Task Report 10-1

2007 On-Board Transit Survey

BMC Analysis

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Project Manager

June 2010

Baltimore Metropolitan Council

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BMC Analysis

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INTRODUCTION

The Maryland Transit Administration, as part of the New Starts analysis of the proposed Red Line, conducted an on-board transit ridership survey to collect data for transportation model enhancements. The Red Line is a proposed transit line running east-west through downtown Baltimore; more detail can be found at http://www.baltimoreredline.com.

The survey was conducted from the Spring of 2007 to the Spring of 2008. The first phase in the Spring of 2007 sampled MARC Commuter Rail, Metro Subway, Light Rail, and Commuter buses at the 95% confidence level. In the Fall of that year, MTA's local buses were surveyed along with additional data collection on the Camden MARC line, the Metro Subway, and some of the Commuter buses serving Washington, D.C, again to achieve a 95% confidence level. Additional surveys of the Metro Subway were made in the Spring of 2008.

When the data were tabulated, a total of 13,158 "completed and usable" surveys were available for analysis.

Complete details on the survey background and methodology can be found in *Baltimore 2007–2008 On-Board Study: Draft Outline Report* (Austin, TX: Nu-Stats, November 2008).

A database of survey responses was provided to BMC. Appendix A shows the survey form used.

DATA PREPARATION

Once it had received the survey response, BMC staff began to review the data and prepare them for further analysis.

One of the first things to be done was to assign a trip purpose to each trip. For each trip, an origin and a destination purpose were given, as shown in Table 1

TABLE 1
Trip End Purposes

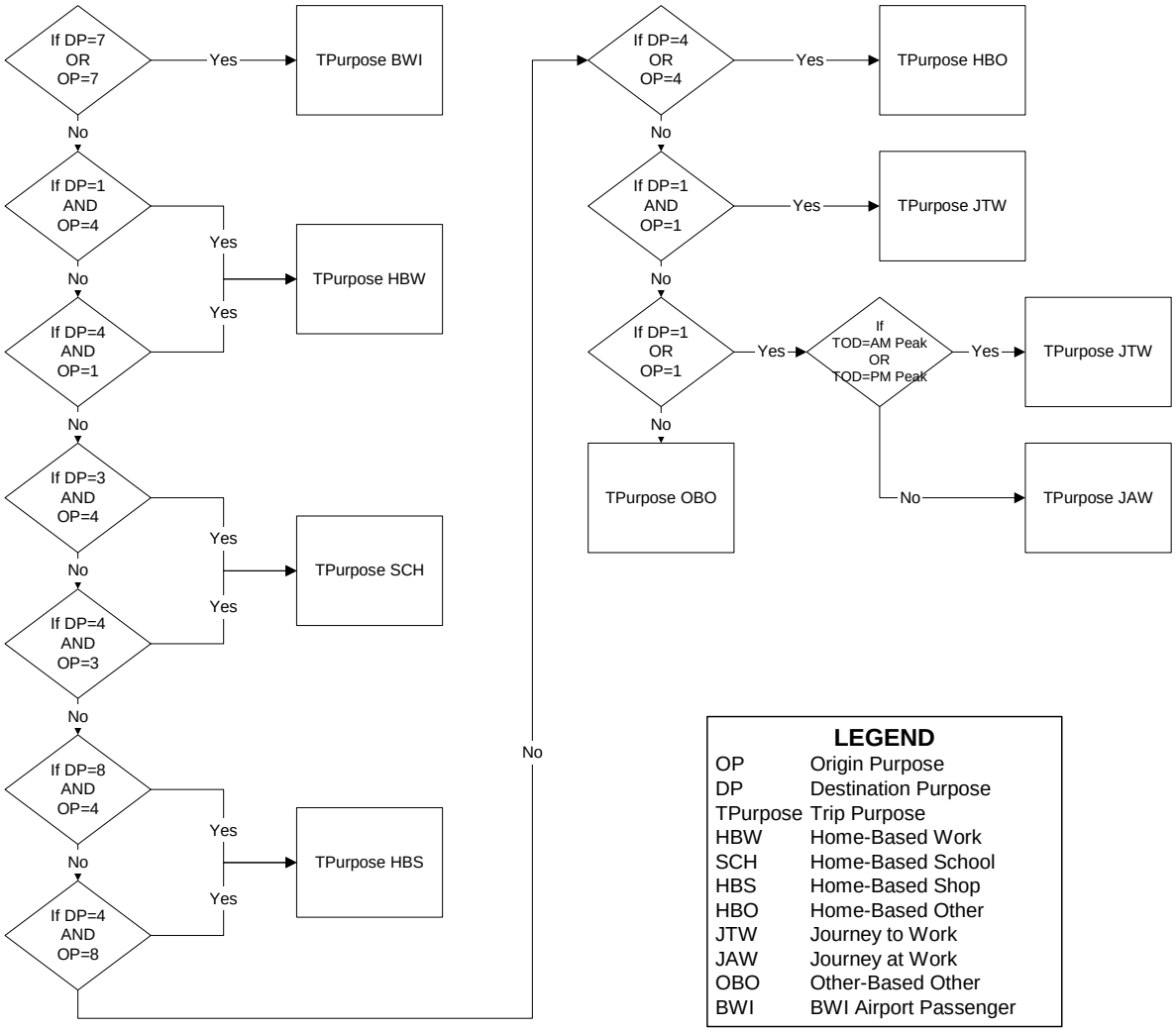
Code	Purpose
1	Work
2	College, University (student only)
3	School (K-12) (student only)
4	Home
5	Recreation/Sightseeing/Restaurant
6	Medical Appointment/Hospital Visit
7	Airport (air passenger only)
8	Shopping
9	Social visit/Church/Personal
10	Sporting event
97	Other (specify):
99	Don't Know/Refused

These trip end purposes were converted into the BMC trip purposes, which are as follows:

- HBW–Home-based Work
- SCH–Home-based School
- HBS–Home-based Shop
- HBO–Home-based Other
- JTW–Journey to Work
- JAW–Journey at Work
- OBO–Other-based Other
- BWI–BWI Air Passenger

The logic shown in Exhibit 1 was used to determine an overall trip purpose:

EXHIBIT 1
Purpose Logic Flow Chart



This logic was applied via a Microsoft Access Module PURPOSE in the database MTA_Data.mdb.

The survey data were provided in origin/destination format, that is, from where a trip started to where a trip ended. While this is generally the normal way to look at travel, it is often desirable to view the data from a production/attraction (P/A) standpoint, particularly when doing travel demand modeling. For the home-based trip purposes, this puts the production end at the home and the attraction end at the non-home endpoint. Such a distinction does not matter for the non-home-based purposes.

Trips were converted to P/A format by assigning the production for any home-based trips to the home end, with the attraction at the non-home end. Also, to make the data comparable with the results of the Baltimore Region Travel Demand Model, trips using

the Brunswick MARC line were excluded. This reduced the number of survey records from 13,158 to 12,683 records.

Other steps were taken to make the data more compatible with the data from the model. The BMC uses a mode hierarchy to identify trips using multiple modes. First in this structure is the commuter rail (MARC) mode. Any trips using MARC are counted as commuter rail trips. The second tier in the hierarchy is called rail, which encompasses rail trips on the Baltimore Metro and Light Rail. Any trip using these two rail modes and not using MARC gets counted as a rail trip (The WMATA Metrorail system in not in the Baltimore model, so WMATA Metrorail trips do not count towards this definition.). Finally, any trip that is bus-only counts as a bus trip.

Additionally, the model distinguishes between walk access and drive access trips. Drive access trips are those that have a drive component on the production (generally home) end.

While a distinction is not made in the model as to modes other than walk and drive (such as bicycle or taxi), the survey provided for several possible answers as seen in Table 2. For the sake of simplicity, only the walk/wheelchair trips were counted as walk access, while the remaining access modes were treated as drive access, as they might involve a longer trip than the normal walkshed of ½ mile. As analysis continued, a review of the "Don't Know/Refused" access trips indicated that many of them appear to share the characteristics of the walk access trips, so they were counted as such.

TABLE 2
Access/Egress Modes

Code	Access Mode
1	Walked/Wheelchair
2	Dropped off
3	Bicycled
4	Taxi
5	Carpooled (rode with someone else)
6	Drove by self
97	Other (specify):
99	Don't Know/Refused

DATA ANALYSIS

Exhibit 2 shows the household locations of persons surveyed. Exhibit 3 shows the number of households by TAZ for those surveyed. Note that these figures could count a household multiple times.

EXHIBIT 2
Survey Household Locations

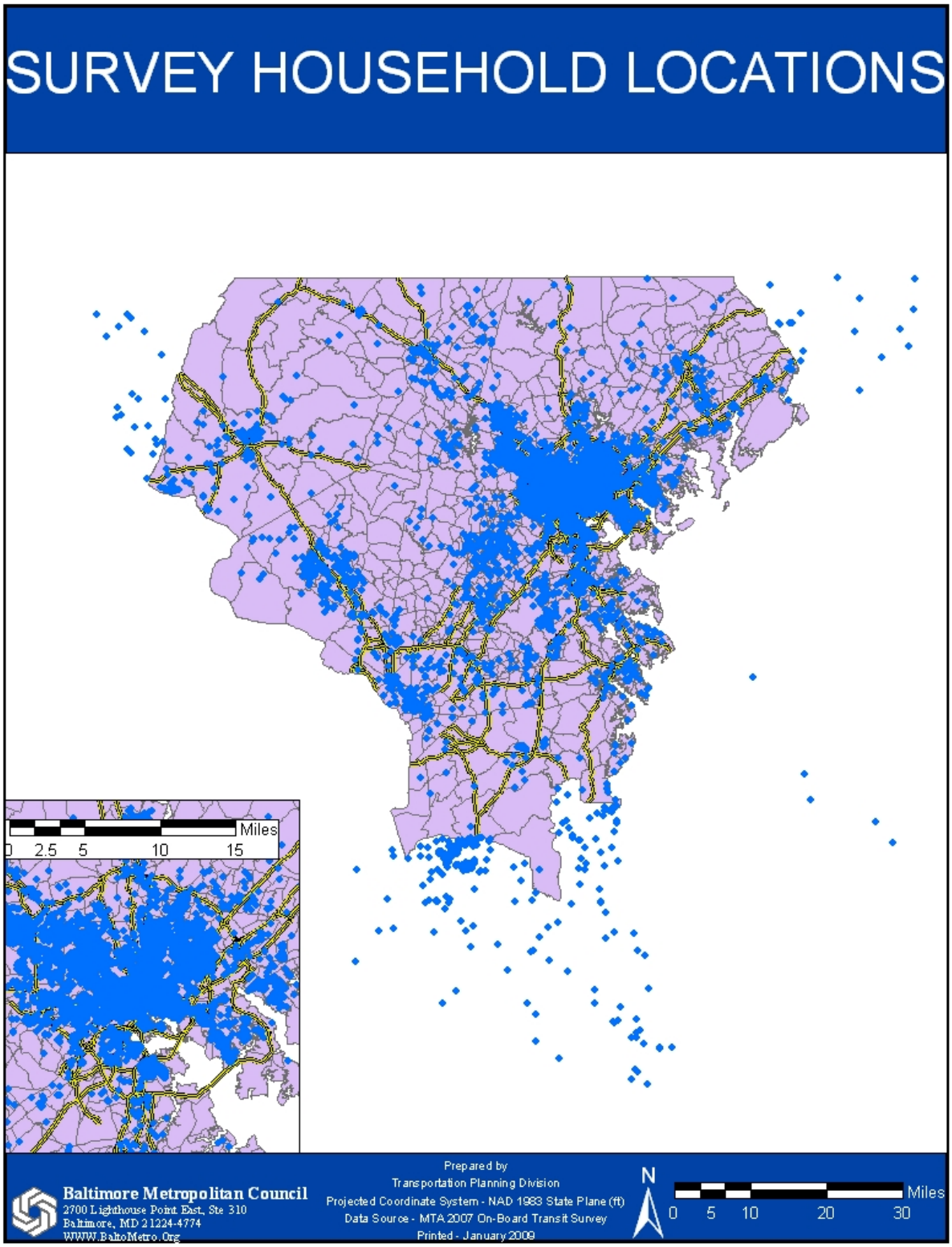


EXHIBIT 3
Number of Survey Households by TAZ

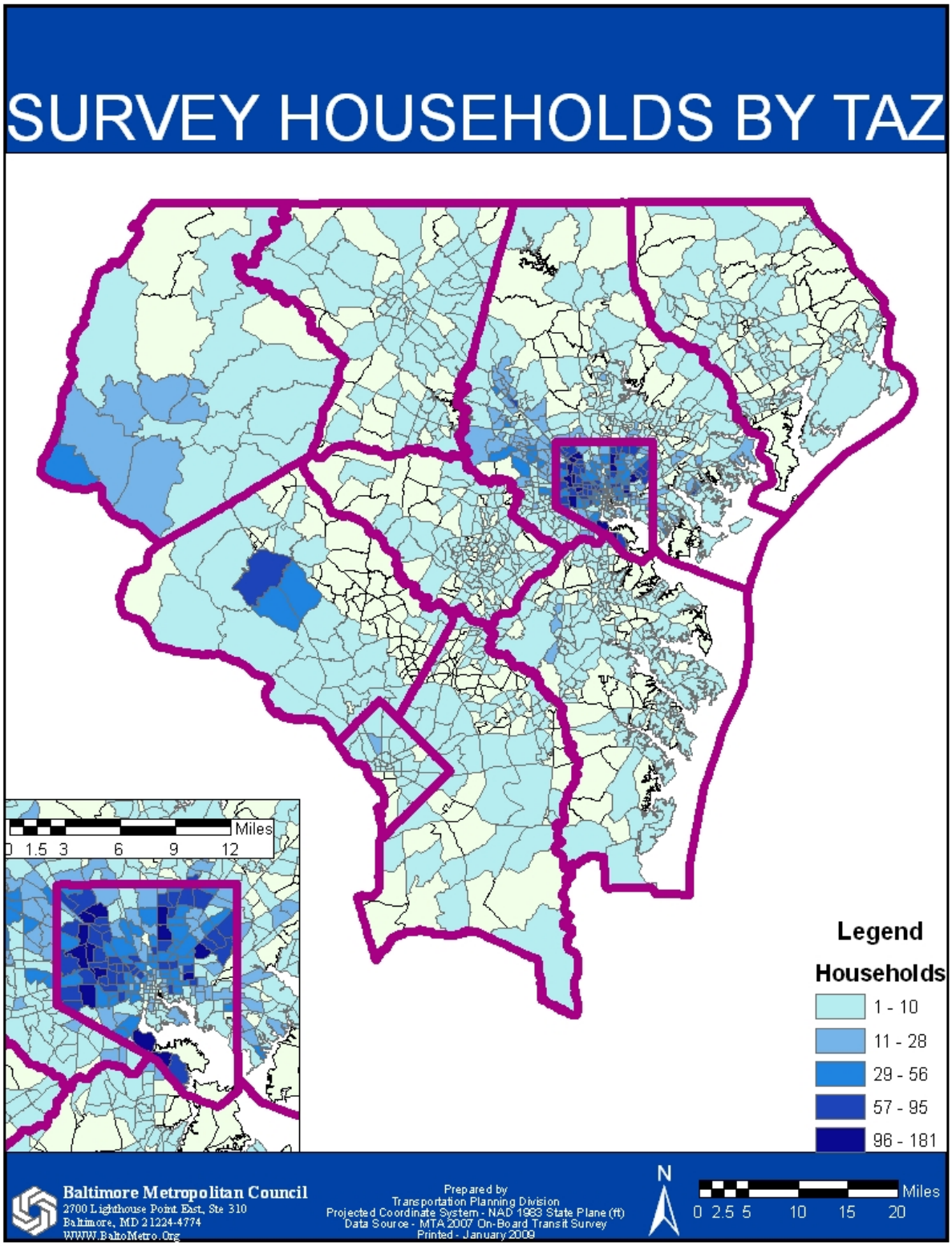
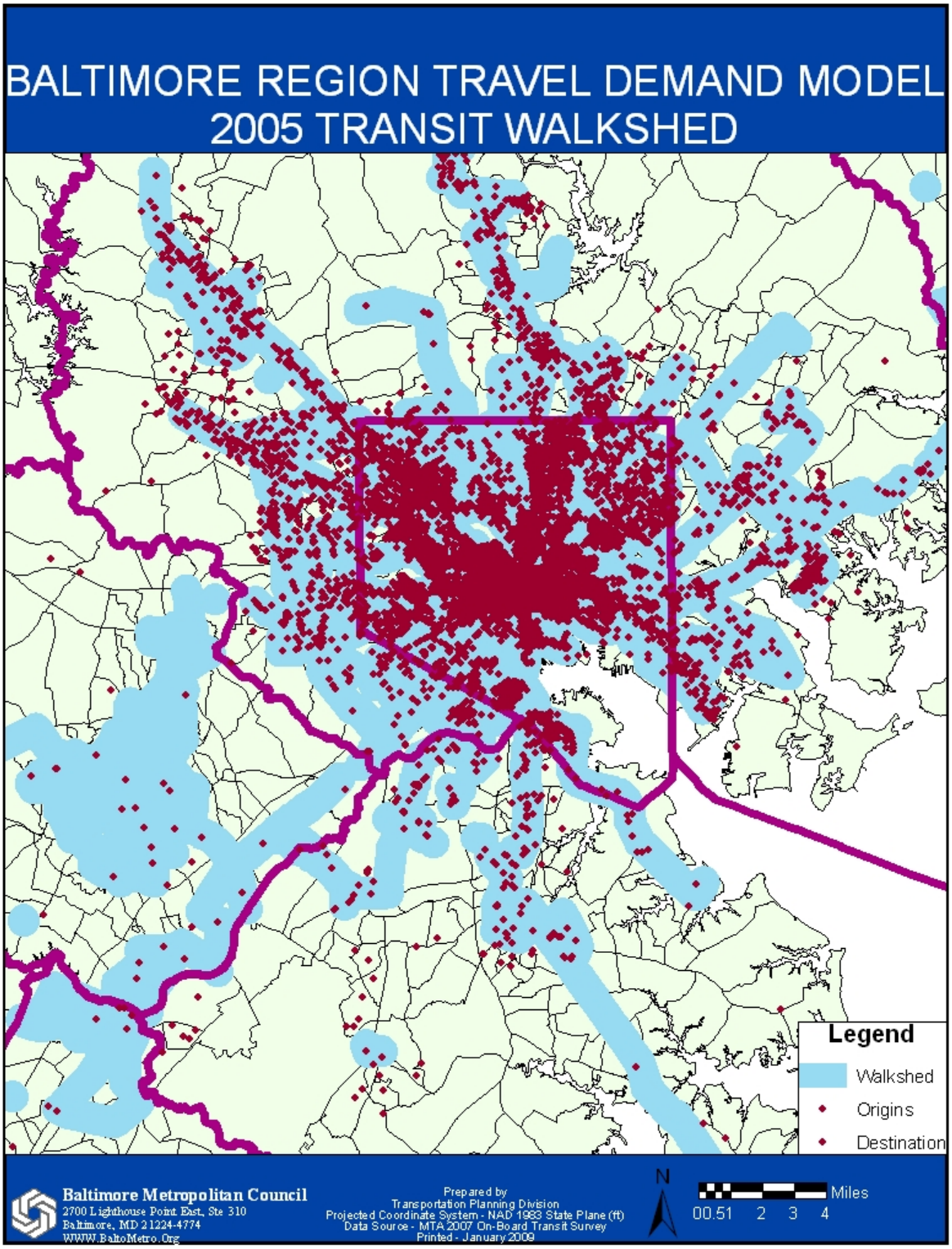


Exhibit 4 is a plot of the walkshed and the location of walk trip origins and walk trip destinations. As can be seen, most of the trips fall well within the walkshed. It appears that many of the relatively few outliers are actually trips that were wrongly answered or geocoded. However, there is a concentration of trips outside the walkshed in the Owings Mills/Randallstown area that may warrant further investigation.

