

APPENDIX A:

POWERPOINT PRESENTATION OF FINAL RESULTS

Atlanta Regional On-Board Transit Survey Summary of Findings

ETC Institute and PBS&J
June 16, 2010

Agenda

- #1: Purpose/Scope
- #2: Major Findings
 - Ridership characteristics
 - Trip characteristics
- #3: Overview of the Report
- #4: Overview of the QA/QC Process
- #5: Overview of the Data Expansion
- #6: Overview of the Database
- #7: Next Steps
- Questions

Topic#1:

Purpose/Scope

Topic #1: Purpose/Goal

- Purpose: to gather data from a statistically valid sample of transit riders in the 20-county metropolitan Atlanta area. The results will be used to update the region's travel demand model and to enhance regional transportation planning efforts
- Goal: to obtain completed surveys from 10% of the transit boardings in the region

Tasks that Were Accomplished

- Survey Training and Start-Up (Sept 2009)
- Survey Administration (Oct 2009 – Jan 2010)
- Data Processing, Geocoding (Feb 2010)
- QA/QC Review (March-April 2010)
- Data Expansion (May 2010)
- Survey Documentation & Final Report (June 2010)

Transit Systems Included in the Survey

- MARTA
- CCT
- GRTA
- GCT
- CAT
- HAT
- CTran
- Emory

• Note: Emory routes were not officially part of the survey, but data from Emory routes that was collected by MARTA was included in the final database)

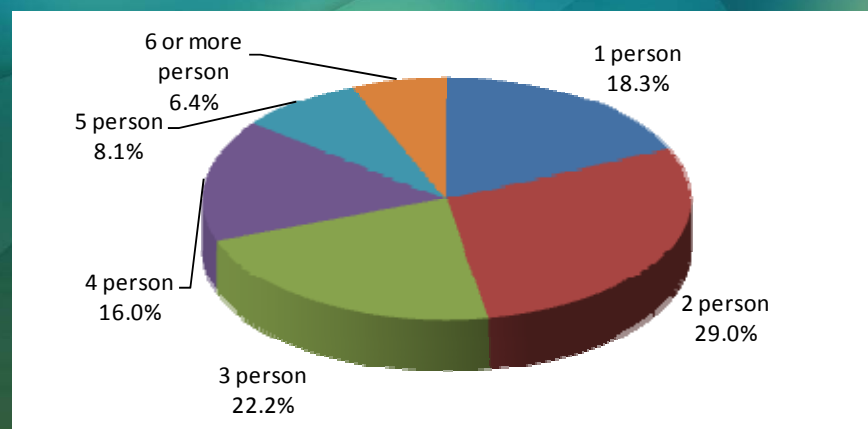
Useable Surveys (use code of 1 or 2) Obtained by System

System	Avg Daily Boardings	Useable Surveys	% Useable Surveys Obtained
Cherokee	55	14	25.5%
Cobb	15693	1990	12.7%
Clayton	8315	782	9.4%
Gwinnett	6741	737	10.9%
Hall	257	35	13.6%
MARTA	403145	44006	10.9%
GRTA	6152	1147	18.6%
TOTAL	440358	48711	11.1%

