Metropolitan Washington Council of Governments (MWCOG)

2008 Regional Bus Survey

Technical Report

June 2009

NuStats a ptv group company

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Executive Summary

Key Findings

Jurisdiction of Residence

- Except for Metrobus, most systems primarily served residents of a particular geographic sub-area of the region.
- More than 10% of TheBus riders are DC residents.

Access Mode

- Except for PTRC and TheBus, more than half the riders access their bus by walking to it.
- The PRTC and TheBus systems have large percentages of riders who park-and-ride, at 22% and 15% respectively.
- PRTC was the system with the greatest percentage of auto passenger drop-offs (8%).
- TransIT and PRTC have the lowest percentage of rail-to-bus transfers (1% and 7%) while CUE had the highest percentage (26%).

Trip Purpose

- Commuting to work accounts for one-half to two-thirds of the trips on each bus system.
- TheBus was the system with the greatest percentage of its riders traveling for personal business reasons (28%).
- TransIT was the system with the greatest percentage of its riders making shopping trips or going to a restaurant (11%).
- A significant percentage of CUE and ART riders were traveling to school (17% for CUE and 15% for ART).

Fare Payment

- SmarTrip was the predominant payment method used by PRTC (57%) and Metrobus (42%).
- Cash was the primary mode of fare payment for TransIT (71%) and TheBus (63%) riders.
- A significant percentage of Ride-On (15%) and Metrobus (11%) riders paid their fare using a weekly pass.
- Approximately 5% of TheBus, TransIT and Ride-On riders paid a discounted senior citizen/disabled rider fare.

Transfers

- Between 60% and 70% of the riders on each system reported making one or more transfers to reach their destination.

- Only about 40% of PRTC riders reported transferring to another transit vehicle to complete their trip.

Transit Benefits

- Overall 24% of the surveyed bus riders reported receiving a transit benefit from their employer
- Approximately 42% of PRTC riders, 35% of DASH riders and 32% of ART riders said that they received a transit benefit.
- Only 5% of TransIT riders and 13% of TheBus riders said they received a transit benefit from their employer.

Auto Ownership

- Approximately 50% of the riders on the Metrobus, TransIT and TheBus systems are from households without autos or other vehicles.
- PRTC Riders were twice as likely to live in households with 2 or more vehicles than bus riders on other systems and three times more likely to live households with 3 or more vehicles in than riders on other systems.

Auto Availability on Trip

- Choice riders are riders who had a vehicle available to them to make the trip they were making, but "chose" to make the trip by bus instead. The PRTC ART and DASH systems had the greatest percentages of "choice" riders.

Race/Ethnicity

- The majority of riders on TheBus and Metrobus systems identified their race/ethnicity as Black/African American.
- By far, CUE had the greatest percentage of riders identifying themselves as Asian (31%).
- The ART and TransIT had high percentages of their riders identifying themselves as Hispanic, 27% on ART and 21% on TransIT.
- TheBus had the lowest percentage of riders identifying themselves as White (10%).
- The majority of riders on TheBus and Metrobus systems identified their race/ethnicity as Black/African American.

Annual Household Income

- Overall, 19% of the bus system riders surveyed reported annual household income of less than $10,000 and more than half of all riders reported household incomes of less than $40,000.
- Almost one-third of TransIT riders reported household incomes of less than $10,000.
- About one-quarter of PRTC riders reported household incomes in excess of $100,000.

Introduction

As Washington DC's regional Council of Governments, The Metropolitan Washington Council of Governments (COG) provides planning, coordination, and action for the region in the areas of comprehensive transportation planning, air and water quality management, environmental monitoring, economic development tracking, evaluating the impact of population growth in the region, public safety program coordination, and promoting adequate child care and housing.

Within COG, The National Capital Region Transportation Planning Board (TPB) serves as the Metropolitan Planning Organization. As such, The TPB is charged with the region's transportation planning activities. The conduct of a regional bus survey was funded within The TPB's Fiscal Year 2008 work program. The purposes of the regional bus survey is to: 1) collect the jurisdiction of residence data of Washington Metropolitan Transit Authority's (WMATA) weekday bus passengers in support of WMATA's bus subsidy allocation formula; 2) collect origin and destination trip patterns of the local jurisdiction bus systems for local bus route planning and regional travel demand model validation; and 3) collect other travel-related and demographic data to update the regional profile of WMATA and local bus system riders and their related bus trips.

In the Spring of 2008, a Regional On-Board Bus Survey was conducted by NuStats on behalf of The TPB. NuStats provided consulting in the areas of survey design, sample review, data collection, data processing, and analysis.

The survey instrument was developed based on previous bus surveys conducted by MWCOG and WMATA as well as a recently-completed on-board survey conducted by the Maryland Transit Administration. The purpose for this coordinated effort was to ensure the resulting dataset can be used in both local transit planning and modeling as well as regional travel demand modeling which includes transit travel between Maryland and Washington DC and surrounding areas.

Data collection, the most labor-intensive and complex task of the survey effort was conducted from X to June 30, 2008. The sampled trips were selected by TPB, while NuStats developed the surveyor assignments, based on the selected trips. A total of 32,425 initial surveys were collected (i.e., returned by respondents as "completed"). After a data quality review of each survey (completeness, accuracy, and quality), a total of 28,420 surveys were deemed complete and included in the final weighted and expanded dataset. Data collection was conducted between April 15th and June 30th, 2008.

Following the data collection, NuStats processed the data using automated and manual data checks. Subsequent to the data processing, TPB weighted and expanded the dataset. The resultant weighted and expanded dataset is used in the data analysis task.

This report provides detailed information on the methods employed and the results of the survey. Section 1, Methods, includes details on the sampling, survey procedures, survey instrument design, and data collection challenges and solutions. Section 2, Survey Data Analysis, includes demographic and travel characteristics of respondents.

1. Survey Methods

The MWCOG data collection effort focused on systems in and around the Washington D.C. area. The systems surveyed were: Metro Bus D.C., Metro Bus Maryland, Metro Bus Virginia, Ride-On (Montgomery County, MD), The Bus (Prince Georges County, MD), TransIT (Frederick County, VI), ART (Arlington County, VI), DASH (Alexandria, VI) CUE (Fairfax, VI), and the PRTC (Woodbridge area, VI). While Louden County, VI was originally part of the sample frame, this service was not sampled due to a recently completed survey. Every passenger over the age of 16 (determined by visual estimation), who boarded the sampled trip received a questionnaire.

Approach to Sampling Bus Trips

The MWCOG on-board survey was a trip based sample. The original distribution of trips, as proposed, was as follows:

Table 1.1: Planned Sampled Trips by System

Transit System	*Service Area*	*Trips to Sample*
Metrobus DC	D.C.	1,920
Metrobus MD	Maryland	945
Metrobus VA	Virginia	735
Ride-On	Montgomery County, MD	725
The Bus	Prince George's Co., MD	100
TransIT (Frederick County Transit)	Frederick County, MD	20
ART (Arlington Transit)	Arlington Co., VA	30
DASH (Alexandria Transit Co.)	Alexandria, VA	100
CUE	Fairfax, VA	30
LC Transit (VA Regional Transit Assoc)	Louden County (Leesburg), VA	20
OmniRide/OmniLink (PRTC)	Woodbridge area, VA	80
	Total	**4,705**

Using criteria derived by MWCOG, trips were selected to be sampled during the course of the study. This file was delivered to NuStats who were allowed to make slight adjustments to maximize efficiency of the surveying effort. Upon finalization of the trips to be surveyed, assignments were generated to make most efficient use of surveyor time. Upon full processing of the trips in an assignment, an assessment was made at the trip level to determine the productivity of the trips. If a trip did not yield the amount of completed questionnaires deemed appropriate (response rate of 15% or better) this trip became eligible for re-surveying. In order to make the best use of the resources available, these trips were prioritized based on type of route (regional or not for WMATA), number of trips within assignment that didn't reach the 15% mark, and ridership encountered on these trips. NuStats re-surveyed trips within assignments and in some cases entire assignments with the intent to bolster the individual trip numbers.

The table below illustrates the number of trips surveyed from each system both in terms of the original survey effort and the re-survey effort. A total of 5,005 trips were surveyed producing 28,420 completed records.