EXHIBIT 4
Origins, Destinations, and Walkshed



Here are some of the results of an analysis of these data.

In transit, a distinction is made between linked and unlinked trips. Since a transit trip from one location to a different destination can involve the use of multiple vehicles, data sometimes represent individual boardings (unlinked trips). At other times, the whole journey, regardless of the number of vehicles used, is counted as a linked trip. Unless specifically mentioned, trips detailed in this report will be linked trips.

Table 3 and Exhibit 5 show the number of trips by time of day. The definition of the terms is as follows:

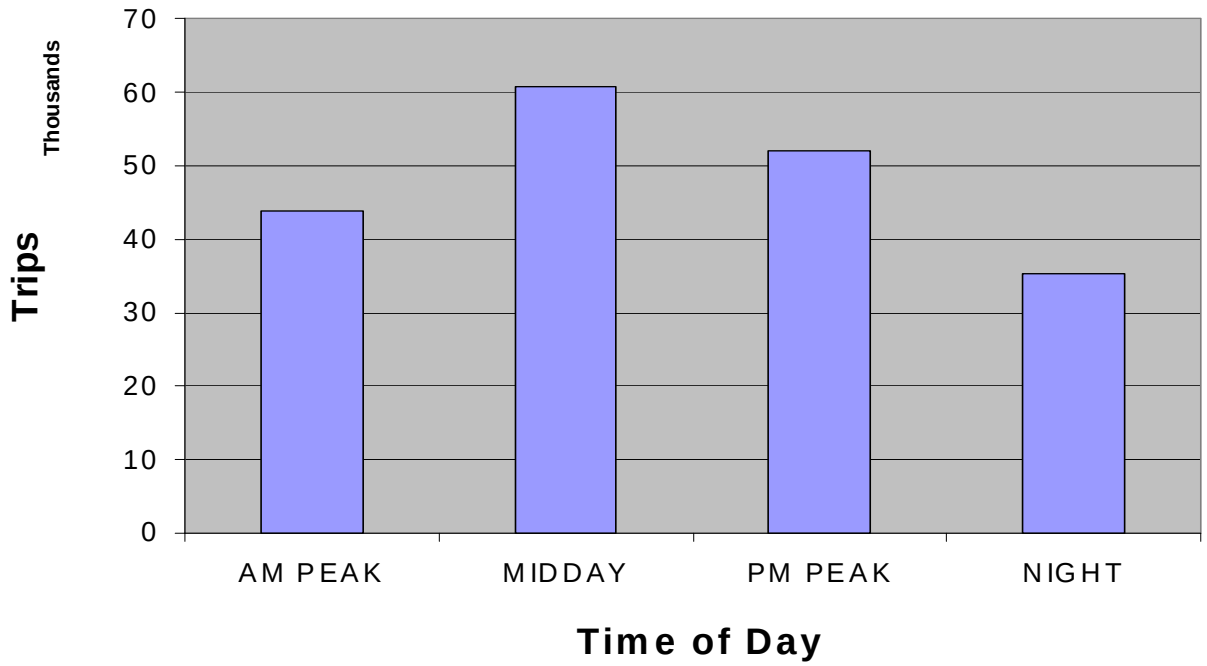
- AM Peak–6:30 to 9:30 a.m.
- Midday–9:30 a.m. to 3:30 p.m.
- PM Peak–3:30 to 6:30 p.m.
- Night–6:30 p.m. to 6:30 a.m.

As can be seen, the midday period has the largest number of trips (although it is twice the duration of each of the two peak periods but only half the length as the night period).

TABLE 3
Trips by Time of Day

Time Period	Trips	Share
AM Peak	43,802	22.8%
Midday	60,837	31.7%
PM Peak	51,939	27.0%
Night	35,328	18.4%
Unknown	174	0.1%
Total	192,080	100.0%

EXHIBIT 5
Trips by Time of Day

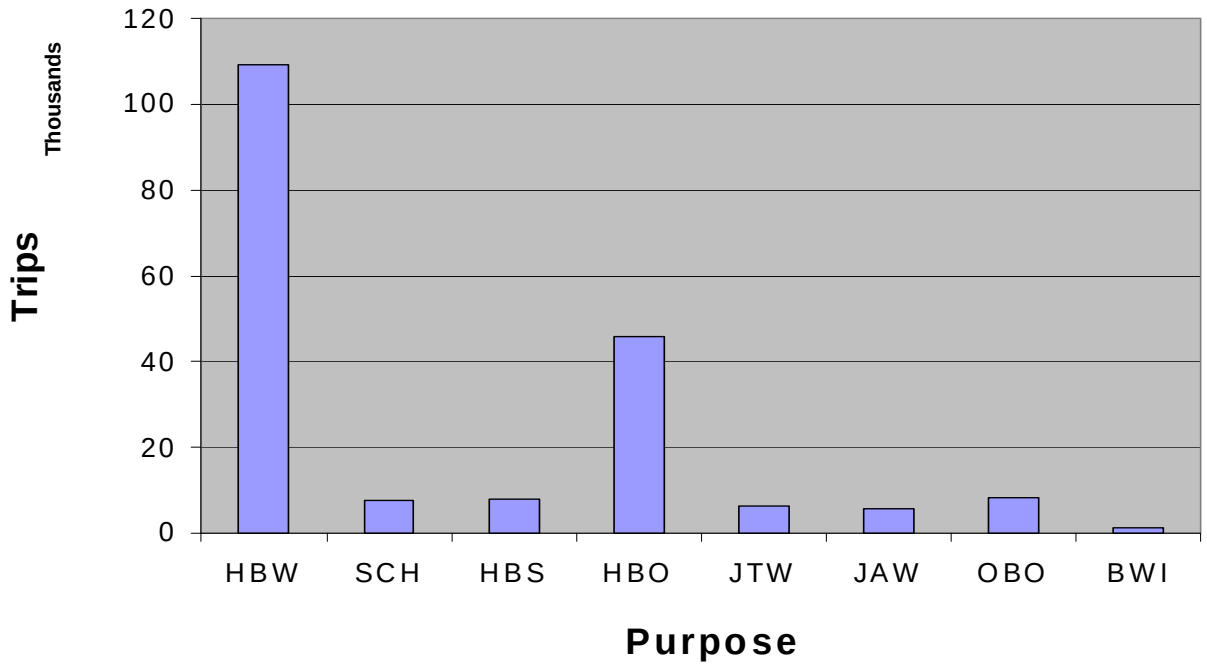


Trips are also divided into the BMC's trip purposes, as shown in Table 4 and Exhibit 6

TABLE 4
Trips by Purpose

Purpose	Trips	Share
HBW	109,232	56.9%
SCH	7,514	3.9%
HBS	7,992	4.2%
HBO	45,954	23.9%
JTW	6,324	3.3%
JAW	5,549	2.9%
OBO	8,299	4.3%
BWI	1,215	0.6%
Total	192,080	100.0%

EXHIBIT 6
Trips by Purpose



By far, HBW trips are the predominant use of transit (57%), followed by HBO, which has less than half as many trips. The remaining purposes make up less than five percent of transit trips apiece.

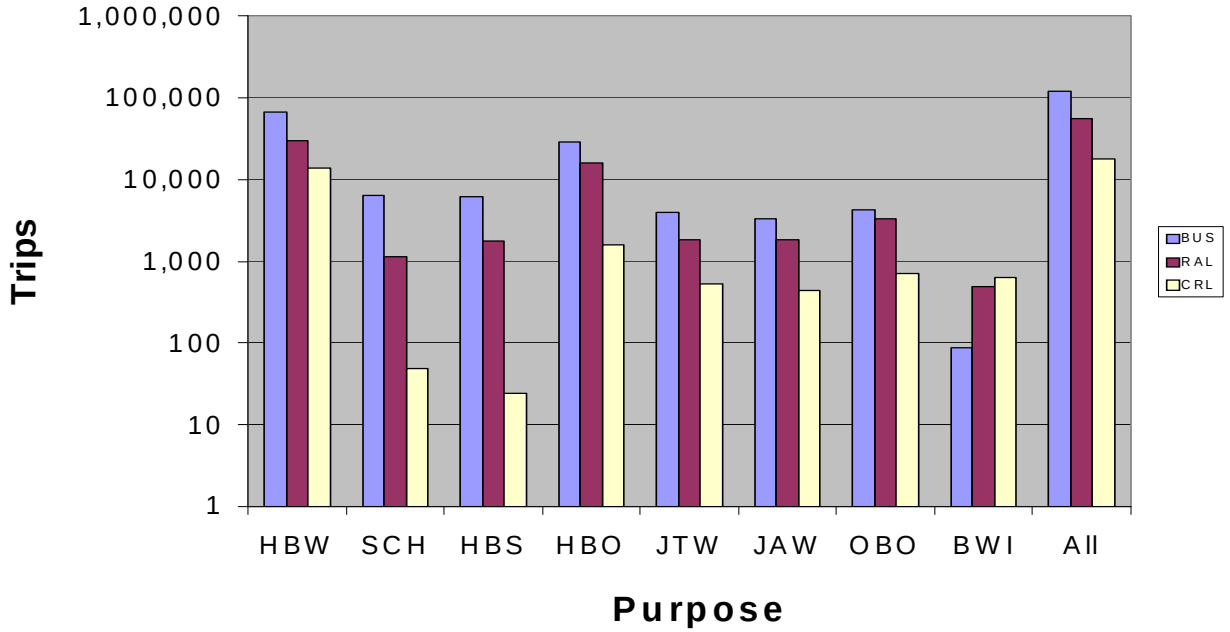
Different trip purposes show predominance by different transit modes. While bus generally has the largest share of riders, the BWI trip purpose favors commuter rail. These shares can be seen in Table 5 and Exhibit 7 (note the logarithmic Y-axis).

TABLE 5
Trips by Purpose and Mode

Purpose	Bus	Rail	Commuter Rail	Total
HBW	65,600	29,802	13,830	109,232
	60.1%	27.3%	12.7%	100.0%
SCH	6,323	1,143	48	7,514
	84.1%	15.2%	0.6%	100.0%
HBS	6,177	1,791	24	7,992
	77.3%	22.4%	0.3%	100.0%
HBO	28,584	15,765	1,604	45,954
	62.2%	34.3%	3.5%	100.0%
JTW	3,978	1,812	533	6,324
	62.9%	28.7%	8.4%	100.0%

Purpose	Bus	Rail	Commuter Rail	Total
JAW	3,276	1,832	441	5,549
	59.0%	33.0%	7.9%	100.0%
OBO	4,276	3,314	710	8,299
	51.5%	39.9%	8.6%	100.0%
BWI	88	488	639	1,215
	7.2%	40.2%	52.6%	100.0%
Total	118,303	55,947	17,830	192,080
	61.6%	29.1%	9.3%	100.0%

EXHIBIT 7
Trips by Purpose and Mode

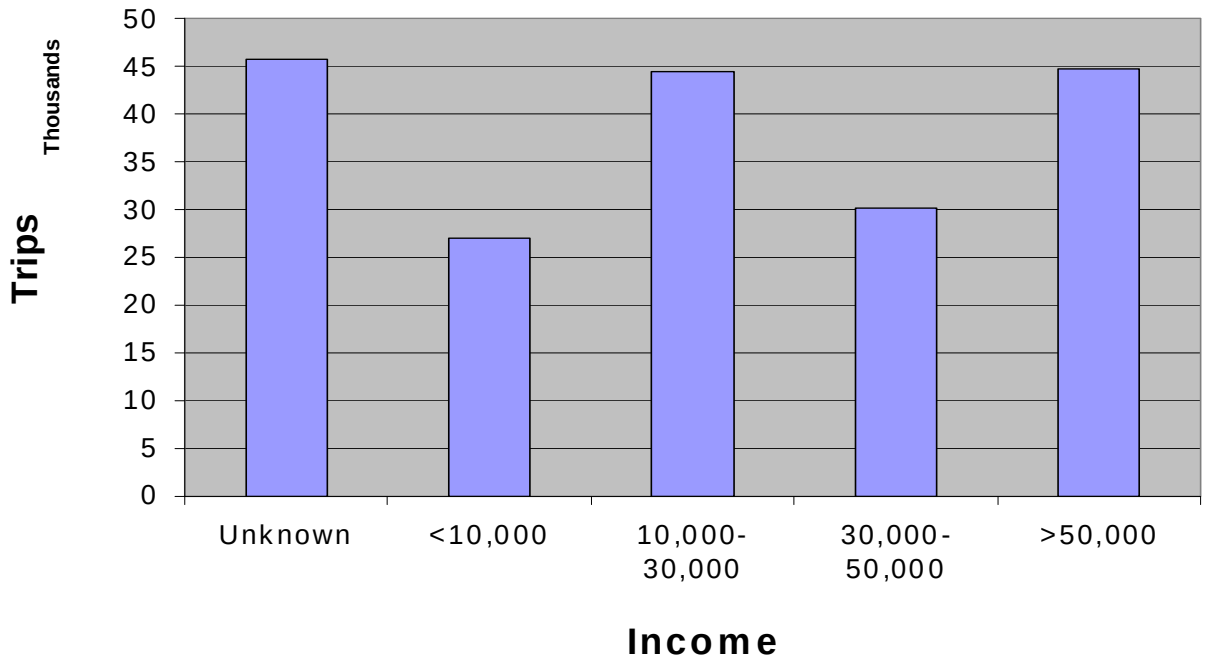


The twelve income classes found in survey responses were rearranged to more closely resemble the four categories used by BMC model. Table 6 shows the ranges used by the survey and their translation to BMC's income classes, as well as the number of trips found in each survey class. As can be seen, this is not an exact match. Note that the survey incomes will be used in reports in this document. The number of trips for each of the aggregated income classes is shown graphically in Exhibit 8.

TABLE 6
Income Classifications and Trips

Survey Income Class	Income Range	BMC Income Class	Trips	Approximate Baltimore Region Income Ranges
1	$10,000 or less	1	27,030	$13,000 or less
2	$10,001 - $20,000	2	44,395	$13,001--$27,000
3	$20,001 - $30,000			
4	$30,001 - $40,000	3	30,206	$27,001-$45,000
5	$40,001 - $50,000			
6	$50,001 - $60,000	4	44,759	More than $45,000
7	$60,001 - $70,000			
8	$70,001 - $80,000			
9	$80,001 - $100,000			
10	$100,001 - $125,000			
11	$125,001 - $150,000			
12	More than $150,000			
	Unknown		45,690	
	Total		192,080	

EXHIBIT 8
Trips by Income

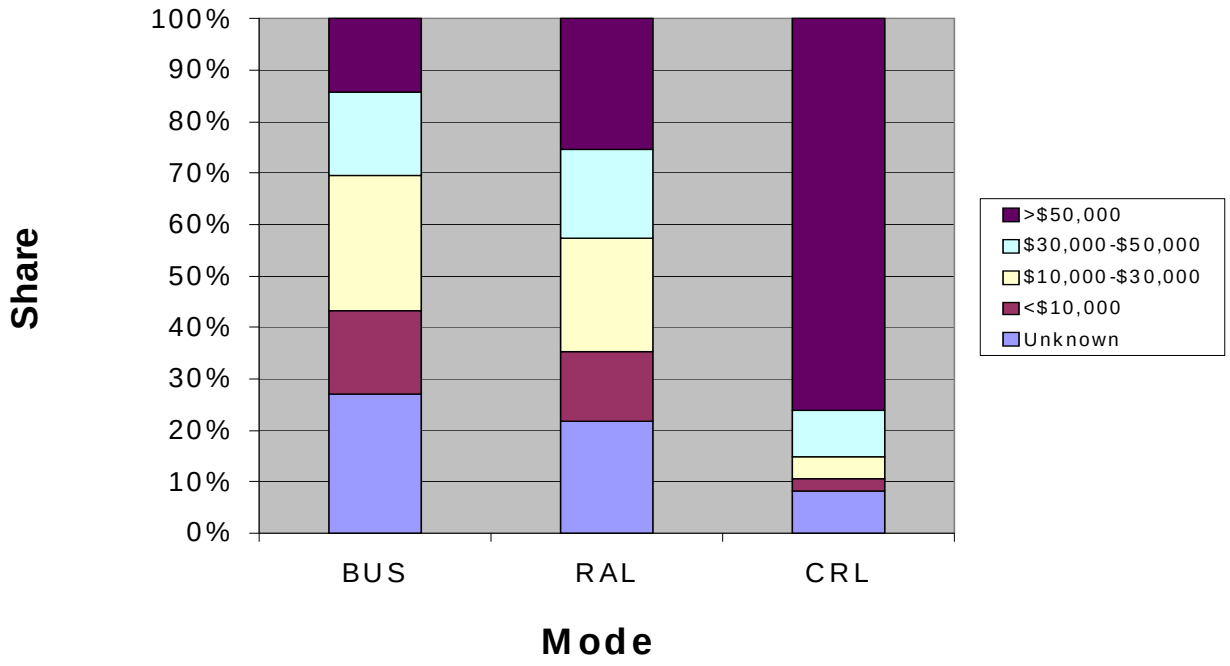


The different income groups have distinct mode preferences. Commuter rail is heavily skewed toward the upper income group, while rail has a more even distribution. Bus is more heavily used by riders in the lower income categories. The number of trips for each mode is shown in Table 7. This distribution by mode can be seen graphically in Exhibit 9.