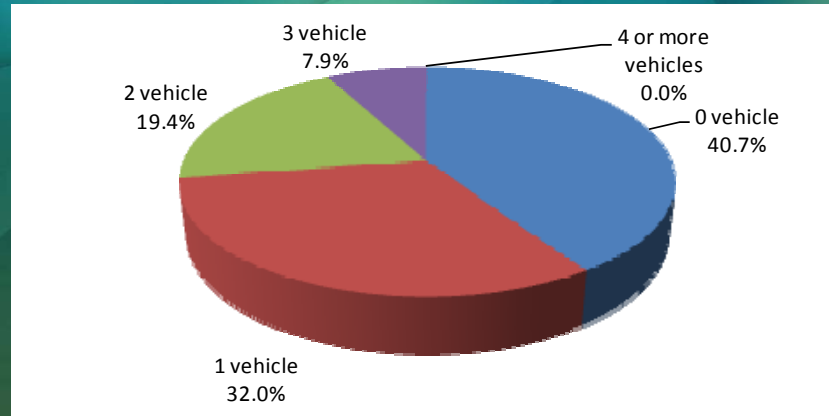
Topic#2: Major Findings

Findings: *Profile of Transit Users*

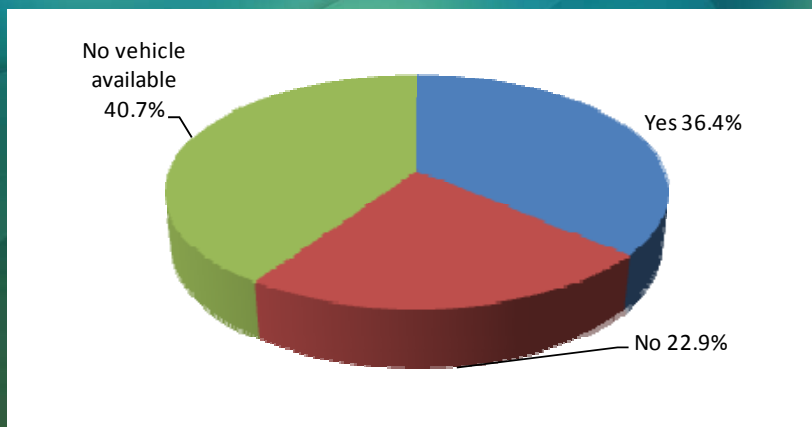
Household Size



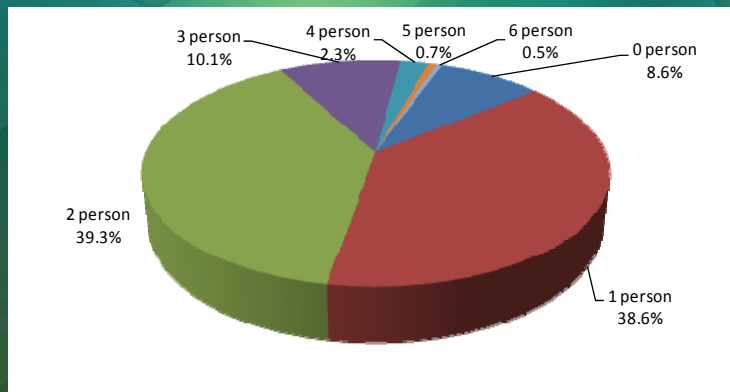
Vehicles Per Household



Vehicle Availability

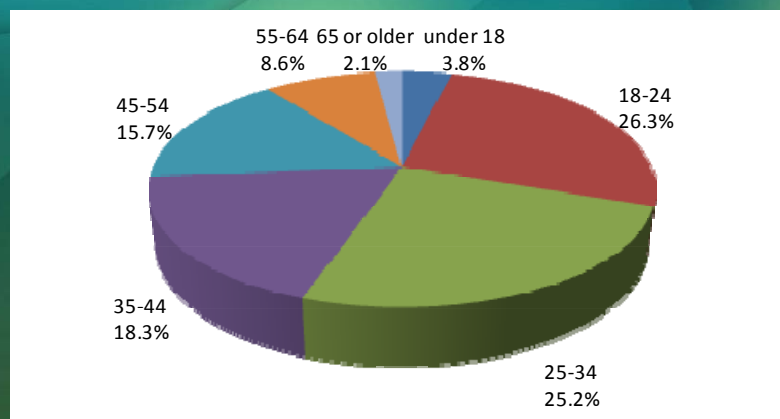


Number of Employed Persons Per Household

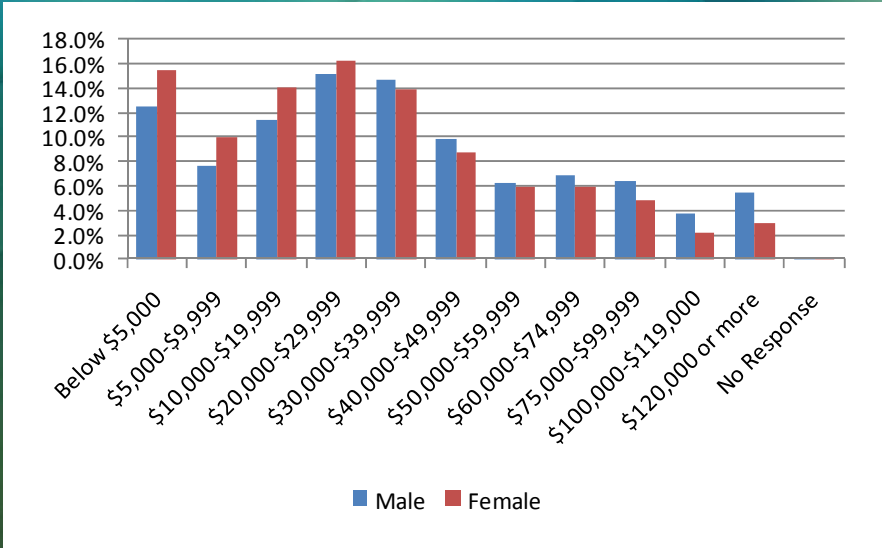


74.5% of those surveyed were employed

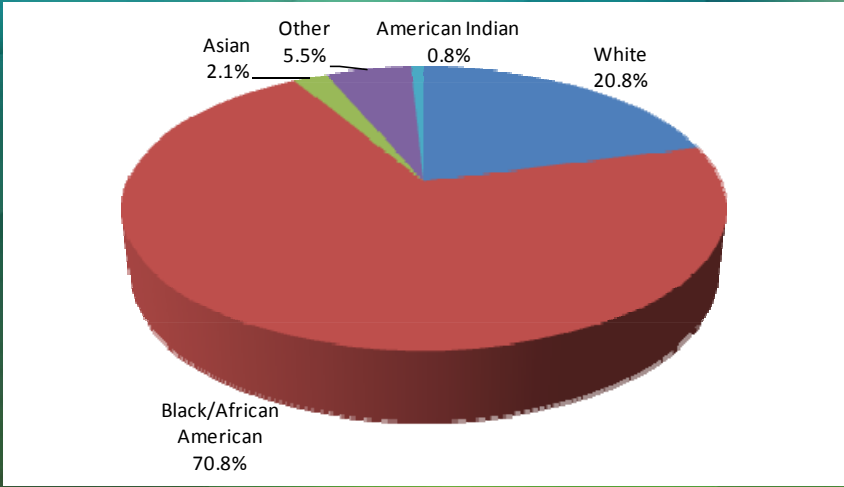
Age of Respondents



Income Distribution



Race