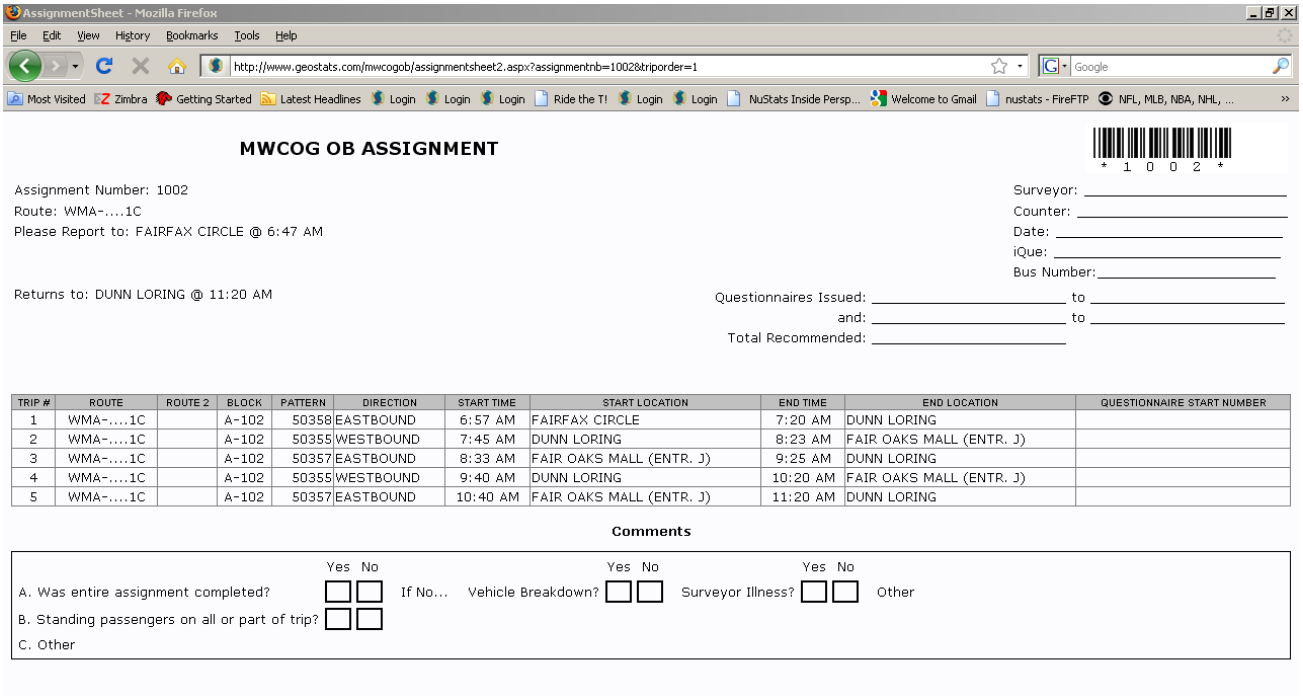
Table 1.2 – Actual Trips Sampled by System

Transit System	*Original Survey Effort # of Trips*	*Re-Surveyed # of Trips*	*Total # of Trips Surveyed*
ART (Arlington Transit)	70	4	74
The Bus (PGC)	147	0	147
CUE (Fairfax, VI)	30	0	30
DASH (Alexandria Transit Co.)	99	0	99
TransIT (Frederick County Transit)	39	0	39
OmniRide/OmniLink (PRTC)	76	0	76
Ride-On (Montgomery Co.)	710	6	716
Metro Bus (D.C, VI, MD)	3,533	291	3,824
Total	**4,704**	**301**	**5,005**

Surveyor Assignments

The final sampling task was the uploading of sampled trips to a web-based field management system to create surveyor assignment sheets. Surveyor assignment sheets were printed from the web-based management system and included the organized bus trips to be sampled, along with specific information for reporting time and location. The assignment sheets were also bar-coded to link them to the field management system. An example assignment sheet is presented in Figure 1.1.

Figure 1.1 - Example Assignment Sheet



AssignmentSheet - Mozilla Firefox

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http://www.geostats.com/mwcogob/assignmentsheet2.aspx?assignmentnb=1002&triporder=1

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MWCOG OB ASSIGNMENT

* 1 0 0 2 *

Assignment Number: 1002
Route: WMA-....1C
Please Report to: FAIRFAX CIRCLE @ 6:47 AM

Returns to: DUNN LORING @ 11:20 AM

Surveyor: _____
Counter: _____
Date: _____
iQue: _____
Bus Number: _____

Questionnaires Issued: _____ to _____
and: _____ to _____
Total Recommended: _____

TRIP #	ROUTE	ROUTE 2	BLOCK	PATTERN	DIRECTION	START TIME	START LOCATION	END TIME	END LOCATION	QUESTIONNAIRE START NUMBER
1	WMA-....1C		A-102	50358	EASTBOUND	6:57 AM	FAIRFAX CIRCLE	7:20 AM	DUNN LORING	
2	WMA-....1C		A-102	50355	WESTBOUND	7:45 AM	DUNN LORING	8:23 AM	FAIR OAKS MALL (ENTR. J)	
3	WMA-....1C		A-102	50357	EASTBOUND	8:33 AM	FAIR OAKS MALL (ENTR. J)	9:25 AM	DUNN LORING	
4	WMA-....1C		A-102	50355	WESTBOUND	9:40 AM	DUNN LORING	10:20 AM	FAIR OAKS MALL (ENTR. J)	
5	WMA-....1C		A-102	50357	EASTBOUND	10:40 AM	FAIR OAKS MALL (ENTR. J)	11:20 AM	DUNN LORING	

Comments

Yes No

A. Was entire assignment completed? ☐☐ If No... Vehicle Breakdown? ☐☐ Surveyor Illness? ☐☐ Other

B. Standing passengers on all or part of trip? ☐☐

C. Other

Survey Instrument

The survey instrument was designed as a self-completion questionnaire with 12 primarily self-coded questions. The set of data items are presented in Table 1.3. For the purposes of this study, which includes jurisdiction revenue allocation based on residence of transit rider as one of the two key objectives (in addition to transit demand modeling needs), any home address or partial home address

with a city name or zip code is valid survey record. In addition, if any city name or zip code information was captured for the origin or destination address or if any easily identifiable location information (eg. the Pentagon, US Capitol, Old Soldiers Home, Walter Reed, Andrews AFB, etc.) is presented as an origin or destination, the questionnaire is considered a valid survey record.

Questionnaires were attractively designed in a two-sided z-fold letter-size format, and printed on heavy card stock for easy distribution and completion. Each survey contained a business reply mail permit for off-bus completion and mail-back. The form was pre-printed with a unique serial number and bar code, which linked each questionnaire to trip-level distribution on a specific trip. Text on the questionnaire invited passengers to register to win a $100 SMARTRIP Card prize by providing their name, telephone number, and home address. This technique captured accurate information for home address, which for a majority of trips was either the trip origin or the trip destination. The questionnaire was designed to obtain information in three major categories: origin/destination travel patterns, access and egress modes, and rider demographics. As noted in Table 1.3, some of the data elements were captured by means other than a question on the questionnaire. This approach had multiple benefits: (1) the questionnaire was shorter to enhance response, and (2) data quality was improved by circumventing respondent-provided information. The questionnaire was developed to accommodate two languages, English and Spanish.

Table 1.3 - Key Data Elements and Capture Method

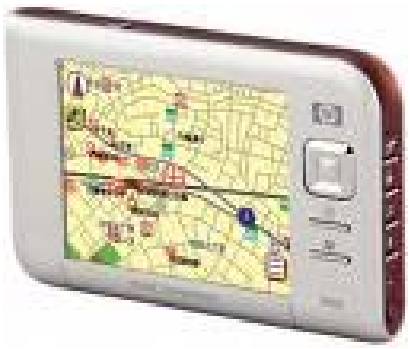
Key Data Element	*Capture Method*
Day of Travel	GPS-enhanced Palm device
Time of Travel	GPS-enhanced Palm device
Route	GPS-enhanced Palm device
Questionnaire Language	Field Code by editor
Home Address	Questionnaire
Origin	Respondent reported on questionnaire with qualifying language that this is unnecessary if respondent started trip at home and has registered to win drawing
Destination	Same as origin
Bus Stop On	GPS-enhanced Palm device
Bus Stop Off	Imputed using information from other sources: Destination, Egress Mode, Distance, and GPS data on bus stops for the sampled trip
Trip Purpose	Questionnaire
Access Mode	Questionnaire
Egress Mode	Questionnaire
Fare	Questionnaire
Transit Benefit from Employer	Questionnaire
Number of Transfers	Questionnaire

Key Data Element	*Capture Method*
Number of Vehicles in HH	Questionnaire
Household Income	Questionnaire
Ethnicity	Questionnaire

Survey Procedures

Survey questionnaires were distributed to all boarding passengers over the age of 16, and were counted by a second on-board surveyor during boarding and alighting. The "counters" used a GPS-enhanced palm device (see Figure 1.2).