TABLE 7
Trips by Mode and Income

Income	Bus	Rail	Commuter Rail	Total
1	18,964	7,665	401	27,030
2	31,285	12,356	754	44,395
3	19,014	9,566	1,626	30,206
4	16,930	14,252	13,578	44,759
Unknown	32,110	12,108	1,472	45,690
Total	118,303	55,947	17,830	192,080

EXHIBIT 9
Trips by Mode and Income

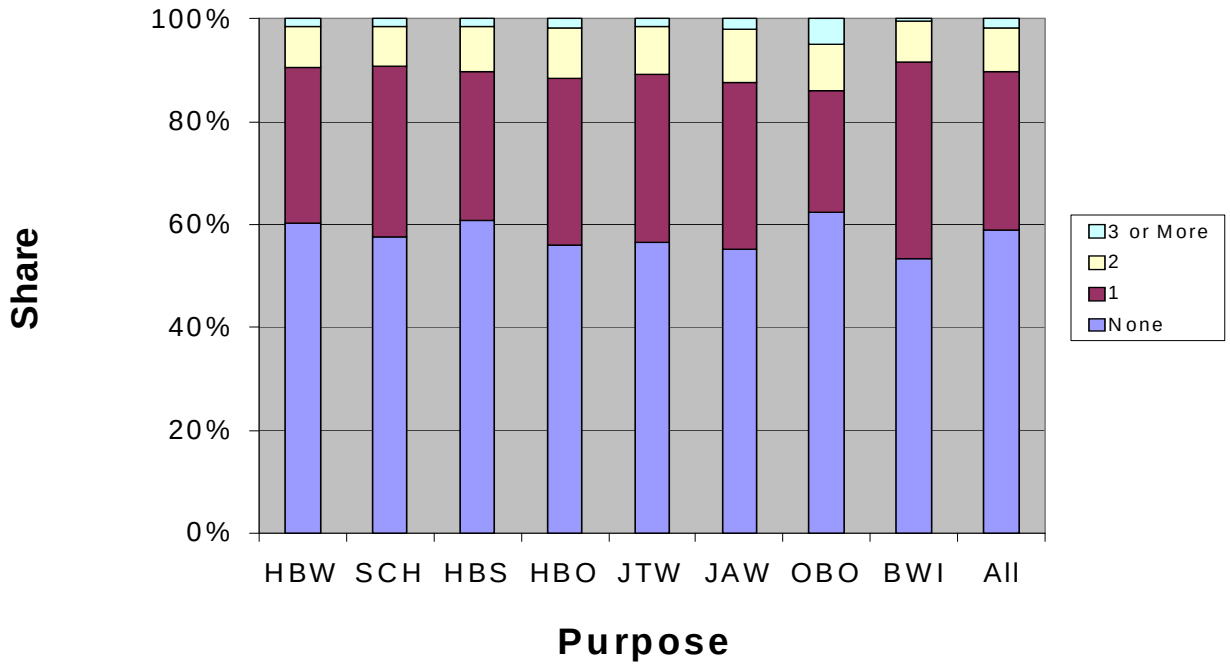


Another thing to be examined was the number of transfers per trip. Roughly 40% of all trips required a single vehicle (zero transfers). There are slight differences in the share for the different purposes, with OBO trips having the largest share of 3 or more vehicles (two or more transfers); about 5% of the OBO trips required transferring at least twice, while for other purposes it was generally no more than 2%. The transfer ratio, which is unlinked trips divided by linked trips, shows itself to be quite consistent across the purposes. These trip numbers and transfer ratios shares are illustrated in Table 8, while the shares per purpose can be found in Exhibit 10.

TABLE 8
Trips by Purpose and Number of Transfers

Transfers	HBW	SCH	HBS	HBO	JTW	JAW	OBO	BWI	Total
0	65,864	4,325	4,862	25,756	3,572	3,063	5,186	648	113,276
1	32,883	2,489	2,310	14,870	2,063	1,793	1,946	464	58,818
2	8,701	575	697	4,500	599	581	760	97	16,510
3 or More	1,784	125	123	828	90	112	408	6	3,476
Total	109,232	7,514	7,992	45,954	6,324	5,549	8,299	1,215	192,080
Transfer Ratio	1.51	1.53	1.51	1.57	1.56	1.59	1.57	1.56	1.53

EXHIBIT 10
Trips Shares by Purpose and Number of Transfers

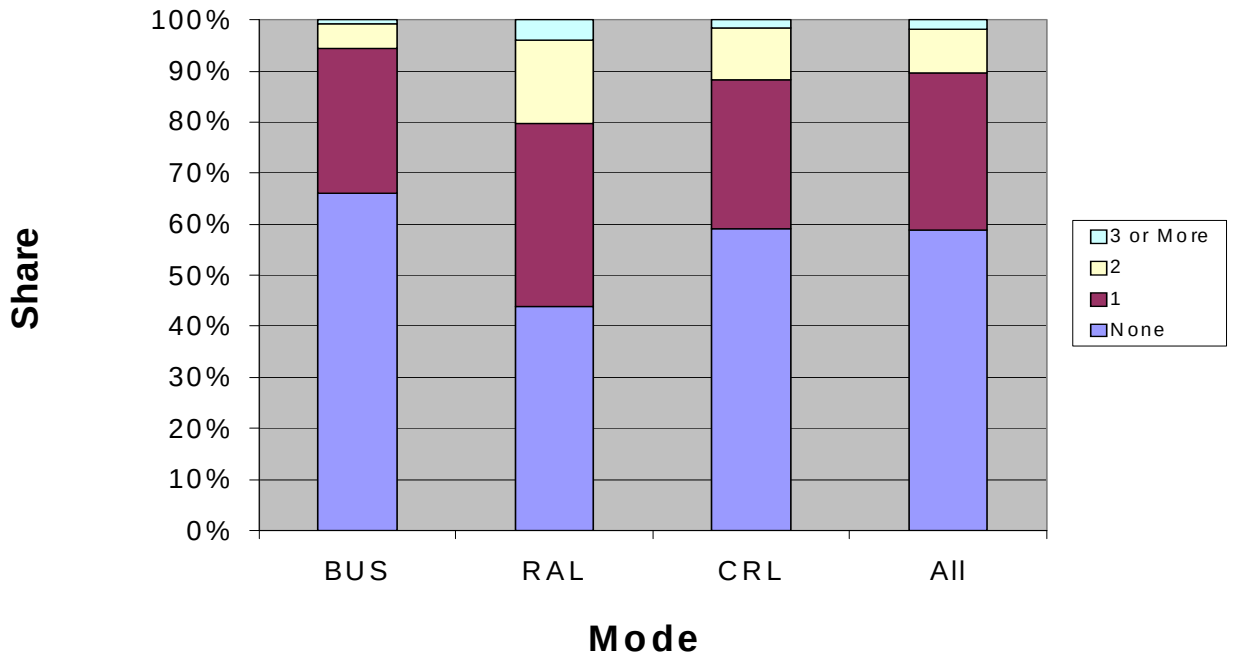


When looking at the number of transfers by mode, it appears trips which are in the rail hierarchy have the largest share of 2 or more transfers when compared with bus and commuter rail modes. Bus has the lowest ratio of transfers. (Recall that these are bus to bus transfers, as bus to rail trips count as a rail trip, and transfer trips involving commuter rail are deemed to be those of highest-level mode.) These data can be seen in Table 9 and Exhibit 11.

TABLE 9
Trips by Mode and Number of Transfers

Transfers	Bus	Rail	Commuter Rail	All
0	78,154	24,596	10,525	113,276
1	33,609	19,985	5,224	58,818
2	5,538	9,148	1,824	16,510
3 or more	1,001	2,218	257	3,476
Grand Total	118,303	55,947	17,830	192,080
Transfer Ratio	1.40	1.80	1.54	1.53

EXHIBIT 11
Trips Shares by Mode and Number of Transfers

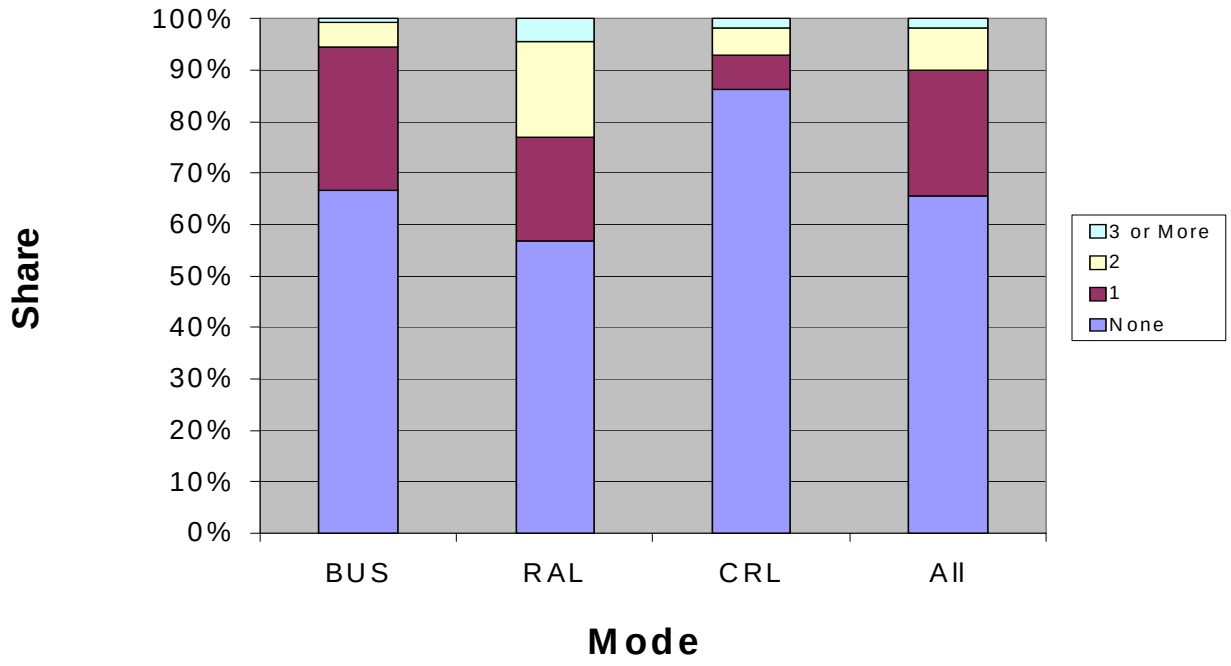


The transfer data were also examined for just transfers within the MTA system. These can be seen in Table 10 and Exhibit 12.

TABLE 10
Trips by Mode and Number of Transfers (MTA Only)

Transfers	Bus	Rail	Commuter Rail	All
0	78,154	24,596	10,525	113,276
1	32,887	8,787	793	42,468
2	5,418	8,017	665	14,099
3 or more	978	1,919	206	3,103
Grand Total	117,437	43,319	12,189	172,946
Transfer Ratio	1.40	1.71	1.22	1.46

EXHIBIT 12
Trips Shares by Mode and Number of Transfers (MTA Only)



The most noticeable difference between these results and the transfer data shown previously is that some 85% of MARC trips do not involve a transfer to or from an MTA service; the share of no-transfer trips on MARC was about 60% when other services (*e.g.,* WMATA Metrorail) were not counted.

Another survey question was about the fare medium used. BMC staff, upon reviewing the survey results, noticed a significant number of respondents noting they used their state employee's ID when specifying "other" to the fare question, so this category was added. Table 11 indicates the categories used. Some of the categories were combined to simplify reading the accompanying graphs, so the table is color coded to match category colors in the graph.

TABLE 11
Fare Types

Fare Type	Fare Description
1	One-Way/Round Trip Cash Fare
2	Day Pass
3	Weekly Pass
4	Ten-Trip Ticket

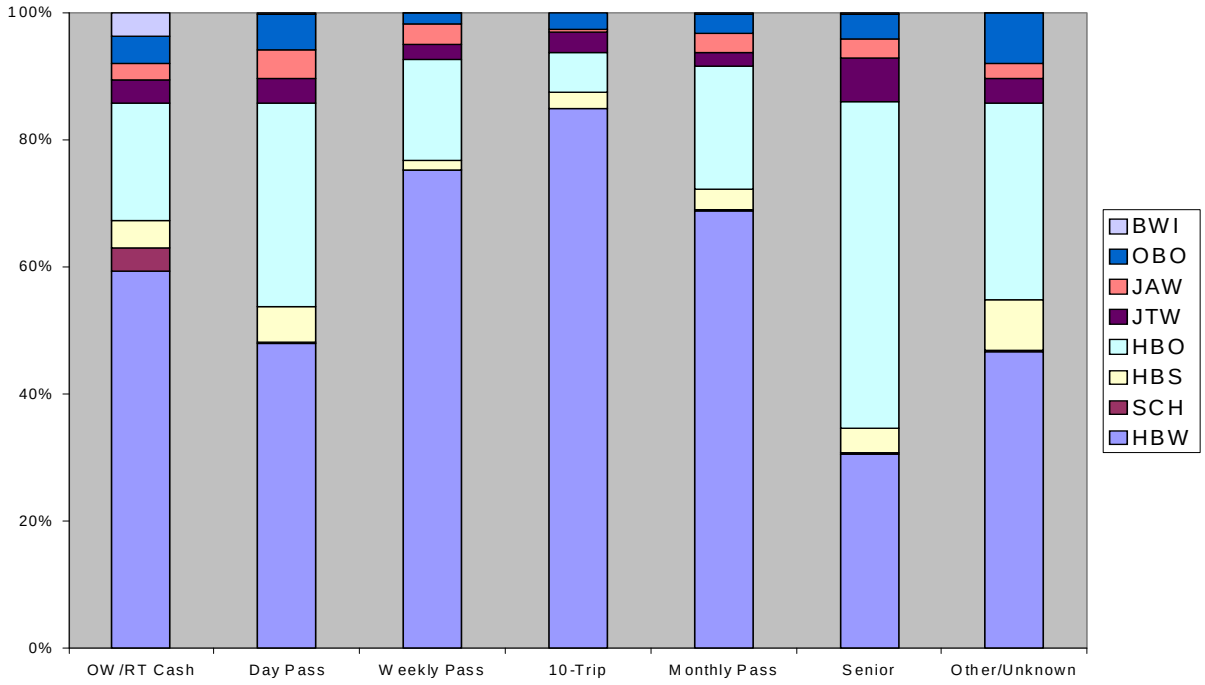
Fare Type	Fare Description
5	Monthly Pass
6	Transit Link Card
7	College Pass
8	Student Ticket
9	Student Cash Fare
10	Senior/Disability One-Way Cash
11	Senior/Disability Day Pass
12	Senior/Disability Weekly Pass
13	Senior Disability Monthly Pass
14	State Employee
97	Other (specify):
99	Don't Know/Refused

Fare types by purpose are shown in Table 12 and Exhibit 13.

TABLE 12
Trips by Fare Type and Purpose

Fare Type	HBW	SCH	HBS	HBO	JTW	JAW	OBO	BWI	Total
OW/RT Cash	14,522	177	1,231	4,536	895	624	1,036	919	23,941
Day Pass	17,375	808	2,597	11,626	1,379	1,627	2,043	93	37,548
Weekly Pass	17,679	450	492	3,732	573	753	374	23	24,076
10-Trip	8,522	13	0	630	311	55	261	0	9,792
Monthly Pass	31,667	360	1,016	8,888	1,035	1,332	1,435	121	45,855
Senior	3,590	70	1,123	6,032	809	351	449	30	12,454
State Employee	2,716	0	40	205	281	66	36	7	3,350
Other/Unknown	13,161	5,637	1,493	10,305	1,041	741	2,665	21	35,064
Total	109,232	7,514	7,992	45,954	6,324	5,549	8,299	1,215	192,080

EXHIBIT 13
Trip Shares by Fare Type and Purpose



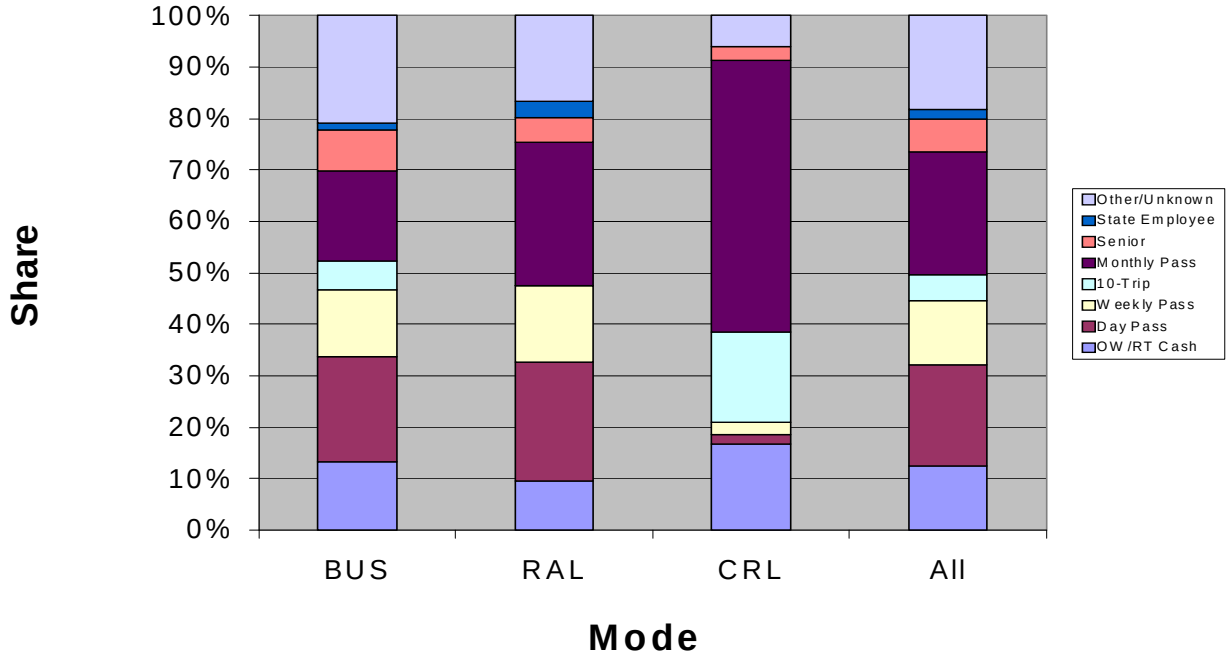
School trips heavily rely on the "other" category, which includes school tickets distributed to Baltimore City public school students (the MTA is a major transporter of schoolchildren in the city). Notice the high penetration of one way or round trip cash fares for BWI trips, giving the impression that many of these riders are not regular patrons who would possess a multi-ride pass. Passes (daily, weekly, and monthly) make up a significant portion of the fare media for the other purposes.

Fare types are also stratified against the mode, as shown in Table 13 and Exhibit 14.

TABLE 13
Trips by Fare Type and Mode

Fare Type	Bus	Rail	Commuter Rail	Total
OW/RT Cash	15,582	5,396	2,963	23,941
Day Pass	24,425	12,789	334	37,548
Weekly Pass	15,273	8,386	417	24,076
10-Trip	6,621	31	3,140	9,792
Monthly Pass	20,832	15,591	9,432	45,855
Senior	9,335	2,646	473	12,454
State Employee	1,561	1,788	1	3,350
Other/Unknown	24,674	9,319	1,071	35,064
Grand Total	118,303	55,947	17,830	192,080

EXHIBIT 14
Trip Shares by Fare Type and Mode



Commuter rail trips rely heavily on monthly passes, although cash fares also make up a larger proportion of these trips than they do for the other modes. The other modes have a more even distribution of fare media use. Senior/disabled fares make up a relatively small percentage of the total trips.

The age of riders varies with purpose. As expected, SCH trips are generally made by youth. Although the BMC's definition of school trips is limited to elementary and secondary students, it appears older persons reported school as a trip end in the survey, even though that was not the desired response. This could be a parent attending a school function, a student at a higher level who misunderstood the question, or an employee of a school who thought that would be an appropriate answer.

