.8
GEORGIA STATE	1	1.7	1.7	91.5
EAST LAKE	1	1.7	1.7	93.2
DECATUR	1	1.7	1.7	94.9
AVONDALE	3	5.1	5.1	100.0
Total	59	100.0	100.0	

Rail Entry Station

Trips ending by taxi

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
CHAMBLEE	2	2.7	2.7	2.7
BROOKHAVEN	1	1.4	1.4	4.1
LENOX	5	6.8	6.8	10.8
LINDBERGH	3	4.1	4.1	14.9
ARTS CENTER	3	4.1	4.1	18.9
MIDTOWN	1	1.4	1.4	20.3
NORTH AVE	1	1.4	1.4	21.6
PEACHTREE CTR	4	5.4	5.4	27.0
OAKLAND CITY	3	4.1	4.1	31.1
COLLEGE PARK	1	1.4	1.4	32.4
AIRPORT	29	39.2	39.2	71.6
FIVE POINTS	8	10.8	10.8	82.4
HIGHTOWER	2	2.7	2.7	85.1
WEST LAKE	3	4.1	4.1	89.2
GEORGIA STATE	1	1.4	1.4	90.5
KING MEMORIAL	1	1.4	1.4	91.9
EAST LAKE	1	1.4	1.4	93.2
DECATUR	3	4.1	4.1	97.3
AVONDALE	2	2.7	2.7	100.0
Total	74	100.0	100.0	

Origin Mode

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WALK/BIKE	5609	72.6	72.7	72.7
	AUTO PASSENGER- PARKED	184	2.4	2.4	75.1
	DROVE	1098	14.2	14.2	89.3
	TAXI	59	.8	.8	90.1
	DROPPED OFF	763	9.9	9.9	100.0
	Total	7713	99.8	100.0	
Missing	System	18	.2		
Total		7731	100.0		

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WALK/BIKE	54	73.0	73.0	73.0
	AUTO PASSENGER- PARKED	1	1.4	1.4	74.3
	DROVE	2	2.7	2.7	77.0
	TAXI	7	9.5	9.5	86.5
	DROPPED OFF	10	13.5	13.5	100.0
	Total	74	100.0	100.0	

Origin Trip Purpose (Activity)

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WORK	2295	29.7	29.7	29.7
	HOME	3598	46.5	46.6	76.2
	SHOPPING	223	2.9	2.9	79.1
	MEAL	96	1.2	1.2	80.4
	MEDICAL	60	.8	.8	81.1
	COLLEGE	390	5.0	5.0	86.2
	PERSONAL	931	12.0	12.0	98.2
	OTHER SCHOOL	135	1.7	1.7	100.0
	OTHER	1	.0	.0	100.0
	Total	7729	100.0	100.0	
Missing	System	2	.0		
Total		7731	100.0		

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WORK	7	11.9	11.9	11.9
	HOME	30	50.8	50.8	62.7
	MEAL	1	1.7	1.7	64.4
	COLLEGE	2	3.4	3.4	67.8
	PERSONAL	17	28.8	28.8	96.6
	OTHER SCHOOL	2	3.4	3.4	100.0
	Total	59	100.0	100.0	

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WORK	21	28.4	28.4	28.4
	HOME	25	33.8	33.8	62.2
	SHOPPING	2	2.7	2.7	64.9
	MEAL	1	1.4	1.4	66.2
	COLLEGE	2	2.7	2.7	68.9
	PERSONAL	23	31.1	31.1	100.0
	Total	74	100.0	100.0	