Figure 1.2 - GPS-Enhanced Palm Device for On-Board Counts



The Palm device recorded the location and time (arrival and departure) at each bus stop, and counters entered the number of passengers boarding and alighting. By entering the top questionnaire number into the unit prior to arrival at a bus stop, this process also linked a sequence of questionnaires directly to a bus stop These data were uploaded daily into a web-based field management system designed to manage surveyor assignments, provide progress reports and data summary tables, and monitor field staff performance.

Labor Recruitment and Training

Surveyors were asked to have lived in the service area and were screened to ensure they had good work habits, were personable, honest, mature, potentially had reliable personal transportation, and paid attention to details. Every individual was trained on both aspects of surveying and counting. This ensured both team members understood each other's roles and responsibilities. Surveyors were trained to read and understand assignment sheets, and were taught basic survey procedures, etiquette, and how to approach riders. The training included role-playing and intensive tutoring.

Counters were trained in the use of the hand-held palm devices, the ride count program, and on-board etiquette. Directly following classroom training, supervisors provided short assignments around three hours in length to each surveyor/counter team for a practice run. Following completion of the initial assignments, surveyor teams were required to return to the survey command center where supervisors verified the accuracy of the surveyor's work. Assignments were then handed out for the next day.

Additional training was conducted if either one of the team members had issues with their first assignment. Throughout the entire project feedback was given to all workers to resolve all issues.

Survey Administration

The full survey was managed by an in-field NuStats survey team comprised of a Data Collection Manager, or proxy, and field coordinators. The initial training was conducted on April 14th and 15th , 2008, prior to the start and during the first week of data collection with First Choice and Express Professional Services (Express). Of the just under 100 people who attended the first two trainings, 71 completed an assignment during that first week. As to be expected for a data collection of this length, additional training were expected to occur. Unfortunately, due to a higher than expected level of attrition, significantly more trainings had to occur to maintain adequate staffing levels. Of the 71 employees who completed an assignment during the first week, only 39 remained entering week three.

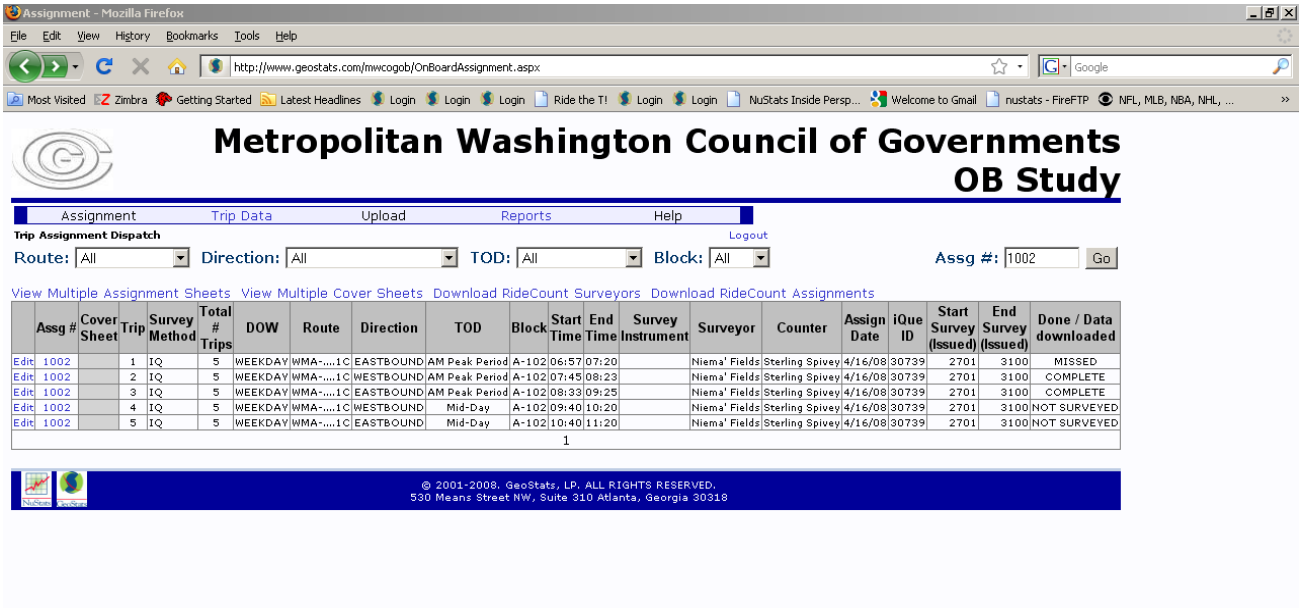
Because we were monitoring this situation, additional training were held near the end of the second week of data collection. For that training, people from both First Choice and Express in attendance, approximately 30 potential team members were trained of which 22 completed their first assignment. All but three of these employees worked through week three.

We were able to hold relatively steady through week three, but by mid-week four, we were down to 51 team members. Because of these numbers, we schedule an additional training for week five with Express and First Choice. Approximately 25 people attended of which 19 completed their first assignment. Unfortunately, of these 20 team members, only eight entered week six of the data collection. Because of this extremely high attrition rate in such a short amount of time, it was determined that both of these temp agencies had reached their limit of usable resources, so an additional staffing agency would have to be employed.

Based on the recommendation of MWCOG, Temporary Staffing Solutions (Telesec) was brought onto the project and a training of approximately 25 people occurred during the seventh week of data collection of which 19 completed an assignment. By the end of the eighth week, we were down to only 44 team members so an additional training was held during week nine using additional members from Telesec. An additional 11 or so people were trained of which nine completed an assignment. The data collection concluded at the end of the tenth week, the week ending June 20th. Over the course of the entire data collection, NuStats trained approximately 200 potential employees.

On-board data collection was conducted by teams that consisted of a surveyor and a counter. The surveyor handed out questionnaires, persuaded passengers to complete the questionnaires, assisted with questions, and collected questionnaires. The counter entered the questionnaire numbers into the hand-held units to link questionnaires to a bus stop, counted the passengers boarding and alighting, selected bus information when boarding or alighting occurred, collected questionnaires, and validated passenger loads after each stop. Daily assignments were distributed by the surveyor manager or supervisors. See Figure 1.3 for a sample of the web-based assignment screen.

Figure 1.3 - Sample Assignment Management Screen



	Assg #	Cover Sheet	Trip	Survey Method	Total # Trips	DOW	Route	Direction	TOD	Block	Start Time	End Time	Survey Instrument	Surveyor	Counter	Assign Date	iQue ID	Start Survey (Issued)	End Survey (Issued)	Done / Data downloaded
Edit	1002		1	IQ	5	WEEKDAY	WMA-....1C	EASTBOUND	AM Peak Period	A-102	06:57	07:20		Niema' Fields	Sterling Spivey	4/16/08	30739	2701	3100	MISSED
Edit	1002		2	IQ	5	WEEKDAY	WMA-....1C	WESTBOUND	AM Peak Period	A-102	07:45	08:23		Niema' Fields	Sterling Spivey	4/16/08	30739	2701	3100	COMPLETE
Edit	1002		3	IQ	5	WEEKDAY	WMA-....1C	EASTBOUND	AM Peak Period	A-102	08:33	09:25		Niema' Fields	Sterling Spivey	4/16/08	30739	2701	3100	COMPLETE
Edit	1002		4	IQ	5	WEEKDAY	WMA-....1C	WESTBOUND	Mid-Day	A-102	09:40	10:20		Niema' Fields	Sterling Spivey	4/16/08	30739	2701	3100	NOT SURVEYED
Edit	1002		5	IQ	5	WEEKDAY	WMA-....1C	EASTBOUND	Mid-Day	A-102	10:40	11:20		Niema' Fields	Sterling Spivey	4/16/08	30739	2701	3100	NOT SURVEYED

1

As assignments were handed out, information was updated in the web-based field management system. When surveyors and counters returned from an assignment, the surveyor manager or supervisors checked the assignment results (i.e., quickly reviewed the questionnaires to spot any glaring performance issues) and downloaded the passenger count data from the Palm devices. If the surveyor managers or supervisors noticed errors with the assignment results (i.e. incomplete data on the surveys), those specific surveys were then pulled for in-field questionnaire editing and surveyors and counters were reminded to look for errors while in the field. The surveyor manager updated the assignment status in the web-based field management system, and then handed out the next assignment. Once the completed assignments were reviewed, the questionnaires were sent to the in-field editing team for inspection and coding prior to being sent to Austin, the location of NuStats' headquarters, for scanning and verification.