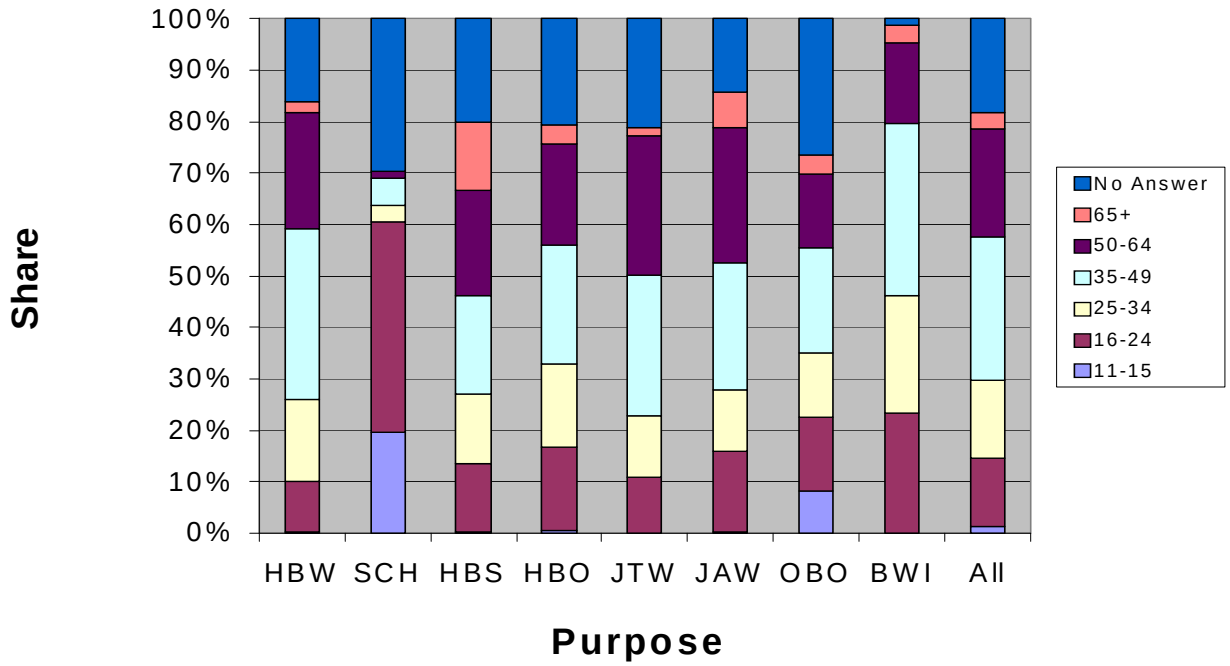
Persons over age 65 make relatively few transit trips. The largest share of senior riders can be found for HBS trips; about 13% of shopping trips are made by persons who identified themselves as seniors.

Details on age of riders by purpose can be seen in Table 14 and Exhibit 15.

TABLE 14
Trips by Age and Purpose

Age	HBW	SCH	HBS	HBO	JTW	JAW	OBO	BWI	Total
11-15	217	1,477	28	241	0	8	685	0	2,655
16-24	10,810	3,071	1,063	7,463	688	878	1,186	283	25,443
25-34	17,459	240	1,073	7,414	749	661	1,044	278	28,918
35-49	36,081	403	1,519	10,566	1,731	1,375	1,691	408	53,775
50-64	24,657	90	1,643	9,134	1,718	1,459	1,194	187	40,082
65+	2,316	0	1,067	1,705	102	377	297	44	5,907
No Answer	17,691	2,234	1,598	9,431	1,336	792	2,202	15	35,299
Total	109,232	7,514	7,992	45,954	6,324	5,549	8,299	1,215	192,080

EXHIBIT 15
Share of Trips by Age and Purpose



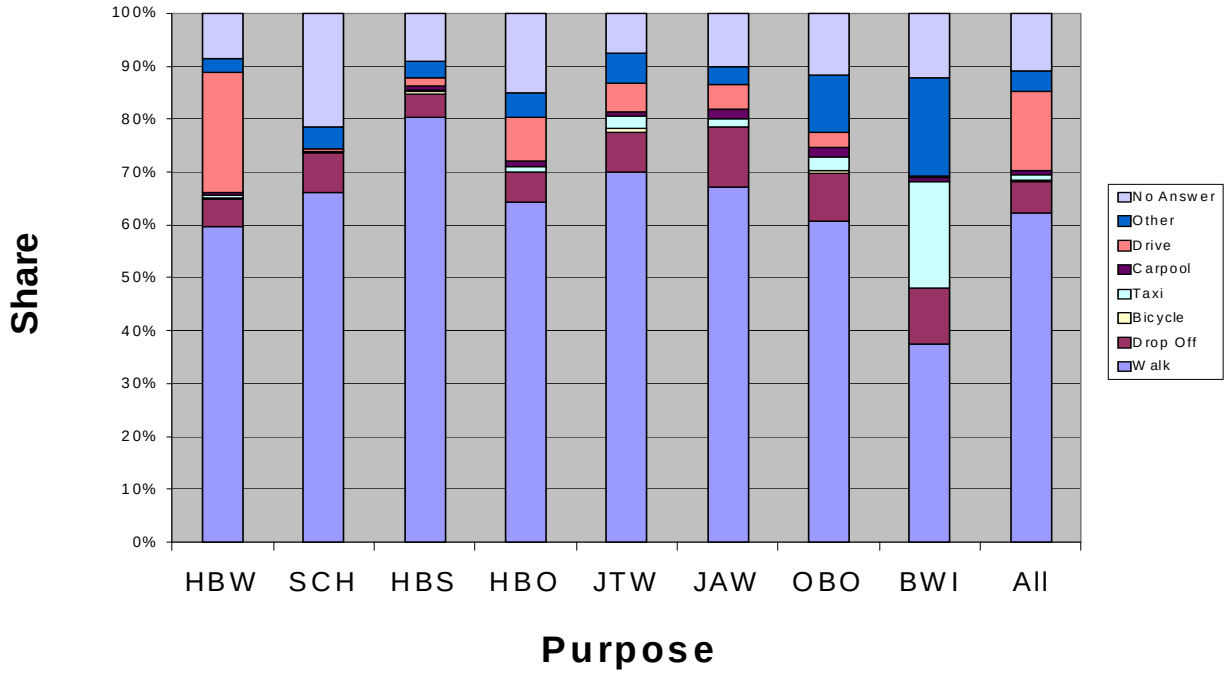
Access mode is an important consideration in transit planning. Riders can take various modes to get to a point where they can access transit and from the last point of their trip on transit. For the purposes of this analysis, drive access is limited to the home end of a home-based transit trip (as people are not likely to keep a vehicle at a location away from home simply to access or egress a non-home location, although it does happen on occasion). By converting trips to production and attraction format, as discussed earlier, the problem of auto access is greatly simplified.

When assigning a trip purpose, a single access mode was assigned to a trip. Generally, the access mode at the home end was used to define the access mode for the trip. If there was not a home end, the trip origin end's access mode was used. This access mode is displayed in Table 15 and Exhibit 16 for the different trip purposes.

TABLE 15
Trips by Purpose and Access Mode

Access	HBW	SCH	HBS	HBO	JTW	JAW	OBO	BWI	All
Walk	62,223	4,965	6,419	29,446	4,410	3,726	5,046	457	116,692
Drop Off	5,450	561	339	2,651	468	634	735	127	10,964
Bicycle	342	9	48	0	43	0	53	0	494
Taxi	636	5	24	474	153	76	213	245	1,826
Carpool	522	6	62	502	51	107	153	9	1,412
Drive	23,567	28	112	3,766	344	254	238	3	28,311
Other	2,877	321	264	2,156	349	189	897	225	7,277
No Answer	8,838	1,608	719	6,853	479	563	962	150	20,171
Grand Total	104,455	7,502	7,988	45,848	6,295	5,549	8,296	1,215	187,148

EXHIBIT 16
Share of Trips by Purpose and Access Mode



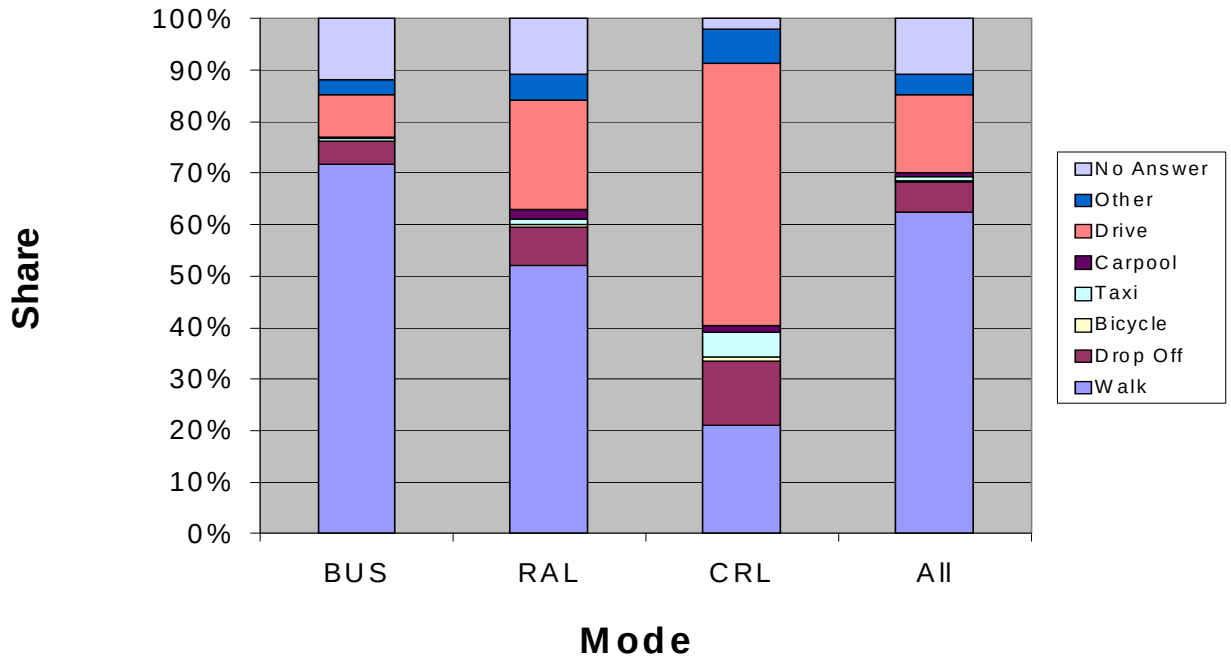
For all purposes except BWI, walk access trips make up the majority. HBS has the highest penetration with 80%. If the "No Answer" response were removed, the share would be even higher. Taxi access makes a large showing for BWI trips.

Table 16 and Exhibit 17 show access mode for the different transit modes.

TABLE 16
Trips by Mode and Access

Access	Bus	Rail	Commuter Rail	All
Walk	84,806	29,185	2,701	116,692
Drop Off	5,259	4,097	1,608	10,964
Bicycle	108	265	121	494
Taxi	528	702	595	1,826
Carpool	325	906	181	1,412
Drive	9,837	11,904	6,570	28,311
Other	3,589	2,845	843	7,277
No Answer	13,850	6,044	278	20,171
Grand Total	118,303	55,947	12,898	187,148

EXHIBIT 17
Share of Trips by Mode and Access



As can be seen, the overwhelming majority of bus trips are walk access, and more than half the rail trips are walk access. About half the commuter rail trips are drive access, although about a quarter are walk access. Being dropped off or picked up is the third most used mode, and others, including carpool, taxi, and bicycle, are generally insignificant. Given that all transit trips are heavily weighted towards the bus mode, walk access still accounts for over 60% of all transit trips.

The distribution of transit trips varies between the different jurisdictions. Table 17 shows the number of trips, while Exhibits 18-25 graphically present the distributions from the production jurisdiction. Possible attractions used in these charts are Baltimore City (ToCity), Baltimore suburban jurisdictions (ToSub), the District of Columbia (ToDC), and the Washington suburbs (ToDCSub).

TABLE 17
Transit Trip Distribution

From Area	ToCity	ToSub	ToDC	ToDCSub	Total
Baltimore City	93,838	28,770	6,664	941	130,213
Anne Arundel	2,260	1,526	3,567	165	7,518
Baltimore County	25,383	10,662	1,080	334	37,459
Carroll County	1,731	153	170	0	2,053
Harford County	819	30	395	43	1,287
Howard County	529	60	2,428	176	3,193
Washington, DC	1,030	662	26	106	1,823
Maryland Suburbs	1,204	372	1,817	209	3,602
Total	126,793	42,235	16,146	1,973	187,148

EXHIBIT 18
Baltimore City Distribution

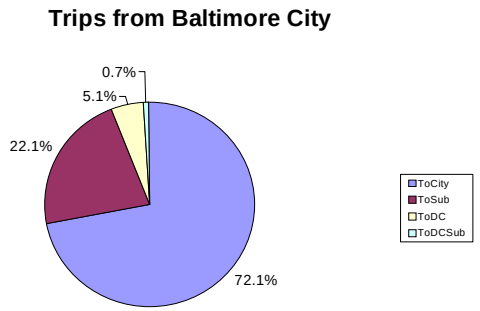


EXHIBIT 19
Anne Arundel County Distribution

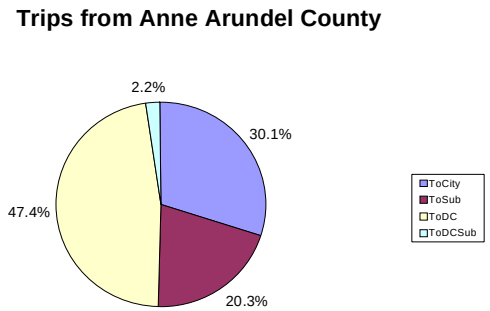


EXHIBIT 20

Baltimore County Distribution

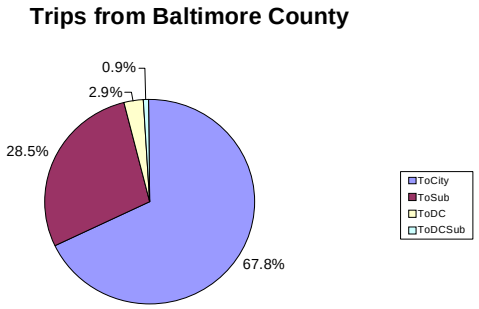


EXHIBIT 21

Carroll County Distribution

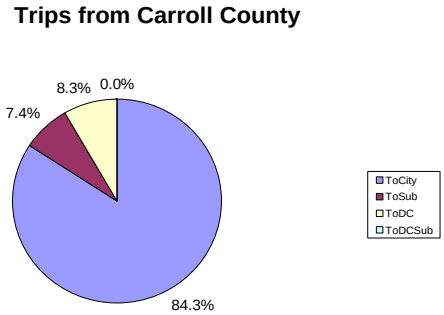


EXHIBIT 22

Harford County Distribution

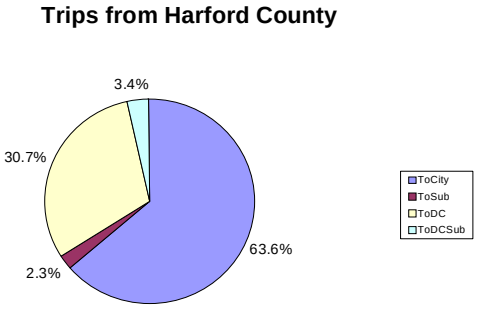


EXHIBIT 23

Howard County Distribution

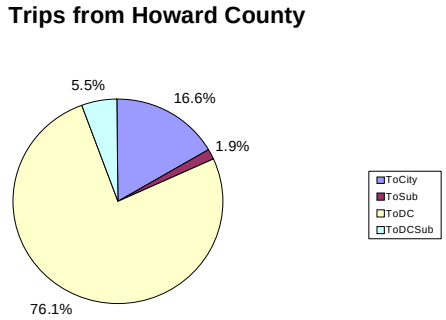


EXHIBIT 24

Washington, DC Distribution

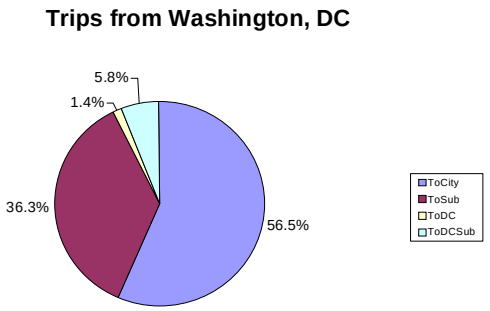
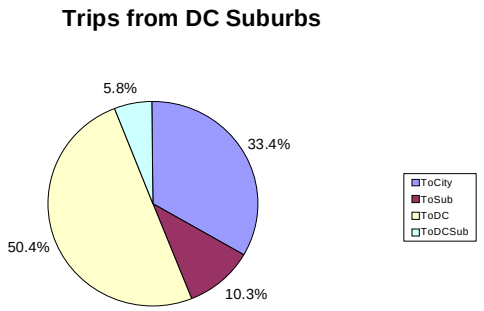


EXHIBIT 25

Washington Suburban Distribution



Baltimore City and Baltimore County, the jurisdictions with the largest number of trip productions, both have similar distributions, with a large number of trips attracted to Baltimore City. Carroll County, although having much fewer trip productions, sends an even higher share of trips to Baltimore City. Anne Arundel County and the Washington suburban jurisdictions have similar distributions patterns, with roughly half the trips to Washington, the second largest share to Baltimore City, and the rest to the suburban jurisdictions in the Baltimore and Washington regions. Harford County and Washington show a majority of trips going to Baltimore City. In Howard County, about three-quarters of the trips are attracted to Washington, DC.

Looking at the household composition found in the survey, vehicle availability is an important consideration in transit use. Table 18 is a cross-tabulation of persons aged 16 or higher per household vs. vehicles per household. As shown by the table, regardless of the number of driving age persons in the household, zero car households predominate among MTA users who responded to the survey.

TABLE 18

Vehicles and Persons per Household

Persons Over Age 16	Vehicles						Total
	0	1	2	3	4 or More	No Answer	
1	42,562	15,988	4,278	891	360	1,812	65,890
2	31,683	20,687	17,918	3,543	932	1,098	75,861
3	20,733	14,131	7,493	4,514	1,302	1,075	49,248
4	9,535	6,239	5,760	3,165	1,878	235	26,813
5 or more	6,156	3,911	2,391	983	1,275	512	15,228
No Answer	9,624	2,028	871	481	103	34,890	47,997
Total	120,293	62,983	38,711	13,577	5,850	39,623	281,038

Exhibit 26 shows shares for vehicles per household by persons of driving age (16 and above) per household.