Rail Departure Station

All rail trips

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
CHAMBLEE	373	4.8	4.8	4.8
BROOKHAVEN	196	2.5	2.5	7.4
LENOX	556	7.2	7.2	14.6
LINDBERGH CENTER	378	4.9	4.9	19.4
ARTS CENTER	294	3.8	3.8	23.2
MIDTOWN	85	1.1	1.1	24.3
NORTH AVENUE	366	4.7	4.7	29.1
CIVIC CENTER	59	.8	.8	29.8
PEACHTREE CENTER	515	6.7	6.7	36.5
GARNETT	23	.3	.3	36.8
WEST END	212	2.7	2.7	39.5
OAKLAND CITY	147	1.9	1.9	41.4
LAKEWOOD-FT	173	2.2	2.2	43.7
MACPHERSON				
EAST POINT	129	1.7	1.7	45.3
COLLEGE PARK	291	3.8	3.8	49.1
AIRPORT	359	4.6	4.6	53.8
FIVE POINTS	1303	16.9	16.9	70.6
HIGHTOWER	415	5.4	5.4	76.0
WEST LAKE	107	1.4	1.4	77.4
ASHBY	88	1.1	1.1	78.5
VINE CITY	56	.7	.7	79.2
OMNI-DOME-GWCC	156	2.0	2.0	81.2
GEORGIA STATE	293	3.8	3.8	85.0
KING MEMORIAL	19	.2	.2	85.3
INMAN PK-	66	.9	.9	86.1
REYNOLDSTOWN				
EDGEWOOD-CANDLER PK	110	1.4	1.4	87.6
EAST LAKE	115	1.5	1.5	89.0
DECATUR	259	3.4	3.4	92.4
AVONDALE	588	7.6	7.6	100.0
Total	7731	100.0	100.0	

Rail Departure Station

Trips originating by taxi

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
CHAMBLEE	1	1.7	1.7	1.7
LENOX	3	5.1	5.1	6.8
LINDBERGH CENTER	5	8.5	8.5	15.3
ARTS CENTER	4	6.8	6.8	22.0
MIDTOWN	2	3.4	3.4	25.4
NORTH AVENUE	2	3.4	3.4	28.8
CIVIC CENTER	1	1.7	1.7	30.5
PEACHTREE CENTER	5	8.5	8.5	39.0
LAKEWOOD-FT	1	1.7	1.7	40.7
MACPHERSON				
COLLEGE PARK	2	3.4	3.4	44.1
AIRPORT	8	13.6	13.6	57.6
FIVE POINTS	16	27.1	27.1	84.7
HIGHTOWER	1	1.7	1.7	86.4
OMNI-DOME-GWCC	2	3.4	3.4	89.8
INMAN PK-	1	1.7	1.7	91.5
REYNOLDSTOWN				
EDGEWOOD-CANDLER PK	1	1.7	1.7	93.2
AVONDALE	4	6.8	6.8	100.0
Total	59	100.0	100.0	

Rail Departure Station

Trips ending by taxi

	Frequency	Percent	Valid Percent	Cumulative Percent
CHAMBLEE	9	12.2	12.2	12.2
BROOKHAVEN	3	4.1	4.1	16.2
LENOX	5	6.8	6.8	23.0
LINDBERGH CENTER	14	18.9	18.9	41.9
ARTS CENTER	1	1.4	1.4	43.2
MIDTOWN	1	1.4	1.4	44.6
NORTH AVENUE	1	1.4	1.4	45.9
PEACHTREE CENTER	5	6.8	6.8	52.7
WEST END	1	1.4	1.4	54.1
LAKEWOOD-FT	1	1.4	1.4	55.4
MACPHERSON				
EAST POINT	1	1.4	1.4	56.8
COLLEGE PARK	4	5.4	5.4	62.2
AIRPORT	5	6.8	6.8	68.9
FIVE POINTS	4	5.4	5.4	74.3
HIGHTOWER	3	4.1	4.1	78.4
ASHBY	2	2.7	2.7	81.1
INMAN PK-	1	1.4	1.4	82.4
REYNOLDSTOWN				
DECATUR	3	4.1	4.1	86.5
AVONDALE	10	13.5	13.5	100.0
Total	74	100.0	100.0	

Destination Mode

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WALK/BIKE	5944	76.9	77.3	77.3
	AUTO PASSENGER- PARKED	153	2.0	2.0	79.3
	DROVE	840	10.9	10.9	90.2
	TAXI	74	1.0	1.0	91.2
	PICKED UP	680	8.8	8.8	100.0
	Total	7691	99.5	100.0	
Missing	System	40	.5		
Total		7731	100.0		