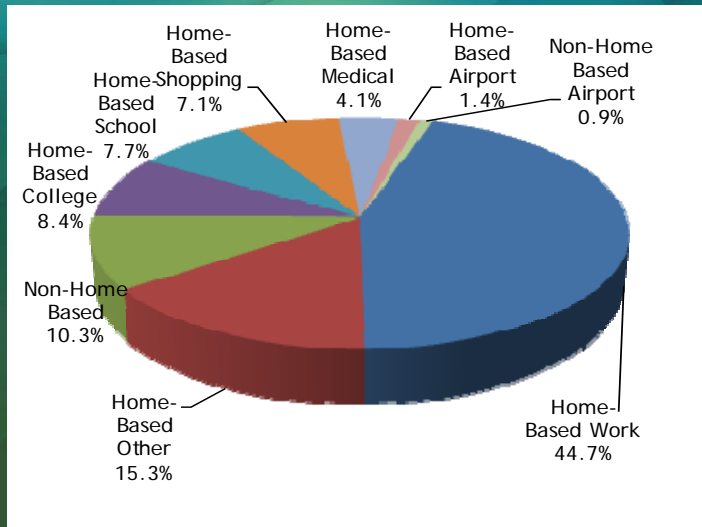


Other Demographic Data

- 48.4% were male; 51.6% were female
- 30.6% of those surveyed were students
- 29.0% did NOT have a driver's license
- 7% were Hispanic
- 1,780 respondents had limited English proficiency

Findings: *Trip Characteristics*

Trip Purpose



Mode of Access to Transit

Mode of Access to Transit	Percent
Walked	72.4%
Dropped Off	14.0%
Drove Alone	10.6%
Rode in a vehicle for part of the trip and walked/biked rest of the way	1.8%
Carpooled/Vanpooled	0.9%
Bicycle	0.3%

