

# Ridership Forecasting: *A briefing*

## Sarasota North-South BRT Alternatives Analysis

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*Sarasota (SCAT) North-South BRT Alternatives Analysis*

# Items for Discussion

- **Why do we need forecasts?**
- **Developing credible forecasts**
- **Adapting the regional TAZ system**
- **Adapting the existing regional networks**
- **Using the survey/data collection efforts**
- **Model Considerations**
- **Involving FTA technical staff**

# Why do we need Ridership Demand Forecasts?

*Demand forecasts provide the primary quantitative indicator of the efficacy of mobility improvements, answering the following:*

- How many people are going to ride the project?
- How does the project fit into the overall mobility picture in the region?
- Who does the project serve?
- Who benefits from the project? Who is hurt?
- What confidence do we have in our decisions?

# Small Starts AA Forecasting: Guiding Principles

- Existing transit user behavior is best proxy for project user behavior
- On-board survey coupled with detailed ridership counts provides the best snapshot of existing transit user behavior
- Identify markets of new ridership types
- Accurate representation of transit services and access characteristics
- Consistency across alternatives
- Efficient use of existing regional data

# Forecasting Approach: Development (Task 5)

- **Research** what other regions have done to identify non-pre-existing ridership
- **Revise** the regional zone system appropriately
- **Represent** the regional highway and transit system accurately and appropriately
- **Render** the on-board survey analytically into assignable trip tables
- **Roll up** the above into a tool suitable for testing alternatives

# Forecasting Approach: Application (Task 6)

- **Develop** operational/market characteristics of each alternative (running times, etc.)
- **Depict** coding of each alternative sensitive to operational characteristics
- **Do** forecasts, examine results, and revise as necessary
- **Document** forecast results comparatively
- **Discuss** model findings and approach with committee and with FTA technical staff

# Reviewing the Regional TAZ System

- Accessibility to transit is key to understanding demand
  - Review TAZ system in corridor
  - Identify zones to be split for size, lop-sidedness, or transit accessibility issues
  - Work with MPO staff to change zone system
  - Modify highway networks accordingly
    - New Centroid Connectors
  - Modify zonal data (ZDATA) as appropriate

# Adapting the Regional Networks

- Review SCM model coding for speeds and configuration
- Add missing facilities used by buses
  - Any added links should be done with FSUTMS coding standards and presented to MPO
- Review and revise coding of access links/centroid connectors
- Code each SCAT and MCAT routes
  - Develop travel time functions to match running times

# Using the On-board Survey Data

- Market segmentation by
  - Route/service used
  - Trip purpose
  - Modes of access/egress
  - Origin, Destination, Boarding and Alighting location
  - Demographic variables (income, age, etc.)
  - Time of Day, Day of Week
- Geocode survey records to regional TAZ system
  - Develop assignable zone-to-zone trip tables
  - Assign to coded networks and check results against actual ridership

# Using the Ridecheck Data

- Basis for factoring survey records
- Target for trip table assignments
- Basis for ridership forecasts
- Understanding of Transfers

# Model Considerations

- Software
  - GIS
  - Model analysis software (CUBE/TP+/Tranplan)
  - Analytical software (spreadsheet/database)
  - SUMMIT (FTA User Benefit Software)
- Elements of the Forecasts
  - Survey-based trip table
  - Incremental ridership based on benefit to markets and derived elasticities
  - Computation of benefits

# Involving the FTA Technical Staff

- FTA early involvement increases chances of the project advancing by
  - Helping us contact others who have dealt with similar issues
  - Reviewing assumptions and parameters
  - Identifying trouble-spots or potential pitfalls early
  - Assistance with data management and surveys
  - The more they understand the project, the better able to evaluate its merits
- Involvement to date

# Questions?













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# Items for Discussion

- **Why do we need demand forecasts?**
- **Requirements of Alternatives Analysis**
- **FTA New Starts/Small Starts/Very Small Starts**
- **What data do we have?**
- **What models/tools do we have?**
- **What effort is it going to take?**

# Why do we need Demand Forecasts?

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# Requirements of Alternatives Analysis

Alternatives Analysis is the planning phase which has the responsibility to

- Evaluate a wide range of potential feasible alternatives (alignments, modes, etc.)
- Provide an analytical basis for selection of a preferred alternative
- Provide a clear path to later planning phases
  - Application to Enter Preliminary Engineering or Project Development phase

# FTA \_\_\_\_\_ Starts

Discretionary Funding Source for Capital Transit Improvements, as outlined in 49 CFR 5309