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WALK/BIKE	43	72.9	72.9	72.9
	AUTO PASSENGER- PARKED	1	1.7	1.7	74.6
	DROVE	1	1.7	1.7	76.3
	TAXI	7	11.9	11.9	88.1
	PICKED UP	7	11.9	11.9	100.0
	Total	59	100.0	100.0	

Destination Trip Purpose (Activity)

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WORK	2426	31.4	31.4	31.4
	HOME	3139	40.6	40.6	72.0
	SHOPPING	396	5.1	5.1	77.1
	MEAL	74	1.0	1.0	78.1
	MEDICAL	58	.8	.8	78.8
	COLLEGE	466	6.0	6.0	84.9
	PERSONAL	1088	14.1	14.1	98.9
	OTHER SCHOOL	83	1.1	1.1	100.0
	Total	7730	100.0	100.0	
Missing	System	1	.0		
Total		7731	100.0		

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WORK	24	40.7	40.7	40.7
	HOME	21	35.6	35.6	76.3
	SHOPPING	4	6.8	6.8	83.1
	MEAL	1	1.7	1.7	84.7
	MEDICAL	3	5.1	5.1	89.8
	PERSONAL	6	10.2	10.2	100.0
	Total	59	100.0	100.0	

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	WORK	16	21.6	21.6	21.6
	HOME	42	56.8	56.8	78.4
	MEDICAL	1	1.4	1.4	79.7
	COLLEGE	3	4.1	4.1	83.8
	PERSONAL	11	14.9	14.9	98.6
	OTHER SCHOOL	1	1.4	1.4	100.0
	Total	74	100.0	100.0	

Frequency of MARTA Ridership (Days/Week)

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	313	4.0	4.2	4.2
	2	309	4.0	4.2	8.4
	3	285	3.7	3.8	12.2
	4	312	4.0	4.2	16.4
	5	3221	41.7	43.4	59.8
	6	780	10.1	10.5	70.3
	7	673	8.7	9.1	79.4
	NOT WEEKLY	1529	19.8	20.6	100.0
Total	7422	96.0	100.0		
Missing System	309	4.0			
Total	7731	100.0			

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	1.7	1.8	1.8
	3	1	1.7	1.8	3.5
	4	3	5.1	5.3	8.8
	5	13	22.0	22.8	31.6
	6	11	18.6	19.3	50.9
	7	9	15.3	15.8	66.7
	NOT WEEKLY	19	32.2	33.3	100.0
	Total	57	96.6	100.0	
Missing System	2	3.4			
Total	59	100.0			

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	8.1	8.8	8.8
	2	2	2.7	2.9	11.8
	3	3	4.1	4.4	16.2
	4	2	2.7	2.9	19.1
	5	13	17.6	19.1	38.2
	6	11	14.9	16.2	54.4
	7	7	9.5	10.3	64.7
	NOT WEEKLY	24	32.4	35.3	100.0
Total	68	91.9	100.0		
Missing System	6	8.1			
Total	74	100.0			

Number of Trips of this Type per Week

All rail trips

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1529	19.8	20.6
	2	313	4.0	4.2
	4	309	4.0	4.2
	6	285	3.7	3.8
	8	312	4.0	4.2
	10	3221	41.7	43.4
	12	780	10.1	10.5
	14	673	8.7	9.1
	Total	7422	96.0	100.0
Missing	0	309	4.0	
Total	7731	100.0		

Trips originating by taxi

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	19	32.2	33.3
	2	1	1.7	1.8
	6	1	1.7	1.8
	8	3	5.1	5.3
	10	13	22.0	22.8
	12	11	18.6	19.3
	14	9	15.3	15.8
	Total	57	96.6	100.0
	Missing	0	2	3.4
Total	59	100.0		

Trips ending by taxi

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	24	32.4	35.3
	2	6	8.1	8.8
	4	2	2.7	2.9
	6	3	4.1	4.4
	8	2	2.7	2.9
	10	13	17.6	19.1
	12	11	14.9	16.2
	14	7	9.5	10.3
	Total	68	91.9	100.0
Missing	0	6	8.1	
Total	74	100.0		

