Mid-South Regional Travel Survey & Model Update

MDOT Quarterly Meeting

April 9-11, 2014

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The Project Team

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- Cambridge Systematics - Primary consultant
  - Lead modeling & survey analysis
- Dikita Engineering – transit survey
- Abt SRBI – household survey
- Neel-Schaffer – freight and bike/ped surveys

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Project Steering Committee

- Memphis MPO Staff
- State DOTs
- Memphis Area Transit Authority (MATA)
- Regional Partners

- Roles of the Committee:
  - Review study materials
  - Ask questions of the project team
  - Provide guidance, feedback, and agency perspectives
  - Facilitate outreach

Introduction & Overview

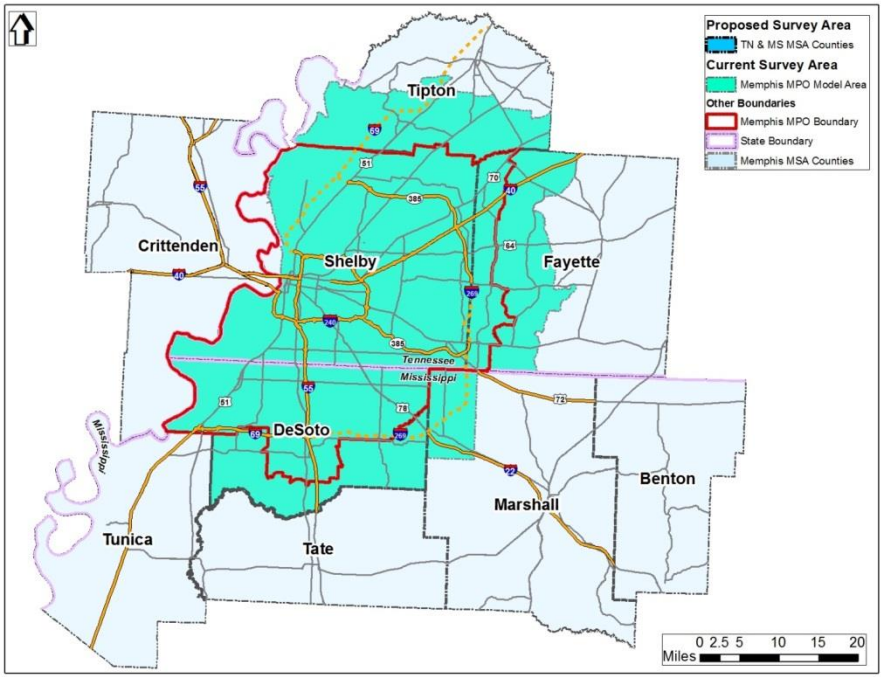
- Purpose of the project
  - Survey regional travel patterns
  - Update the MPO's regional Travel Demand Model
  - Long-range transportation planning

- Modeling Needs
  - Air Quality Conformity
  - Congestion Management
  - Scenario Planning
  - Performance Measures