EXHIBIT 26

Share of Trips by Vehicles and Driving Age Persons

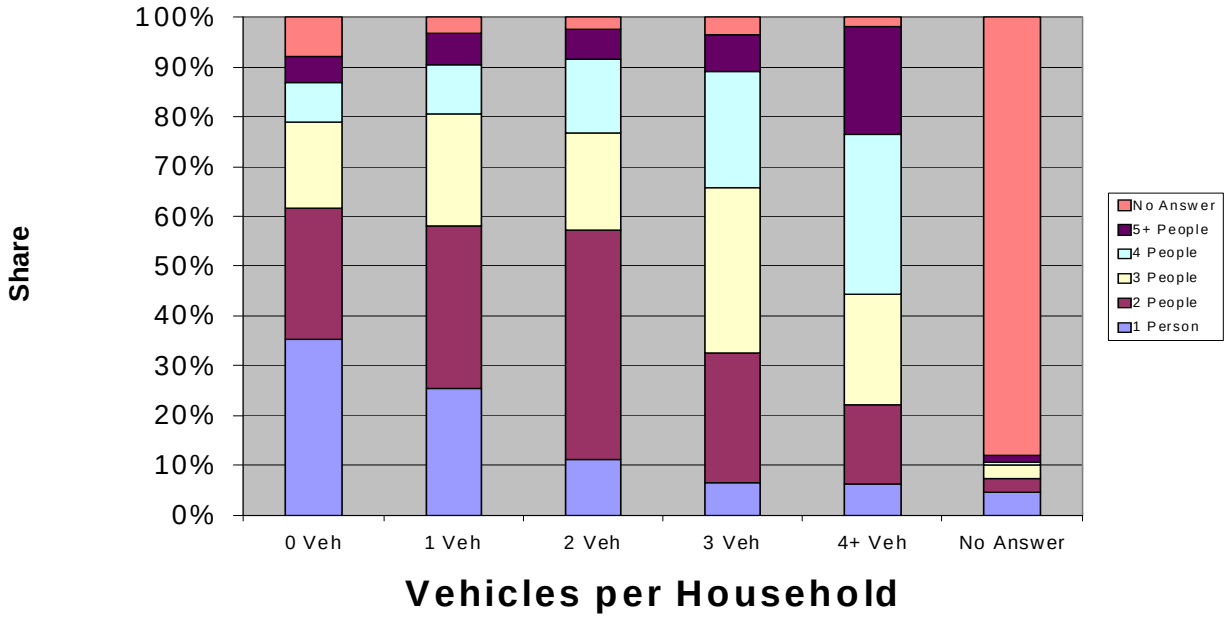
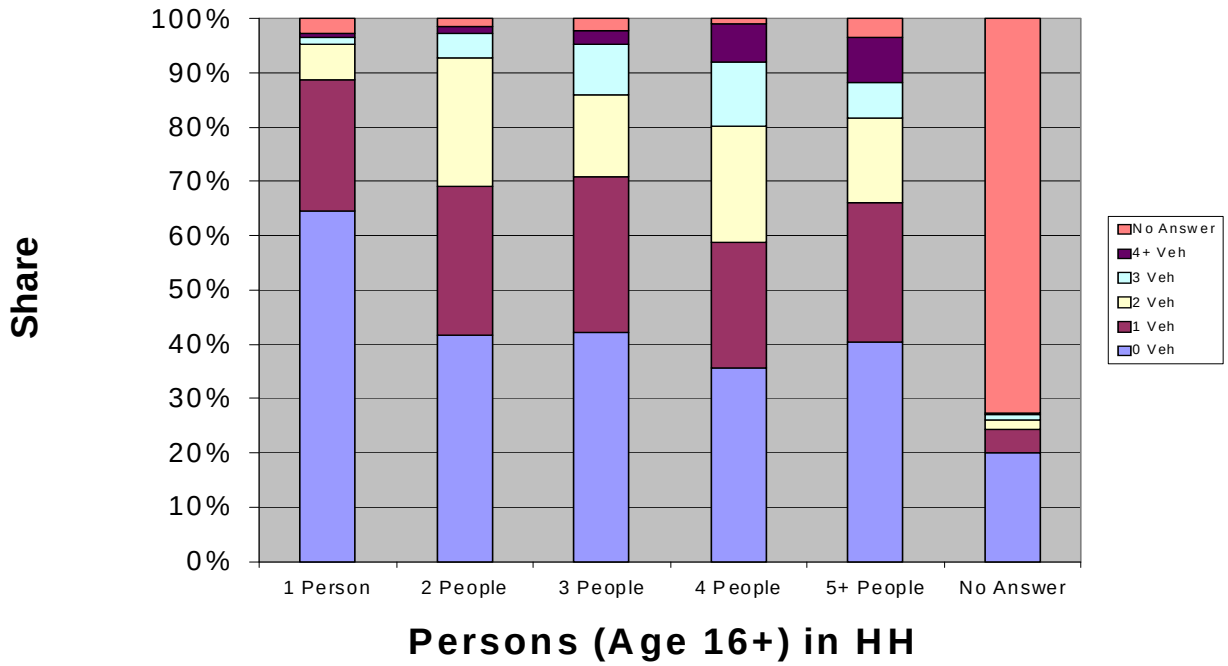


Exhibit 27 uses the same data, except each bar represents persons per households and is split into the vehicles per household for each.

EXHIBIT 27
Share of Trips by Driving Age Persons and Vehicles



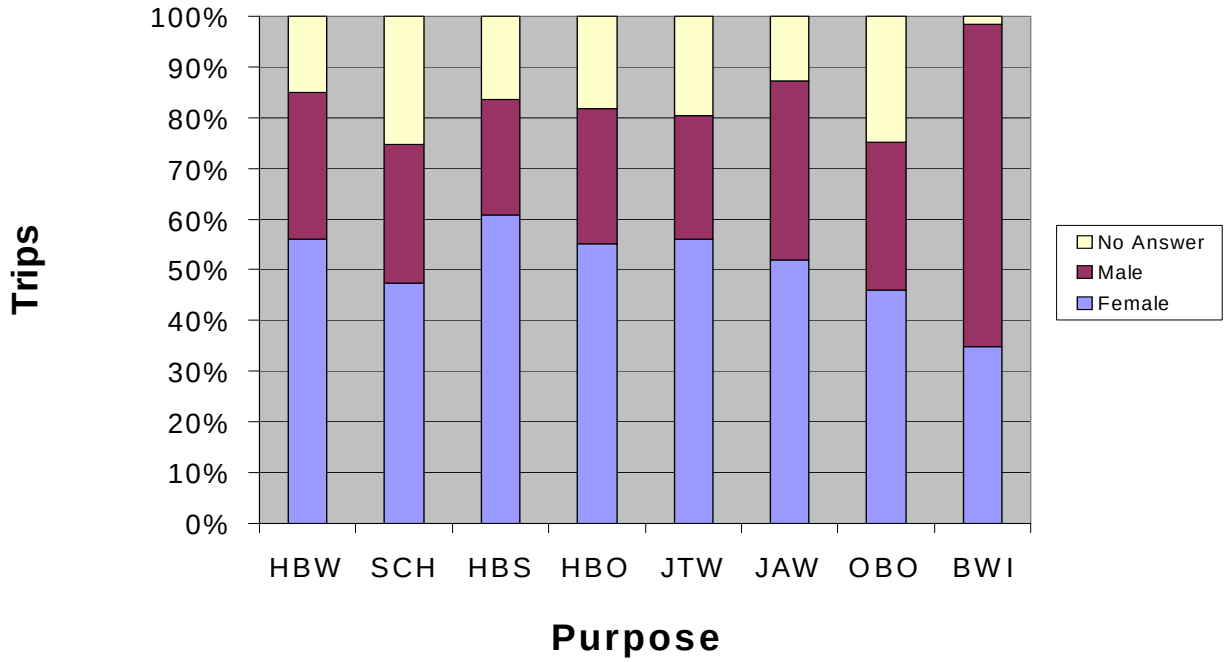
Members of single-person (of driving age) households who use transit are more likely to not own a vehicle. The share drops when more people of driving age are found in the household, but that figure remains at around 40% for the share of the households having no vehicle even with 3 or more people of driving age in the household. Excluding non-responses to this question, about half of trips on MTA are made by people living in households with no vehicles.

Women predominate among MTA riders, by an almost 2 to 1 ratio over men. Table 19 shows the ridership by mode, and these data are displayed graphically in Exhibit 28. The only purpose in which men predominate is BWI, and virtually everyone traveling to BWI answered that question. SCH and OBO trips had the highest non-response rate to this question.

TABLE 19
Trips by Sex and Purpose

Sex	HBW	SCH	HBS	HBO	JTW	JAW	OBO	BWI	Total
Female	60,752	3,464	4,683	24,637	3,404	2,667	3,564	438	103,610
Male	30,993	1,837	1,766	12,180	1,485	2,032	2,593	762	53,649
No Answer	17,487	2,214	1,543	9,136	1,435	850	2,142	15	34,822
Total	109,232	7,514	7,992	45,954	6,324	5,549	8,299	1,215	192,080

EXHIBIT 28
Trip Shares by Purpose and Sex

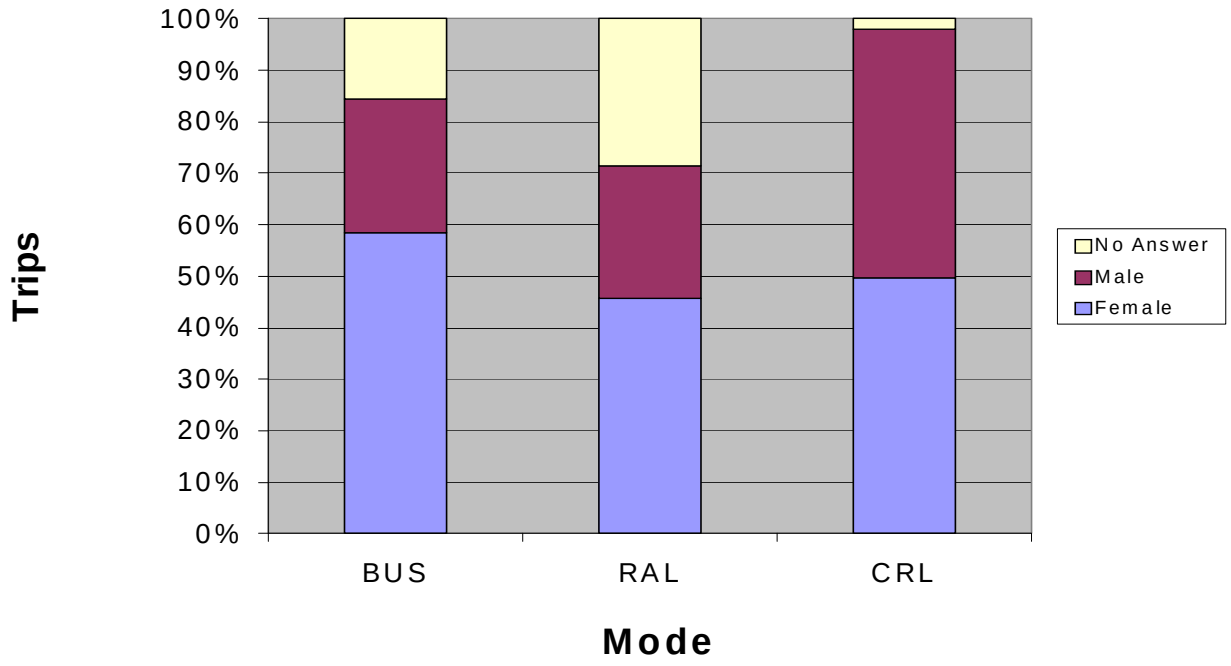


Looking at these data by mode in Table 20 and Exhibit 29, it can be seen that the numbers are almost the same for men and women on MARC, (and the question is most often answered). Fewer than ¾ of rail users answered the question.

TABLE 20
Trips by Mode and Sex

Sex	Bus	Rail	Commuter Rail	All
Female	69,135	25,610	8,864	103,610
Male	30,663	14,387	8,598	53,649
Unknown	18,504	15,950	368	34,822
All	118,303	55,947	17,830	192,080

EXHIBIT 29
Trip Shares by Mode and Sex

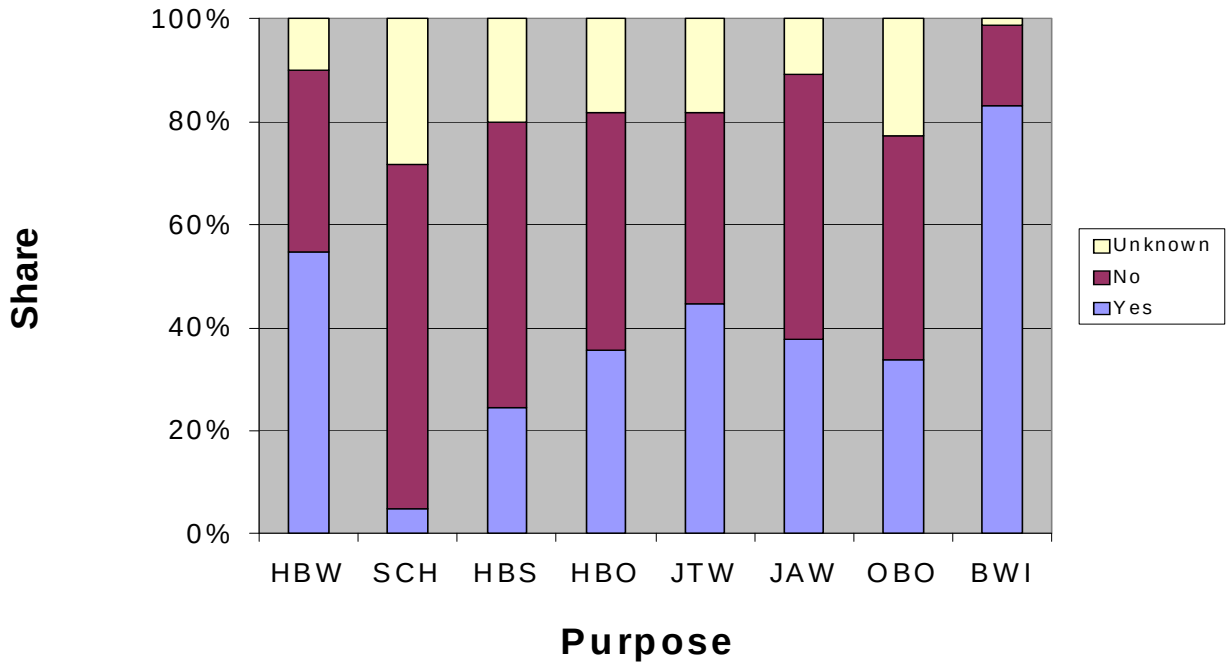


Transit users were asked if they had a driver's license. Over half of those surveyed reported possessing one, but there was quite a variation among the different trip purposes. Not surprisingly, school trips reported an extremely low share of driver's license holders. On the opposite end of the spectrum, over 80% of BWI trips were made by licensed drivers. The results are found in Table 21 and Exhibit 30.

TABLE 21
Drivers License Status by Purpose

License	HBW	SCH	HBS	HBO	JTW	JAW	OBO	BWI	All
Yes	59,897	354	1,951	16,367	2,825	2,088	2,804	1,010	87,295
No	38,488	5,037	4,442	21,191	2,353	2,869	3,610	191	78,180
Unknown	10,847	2,123	1,599	8,396	1,146	593	1,886	15	26,605
Total	109,232	7,514	7,992	45,954	6,324	5,549	8,299	1,215	192,080

EXHIBIT 30
Drivers License Status by Purpose

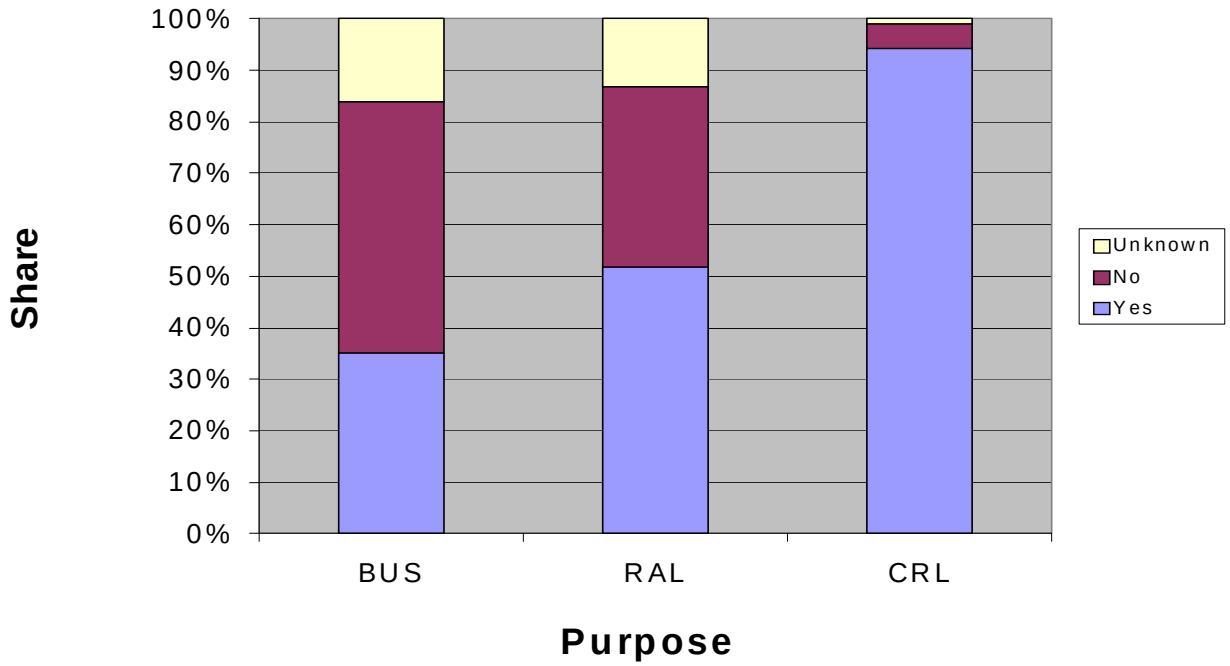


When looking at driver's license status by mode, it can be seen that about half of all bus trips are taken by people without driver's licenses. Licensed drivers make up the majority of the passengers on rail, and the overwhelming majority on commuter rail. These figures are shown in Table 22 and Exhibit 31.

TABLE 22
Drivers License Status by Mode

License Status	Bus	Rail	Commuter Rail	All
Yes	41,509	28,996	16,791	87,295
No	57,727	19,572	881	78,180
Unknown	19,067	7,379	158	26,605
Total	118,303	55,947	17,830	192,080

EXHIBIT 31
Drivers License Status by Mode



Respondents were asked if their employers paid for any of their transit trips. Possible answers were:

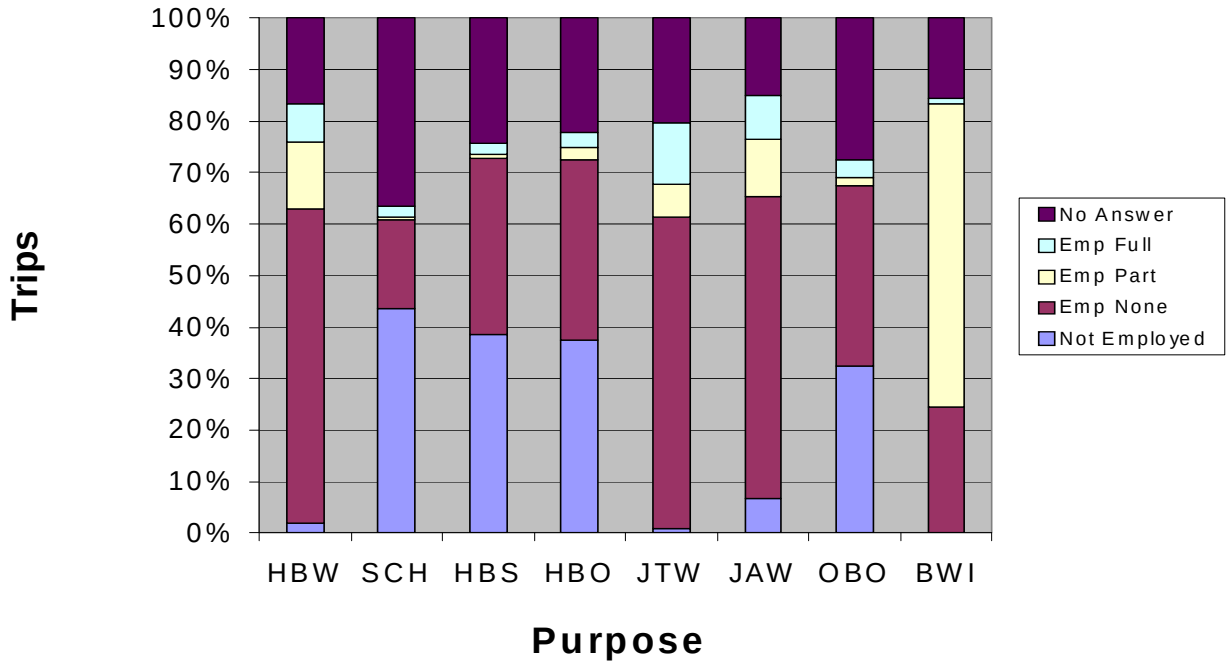
- Not Employed
- Employer pays none (Emp none)
- Employer pays part (Emp part)
- Employer pays in full (Emp full)

Very few transit riders have their fares entirely or even partially paid by their employers. The responses by purpose are shown in Table 23 and Exhibit 32. There were a few work-related trips (HBW, JTW, and JAW) with responses of not employed. The BWI purpose shows a large share of partial employer payment, which seems odd, as one would expect full employer payment if it is a business trip, unless a lot of people who get partial reimbursement choose to take transit to the airport.