Current proposed rule comes in 3 flavors:

- **New Starts** (>\$75M federal share)
- **Small Starts** (<\$75M federal share)
- **Very Small Starts** (<\$50M total cost, etc.)
- Notice of Proposed Rulemaking is issued

# FTA \_\_\_\_\_ Starts: Forecasting Implications

Projects are given an overall rating based on Cost Effectiveness

- Rating based on Mobility Improvement measure
- Transportation System User Benefits (TSUB)
- Quantitative representation of the total aggregate mobility benefit of the project
- Complicated mathematical calculation
- Very Small Starts are automatically cost effective if they meet certain criteria

# FTA \_\_\_\_\_ Starts: Forecasting Implications

Each level has different requirements for forecasts

## New Starts:

Full regional-model based forecasts with TSUB  
for Year of Opening and Long-range Year

## Small Starts:

Full regional-model based forecasts with TSUB  
for Year of Opening

## Very Small Starts:

More limited means tests of project ridership

# The Need for this in Alternatives Analysis

Officially, Alternatives Analyses are not New Starts projects, so they do not require all of the mobility measures/cost effectiveness calculation

But...such is used by FTA when evaluating the Application to Enter P.E. (or P.D.) that follows an Alternatives Analysis

So...for all intents and purposes, all of this is required in an AA if FTA \_\_\_ Starts funding is to be a part of the funding.

# FTA New/Small Starts Forecasting Requirements: Highlights

## Project Justification/Making the Case

- Not quite the same as “Purpose and Need”

Input data is based on regionally adopted forecasts

Use of a suitable disaggregate demand model

Fixed trip distribution across alternatives

Trip pattern data based on recent local surveys

Model parameters must be within acceptable ranges

Suitable review of eventual “Baseline” alternative

# Forecasting Issues in Sarasota

- AA Needs to look at a range of alternative concepts
  - Which tool to use to screen alternatives?
  - Which tool to use to develop detailed forecasts?
- Adapting regional model to compute TSUB
- Available Survey and Trip-pattern data
  - How to calibrate/validate
  - Project justification

# What Data do we have available to us in Sarasota?

- Available data
  - Regional socioeconomic forecasts (MPO adopted)
  - Transit operating and usage data
  - Data to be collected under §5339 grant
  - Harris Interactive data
  - Florida Statewide data
  - Other data

# What modeling tools do we have at our disposal?

- Modeling tools to choose from
  - Sarasota-Manatee-Charlotte MPO model
  - FDOT District 1 model (in development)
  - Tampa Bay Regional model (TBRPM)
  - Florida Statewide Planning Model
  - Noblis IBAT tool
  - Simplified approach (Very Small Starts)
  - An imported model

# Model Pros and Cons

- Sarasota-Manatee-Charlotte MPO Model
  - Regional model for this region
  - FSUTMS standard model in TP+/Cube
  - Highway-only at this point
  - Is network detail sufficient?
  - Calibration/Validation issues
- FDOT District 1 Model
  - In development, not ready for use yet
  - Is network detail sufficient

# Model Pros and Cons (continued)

- Tampa Bay Regional Planning Model (TBRPM)  
Regional model for this region
  - Transit modeling capability
  - Has not yet been applied for FTA New Starts
  - Coverage stops short of Sarasota
  - Is network detail sufficient?
  - Different FDOT District
- Florida Statewide Planning Model
  - Network detail too coarse

# Model Pros and Cons (continued)

- Noblis IBAT Tool
  - Tool to evaluate different BRT/ITS technologies
  - Estimate running time and ridership along line
  - Not fully network-based
  - Not sufficient for FTA New Starts/Small Starts/TSUB computation
  - Could be good tool for screening
  - Useful for analysis of transit travel time
- Simplified (e.g. spreadsheet) approach
  - Only appropriate in Very Small Starts
  - Possibly for downtown circulator
- Imported model tool
  - Import an “FTA standard” mode choice model
  - Few other obvious Florida candidates

# So...

## What effort is it going to take?

- Technical workshop (Thursday morning) will discuss these issues in more detail
- Solicit feedback and buy-in from FTA technical staff
- Likely approach is a hybrid
  - Combining elements of different models and data
  - Adding transit analysis elements where none exists
  - How best to use Noblis IBAT and Harris Interactive data?
- Big, time-consuming effort to develop, code, test, and apply models
- FTA involvement is critical (early and often)

# Discussion and Questions