Household Size

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1106	14.3	15.1	15.1
	2	2238	28.9	30.6	45.8
	3	1625	21.0	22.2	68.0
	4	1297	16.8	17.8	85.8
	5	598	7.7	8.2	94.0
	6	222	2.9	3.0	97.0
	7	117	1.5	1.6	98.6
	8	46	.6	.6	99.2
	9	25	.3	.3	99.6
	10	16	.2	.2	99.8
	12	8	.1	.1	99.9
	13	2	.0	.0	99.9
	14	2	.0	.0	100.0
	15	3	.0	.0	100.0
		Total	7305	94.5	100.0
Missing	System	426	5.5		
Total		7731	100.0		

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	18.6	20.4	20.4
	2	21	35.6	38.9	59.3
	3	6	10.2	11.1	70.4
	4	12	20.3	22.2	92.6
	5	1	1.7	1.9	94.4
	6	1	1.7	1.9	96.3
	7	2	3.4	3.7	100.0
	Total	54	91.5	100.0	
Missing	System	5	8.5		
Total		59	100.0		

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	19	25.7	27.1	27.1
	2	23	31.1	32.9	60.0
	3	15	20.3	21.4	81.4
	4	7	9.5	10.0	91.4
	5	3	4.1	4.3	95.7
	6	1	1.4	1.4	97.1
	7	1	1.4	1.4	98.6
	9	1	1.4	1.4	100.0
		Total	70	94.6	100.0
Missing	System	4	5.4		
Total		74	100.0		

Vehicle Ownership

All rail trips

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2242	29.0	40.6
	2	2154	27.9	39.0
	3	784	10.1	14.2
	4	275	3.6	5.0
	5	66	.9	1.2
	6	2	.0	.0
	7	1	.0	.0
	8	1	.0	.0
Total	5525	71.5	100.0	
Missing System	2206	28.5		
Total	7731	100.0		

Trips originating by taxi

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	21	35.6	55.3
	2	9	15.3	23.7
	3	6	10.2	15.8
	4	1	1.7	2.6
	5	1	1.7	2.6
Total	38	64.4	100.0	
Missing System	21	35.6		
Total	59	100.0		

Trips ending by taxi

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	27	36.5	50.0
	2	19	25.7	35.2
	3	5	6.8	9.3
	4	3	4.1	5.6
Total	54	73.0	100.0	
Missing System	20	27.0		
Total	74	100.0		

Availability of Transportation Alternatives for the Trip

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	2888	37.4	38.8	38.8
	DRIVE	3453	44.7	46.4	85.2
	RIDE	1101	14.2	14.8	100.0
	Total	7442	96.3	100.0	
Missing	System	289	3.7		
Total		7731	100.0		

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	29	49.2	51.8	51.8
	DRIVE	16	27.1	28.6	80.4
	RIDE	11	18.6	19.6	100.0
	Total	56	94.9	100.0	
Missing	System	3	5.1		
Total		59	100.0		

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	34	45.9	49.3	49.3
	DRIVE	23	31.1	33.3	82.6
	RIDE	12	16.2	17.4	100.0
	Total	69	93.2	100.0	
Missing	System	5	6.8		
Total		74	100.0		

Gender

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	3505	45.3	47.4	47.4
	FEMALE	3884	50.2	52.6	100.0
	Total	7389	95.6	100.0	
Missing	System	342	4.4		
Total		7731	100.0		

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	25	42.4	44.6	44.6
	FEMALE	31	52.5	55.4	100.0
	Total	56	94.9	100.0	
Missing	System	3	5.1		
Total		59	100.0		

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	33	44.6	48.5	48.5
	FEMALE	35	47.3	51.5	100.0
	Total	68	91.9	100.0	
Missing	System	6	8.1		
Total		74	100.0		

Race

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BLACK	3800	49.2	53.3	53.3
	WHITE	3017	39.0	42.3	95.6
	HISPANIC	97	1.3	1.4	97.0
	ASIAN	98	1.3	1.4	98.3
	OTHER	118	1.5	1.7	100.0
	Total	7130	92.2	100.0	
Missing	System	601	7.8		
Total		7731	100.0		