TABLE 23
Employer Fare Payment by Purpose

Employer Payment	HBW	SCH	HBS	HBO	JTW	JAW	OBO	BWI	All
Not Employed	1,999	3,269	3,087	17,233	51	369	2,682		28,972
Emp None	66,804	1,311	2,722	16,061	3,822	3,257	2,916	282	97,572
Emp Part	14,039	29	65	1,081	409	620	137	679	16,390
Emp Full	8,378	171	173	1,373	753	469	285	10	11,782
No Answer	18,011	2,736	1,945	10,206	1,289	834	2,279	180	37,364
Total	109,232	7,514	7,992	45,954	6,324	5,549	8,299	65	192,080

EXHIBIT 32
Employer Fare Payment by Purpose

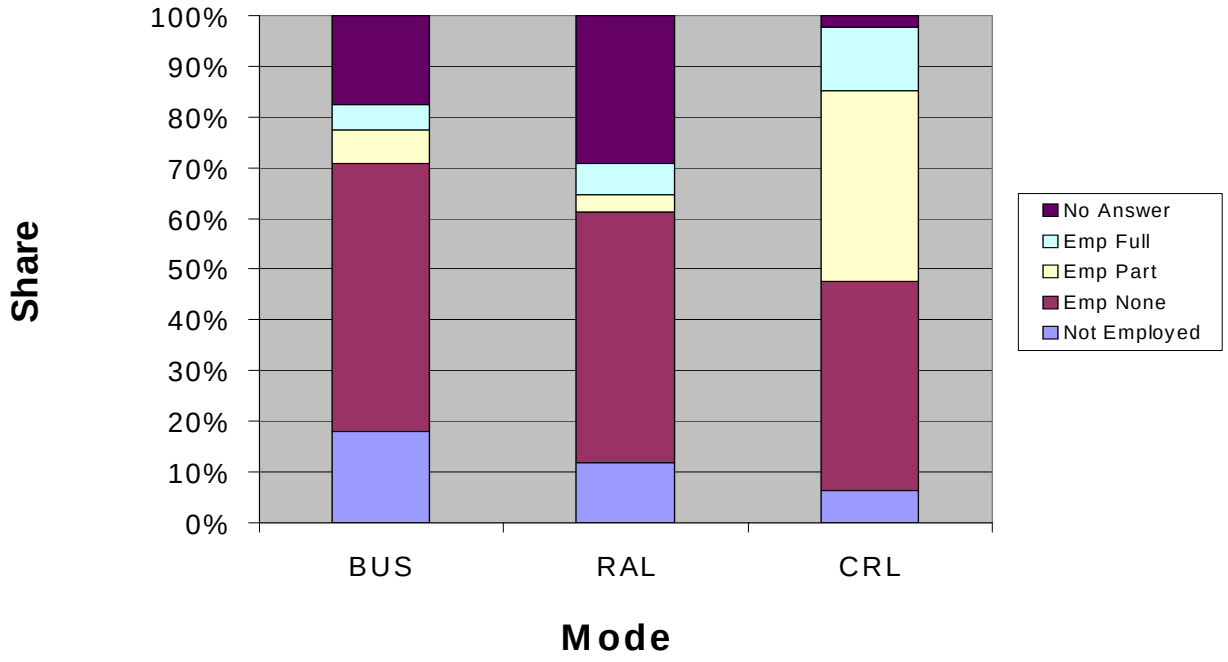


When reviewing the results by mode, almost 40% of commuter rail users have partial payment and 12% have full payment. The shares for employer payment are much lower for the other two modes. These numbers can be seen in Table 24 and Exhibit 33.

TABLE 24
Employer Fare Payment by Mode

Employer Payment	Bus	Rail	Commuter Rail	All
Not Employed	21,229	6,607	1,135	28,972
Emp None	62,565	27,650	7,357	97,572
Emp Part	7,787	1,887	6,715	16,390
Emp Full	6,049	3,528	2,206	11,782
No Answer	20,672	16,275	417	37,364
Total	118,303	55,947	17,830	192,080

EXHIBIT 33
Employer Fare Payment by Mode



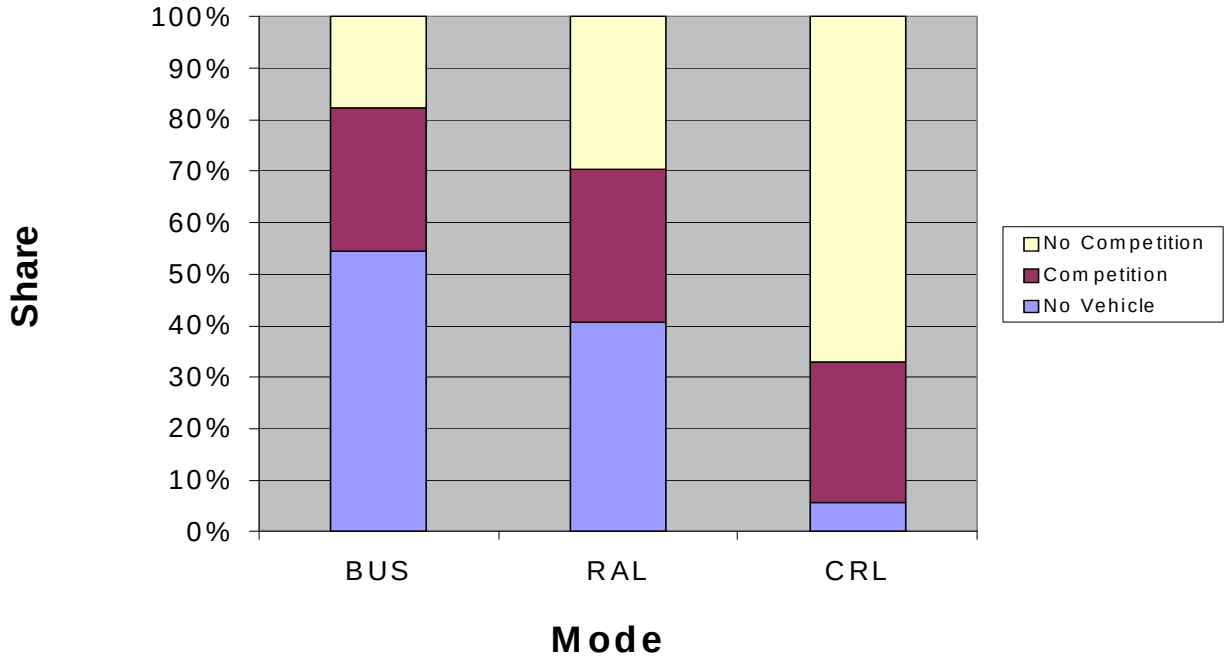
Competition for vehicles is a consideration of why people use transit. If there are no vehicles available for a trip, either because the household has no vehicles or the number of drivers exceeds the number of vehicles, a trip may be made by transit out of necessity. If the number of drivers equals or is less than the number of vehicles in a household, meaning no competition for vehicles, then transit use is clearly a matter of choice of mode.

Table 25 shows these data by trip mode, as does Exhibit 34.

TABLE 25
Competition for Vehicles by Mode

	Bus	Rail	Commuter Rail	All
No Vehicle	50,412	15,357	957	66,726
Competition	25,567	11,284	4,587	41,437
No Competition	16,354	11,181	11,287	38,822
Total	92,332	37,822	16,831	146,985

EXHIBIT 34
Competition for Vehicles by Mode

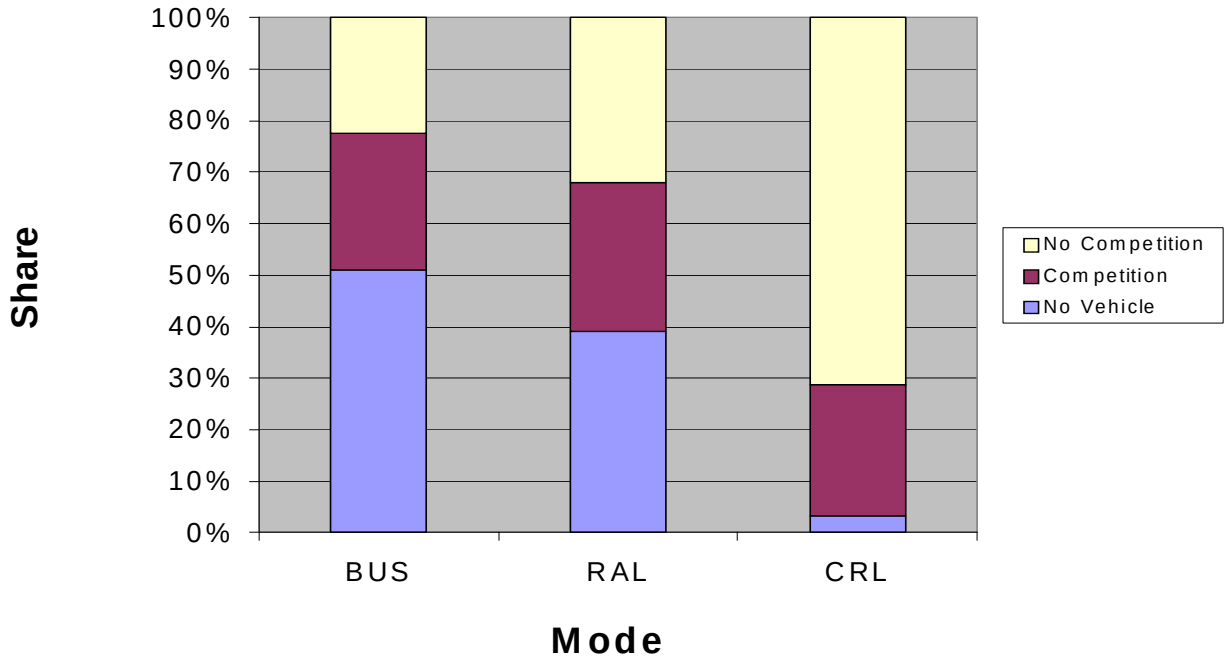


These data were also examined strictly for the HBW purpose. It was thought that transit was more a matter of choice for this purpose. As seen in Table 26 and Exhibit 35, there is a slight shift towards the No Competition category, but it is minor.

TABLE 26
HBW Competition for Vehicles by Mode

	Bus	Rail	Commuter Rail	All
No Vehicle	27,623	7,527	419	35,569
Competition	14,301	5,593	3,406	23,300
No Competition	12,202	6,184	9,499	27,885
Total	54,126	19,304	13,324	86,754

EXHIBIT 35
HBW Competition for Vehicles by Mode

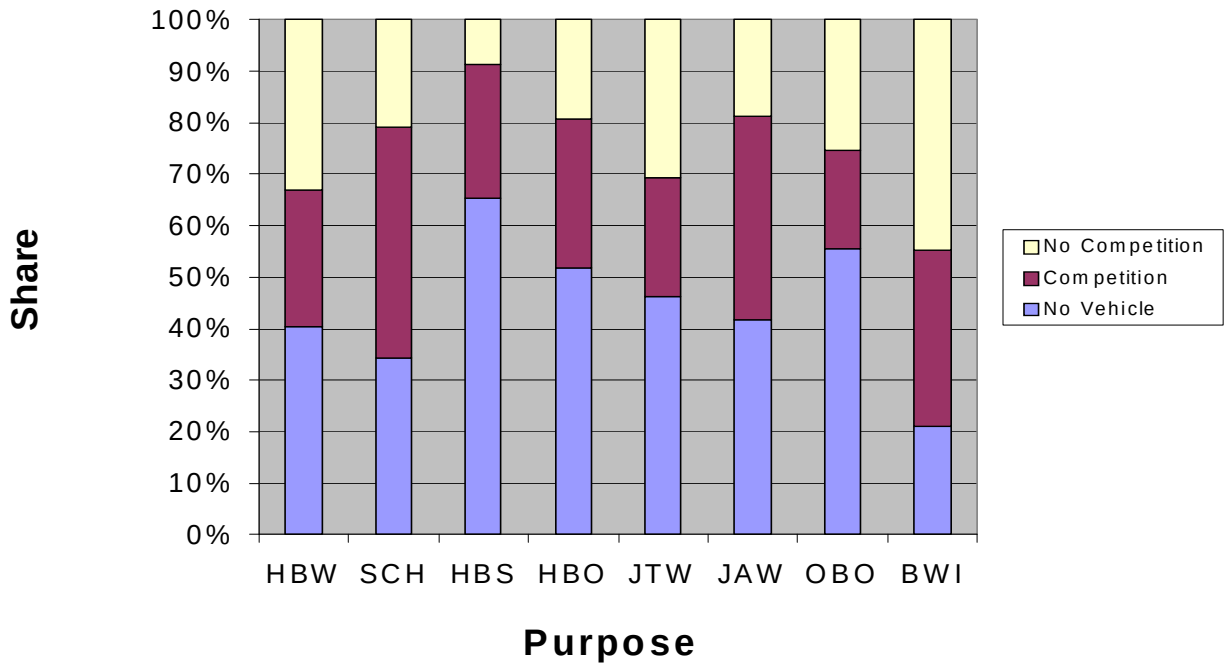


These data were also examined by purpose, as shown in Table 27 and Exhibit 36. As can be seen, about 65% of HBS (shopping) trips are by people in households without vehicles. BWI trips have the lowest level of non-vehicle households and the highest share of trips from households with no competition for vehicles.

TABLE 27
Competition for Vehicles by Purpose

	HBW	SCH	HBS	HBO	JTW	JAW	OBO	BWI	All
No Vehicle	35,569	1,740	3,872	17,927	2,236	1,800	3,333	248	66,726
Competition	23,300	2,269	1,524	9,974	1,109	1,708	1,151	403	41,437
No Competition	29,190	1,060	520	6,641	1,483	814	1,524	529	41,761
Total	88,060	5,068	5,915	34,542	4,828	4,323	6,007	1,180	149,924

EXHIBIT 36
Competition for Vehicles by Purpose



COMPARISON OF SURVEY WITH BALTIMORE REGION TRAVEL DEMAND MODEL

Since on-board transit surveys form a basis for evaluating and developing regional travel demand models, it would be good to compare this survey against the existing model to see how well the existing model performs based on newly collected data. Any areas where discrepancies are found should be a priority for future model development work.

In the model, transit trips are broken down by access mode (walk and drive) and mode hierarch (bus, rail, commuter rail). Trips are also broken down into peak (AM and PM peak periods) and off-peak (midday and night).

A comparison was made between the 2005 Round 7A model results and the survey results for the number of transit trips. These are shown in Table 28 as well as graphically in Exhibits 37 and 38 for linked and unlinked trips, respectively (note the logarithmic Y-axis).

TABLE 28
Transit Trips

Access	Time	Mode	Survey			Model		
			Linked	Unlinked	Transfer Ratio	Linked	Unlinked	Transfer Ratio
Walk	Peak	Bus	46,155	64,346	1.39	66,601	112,767	1.69
		Rail	14,848	29,461	1.98	31,517	73,608	2.34
		Com-muter Rail	1,281	2,209	1.72	4,485	12,377	2.76
	Off-Peak	Bus	52,490	76,446	1.46	44,878	73,185	1.63
		Rail	20,380	41,525	2.04	23,563	56,973	2.42
		Com-muter Rail	1,697	3,425	2.02	2,771	8,004	2.89
Drive	Peak	Bus	13,360	16,128	1.21	9,932	11,502	1.16
		Rail	10,994	14,498	1.32	3,763	4,251	1.13
		Com-muter Rail	5,234	7,938	1.52	3,794	6,736	1.78
	Off-Peak	Bus	6,123	9,057	1.48	4,533	6,636	1.46
		Rail	9,725	15,674	1.61	2,126	2,421	1.14
		Com-muter Rail	4,685	7,160	1.53	1,435	2,515	1.75
Total			186,974	287,867	1.54	207,148	384,050	1.85

