

# Transit Survey White Paper

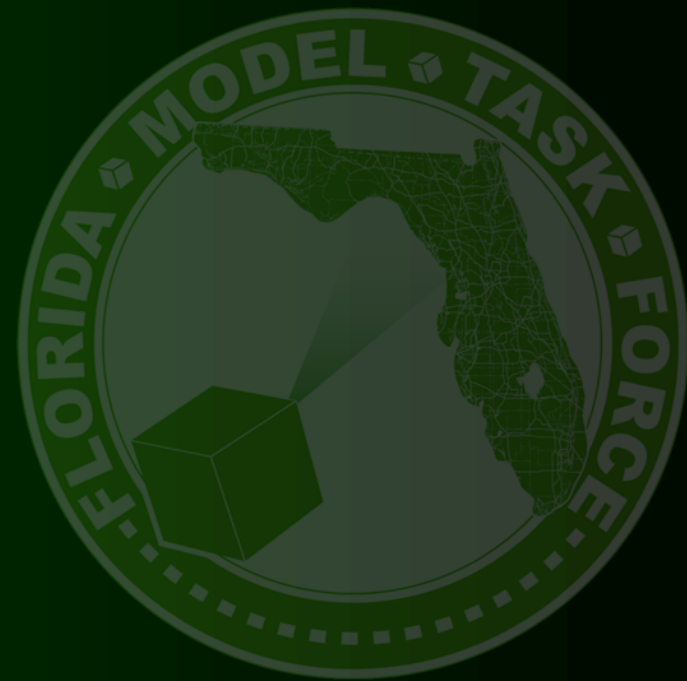
*presented to*

**MTF Transit Committee**

*presented by*

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# Overview

## ● Purpose

- Provide techniques to help gather more meaningful survey data
- Advance the transit survey state-of-practice in Florida

## ● Motivations

- 2008 Florida transit survey research highlighted many issues with recently completed onboard surveys
  - Inattention to response bias
  - General condition of some survey datasets
  - Lack of documentation → Focus? Purpose?
- Guidance from FTA on improving travel survey practices

# The Traditional Onboard Survey Process

## Step Description

**Develop survey instrument**

**Distribute surveys to all/most riders**

**Some riders fill out surveys & return**

**Some returned surveys are complete**

**Expand completed surveys based on average weekday ridership by route**

**Calibrate mode choice model using expanded dataset**

# Problems with the Traditional Process

Step Description	Observation
Develop survey instrument	Purpose usually not clearly defined → inconsistent focus
Distribute surveys to all/most riders	Some bias
Some riders fill out surveys & return	Response bias
Some returned surveys are complete	Response bias
Expand completed surveys based on average weekday ridership by route	Occasionally performed; typically maintains/aggravates response bias; typically little survey QA/QC
Calibrate mode choice model using expanded dataset	Model now reflects survey bias; Little/no validation of other aspects of model



# An Example of Response Bias

## Survey Results

Daily boardings	600
Completed surveys	15
Walk-access	2
Drive-access	13

## Uniform Expansion

Daily boardings	600
Completed surveys	15
Survey weight	40.0

Walk-access trips	80
Drive-access trips	520

Park-ride lot  
count = 15  
cars

## Revised Expansion

Walk-Access Expansion	
Daily boardings	570
Completed surveys	2
Survey weight	285.0

Drive-Access Expansion	
Daily boardings	30
Completed surveys	13
Survey weight	2.31



# A Proposed Onboard Survey Process

Step Description	Comment
<b>Develop survey plan</b>	<b>Comprehensive plan to address purpose &amp; weaknesses of survey</b>
Develop survey instrument	
Distribute surveys to all/most riders	
Some riders fill out surveys & return	
Some returned surveys are complete	
<b>Perform QA/QC on survey data</b>	<b>Verifies reasonableness of survey information</b>
Expand completed surveys based on average weekday ridership by route	
<b>Verify survey expansion</b>	<b>Validates survey information as accurate representation of travel patterns</b>
<b>Compare model structure and parameters to survey results</b>	<b>Validates pathbuilding and model structure procedures</b>
Calibrate mode choice model using expanded dataset	



# The Survey Plan

- Transit service and rider characteristics
- Distribution method
- Sampling plan
- Data items
- Ancillary data collection plan and application
- Pilot survey plan
- QA/QC procedures
- Expansion methodology & verification
- Expanded dataset analysis
- Timeline/schedule
- Agency and contractor responsibilities