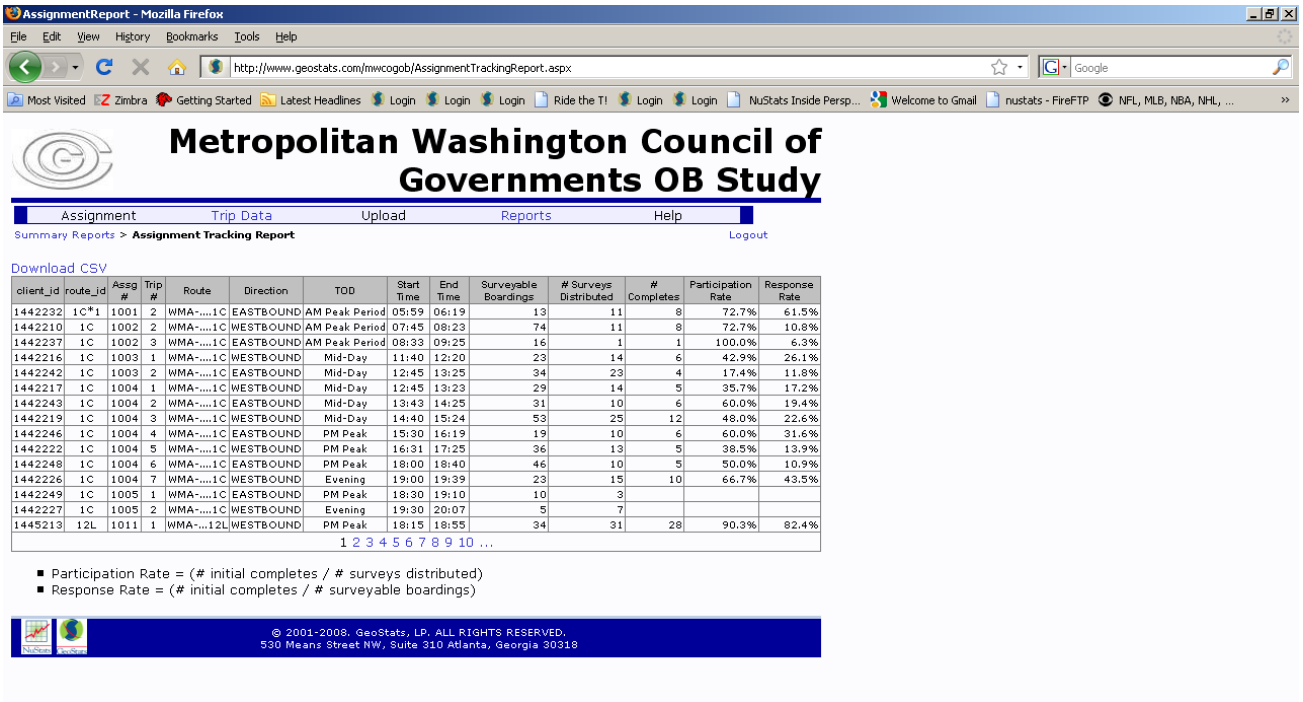
In-Field Questionnaire Editing

Following the surveyor check-in, completed questionnaires were presented to on-site data editors for editing and correction. The data editors were three local residents who were familiar with the geography of the transit service area. Data editors reviewed each completed questionnaire and used geographic resources to complete or correct address information. This process provided a means to "save" questionnaires with a few address research steps in the field. After each questionnaire had been reviewed, data managers scanned the bar code on the questionnaire using a procedure that identified the questionnaire as a "complete." This information was uploaded to the field management system as one data input for the status reports. "Complete" questionnaires were sent to Austin for scanning and verification.

Status Reporting

The Data Collection Manager was responsible for preparing status reports from the web-based field management system. This automated application conducted consistency checks, flagged problem records, and cleaned and purged flagged records. The Data Collection Manager reviewed this information for accuracy in the status, response, and performance reports to the web-based field management system. A sample report is shown in Figure 1.4.

Figure 1.4 - Sample Onboard Completes Report



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Metropolitan Washington Council of Governments OB Study

Assignment Trip Data Upload Reports Help

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client_id	route_id	Assg #	Trip #	Route	Direction	TOD	Start Time	End Time	Surveyable Boardings	# Surveys Distributed	# Completes	Participation Rate	Response Rate
1442232	1C*1	1001	2	WMA-....1C	EASTBOUND	AM Peak Period	05:59	06:19	13	11	8	72.7%	61.5%
1442210	1C	1002	2	WMA-....1C	WESTBOUND	AM Peak Period	07:45	08:23	74	11	8	72.7%	10.8%
1442237	1C	1002	3	WMA-....1C	EASTBOUND	AM Peak Period	08:33	09:25	16	1	1	100.0%	6.3%
1442216	1C	1003	1	WMA-....1C	WESTBOUND	Mid-Day	11:40	12:20	23	14	6	42.9%	26.1%
1442242	1C	1003	2	WMA-....1C	EASTBOUND	Mid-Day	12:45	13:25	34	23	4	17.4%	11.8%
1442217	1C	1004	1	WMA-....1C	WESTBOUND	Mid-Day	12:45	13:23	29	14	5	35.7%	17.2%
1442243	1C	1004	2	WMA-....1C	EASTBOUND	Mid-Day	13:43	14:25	31	10	6	60.0%	19.4%
1442219	1C	1004	3	WMA-....1C	WESTBOUND	Mid-Day	14:40	15:24	53	25	12	48.0%	22.6%
1442246	1C	1004	4	WMA-....1C	EASTBOUND	PM Peak	15:30	16:19	19	10	6	60.0%	31.6%
1442222	1C	1004	5	WMA-....1C	WESTBOUND	PM Peak	16:31	17:25	36	13	5	38.5%	13.9%
1442248	1C	1004	6	WMA-....1C	EASTBOUND	PM Peak	18:00	18:40	46	10	5	50.0%	10.9%
1442226	1C	1004	7	WMA-....1C	WESTBOUND	Evening	19:00	19:39	23	15	10	66.7%	43.5%
1442249	1C	1005	1	WMA-....1C	EASTBOUND	PM Peak	18:30	19:10	10	3			
1442227	1C	1005	2	WMA-....1C	WESTBOUND	Evening	19:30	20:07	5	7			
1445213	12L	1011	1	WMA-...12L	WESTBOUND	PM Peak	18:15	18:55	34	31	28	90.3%	82.4%

1 2 3 4 5 6 7 8 9 10 ...

- Participation Rate = (# initial completes / # surveys distributed)
- Response Rate = (# initial completes / # surveyable boardings)

530 Means Street NW, Suite 310 Atlanta, Georgia 30318

Project Challenges and Solutions

In any project there are going to be challenges to overcome particularly during the data collection effort. As these challenges were encountered in the field, NuStats focused on dealing immediately with the issues and looked for process improvements to minimize any negative results to the study.

In general, it was very difficult to acquire and keep employees for a prolonged period of time during the project. (The number of trainings and the volume of people trained are included in this report.) In addition to basic surveyor attrition, another challenge was the type of assignments that we had to distribute. Based on the nature of the sample, it was often difficult to piece together a seven to eight hour day without working split shifts, working both the a.m. and p.m. peak shifts with substantial time without an assignment in between. In an effort to combat this issue, multiple trainings were conducted to find staff who possessed the right skill set, and whose schedule met the needs of the project.