How Income Affects Access to Transit

Household Income < \$20,000

- Walk – 79%
- Drive Alone – 4%
- Dropped Off – 14%

Household Income > \$75,000

- Walk – 56%
- Drive Alone – 29%
- Dropped Off – 13%

Distance Walked (miles)

Walk Distance to Transit	Percent
Less than 1/8 mile	53.0%
1/8 - 1/4 mile	26.9%
1/4 - 1/2 mile	11.3%
1/2 - 3/4 mile	4.5%
3/4 - 1 mile	1.5%
1 - 1 1/2 miles	1.7%
1 1/2 - 2 miles	0.5%
Greater than 2 miles	0.5%

Distance Walked (minutes)

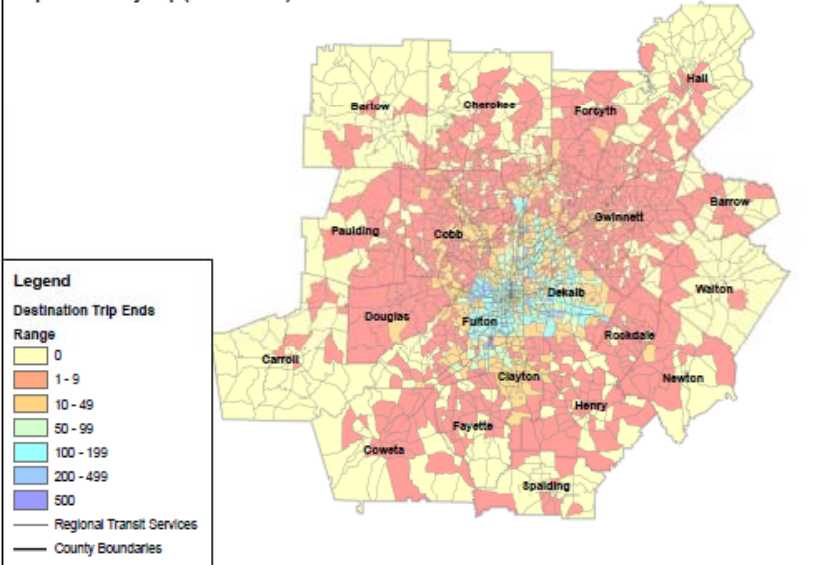
Reported Travel Time to Access Transit	Percent
5 minutes or less	70.6%
10 minutes or less	90.4%
15 minutes or less	96.4%
20 minutes or less	98.4%

County Where Trips Began

Origin County of Trip	Percent
Fulton	60.6%
DeKalb	25.2%
Clayton	5.3%
Cobb	3.8%
Gwinnett	2.7%
Henry	0.4%
Douglas	0.3%
Fayette	0.3%
Forsyth	0.3%
Rockdale	0.2%
Newton	0.1%
Cherokee	0.1%
Coweta	0.1%
Paulding	0.1%
Hall	0.1%
Spalding	0.1%
Outside Region	0.2%

Where Trips Ended by TAZ

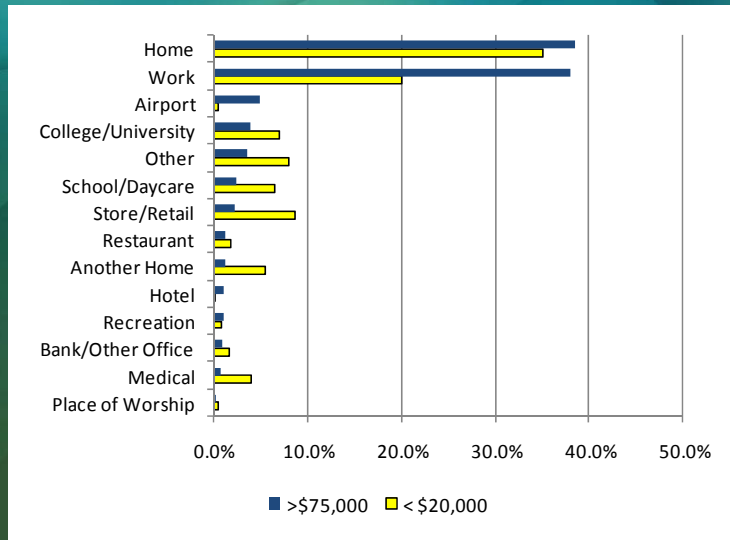
Trip End Density Map (Destinations)