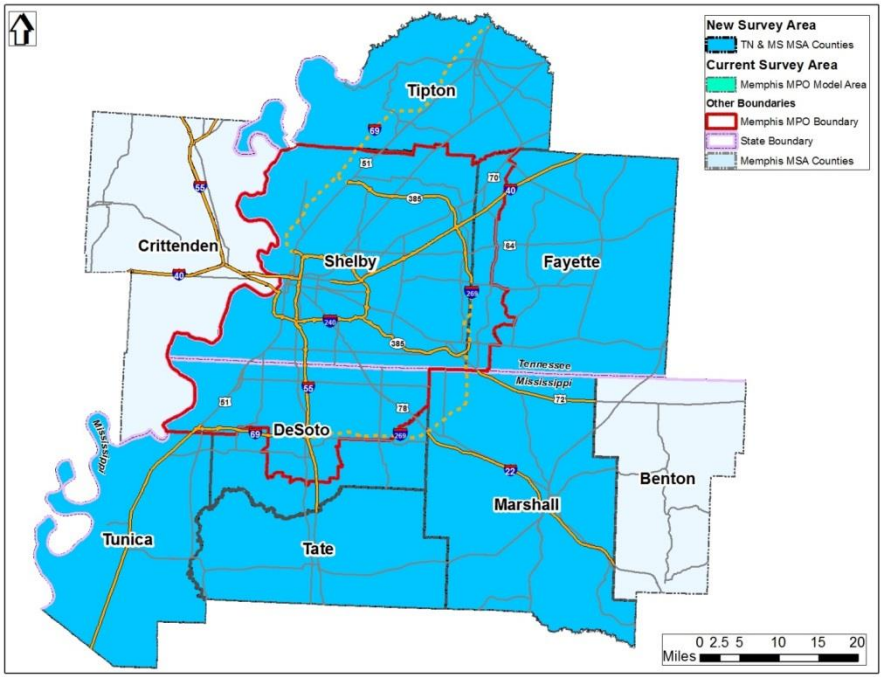
Introduction & Overview

- Key components of regional travel survey
  - Household Travel Survey
    - Statistical sample of households in the region
  - On Board Transit Survey
    - Survey all existing routes incorporating existing ridership data
  - Bike/Pedestrian Survey
    - Survey of non motorized travel methods
  - Freight Data
    - Incorporate freight data from a multiple of sources to incorporate into the travel demand model.

Study Area



1998 Survey Area



2014 Survey Area

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Household Travel Survey

- Statistical sample of households in the region
  - 4,500 completed households
  - Stratified by county & household type
  - Address-based sampling
  - Use of GPS/GIS tools for quality control
- Survey issues
  - Maximizing response rates & addressing non-response
  - Oversampling of hard to reach households
  - Incentivizing participation