Another challenge was the lack of receptiveness by some of the passengers, specifically on certain routes in the D.C. area. We routinely encounter this in other regions, but it was a greater presence in the Washington D.C. area. Surveyors were encouraged (through one-on-one training) to stress the incentive to increase participation amongst respondents, and further explain the importance of the survey to those who were reluctant to take part. Having to deal with a public that was either apathetic, or at times unruly, made it more difficult to collect questionnaires and this frustration further increased surveyor attrition.

There were other surveyor issues that demanded immediate attention. In one case, a surveyor was trying to sell their fare card (the fare card surveyors were issued to perform their assignments) to the general public. This individual was released from the project immediately as our field managers became aware of this. All other surveyors were further notified that project field management and the client were observing the project anonymously and that any deviation from survey protocol would not be tolerated and immediately release from the project would occur if not.

Another incident occurred in the MWCOG building in which a team member assaulted their survey team member. This individual was terminated from the project immediately and the temporary staffing was notified. Allegations were also made that a temporary surveyor stole a laptop and an umbrella on their way in or out of the MWCOG offices. While this was not substantiated, NuStats staff began escorting all employees in and out of the building to ensure no other incidents of this nature occurred.

A final major issue was the bus stop files provided for each system and each route did not contain all of the designated stops. Basically, only time points along each bus trip was provided which prevented counters to count boardings at each stop, as is the usual protocol. An adjustment to the counting procedures was made instructing counters to select the nearest intersection where the boarding or alighting occurred.

2. Survey Data Analysis

Background

The survey was distributed among bus passengers of Arlington County Transit (ART), Prince George's County (TheBus), City of Fairfax (CUE), Alexandria (DASH), Frederick County (TransIT), Potomac Rappahannock Transit Commission (PRTC), Montgomery County (Ride-On), and WMATA's MetroBus. A separate, independent survey was conducted among Fairfax Connector passengers. Results included for the Fairfax Connector survey were provided separately and inserted into the data tables manually. All results are based on weighted/expanded data unless otherwise noted. The following table summarizes the distribution of unlinked trips by transit system.

Table 2.1 – Unlinked Trips by Transit System

Transit System	*Frequency*	*Percent*
TransIT	2,813	0.4%
CUE	3,563	0.6%
ART	4,719	0.7%
PRTC	12,425	1.9%
DASH	14,673	2.3%
TheBus	15,262	2.4%
Fairfax Connector	37,600	5.8%
Ride-On	97,966	15.2%
MetroBus	454,897	70.6%
Total	643,918	100.0%

May not sum to 100% due to rounding.

Demographics

Passengers can access nearly any transit system regardless of their jurisdiction of residence. However, most transit systems provide service to a particular to certain geographic areas of the region as the following table illustrates. MetroBus is the exception – passengers reside in DC, Maryland, and Northern Virginia. And, although TheBus mainly operates in Prince George's County, just over ten percent of TheBus riders reside in DC.

Table 2.2 – Bus Riders Jurisdiction of Residence

Transit System	*Washington DC*	*Suburban Maryland*	*Northern Virginia*	*Outside Region*
ART	5%	4%	90%	1%
TheBus	11%	88%	1%	---
CUE	5%	5%	88%	2%
DASH	3%	3%	94%	1%
TransIT	---	97%	---	3%
PRTC	---	1%	98%	1%
Connector	3%	3%	91%	3%
Ride-On	5%	93%	1%	1%
Metrobus	49%	33%	16%	1%
All	38%	43%	18%	1%

May not sum to 100% due to rounding.

Bus Riders can be categorized as "choice" riders or not based on the availability of a vehicle when they made their transit trip ("chose" to ride transit even though a vehicle was available to make the same trip on which they were surveyed). Choice riders appear to be more prevalent among ART, DASH, and PRTC passengers, while the lowest percentages appear to be among TransIT and TheBus passengers with nearly one-in-four passengers who did not have a vehicle available to make the trip on which they were surveyed. The table below summarizes the percentage of passengers with and without a vehicle available for the trip.

Table 2.3 – Vehicle Availability on Surveyed Trip

Transit System	*Yes*	*No*
ART	42%	58%
TheBus	27%	73%
CUE	33%	67%
DASH	40%	60%
TransIT	24%	76%
PRTC	54%	46%
Connector	46%	54%
Ride-On	30%	70%
Metrobus	28%	72%
All	29%	71%

May not sum to 100% due to rounding.

As can be expected, the systems with the lowest percentage of "Choice" riders are likely to have low percentages of auto ownership among its passengers. Nearly half or more of TheBus (49%), TransIT (52%), and Metrobus (53%) passengers do not have a usable auto, van, truck, or SUV available at their home. PRTC passengers were are as likely than passengers on other systems to live in a household with two or more vehicles. They are also three times as likely than other system passengers to have three or more vehicles available to their household. The following table summarizes the auto availability of passengers by system.

Table 2.4 – Vehicle Availability by System

	Number of HH Vehicles			
Transit System	*No Vehicles*	*One Vehicle*	*Two Vehicles*	*Three or More Vehicles*
ART	43%	42%	13%	3%
TheBus	49%	26%	21%	4%
CUE	45%	31%	19%	5%
DASH	37%	43%	17%	3%
TransIT	52%	31%	10%	7%
PRTC	26%	30%	28%	17%
Connector	32%	32%	27%	9%
Ride-On	43%	31%	19%	6%
Metrobus	53%	30%	13%	4%
Total	50%	31%	14%	5%

May not sum to 100% due to rounding.

The majority of riders on TheBus and MetroBus identified their race/ethnicity as Black/African American, while TheBus also had the lowest percentages of riders who identified themselves as White. Nearly one-third (31%) of CUE riders identify themselves as Asian – the highest percent of Asian riders among all bus systems in the survey. Among Hispanic riders, ART and TransIT have the highest percentages at 27% and 21% respectively. The following table summarizes the race/ethnicity distribution by transit system.

Table 2.5 – Race/Ethnicity of Riders by System

	Asian	*Black/African-American*	*Hispanic*	*Native American*	*White*	*Multi-Racial*	*No Response*
ART	4%	34%	27%	---	28%	1%	6%
TheBus	2%	70%	10%	---	10%	1%	7%
CUE	31%	18%	14%	---	31%	2%	3%
DASH	7%	35%	15%	1%	33%	1%	9%
TransIT	2%	42%	21%	---	31%	4%	1%
PRTC	4%	36%	14%	1%	38%	1%	6%
Connector					35%		
Ride-On	9%	45%	16%	---	23%	2%	6%
Metrobus	4%	59%	10%	1%	19%	2%	6%
Total	5%	56%	11%	1%	20%	2%	6%

May not sum to 100% due to rounding.

Nearly one-in-five (19%) of all bus system riders reported an annual household income of less than $10,000 and more than half reported an annual household income of less than $40,000. TransIT riders have the highest percentage of riders with an annual income of less than $10,000 at nearly one-third (31%). PRTC has the highest percentage (28%) of riders in the highest income category of $100,000 or more. Table 2.5 summarizes the annual household income distributions by bus system.

Table 2.5 – Household Annual Income by System

	<10K	*10-20K*	*20-40K*	*40-60K*	*60-100K*	*100K+*	*No Response*
ART	22%	10%	15%	10%	15%	14%	14%
TheBus	16%	8%	24%	11%	17%	7%	17%
CUE	20%	9%	19%	15%	10%	12%	15%
DASH	16%	8%	20%	13%	16%	14%	13%
TransIT	31%	9%	32%	11%	5%	3%	8%
PRTC	14%	6%	13%	9%	18%	28%	12%
Connector	13%	8%	15%	11%	17%	20%	16%
Ride-On	18%	10%	20%	15%	13%	9%	15%
Metrobus	19%	11%	23%	14%	12%	9%	12%
Total	19%	10%	22%	14%	13%	9%	13%

May not sum to 100% due to rounding.