Destinations by Type of Place

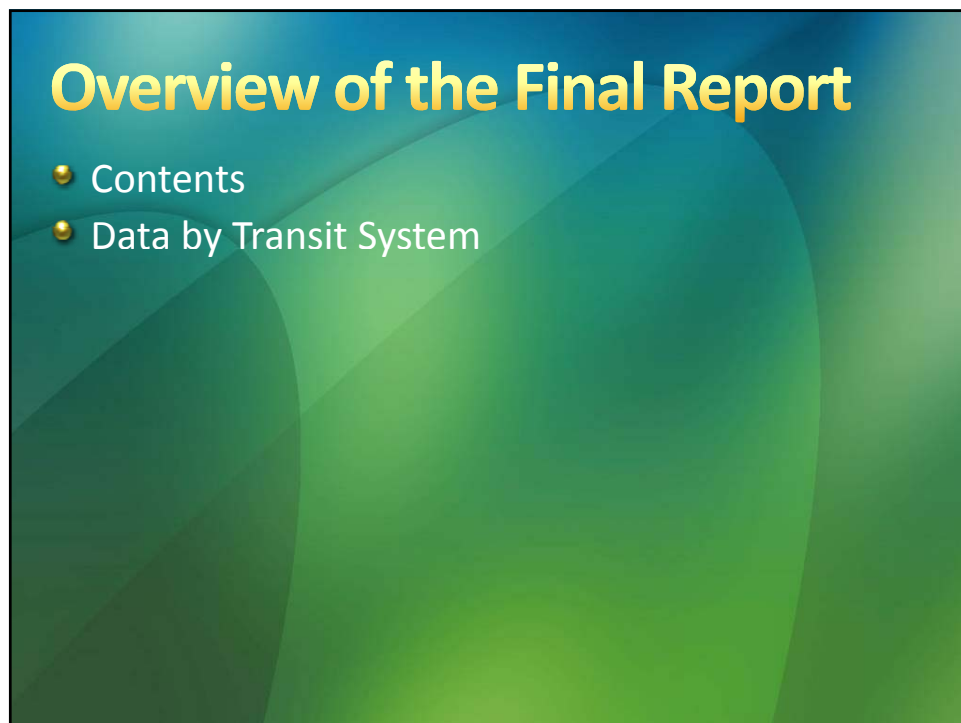
Types of Destination Places	Percent
Home	37.1%
Work	28.3%
Store/Retail	6.5%
Other	5.8%
College/University	5.6%
School/Daycare	4.8%
Another Home	3.8%
Medical	2.5%
Airport	1.4%
Bank/Other Office	1.3%
Restaurant	1.3%
Recreation	0.7%
Hotel	0.4%
Place of Worship	0.4%

Destinations by HH Income



Trip Distance

Purpose	Percent
<.500 Mile	0.7%
.500- 0.999	2.4%
1.000 - 4.999	33.5%
5.000 - 9.999	27.9%
10.000 - 14.999	16.5%
15.000 - 19.999	8.7%
20.000 - 24.999	5.1%
25.000 - 29.999	2.5%
30.000 - 34.999	1.0%
35.000 - 39.999	0.5%
40.000 - 44.999	0.3%
45.000 - 49.999	0.1%
50.000 - 74.999	0.2%
>75.000 - 99.999	0.0%
>100.000	0.2%
Unknown	0.6%



Topic#4:

Overview of the QA/QC Process

Overview of QA/QC Process

COLLECT DATA

(From riders at 235 bus routes or rail stations located throughout region)

PRE-PROCESS DATA

(Build db of transit trip records. Identify those records that comply with completeness and stage-1 logic checks)

QA/QC REVIEW

(Add travel forecast model variables to survey db. Conduct visual inspection and outlier tests. Tag survey trips that are perplexing in logistical sense)

**REFINEMENTS/
EXPANSION**

(Fix data that was flagged during QA/QC Review. Update sample counts by stratification parameters)

QA/QC: Data Collection Controls

- High quality interviews were used and extensive training was conducted
- More than 100 checks were included on the tablet PCs to ensure data collection in the field was complete and accurate
- Phone follow-ups were completed with more than 18,000 survey participants to ensure the accuracy of the data collected