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BLACK	32	54.2	58.2	58.2
	WHITE	19	32.2	34.5	92.7
	OTHER	4	6.8	7.3	100.0
	Total	55	93.2	100.0	
Missing	System	4	6.8		
Total		59	100.0		

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BLACK	31	41.9	46.3	46.3
	WHITE	34	45.9	50.7	97.0
	HISPANIC	1	1.4	1.5	98.5
	OTHER	1	1.4	1.5	100.0
	Total	67	90.5	100.0	
Missing	System	7	9.5		
Total		74	100.0		

Age Group

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LESS THAN 16	127	1.6	1.7	1.7
	16-24	2116	27.4	28.5	30.2
	25-39	3393	43.9	45.7	75.9
	40-59	1525	19.7	20.5	96.4
	60-64	137	1.8	1.8	98.2
	65 & OLDER	130	1.7	1.8	100.0
	Total	7428	96.1	100.0	
Missing	System	303	3.9		
Total		7731	100.0		

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16-24	12	20.3	22.2	22.2
	25-39	30	50.8	55.6	77.8
	40-59	10	16.9	18.5	96.3
	60-64	2	3.4	3.7	100.0
	Total	54	91.5	100.0	
Missing	System	5	8.5		
Total		59	100.0		

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16-24	10	13.5	14.7	14.7
	25-39	42	56.8	61.8	76.5
	40-59	14	18.9	20.6	97.1
	60-64	2	2.7	2.9	100.0
	Total	68	91.9	100.0	
Missing	System	6	8.1		
Total		74	100.0		

Income Group

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LESS THAN \$5,000	551	7.1	8.0	8.0
	\$5,000-9,999	472	6.1	6.8	14.8
	\$10,000-14,999	682	8.8	9.9	24.7
	\$15,000-24,999	1294	16.7	18.7	43.4
	\$25,000-34,999	1212	15.7	17.6	61.0
	MORE THAN \$35,000	2693	34.8	39.0	100.0
	Total	6904	89.3	100.0	
Missing	System	827	10.7		
Total		7731	100.0		

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LESS THAN \$5,000	3	5.1	5.6	5.6
	\$5,000-9,999	3	5.1	5.6	11.1
	\$10,000-14,999	6	10.2	11.1	22.2
	\$15,000-24,999	13	22.0	24.1	46.3
	\$25,000-34,999	11	18.6	20.4	66.7
	MORE THAN \$35,000	18	30.5	33.3	100.0
	Total	54	91.5	100.0	
Missing	System	5	8.5		
Total		59	100.0		

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LESS THAN \$5,000	2	2.7	3.1	3.1
	\$5,000-9,999	8	10.8	12.5	15.6
	\$10,000-14,999	7	9.5	10.9	26.6
	\$15,000-24,999	11	14.9	17.2	43.8
	\$25,000-34,999	9	12.2	14.1	57.8
	MORE THAN \$35,000	27	36.5	42.2	100.0
	Total	64	86.5	100.0	
Missing	System	10	13.5		
Total		74	100.0		

Tenure as a MARTA Rider

All rail trips

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LESS THAN 1 MONTH	599	7.7	8.1	8.1
	1-6 MONTHS	1090	14.1	14.8	22.9
	7-12 MONTHS	586	7.6	7.9	30.8
	MORE THAN 12 MONTHS	5101	66.0	69.2	100.0
	Total	7376	95.4	100.0	
Missing	System	355	4.6		
Total		7731	100.0		

Trips originating by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LESS THAN 1 MONTH	11	18.6	20.0	20.0
	1-6 MONTHS	7	11.9	12.7	32.7
	7-12 MONTHS	6	10.2	10.9	43.6
	MORE THAN 12 MONTHS	31	52.5	56.4	100.0
	Total	55	93.2	100.0	
Missing	System	4	6.8		
Total		59	100.0		

Trips ending by taxi

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LESS THAN 1 MONTH	9	12.2	13.6	13.6
	1-6 MONTHS	12	16.2	18.2	31.8
	7-12 MONTHS	6	8.1	9.1	40.9
	MORE THAN 12 MONTHS	39	52.7	59.1	100.0
	Total	66	89.2	100.0	
Missing	System	8	10.8		
Total		74	100.0		