Travel Characteristics

Respondents were asked how they accessed the bus on which they were surveyed. The majority of bus passengers, with the exception of PRTC and TheBus, walked to access the bus. Compared to the other bus systems, a larger percentage of PRTC and TheBus passengers accessed the bus on which they were surveyed by park-and-ride at 22% and 15% respectively. PRTC had the highest of bus passenger drop offs at 8%, more than double the Fairfax Connector, which was the next highest. Among rail-to-bus transfers, TransIT and PRTC had the lowest percentage at 1% and 7% respectively, while CUE had just over one-in-four (26%) of their passengers who transfer to the bus from rail. The following table summarizes the access mode by system.

Table 2.6 – Access Mode by System

	Walk	*Metrorail*	*Bus*	*Auto Driver*	*Auto Passenger*	*Bike*	*Other*
ART	76%	15%	7%	1%	---	---	1%
TheBus	49%	21%	10%	15%	3%	---	2%
CUE	65%	26%	6%	1%	1%	---	1%
DASH	71%	14%	10%	1%	2%	---	1%
TransIT	70%	1%	25%	1%	1%	---	1%
PRTC	49%	7%	12%	22%	8%	---	2%
Connector	45%	29%	12%	7%	4%	---	2%
Ride-On	54%	19%	20%	2%	3%	---	1%
Metrobus	59%	17%	18%	2%	2%	---	1%
All	58%	17%	18%	3%	2%	---	1%

May not sum to 100% due to rounding.

Passengers were asked the purpose for their bus trip. A majority of the trips were for going to work with the lowest (52%) among Ride-On passengers and the highest (71%) among Connector passengers. A higher percentage of CUE (17%) and ART (15%) passengers compared to those of other systems ride the bus to school. No other system has more 6% of the passengers riding public transit buses to school. Among trips for personal business reasons, TheBus has the highest percentage at 28%. Shopping trips

or going to a restaurant using the bus was more popular among TransIT passengers (11%) than any other system. Table 2.7 displays the percent distribution of trip purpose by transit system.

Table 2.7 – Trip Purpose by System

Transit System	*Go to Work*	*Job-Related*	*Personal Business*	*Shopping or Meal*	*To School*	*Social Recreational*	*Other*
ART	62%	3%	13%	6%	15%	1%	---
TheBus	54%	4%	28%	6%	5%	3%	---
CUE	57%	2%	14%	3%	17%	5%	2%
DASH	63%	4%	14%	8%	6%	5%	1%
TransIT	56%	10%	18%	11%	4%	2%	---
PRTC	68%	3%	13%	9%	4%	3%	---
Connector	71%	3%	9%	7%	3%	4%	2%
Ride-On	52%	4%	19%	9%	9%	6%	1%
Metrobus	55%	5%	20%	7%	7%	5%	---
All	55%	5%	20%	7%	8%	5%	1%

May not sum to 100% due to rounding.

Cash and SmarTrip were the two most predominant methods of fare payment across all transit systems. Just over seven-in-ten (71%) TransIT passengers paid their fare with cash, while 63% of TheBus passengers did the same. All other systems had at least one-in-three passengers pay with cash. PRTC had the highest percentage of passengers who paid their fare using SmarTrip at nearly six-in-ten passengers (57%). The bus had the lowest SmarTrip utilization at only 8%. Ride-On and Metrobus had the highest utilization of a weekly pass with 15% and 11% respectively. Approximately 5% of TheBus, TransIT, and Ride-On passengers paid for the trip using a discounted senior citizen/disabled rider fare, about two percentage points more than any other system. The following table summarizes the fare payment media by system.

Table 2.8 – Fare Payment Media by System

	Cash	*Smart Trip*	*Weekly Pass*	*Rail Transfer*	*Bus Transfer*	*Senior Discount*	*Other*
ART	45%	36%	8%	2%	2%	1%	7%
TheBus	63%	8%	3%	3%	6%	6%	11%
CUE	39%	31%	2%	2%	3%	---	24%
DASH	43%	37%	2%	2%	4%	---	12%
TransIT	71%	---	---	3%	4%	5%	18%
PRTC	34%	57%	---	---	---	1%	8%
Connector	38%	51%	2%	3%	2%	2%	4%
Ride-On	34%	26%	15%	2%	2%	5%	16%
Metrobus	34%	42%	11%	2%	3%	3%	5%
All	35%	38%	11%	2%	3%	4%	7%

May not sum to 100% due to rounding.

Between 60% and 70% of the riders reported making at least one transfer to reach their final destination. Between 3% and 6% of passengers in each system make three or more transfers. RPTC passengers make the fewest transfers with 58% making no transfers to get to their final destination.

Table 2.9 – Number of Transfers by System

Transit System	*No Transfers*	*One Transfer*	*Two Transfers*	*Three or More Transfers*
ART	38%	45%	13%	4%
TheBus	31%	47%	16%	6%
CUE	38%	47%	12%	3%
DASH	40%	44%	13%	3%
TransIT	34%	52%	9%	5%
PRTC	58%	29%	7%	6%
Connector	30%	48%	16%	6%
Ride-On	31%	48%	16%	6%
Metrobus	33%	45%	17%	5%
All	33%	45%	17%	5%

May not sum to 100% due to rounding.

All passengers (regardless if they are employed or not) were asked if they receive transit benefits from their employer. Slightly more than four-in-ten (42%) PRTC passengers indicated they receive transit benefits. The lowest percentage of passengers receiving transit benefits are those who ride TransIT at 5%. Overall, nearly one-in-four (24%) of all passengers receive transit benefits from their employer. The following table summarizes these results by system.

Table 2.10 – Percent of Passengers Who Receive Employee Transit Benefits by System

Transit System	*Yes*	*No*
ART	32%	68%
TheBus	13%	87%
CUE	23%	77%
DASH	35%	65%
TransIT	5%	95%
PRTC	42%	58%
Connector	NA	NA
Ride-On	21%	79%
Metrobus	24%	76%
All	24%	76%

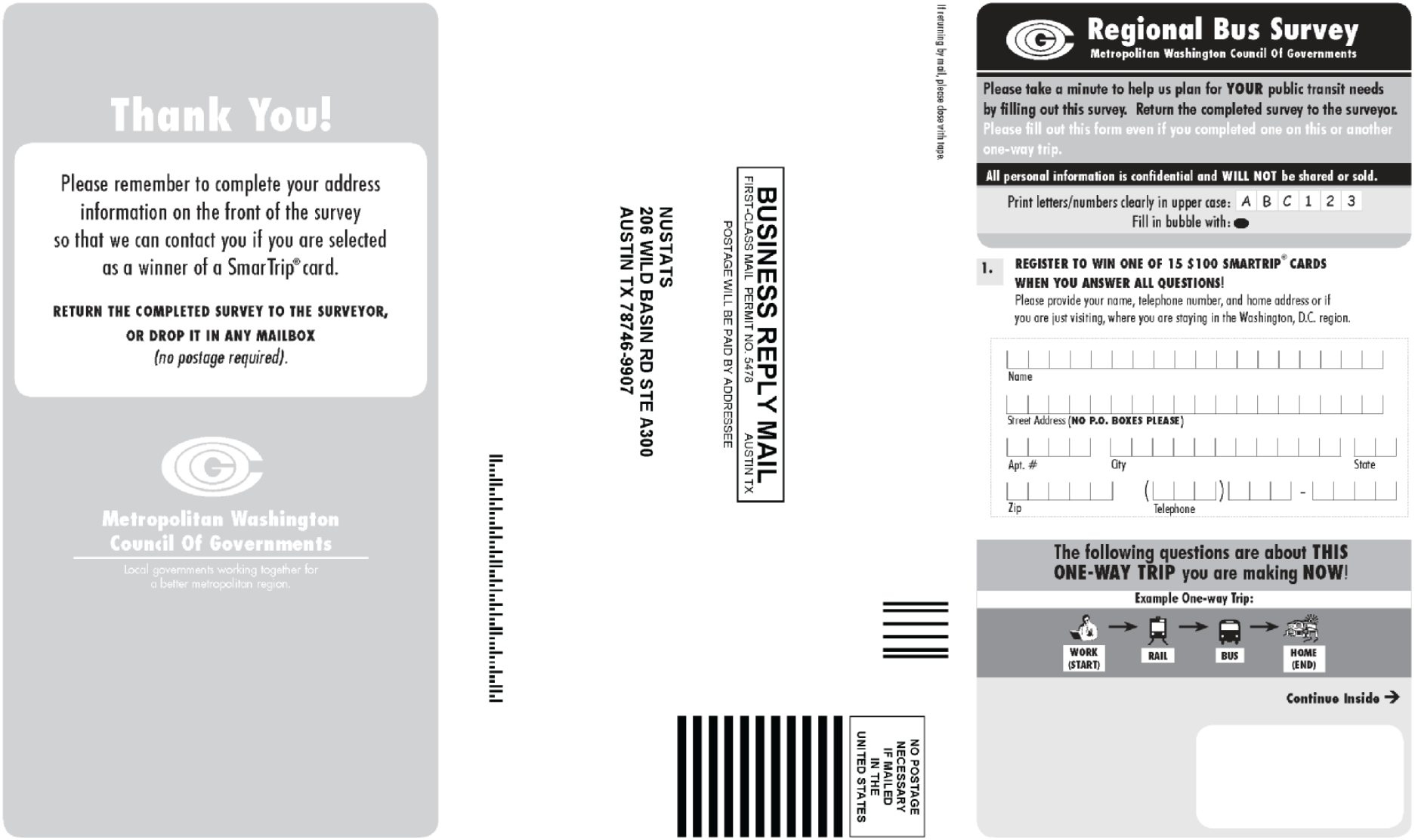
May not sum to 100% due to rounding.