EXHIBIT 37
Linked Transit Trips by Access and Time of Day

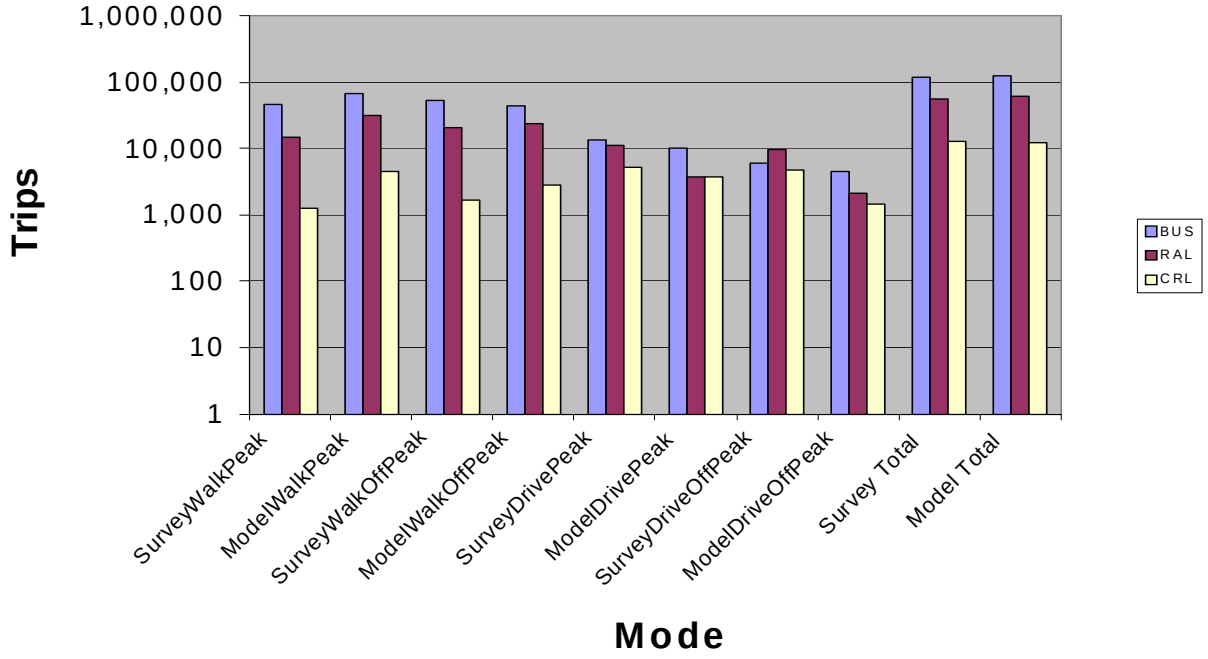
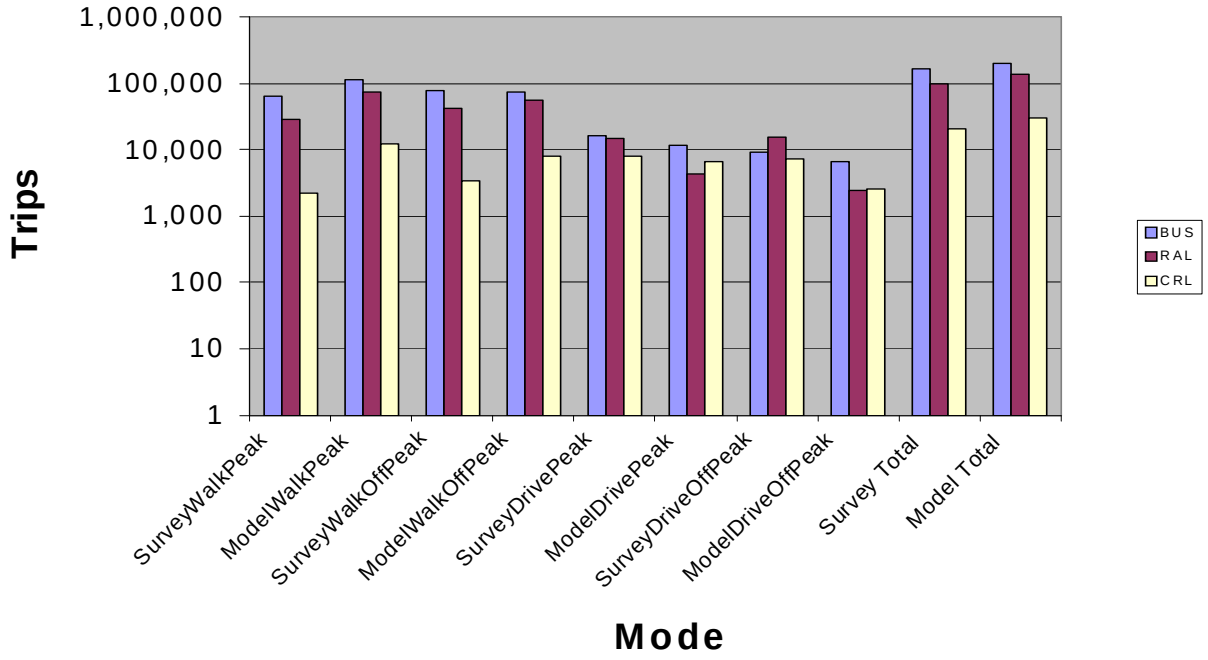


EXHIBIT 38
Unlinked Transit Trips by Access and Time of Day



While there are discrepancies between the model and survey for the different subcategories, the overall totals are fairly close. The survey numbers were based on the survey weights for unlinked trips and the individual survey weights times the linked-trip factor for the linked trips. The model numbers are based on trips tables for the linked trips and the assignment reports for the unlinked trips.

While there are differences, it should be noted that the two datasets are not directly comparable. The BMC model includes only trips with at least one end in the Baltimore region; the survey will include trips just within the Washington region. Included in the model but not specifically in the survey are the local transit system (Annapolis Transit, Harford County Transit Services, and Howard Transit).

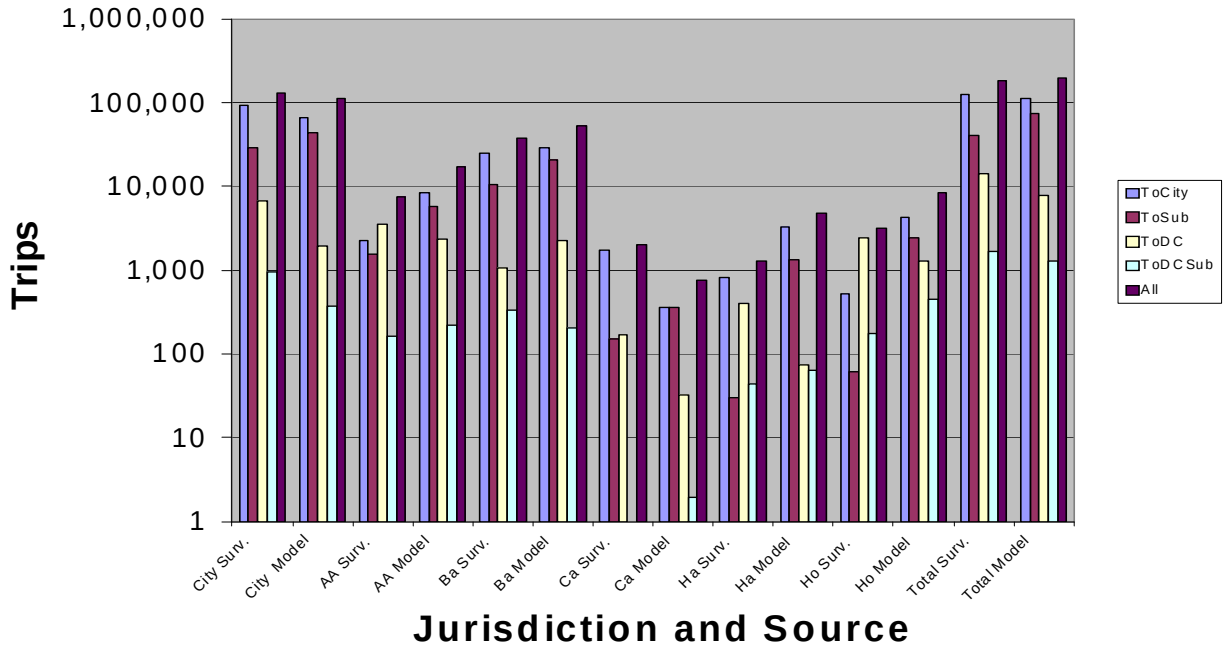
While the data may need some adjustment, it appears that commuter rail trips have too high a transfer ratio in the model. This should be taken into account during the next model update. Target values for transit trips may also need to be adjusted.

The distribution of transit trips in the model was also examined and compared with that from the survey. The number of trips from each Baltimore-region production zone (Washington-region productions are not included) is shown in Table 29 and in Exhibit 39. The same geographic division used earlier in this report for attractions is also applied here.

TABLE 29
Transit Trip Distribution

From Jurisdiction	Data Type	To Baltimore City	To Baltimore Suburbs	To District of Columbia	To Washington Suburbs	Total
Baltimore City	Survey	93,838	28,770	6,664	941	130,213
	Model	65,330	43,371	1,932	375	111,008
Anne Arundel County	Survey	2,260	1,526	3,567	165	7,518
	Model	8,482	5,863	2,366	221	16,932
Baltimore County	Survey	25,383	10,662	1,080	334	37,459
	Model	29,390	20,678	2,242	201	52,510
Carroll County	Survey	1,731	153	170	0	2,053
	Model	363	362	32	2	759
Harford County	Survey	819	30	395	43	1,287
	Model	3,243	1,355	73	65	4,736
Howard County	Survey	529	60	2,428	176	3,193
	Model	4,314	2,403	1,264	440	8,420
Total	Survey	124,559	41,201	14,304	1,658	181,722
	Model	111,121	74,033	7,909	1,303	194,366

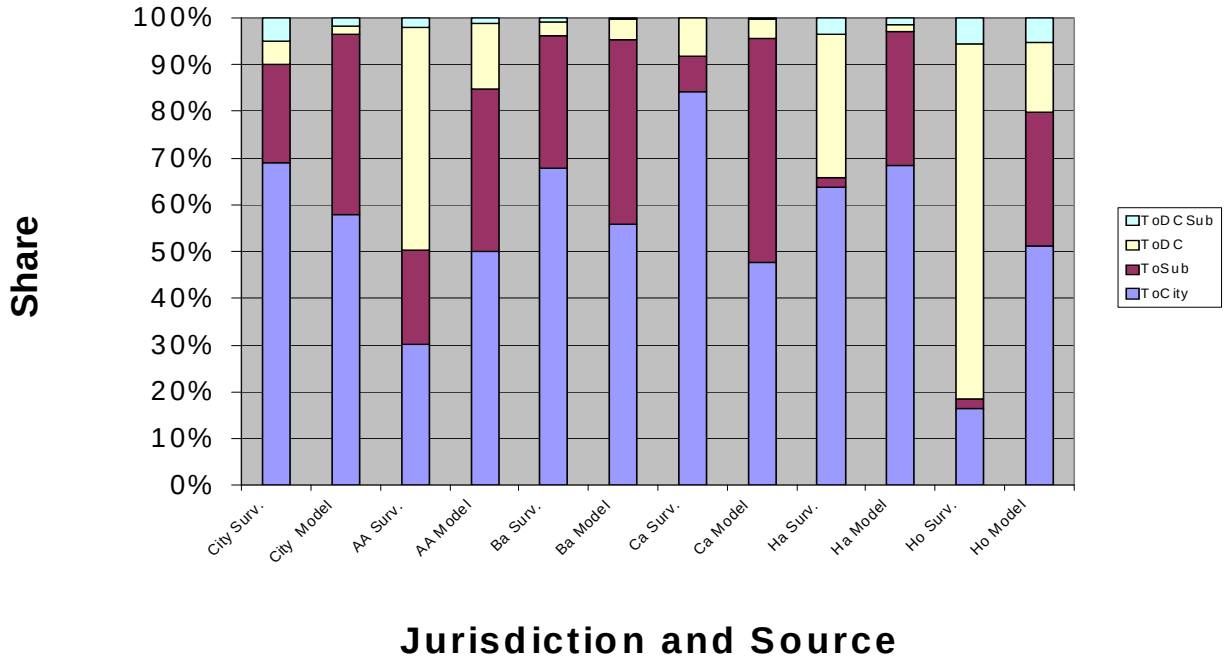
EXHIBIT 39
Transit Trip Distribution



As can be seen, there are variations between the surveyed results and the modeled ones, many of which are quite large, with one value being multiple times the corresponding value from the other source. However, the overall total does not show too much discrepancy.

Exhibit 40 shows the shares of distribution as stacked bars.

EXHIBIT 40
Transit Trip Distribution Shares



Here, it can be seen that the model generally overestimates trips to Baltimore suburban jurisdictions and generally underestimates trips to Washington, DC, particularly from Anne Arundel, Harford, and Howard counties. These factors should be kept in mind for the next mode choice model calibration or update.

A third way of comparing the survey with modeled trips is to look at the assignment. This gives an idea of how well the model network meets the needs of travel demand. Discrepancies between modeled and surveyed data may indicate a problem with the transit network.

Boarding data were obtained from the Maryland Transit Administration for Fiscal Year 2008 (July 2007-June 2008). These data were compared to the calculated ridership by line based on the survey responses, the Round 7A assignment for 2005, and assigned trips from trip tables derived from the survey data. Data from the twenty-five most heavily used transit lines are shown in Table 30.

TABLE 30
Transit Ridership by Route

	MTA Reported Ridership	Survey Records	2005 Round 7A Assignment	Survey Trips Assigned
METRO	43,035	41,450	38,382	36,808
MARCP	16,101	10,046	10,296	9,602
CLRL	15,140	17,652	29,482	14,138
MTA15	12,763	12,742	11,010	12,603
MTA8	12,335	12,423	19,053	12,778
MTA5	10,934	9,921	5,210	7,856
MTA13	10,277	10,087	13,086	14,013
MTA23	9,834	9,871	4,923	4,446
MTA10	9,449	8,556	16,581	11,133
MTA3	9,314	9,932	15,665	13,238
MTA20	8,718	8,359	6,418	6,085
MTA19	7,199	7,009	9,872	7,999
MTA35	6,950	7,044	8,795	5,245
MTA91	6,931	6,540	2,450	4,687
MTA22	6,735	6,719	10,554	6,372
MTA40	6,259	7,199	27,929	23,929
M3	5,861	5,096	5,338	6,670
MTA51	5,654	5,508	5,893	7,540
MTA1	5,374	4,885	3,662	3,936
MTA44	5,309	5,117	8,964	4,992
MTA36	5,096	4,520	2,024	2,169
M1	5,023	4,269	3,326	3,792
MTA11	4,612	4,500	7,884	7,338
MTA64	4,203	4,220	6,567	5,108
MARCC	4,005	2,877	2194	822
Combined 3-36	14,410	14,452	17,689	15,407
Combined 20-23-40	24,811	25,428	39,270	34,460
Total	237,111	226,541	275,558	233,299
RMSE		15.2%	69.3%	46.1%

Because certain routes run in close proximity, it was decided to also show combined totals for the 20, 23, and 40, which run in the East-West corridor through downtown Baltimore. Also, the 3 and the 36, which run between downtown and the north-northeast of Baltimore, were combined, which explains the shading above.

CONCLUSIONS

Several things can be concluded from these data. The survey record data closely match the reported MTA ridership with a few exceptions, although this congruity is to be expected if ridership counts were used to weight the survey records. Surprisingly, the two MARC lines show large variation, with much lower boarding totals from the survey than the ridership number to which it was weighted.

Also, the Light Rail ridership used to determine the sample size was much lower than figures normally seen. Other data reviewed by the BMC give a daily ridership of around 25,000. This deserves some follow up.

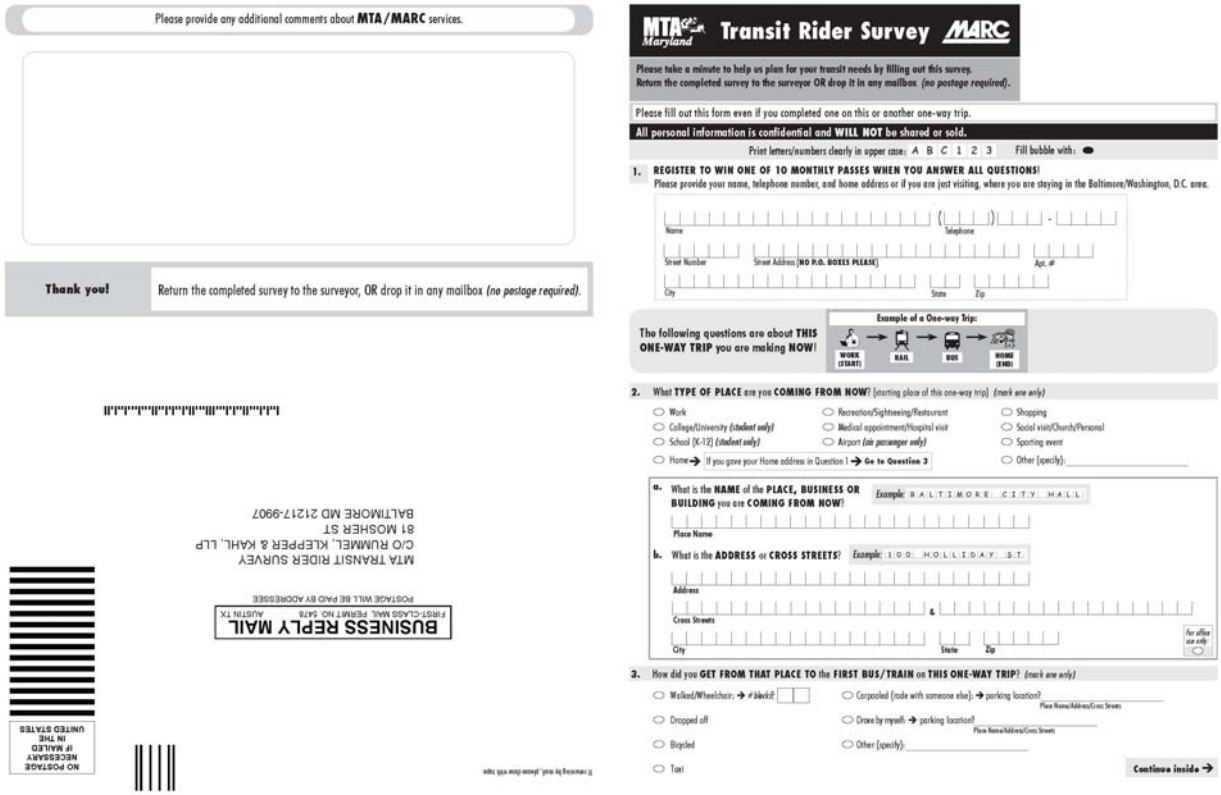
Then the modeled volumes are compared with ridership. Discrepancies can be caused by problems with the input trip tables and/or problems with the networks. To determine the underlying cause, a trip table was created from the survey data and also assigned to the BMC transit network. If the survey assignment matches the modeling assignment but not the survey results, then that may indicate a network problem. If the survey assignment is closer to the survey results but different from the modeling assignment, then there may be a problem with the transit trip tables produced by the model.

It should be kept in mind that the model runs at a rather gross level of detail for transit purposes, particularly for walk access and egress. Some preliminary investigation of discrepancies showed that many survey rail trips would become bus trips when assigned because of the location of rail stops on the edges of a zone vs. the interior location of bus stops. These bus connections would thus be closer to the zonal centroid, from and to which all trips are assumed to begin or end.

This analysis should be conducted for any mode choice model update.

Appendix A: Survey Instruments

Figure A-1: Phase I Survey Instrument (English)



Please provide any additional comments about **MTA/MARC** services.

Thank you! Return the completed survey to the surveyor, OR drop it in any mailbox *(no postage required)*.

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 5478 AUSTIN TX
POSTAGE WILL BE PAID BY ADDRESSEE
MTA TRANSIT RIDER SURVEY
C/O RUMMEL, KLEPPER & KAHL, LLP
81 MOSHER ST
BALTIMORE MD 21217-9907

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

If mailing by mail, please close this tape

MTA Maryland **Transit Rider Survey** MARC

Please take a minute to help us plan for your transit needs by filling out this survey.
Return the completed survey to the surveyor OR drop it in any mailbox *(no postage required)*.

Please fill out this form even if you completed one on this or another one-way trip.

All personal information is confidential and WILL NOT be shared or sold.

Print letters/numbers clearly in upper case: A B C 1 2 3 Fill bubble with: ●

1. **REGISTER TO WIN ONE OF 10 MONTHLY PASSES WHEN YOU ANSWER ALL QUESTIONS!**
Please provide your name, telephone number, and home address or if you are just visiting, where you are staying in the Baltimore/Washington, D.C. area.