Figure 2.4 Memphis HTS Study Area

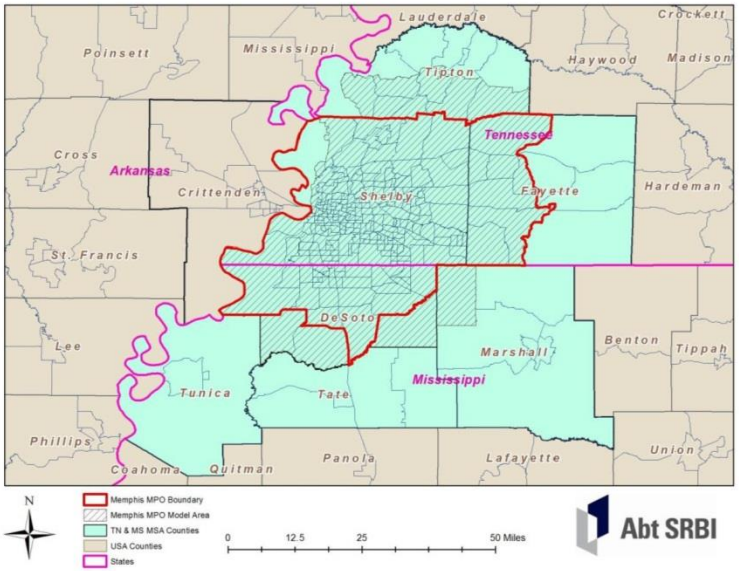
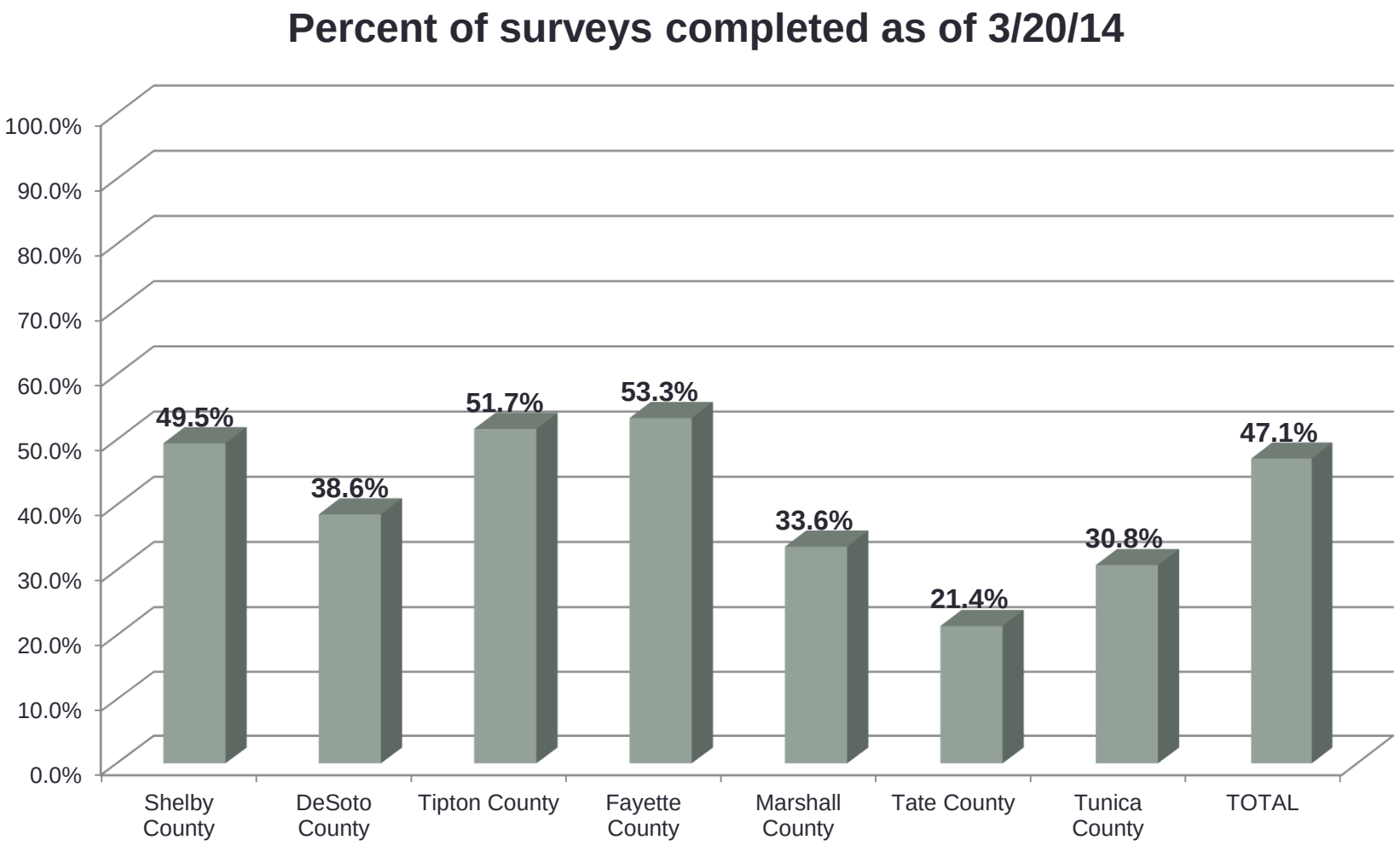


Table 2.3 Household Counts in the Study Area

County	HH Size (Source: 2010 Census)			Number of Vehicles (Source: ACS five-year estimates)			Total
	1	2	3+	0	1	2+	
Fayette, Tennessee	3,013	5,480	6,012	530	3,509	8,781	12,820
Shelby, Tennessee	99,495	104,238	147,238	32,739	134,510	159,367	326,616
Tipton, Tennessee	4,264	6,929	10,424	889	5,725	12,627	19,241
DeSoto, Mississippi	11,436	18,170	28,142	1,489	16,205	34,889	52,583
Marshall, Mississippi	3,257	4,389	5,723	1,088	3,936	6,625	11,649
Tate, Mississippi	2,206	3,220	4,609	560	2,950	5,639	9,149
Tunica, Mississippi	1,159	1,041	1,727	422	1,826	1,550	3,798
Total	124,830	143,467	203,875	37,717	168,661	229,478	435,856