Appendix A: Survey Instruments

Figure A-1: Survey Instrument (English)

Figure A-2: Survey Instrument (Spanish)

Figure A-1 - English-Language Survey Instrument



Thank You!

Please remember to complete your address information on the front of the survey so that we can contact you if you are selected as a winner of a SmarTrip® card.

RETURN THE COMPLETED SURVEY TO THE SURVEYOR, OR DROP IT IN ANY MAILBOX
(no postage required).

Metropolitan Washington Council Of Governments

Local governments working together for a better metropolitan region.

If returning by mail, please close with tape.

NUSTATS
206 WILD BASIN RD STE A300
AUSTIN TX 78746-9907

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 5478 AUSTIN TX

POSTAGE WILL BE PAID BY ADDRESSEE

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

Regional Bus Survey
Metropolitan Washington Council Of Governments

Please take a minute to help us plan for **YOUR** public 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 in bubble with: ●

1. **REGISTER TO WIN ONE OF 15 $100 SMARTRIP® CARDS 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 Washington, D.C. region.

Name

Street Address (**NO P.O. BOXES PLEASE**)

Apt. # City State

Zip ( ) -
Telephone

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

Example One-way Trip:

WORK (START) → RAIL → BUS → HOME (END)

Continue Inside →

2. Where are you **COMING FROM**?
(Starting place of this one-way trip) *(Please fill in one bubble only)*

- ○ Work
- ○ Medical/Dental/Healthcare
- ○ Job-related business
- ○ Personal trip
- ○ Shopping or Meal
- ○ Social/Recreation/Sightseeing
- ○ School *(students only)*
- ○ Other (specify): _____
- ○ Home → If you gave your Home address in Question 1 → **Go to Question 3**

a. What is the **NAME** of the **PLACE, BUSINESS OR BUILDING** you are **COMING FROM**?

Example: W H I T E H O U S E

Place Name

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

Example: 1 6 0 0 P E N N S Y L V A N I A A V E N W

Address

Cross Street 1 &

Cross Street 2

City State Zip

3. How did you get to **THIS** bus? *(Please fill in one bubble only)*

- ○ Walked: → *# blocks?* ☐☐
- ○ Wheelchair: → *# blocks?* ☐☐
- ○ Drove and parked
- ○ Transferred from Metrorail
- ○ Rode with someone who parked
- ○ Transferred from MARC
- ○ Dropped off by someone
- ○ Transferred from VRE
- ○ Taxi
- ○ Transferred from Amtrak
- ○ Bicycle
- ○ Other (specify): _____
- ○ Transferred from another Bus: _____
  Transit System/Route Number

4. Where are you **GOING TO**?
(Destination of this one-way trip) *(Please fill in one bubble only)*

- ○ Work
- ○ Medical/Dental/Healthcare
- ○ Job-related business
- ○ Personal trip
- ○ Shopping or Meal
- ○ Social/Recreation/Sightseeing
- ○ School *(students only)*
- ○ Other (specify): _____
- ○ Home → If you gave your Home address in Question 1 → **Go to Question 5**

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

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

5. How will you get there from **THIS** bus? *(Please fill in all bubbles that apply)*

- ○ Walk: → *# blocks?* ☐☐
- ○ Wheelchair: → *# blocks?* ☐☐
- ○ Drive a vehicle that was parked
- ○ Transfer to Metrorail
- ○ Ride with someone who parked
- ○ Transfer to MARC
- ○ Be picked up by someone
- ○ Transfer to VRE
- ○ Taxi
- ○ Transfer to Amtrak
- ○ Bicycle
- ○ Other (specify): _____
- ○ Transfer to another Bus: _____
  Transit System/Route Number

6. How did you pay the **FARE** for this bus ride? *(Please fill in one bubble only)*

- ○ Cash/Money
- ○ Day Pass
- ○ Ten-Trip Ticket
- ○ SmarTrip®
- ○ Weekly Pass
- ○ Regional Bus Transfer
- ○ Rail-to-Bus Transfer
- ○ Monthly Pass
- ○ Senior/Disabled Fare
- ○ Other (specify): _____

7. **INCLUDING THIS BUS**, how many **TOTAL BUSES** and **TRAINS** will you use in making this one-way trip?

- ○ 1, this bus only
- ○ 2
- ○ 3
- ○ 4 or more

8. Do you receive a **TRANSIT BENEFIT** (e.g., SmartBenefits/Metrocheks) from your **EMPLOYER**?

- ○ Yes
- ○ No

9. How many usable **CARS**, **SUVs**, **VANS** or **TRUCKS** are at your home?

- ○ None
- ○ 1
- ○ 2
- ○ 3 or more

10. Did you have a usable car, SUV, van or truck **AVAILABLE TO YOU TODAY** that you could have used to make this trip, instead of riding the bus?

- ○ Yes
- ○ No

11. What was your estimated **TOTAL HOUSEHOLD INCOME** in 2007 before taxes?

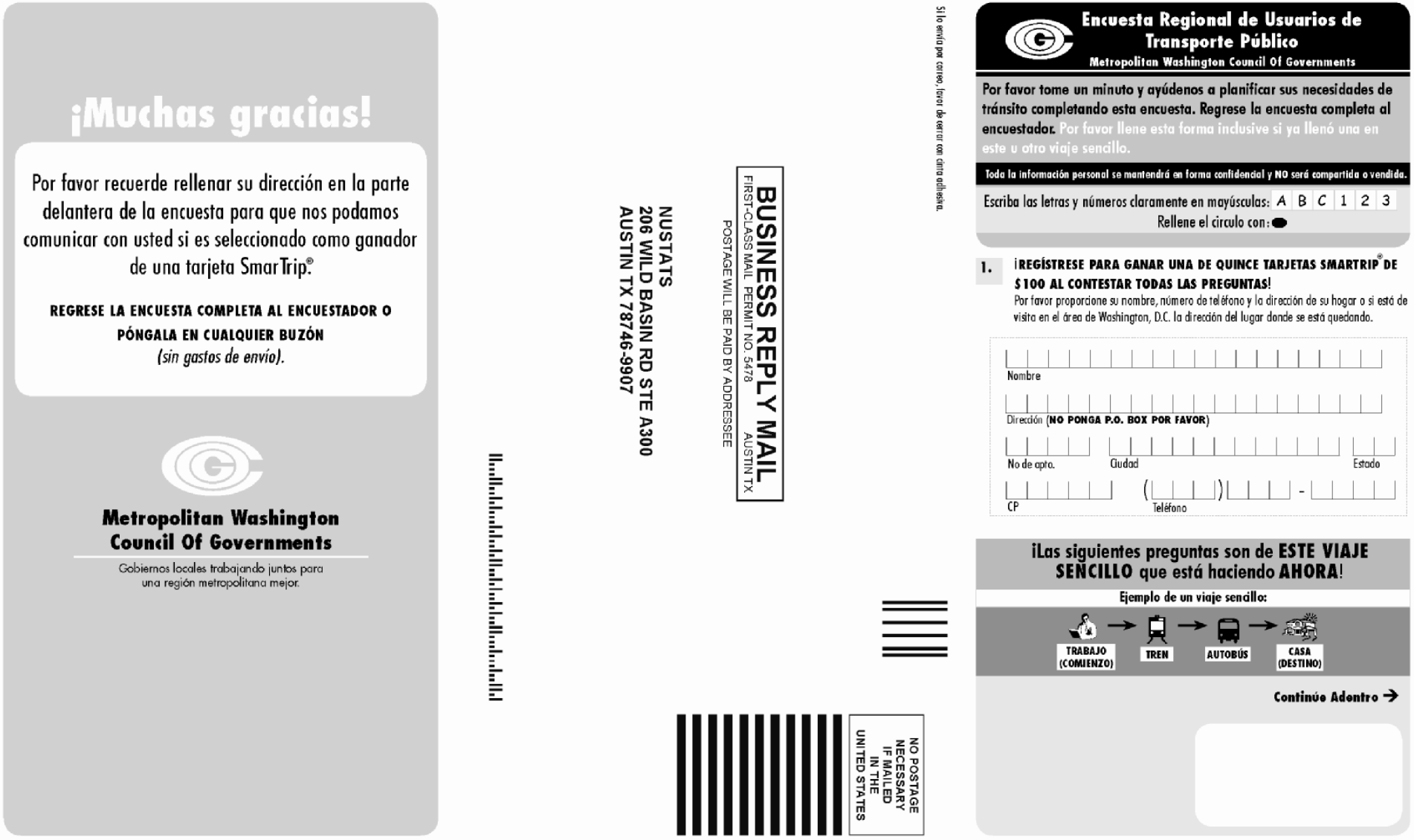
- ○ $10,000 or less
- ○ $40,001 - $50,000
- ○ $80,001 - $100,000
- ○ $10,001 - $20,000
- ○ $50,001 - $60,000
- ○ $100,001 - $125,000
- ○ $20,001 - $30,000
- ○ $60,001 - $70,000
- ○ $125,001 - $150,000
- ○ $30,001 - $40,000
- ○ $70,001 - $80,000
- ○ More than $150,000