# Rider and System Characteristics

## Some Examples

**Common Rider Characteristics to be Included in Survey Plan**

Rider Characteristic	Example(s)
Common languages	English, Spanish, Creole
Access modes	Walk, bicycle, park-ride, drop-off
Routes with standing loads, including areas and times	
Age	Under 16, Over 65
Frequency of use	Special events or daily use
Common trip purposes	Work, school (line-haul), circulate through downtown
Student groups	Elementary, high, college/university
Tourist, visitor or other special groups	Convention groups, sporting events
Percentage of captive/choice riders	Roughly 80% captive, 20% choice

**: Common System Characteristics to be Included in Survey Plan**

System Characteristic	Example(s)
Types of service	Local, express, paratransit, bus rapid transit, circulator, rail
Common service frequencies	15-20 minutes for local service 30 minutes for express service in peak periods only
Fare system	Boarding fare, transfer fare, pass types
Areas served	Entire urban area with highest service near downtown
Major transfer areas	Downtown transfer/transit centers
Official park-ride lots or drop-off areas	
Unofficial park-ride lots or drop-off areas	Shopping malls or strip malls

# Recommended Data Items

FTA Recommended Data Items that Survey Instruments Must Contain

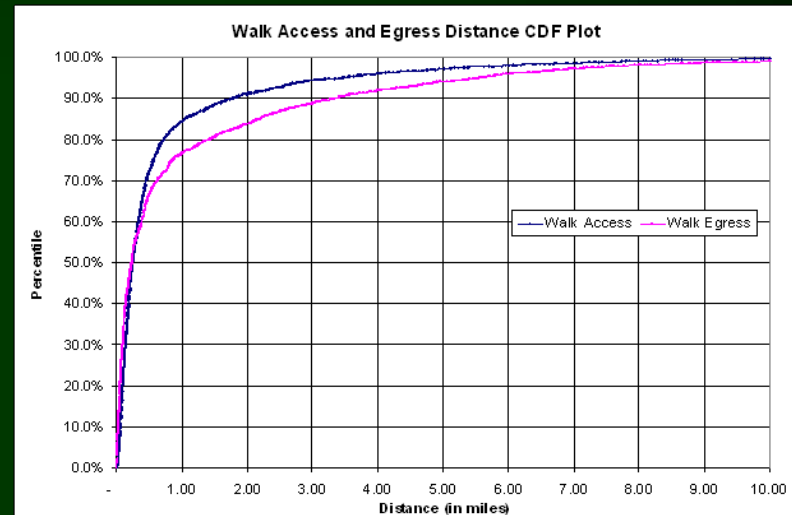
#	Category	Data Items
1	Origin	Location, purpose, transit access mode, park-ride location
2	Transit path	Full set of origin-to-destination transit lines used, boarding and alighting stop/station for surveyed vehicle
3	Destination	Location, purpose, transit egress mode, park-ride location
4	Person	Driver's license (definite) Age, worker/student (may vary by location)
5	Household	Number of vehicles owned (definite) Number of persons, adults, drivers and workers (may vary by location) Income (may vary by location)

- Explicitly define the data items comprising a “complete” survey record; this will avoid having unusable records in the final dataset

# Survey QA/QC Techniques

- Manual review
- Multi-dimensional tabulations
  - Trip purpose, time period, geographic district, access mode, surveyed mode, number of transfers, egress mode, market segment

- CDF plots



# Verifying Survey Expansion

- Compare the expanded dataset results to independently collected data

Some Common Comparisons for Verifying Survey Expansion

Rider Characteristic	Independently Collected Data	Expanded Onboard Survey Dataset	Notes
Park-riders	Park-ride vehicle counts	½ of park-ride trips (to produce equivalent vehicles)	Can be by lot or station if desired
Boardings by time of day period	Automated Passenger Counts by time of day period	Trips by time of day period	
Boardings by fixed-guideway station	Boardings by fixed-guideway station	Boarding by fixed-guideway station	
Students	Student and/or youth passes sold or distributed	½ of student trips (to produce equivalent number of students)	
Transfers at key locations	Transfer counts at key locations	Unlinked trips that transfer/would be expected to transfer at key locations	Can be performed by location



# Survey Data Application

- **Assign survey trip table**
  - **Unassigned records help identify previously unforeseen issues with survey geocoding, access and network coding procedures, pathbuilding procedures**
- **Review pathbuilder parameters**
  - **Park-ride and drop-off access distances**
  - **Review egress modes**
- **Review travel characteristics**
  - **Transit trip distance**
  - **Geographic O/D travel flows**



## Status

- Draft completed mid-October 2009
- Now in review & comment phase
- Please contact Vladimir Majano (850-414-4823 or [vladimir.majano@dot.state.fl.us](mailto:vladimir.majano@dot.state.fl.us)) if you would like to review the draft white paper
- All comments due by November 20<sup>th</sup>