Household Travel Survey



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Household Travel Survey

# Travel Wk*	Recruited	Retrieval Mode**				Total Retrieval	Cumulative Retrieved	Retrieval Response Rate	% of Retrieval Target***
		Phone	Web	Mail	Multi-Mode				
1	885	1	499	100	0	600	600	67.8%	141.2%
2	324	0	140	51	0	191	791	59.0%	122.8%
3	694	3	182	111	0	296	1087	42.7%	88.9%
4	669	0	200	97	0	297	1384	44.4%	92.5%
5	643	1	253	31	0	285	1669	44.3%	92.3%
6	693	0	215	4	0	219	1888	31.6%	65.8%
7	581	0	174	0	0	174	2062	29.9%	62.4%
8	599	0	58	0	0	58	2120	9.7%	20.2%
9	685	0	0	0	0	0	2120	0.0%	0.0%
10	749	0	0	0	0	0	2120	0.0%	0.0%
11	1	0	0	0	0	0	2120	0.0%	0.0%
Total	**6523**	**5**	**1721**	**394**	**0**	2120	2120	32.5%	67.7%

Transit On-Board Survey

- Calibrate & validate travel demand model
- Meet FTA reporting requirements
- Survey all existing routes
  - Incorporate existing ridership data
  - AM Peak, Mid-day, PM Peak, Evening

MATA

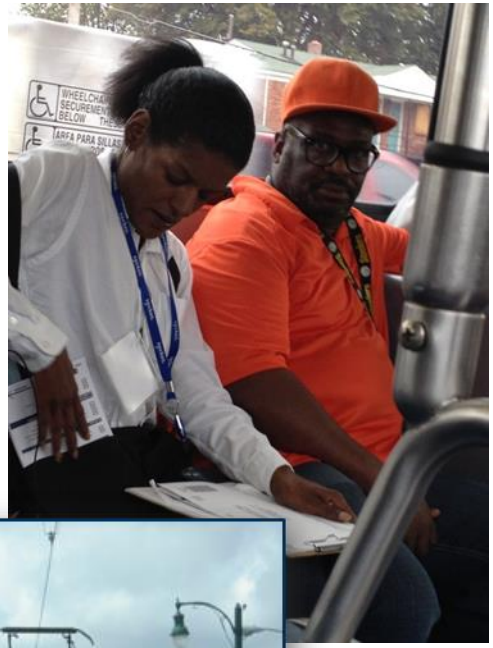
Program and Design
- Sampling Plans
- Instruments
- Download schedules
- Methodology

Coordinate
- Agency requirements
- Survey activity
- Recruit, hire, and train local team

Collect Data
- Organize field activity
- Supervise with experienced field personnel
- Improve response rates

Transit On-Board Survey

- Survey of existing routes completed.
- Currently preparing Paratransit portion of the survey.
- Drawing
  - 10 Adult 31-day passes
  - iPhone



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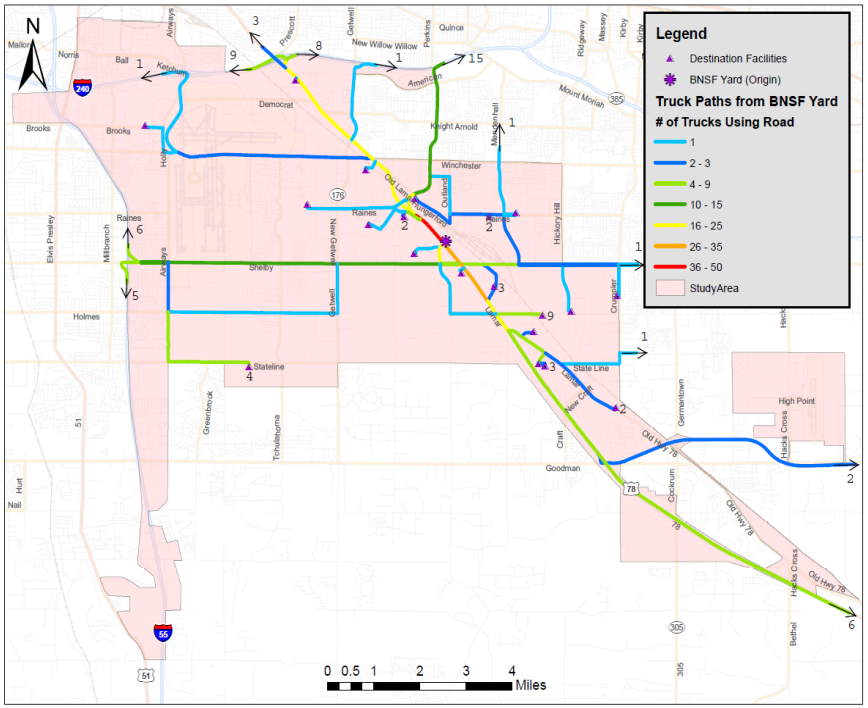
Non-Motorized Survey