QA/QC: Pre Processing of Data

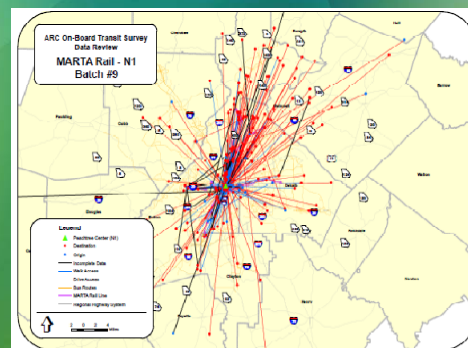
- All required fields were filled with valid data for that field.
- Place names and street addresses were properly and consistently spelled
- The number of household occupants was greater than or equal to the number of employed members of the household and the number of adults in the household
- Number of household occupants was greater than or equal to the adults in the household
- Number of workers was greater than the household size
- Number of household vehicles was consistent with the household income and number of workers
- Household income responses appeared consistent with annual household income and other household characteristics
- Distribution of the results by individual interviewer. This was done to identify biases in the sampling procedures that were performed by interviewers.
- All five address fields were geocoded to LAT/LON

QA/QC: Visual GIS Review

- Inappropriate boarding or egress locations in relation to the surveyed transit route, origin trip end and destination trip end;
- Inappropriate origin or destination locations in relation to the surveyed transit route or rail station, access mode and egress mode; and,
- Inappropriate trip leg detail in relation to the origin, destination, transit route or rail station surveyed, access mode and egress mode

QA/QC: Visual GIS Review

Sample Name: SP		Router Name: MURATA Real Free Points	
Travel Distance: MURATA			
No. of Samples: 373		Service Type: Real	
No. of Samples: 373		Survey Date: 11/13/2010	
WIP PURPOSE			
Types		WALKERS	
Time	Feet	Mean	Min/Max
Min	Feet	Feet	Feet
Initial	3.5	0	100.0 2.5
Return	0	2	0.0 1.0
Hold	0	2	0.0 1.0
Interval	2	4	0.5 1.0
1st Stop	0	0	0.0 0.0
Mid Stop	0	0	0.0 0.0
Mid Stop	0	0.4	0.0 0.0
Unknown	0	0	0.0 0.0
Total	390.0	total	100.0 3.77
WALKTIMES (Min.)		WALKEDIRGRAPHICS (Feet)	
Survey	Feet	Survey	Feet
Range (Min.)	0	Range (Min.)	0
0 - 5.0	23	0 - 5.0	40
5.0 - 10.0	39	5.0 - 10.0	37
10.0 - 15.0	31	10.0 - 15.0	30
15.0 - 20.0	30	15.0 - 20.0	31
20.0 - 25.0	2	20.0 - 25.0	0
25.0 - 30.0	0	25.0 - 30.0	0
30.0 - 3	0	30.0 - 3	0
Total	158	Total	158
WALK TIMES (Min.)		WALKEDIRGRAPHICS (Feet)	
Survey	Feet	Survey	Feet
Range (Min.)	0	Range (Min.)	0
0 - 5.0	44	0 - 5.0	32
5.0 - 10.0	62	5.0 - 10.0	37
10.0 - 15.0	31	10.0 - 15.0	30
15.0 - 20.0	25	15.0 - 20.0	31
20.0 - 25.0	4	20.0 - 25.0	3
25.0 - 30.0	3	25.0 - 30.0	0
30.0 - 3	0	30.0 - 3	0
Total	209	Total	209
MODELED O-BIP TIME		MODELED O-BIP TIME	
Range (Min.)	0	Range (Min.)	0
0 - 5.0	0	0 - 5.0	0
5.0 - 10.0	0	5.0 - 10.0	0
10.0 - 15.0	0	10.0 - 15.0	0
15.0 - 20.0	0	15.0 - 20.0	0
20.0 - 25.0	0	20.0 - 25.0	0
25.0 - 30.0	0	25.0 - 30.0	0
30.0 - 3	0	30.0 - 3	0
Total	0.00	Total	0.00
REMOVED O-BIP TIME			
Actual	Feet	1st	Feet
Min	Feet	Min	Feet
SP - 500	37	SP - 500	37
SP - 500	2	SP - 500	2
SP - 500	27	SP - 500	27
SP - 500	50	SP - 500	50
SP - 500	51	SP - 500	51
SP - 500	37	SP - 500	37
total	total	total	total
390.0	390.0	390.0	390.0