Name | Telephone | Street Number | Street Address (NO P.O. BOXES PLEASE) | Apt. # | City | State | Zip

The following questions are about **THIS ONE-WAY TRIP** you are making **NOW**!

Example of a One-way Trip: WORK (START) → RAIL → BUS → HOME (END)

2. What **TYPE OF PLACE** are you **COMING FROM NOW**? (starting place of this one-way trip) *(mark one only)*

○ Work ○ Recreation/Sightseeing/Restaurant ○ Shopping
○ College/University *(student only)* ○ Medical appointment/Hospital visit ○ Social visit/Church/Personal
○ School (K-12) *(student only)* ○ Airport *(air passenger only)* ○ Sporting event
○ Home → If you gave your Home address in Question 1 → **Go to Question 3** ○ Other (specify): _____

a. What is the **NAME** of the **PLACE, BUSINESS OR BUILDING** you are **COMING FROM NOW**? *Example:* B A L T I M O R E C I T Y H A L L
Place Name

b. What is the **ADDRESS** or **CROSS STREETS**? *Example:* 1 0 0 H O L L I D A Y S T
Address
Cross Streets &
City | State | Zip | For office use only

3. How did you **GET FROM THAT PLACE TO** the **FIRST BUS/TRAIN** on **THIS ONE-WAY TRIP**? *(mark one only)*

○ Walked/Wheelchair: → # blocks? ○ Carpooled (rode with someone else): → parking location? (Place Name/Address/Cross Streets)
○ Dropped off ○ Drove by myself: → parking location? (Place Name/Address/Cross Streets)
○ Bicycled ○ Other (specify): _____
○ Taxi

Continue inside →

4. If you **TRANSFERRED** to **GET TO THIS BUS/TRAIN** (the one you are riding now), which **ROUTE** did you use? *(mark one only)*

- ○ I did not transfer
- ○ MTA Bus Route Number/Name: _____

○ Washington Metrobus ○ MARC - Camden Line ○ Baltimore Light Rail
○ Washington Metrorail ○ MARC - Penn Line ○ Amtrak
○ MARC - Brunswick Line ○ Baltimore Metro Subway ○ Other (specify): _____

5. If you will **TRANSFER FROM THIS BUS/TRAIN** to **GET TO** your **FINAL DESTINATION** which **ROUTE** will you use? *(mark one only)*

- ○ I will not transfer
- ○ MTA Bus Route Number/Name: _____

○ Washington Metrobus ○ MARC - Camden Line ○ Baltimore Light Rail
○ Washington Metrorail ○ MARC - Penn Line ○ Amtrak
○ MARC - Brunswick Line ○ Baltimore Metro Subway ○ Other (specify): _____

6. How will you **GET FROM THE LAST BUS/TRAIN** to your **FINAL DESTINATION** on **THIS ONE-WAY TRIP**? *(mark one only)*

○ Walk/Wheelchair: → # blocks? ☐☐ ○ Carpool (will ride with someone else): → parking location? _____ (Place Name/Address/Cross Streets)
○ Get picked up ○ Drive by myself: → parking location? _____ (Place Name/Address/Cross Streets)
○ Bicycle ○ Other (specify): _____
○ Taxi

7. What **TYPE OF PLACE** is your **FINAL DESTINATION** on **THIS ONE-WAY TRIP**? *(mark one only)*

○ Work ○ Recreation/Sightseeing/Restaurant ○ Shopping
○ College/University *(student only)* ○ Medical appointment/Hospital visit ○ Social visit/Church/Personal
○ School (K-12) *(student only)* ○ Airport *(air passenger only)* ○ Sporting event
○ Home → If you gave your Home address in Question 1 → **Go to Question 8** ○ Other (specify): _____

a. What is the **NAME** of the **PLACE, BUSINESS OR BUILDING** you are **GOING TO NOW**?

Place Name

b. What is the **ADDRESS** or **CROSS STREETS**?

Address

Cross Streets &

City State Zip

8. **LIST ALL** of the **BUS ROUTES AND RAIL LINES** in the **EXACT ORDER** you will use to make **THIS ONE-WAY TRIP:**

FIRST Bus Route or Rail Line:	→	**SECOND** Bus Route or Rail Line:	→	**THIRD** Bus Route or Rail Line:	→	**FOURTH** Bus Route or Rail Line:

9a. If you used/will use **RAIL** *(Washington Metrorail, MARC, Baltimore Metro Subway or Baltimore Light Rail)* on **THIS ONE-WAY TRIP**, what was/will be the **FIRST** station **WHERE YOU BOARDED**? *(If you transfer between lines, write where you boarded your first train.)*

Rail Station Name ○ Did not/will not use rail on this one-way trip

9b. If you used/will use **RAIL** *(Washington Metrorail, MARC, Baltimore Metro Subway or Baltimore Light Rail)* on **THIS ONE-WAY TRIP**, what was/will be the **LAST** station **WHERE YOU WILL GET OFF**? *(If you transfer between lines, write where you will get off your last train.)*

Rail Station Name ○ Did not/will not use rail on this one-way trip

10. How did you **PAY** to get on **THIS VEHICLE**? *(mark one only)*

○ One-Way Cash Fare ○ Monthly Pass ○ Student Cash Fare ○ Senior Disability Monthly Pass
○ Day Pass ○ Transit Link Card ○ Senior/Disability One-Way Cash ○ Other (specify): _____
○ Weekly Pass ○ College Pass ○ Senior/Disability Day Pass
○ Ten-Trip Ticket ○ Student Ticket ○ Senior/Disability Weekly Pass

11. Does your **EMPLOYER PAY** for all or part of **YOUR FARE**?

○ Not employed ○ Employer paid nothing ○ Employer paid part ○ Employer paid all

12. How **OFTEN** do you ride transit to make **THIS ONE-WAY TRIP**?

○ 1 day a week ○ 4 to 5 days a week ○ 1 to 3 days a month ○ First time riding
○ 2 to 3 days a week ○ 6 to 7 days a week ○ Less than once a month

13. If **MTA** service were **NOT AVAILABLE AT ALL** how would you make **THIS ONE-WAY TRIP**?

○ Walk/Wheelchair ○ Drive by myself ○ Bicycle ○ Would not make this trip
○ Get dropped off ○ Carpool (ride with someone else) ○ Taxi ○ Other (specify): _____

14. How many children **UNDER THE AGE OF 11** are **TRAVELING WITH YOU** on **THIS ONE-WAY TRIP**?

○ None ○ 1 ○ 2 ○ 3 ○ 4 or more

15. Including yourself, how many people **OVER THE AGE OF 15** live in your household?

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 or more

16. Including yourself, how many people **OVER THE AGE OF 15** who live in your household are employed either **FULL-TIME** or **PART-TIME**?

○ None ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 or more

17. How many registered **CARS, TRUCKS,** or **MOTORCYCLES** are available to your household?

○ None ○ 1 ○ 2 ○ 3 ○ 4 or more

18. What is your **AGE**?

○ 11 - 15 ○ 16 - 24 ○ 25 - 34 ○ 35 - 49 ○ 50 - 64 ○ 65 + years of age

19. Do you have a **VALID DRIVER'S LICENSE**?

○ Yes ○ No

20. Are you...

○ Female ○ Male

21. What is your **RACE/ETHNICITY**? *(mark the bubble that best describes you)*

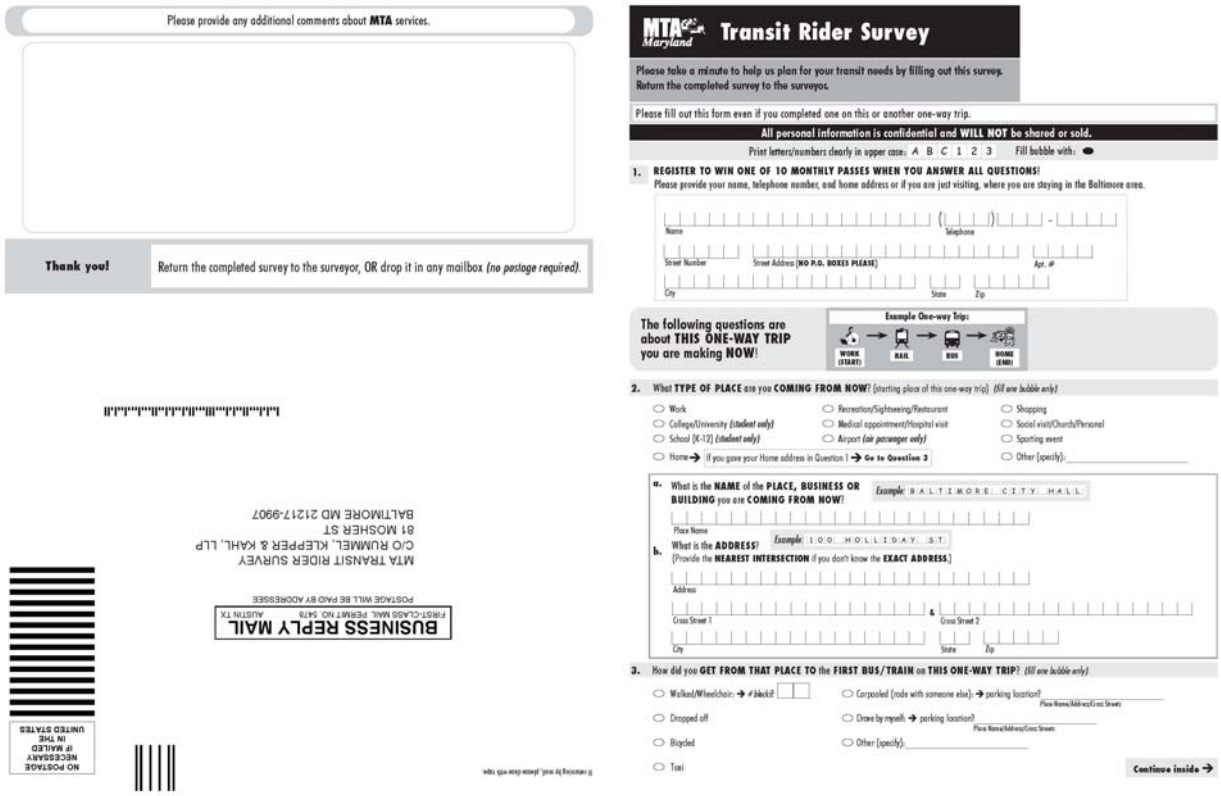
○ Asian ○ Hispanic ○ White ○ Other (specify): _____
○ Black/African American ○ Native American ○ More than one race/ethnicity

22. What was your estimated **TOTAL HOUSEHOLD INCOME** in 2006 before taxes?

○ $10,000 or less ○ $30,001 - $40,000 ○ $60,001 - $70,000 ○ $100,001 - $125,000
○ $10,001 - $20,000 ○ $40,001 - $50,000 ○ $70,001 - $80,000 ○ $125,001 - $150,000
○ $20,001 - $30,000 ○ $50,001 - $60,000 ○ $80,001 - $100,000 ○ More than $150,000

Please continue on the back →

Figure A-2: Phase II Survey Instrument (English)



Please provide any additional comments about **MTA** services.

Thank you! Return the completed survey to the surveyor, OR drop it in any mailbox *(no postage required)*.

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 5478 AUSTIN TX
POSTAGE WILL BE PAID BY ADDRESSEE

MTA TRANSIT RIDER SURVEY
C/O RUMMEL, KLEPPER & KAHL, LLP
81 MOSHER ST
BALTIMORE MD 21217-9907

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

MTA Maryland Transit Rider Survey

Please take a minute to help us plan for your transit needs by filling out this survey. Return the completed survey to the surveyor.

Please fill out this form even if you completed one on this or another one-way trip.

All personal information is confidential and WILL NOT be shared or sold.

Print letters/numbers clearly in upper case: A B C 1 2 3 Fill bubble with: ●

1. **REGISTER TO WIN ONE OF 10 MONTHLY PASSES WHEN YOU ANSWER ALL QUESTIONS!**
Please provide your name, telephone number, and home address or if you are just visiting, where you are staying in the Baltimore area.

Name ( ) Telephone -
Street Number Street Address (**NO P.O. BOXES PLEASE**) Apt. #
City State Zip

The following questions are about THIS ONE-WAY TRIP you are making NOW!

Example One-way Trip: WORK (START) → RAIL → BUS → HOME (END)

2. What **TYPE OF PLACE** are you **COMING FROM NOW**? (starting place of this one-way trip) *(fill one bubble only)*

- ○ Work
- ○ College/University *(student only)*
- ○ School (K-12) *(student only)*
- ○ Home → If you gave your Home address in Question 1 → **Go to Question 3**
- ○ Recreation/Sightseeing/Restaurant
- ○ Medical appointment/Hospital visit
- ○ Airport *(air passenger only)*
- ○ Shopping
- ○ Social visit/Church/Personal
- ○ Sporting event
- ○ Other (specify): _____

a. What is the **NAME** of the **PLACE, BUSINESS OR BUILDING** you are **COMING FROM NOW**? *Example:* B A L T I M O R E C I T Y H A L L
Place Name

b. What is the **ADDRESS**? *Example:* 1 0 0 H O L L I D A Y S T
(Provide the **NEAREST INTERSECTION** if you don't know the **EXACT ADDRESS**.)
Address
Cross Street 1 & Cross Street 2
City State Zip

3. How did you **GET FROM THAT PLACE TO** the **FIRST BUS/TRAIN** on **THIS ONE-WAY TRIP**? *(fill one bubble only)*

- ○ Walked/Wheelchair: → # blocks?
- ○ Dropped off
- ○ Bicycled
- ○ Taxi
- ○ Carpooled (rode with someone else): → parking location? Place Name/Address/Cross Streets
- ○ Drove by myself: → parking location? Place Name/Address/Cross Streets
- ○ Other (specify): _____

Continue inside →

Remember: The following questions are about THIS ONE-WAY TRIP you are making NOW!

Example One-way Trip: WORK (START) → RAIL → BUS → HOME (END)

4. If you **TRANSFERRED** to **GET TO THIS BUS/TRAIN** (the one you are riding now), which **ROUTE** did you use? *(fill one bubble only)*

- ○ I did not transfer
- ○ MTA Bus Route Number/Name: _____
- ○ Baltimore Metro Subway ○ MARC - Camden Line ○ Amtrak
- ○ Baltimore Light Rail ○ MARC - Penn Line ○ Other (specify): _____

5. If you will **TRANSFER FROM THIS BUS/TRAIN** to **GET TO** your **FINAL DESTINATION** which **ROUTE** will you use? *(fill one bubble only)*

- ○ I will not transfer
- ○ MTA Bus Route Number/Name: _____
- ○ Baltimore Metro Subway ○ MARC - Camden Line ○ Amtrak
- ○ Baltimore Light Rail ○ MARC - Penn Line ○ Other (specify): _____

6. How will you **GET FROM THE LAST BUS/TRAIN** to your **FINAL DESTINATION** on **THIS ONE-WAY TRIP**? *(fill one bubble only)*

- ○ Walk/Wheelchair: → # blocks? ☐☐
- ○ Carpool (will ride with someone else): → parking location? _____ (Place Name/Address/Cross Streets)
- ○ Get picked up
- ○ Drive by myself: → parking location? _____ (Place Name/Address/Cross Streets)
- ○ Bicycle
- ○ Other (specify): _____
- ○ Taxi

7. What **TYPE OF PLACE** is your **FINAL DESTINATION** on **THIS ONE-WAY TRIP**? *(fill one bubble only)*

- ○ Work ○ Recreation/Sightseeing/Restaurant ○ Shopping
- ○ College/University *(student only)* ○ Medical appointment/Hospital visit ○ Social visit/Church/Personal
- ○ School (K-12) *(student only)* ○ Airport *(air passenger only)* ○ Sporting event
- ○ Home → If you gave your Home address in Question 1 → **Go to Question 8**
- ○ Other (specify): _____

a. What is the **NAME** of the **PLACE, BUSINESS OR BUILDING** you are **GOING TO NOW**?

Place Name

b. What is the **ADDRESS**?
(Provide the **NEAREST INTERSECTION** if you don't know the **EXACT ADDRESS**.)

Address

Cross Street 1 & Cross Street 2

City State Zip

8. **LIST ALL** of the **BUS ROUTES AND RAIL LINES** in the **EXACT ORDER** you will use to make **THIS ONE-WAY TRIP:**

FIRST Bus Route or Rail Line:	**SECOND** Bus Route or Rail Line:	**THIRD** Bus Route or Rail Line:	**FOURTH** Bus Route or Rail Line:

9a. If you used/will use **RAIL** *(MARC, Baltimore Metro Subway or Baltimore Light Rail)* on **THIS ONE-WAY TRIP**, what was/will be the **FIRST** station **WHERE YOU BOARDED**? *(If you transfer between lines, write where you boarded your first train.)*

Rail Station Name ○ Did not/will not use rail on this one-way trip

9b. If you used/will use **RAIL** *(MARC, Baltimore Metro Subway or Baltimore Light Rail)* on **THIS ONE-WAY TRIP**, what was/will be the **LAST** station **WHERE YOU WILL GET OFF**? *(If you transfer between lines, write where you will get off your last train.)*

Rail Station Name ○ Did not/will not use rail on this one-way trip

10. How did you **PAY** to get on **THIS VEHICLE**? *(fill one bubble only)*

- ○ One-Way Cash Fare ○ Monthly Pass ○ Student Cash Fare ○ Senior Disability Monthly Pass
- ○ Day Pass ○ Transit Link Card ○ Senior/Disability One-Way Cash ○ Other (specify): _____
- ○ Weekly Pass ○ College Pass ○ Senior/Disability Day Pass
- ○ Ten-Trip Ticket ○ Student Ticket ○ Senior/Disability Weekly Pass

11. Does your **EMPLOYER PAY** for all or part of **YOUR FARE**?

○ Not employed ○ Employer paid nothing ○ Employer paid part ○ Employer paid all

12. Including yourself, how many people **OVER THE AGE OF 15** live in your household?

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 or more

13. Including yourself, how many people **OVER THE AGE OF 15** who live in your household are employed either **FULL-TIME** or **PART-TIME**?

○ None ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 or more

14. How many registered **CARS, TRUCKS,** or **MOTORCYCLES** are available to your household?

○ None ○ 1 ○ 2 ○ 3 ○ 4 or more

15. What is your **AGE**?

○ 11 - 15 ○ 16 - 24 ○ 25 - 34 ○ 35 - 49 ○ 50 - 64 ○ 65 + years of age

16. Do you have a **VALID DRIVER'S LICENSE**?

○ Yes ○ No

17. Are you...

○ Female ○ Male

18. What is your **RACE/ETHNICITY**? *(fill the bubble that best describes you)*

- ○ Asian ○ Hispanic ○ White ○ Other (specify): _____
- ○ Black/African American ○ Native American ○ More than one race/ethnicity

19. What was your estimated **TOTAL HOUSEHOLD INCOME** in 2006 before taxes?

- ○ $10,000 or less ○ $30,001 - $40,000 ○ $60,001 - $70,000 ○ $100,001 - $125,000
- ○ $10,001 - $20,000 ○ $40,001 - $50,000 ○ $70,001 - $80,000 ○ $125,001 - $150,000
- ○ $20,001 - $30,000 ○ $50,001 - $60,000 ○ $80,001 - $100,000 ○ More than $150,000

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