12. What is your **RACE/ETHNICITY**? *(Please fill all bubbles that apply)*

- ○ Asian
- ○ Native American
- ○ Black/African American
- ○ White
- ○ Hispanic
- ○ Other (specify): _____

Please Continue on the Back →

Figure A-2 - Survey Instrument (Spanish)



2. ¿De dónde **VIENE EN ESTE MOMENTO**?
(Comienzo de este viaje sencillo) *(marque sólo uno)*

- ○ Trabajo
- ○ Cita médica/Dental/Asistencia sanitaria
- ○ Negocio relacionado con el trabajo
- ○ Viaje personal
- ○ Compras o comida
- ○ Visita social/Recreación/Turismo
- ○ Escuela *(sólo estudiantes)*
- ○ Otra (especifique): _____
- ○ Hogar → Si ya proporcionó su dirección en la Pregunta 1 → **Vaya a la pregunta 4**

a. ¿Cuál es el nombre del **LUGAR, NEGOCIO O EDIFICIO** del que **VIENE**?
Ejemplo: W H I T E H O U S E

Nombre del lugar

b. ¿Cuál es la **DIRECCIÓN**?
(Proporcione el cruce más cercano si no conoce la **DIRECCIÓN EXACTA**.)
Ejemplo: 1 6 0 0 P E N N S Y L V A N I A A V E N W

Dirección

Cruce de Calle 1 &

Cruce de Calle 2

Ciudad Estado CP

3. ¿Cómo llego a **ESTE** autobús? *(marque sólo uno)*

- ○ Caminé: → *¿# de cuadras?* ☐☐
- ○ Silla de ruedas: → *¿# de cuadras?* ☐☐
- ○ Manejé y me estacioné
- ○ Trasbordé de Metrorail
- ○ Viajé con alguien que se estacionó
- ○ Trasbordé de MARC
- ○ Me dejaron
- ○ Trasbordé de VRE
- ○ Taxi
- ○ Trasbordé de Amtrak
- ○ Bicicleta
- ○ Otra (especifique): _____
- ○ Me transferí e otro autobús: _____
  Sistema de Transporte Público/Número de Ruta

4. ¿A dónde se **DIRIGE**?
(Destino de este viaje sencillo de transporte público) *(marque sólo uno)*

- ○ Trabajo
- ○ Cita médica/Dental/Asistencia sanitaria
- ○ Negocio relacionado con el trabajo
- ○ Viaje personal
- ○ Compras o comida
- ○ Visita social/Recreación/Turismo
- ○ Escuela *(sólo estudiantes)*
- ○ Otra (especifique): _____
- ○ Hogar → Si ya proporcionó su dirección en la Pregunta 1 → **Vaya a la pregunta 5**

a. ¿Cuál es el **NOMBRE** del **LUGAR, NEGOCIO O EDIFICIO** al que se **DIRIGE**?

Nombre del lugar

b. ¿Cuál es la **DIRECCIÓN**?
(Proporcione el cruce más cercano si no conoce la **DIRECCIÓN EXACTA**.)

Dirección

Cruce de Calle 1 &

Cruce de Calle 2

Ciudad Estado CP

5. ¿Cómo va a llegar a su destino final de **ESTE** autobús?
(marque todos los que apliquen)

- ○ Caminando: → *¿# de cuadras?* ☐☐
- ○ Silla de ruedas: → *¿# de cuadras?* ☐☐
- ○ Manejando mi automóvil que estacioné
- ○ Trasbordo a Metrorail
- ○ Viajar con alguien que se estacionó
- ○ Trasbordo a MARC
- ○ Me van a recoger
- ○ Trasbordo a VRE
- ○ Taxi
- ○ Trasbordo a Amtrak
- ○ Bicicleta
- ○ Otra (especifique): _____
- ○ Voy a trasbordar a otro autobús: _____
  Sistema de Transporte Público/Número de Ruta

6. ¿Cómo pagó su **TARIFA** en **ESTE VEHÍCULO**? *(marque sólo uno)*

- ○ Efectivo
- ○ Pase por un día
- ○ Boleto para 10 recorridos
- ○ SmarTrip®
- ○ Pase semanal
- ○ Trasbordo de autobús regional
- ○ Trasbordo de tren-a-autobús
- ○ Pase mensual
- ○ Tarifa de ancianos/discapacitados
- ○ Otra (especifique): _____

7. **INCLUYENDO ESTE AUTOBÚS**, ¿en **TOTAL** cuántos **AUTOBUSES** y **TRENES** va a usar en este viaje sencillo?

- ○ 1, solamente este autobús
- ○ 2
- ○ 3
- ○ 4 o más

8. ¿Recibe **ASISTENCIA PARA EL TRANSPORTE PÚBLICO** (p. ej, SmartBenefits/Metrocheks) de su **EMPLEADOR**?

- ○ Sí
- ○ No

9. ¿Cuántos **AUTOMÓVILES, SUVS, CAMIONETAS O MOTOCICLETAS** registrados hay disponibles en su hogar?

- ○ Ninguna
- ○ 1
- ○ 2
- ○ 3 o más

10. ¿Tuvo un automóvil, SUV, furgoneta, o camioneta **DISPONIBLE HOY** que pudo usar para hacer este viaje en vez de viajar en el autobús?

- ○ Sí
- ○ No

11. ¿Aproximadamente qué fue el **INGRESO** combinado de su **HOGAR** en el 2007?

- ○ Menos de $10,000
- ○ $10,001 - $20,000
- ○ $20,001 - $30,000
- ○ $30,001 - $40,000
- ○ $40,001 - $50,000
- ○ $50,001 - $60,000
- ○ $60,001 - $70,000
- ○ $70,001 - $80,000
- ○ $80,001 - $100,000
- ○ $100,001 - $125,000
- ○ $125,001 - $150,000
- ○ Más de $150,000

12. ¿De que **RAZA** o **DESCENDENCIA ÉTNICA** es usted?
(por favor marque todos los que apliquen)

- ○ Asiático
- ○ Nativo Americano
- ○ Negro/Afroamericano
- ○ Blanco
- ○ Hispano
- ○ Otra (especifique): _____

Por Favor, Continúe al Otro Lado →