QA/QC: Visual GIS Review

- Visually inspect and examine key variables of survey trips with short distances (short for local bus and rail was < 1.0 mile; for express bus it was 3.0 to 5.0 miles depending on transit provider).
- Visually inspect spatial sensibility and key variables of walk access trips with zero transfers.
- Visually inspect spatial sensibility and key variables of walk access trips with three or more transfers.
- Visually inspect spatial sensibility and key variables of drive access trips with zero transfers.
- Visually inspect spatial sensibility and key variables of drive access trips with three or more transfers.
- Tag any drive access survey trips that reported 'Drive Alone' from the origin and 'Drive Alone' to the destination.
- Investigate logistic sensibility of any other O-D travel desire line that merits inspection based on trip distance and spatial orientation
- Tag all survey trips with a quality designation of 1' complete; '2' inconsistent but easily fixed in our opinion; or '3' inconsistent and probably difficult to fix.
- Tag all survey trips having a quality designation '2' or '3' with a diagnostic note.

QA/QC: Refinement

- Records that were flagged AND needed to ensure that reasonable expansion factors were generated were corrected
- The corrected records were reviewed again using the same process that has been described

Topic#5:

***Overview of the Data
Expansion Process***

**Data Expansion Process (RAIL)
For Unlinked Trips**

- Step 1: Review the actual distribution of completed surveys
- Step 2: Review the actual ridership between each rail station by time of day.
- Step 3: Adjust the distribution of actual ridership upward to account for "unknown" trips that were not clearly coded to both a station of entry and exit by time of day.
- Step 4: Calculate the actual gap between the number of surveys that were completed and the numerical goal was set for each cell in the sampling matrix.
- Step 5: Calculate the multipliers (unlinked trip expansion factors) that were used to expand the unlinked trips. Only 15 cells did not meet the original sampling goals that were set for the project.

Data Expansion Process (RAIL) for Unlinked Trips

- SHOW TABLES

Data Expansion Process (BUS) for Unlinked Trips

- Step 1: Review the actual distribution of completed surveys for various stops/segments along each route by time of day
- Step 2: Review the distribution of completed surveys as a percentage of total boardings for each of the segments/major stops along the route by time of day
- Step 3: Review the actual boardings (ONs) and actual alightings (OFFs) for each segment/major stop along the route.
- Step 4: Calculate the actual boardings (ONs) and actual alightings (OFF) by segment/major stop.
- Steps 5 and 6: Apply an iterative process to estimated number of ONs and OFFs from between major stops/route segment along each route
- Step 6: Calculate the weighting factors for unlinked trips.

Data Expansion Process (BUS) for Unlinked Trips

- SHOW TABLES

Data Expansion Process (BUS) for LINKED Trips

Formula = $1/(1+\text{number of transfers})$

Data Validation

- Predicted Boardings vs. Actual Boardings by Route by Time of Day
- Number of Predicted Trips Between Train Stations vs. the actual number of trips between stations by time of day
- Demographic Characteristics of Transit Users vs. Previous Survey Findings
- Total Number of Park and Ride Users vs. Number of Vehicles Parked at Regional Park and Ride Lots

Topic#6:

Overview of the Database

Composition of the Final Database

Survey Use Code	# Records
1=Fully Useable	43703
2=Usable for most modeling purposes	5008
3=Complete, but not usable for modeling	1267
4=Not complete	3515
5=Short Trip	3008
6=Dummy Records for expansion	969
TOTAL	57470

Topic #7: Next Steps

Next Steps

- June 23
 - Committee members submit requests for additional analysis/changes to the Draft Final Report
- June 30
 - ETC Institute submits the revised Final Report and databases to ARC to fulfill contractual requirements
- July 2010
 - ETC Institute works with FTA input to refine survey documentation
 - Additional cleaning of survey records on the draft final report and databases
- July 31, 2010
 - ETC Institute publishes a revised final report and submits updated database

Questions ???

THANK YOU