- Purposes of the bike/ped surveys
  - Provide baseline data & model inputs
  - Evaluate impacts of investments & policies
- Mining of household and transit surveys
  - Trips made by biking and walking
  - Availability of bicycles for transportation
- Choice-based sample survey
  - 2011 Regional Bicycle & Pedestrian Plan
  - Over 2,100 responses
- Counts at key locations
  - National Bike & Ped Documentation Project
  - Existing & planned facilities; problem areas

Freight Survey – Existing Data

- Reliance on existing data sets/tools:
  - Federal Freight Analysis Framework
  - American Transportation Research Institute (ATRI)
  - TRANSEARCH
  - National Performance Management Research Data Set (NPMRDS)
- Previous studies
  - I-40 Origin-Destination Truck Survey
  - US-78 (Lamar Ave) Truck Field Survey



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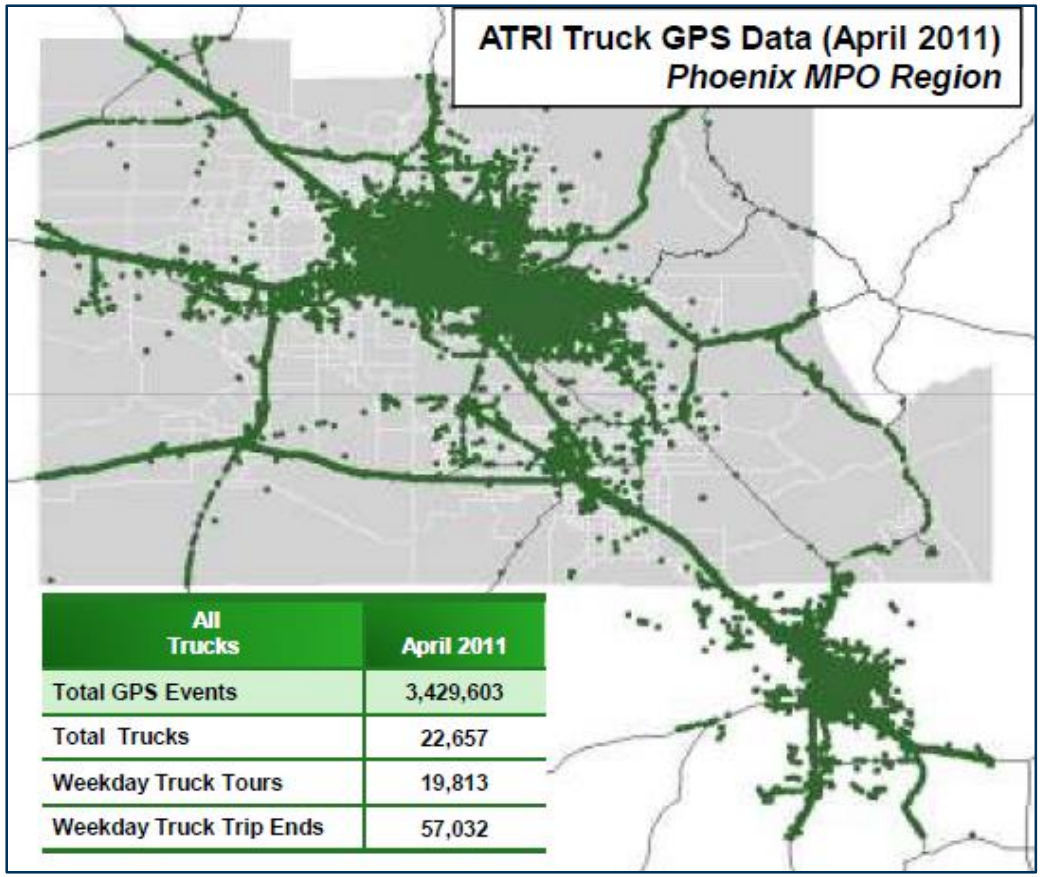
Freight Survey – GPS Data

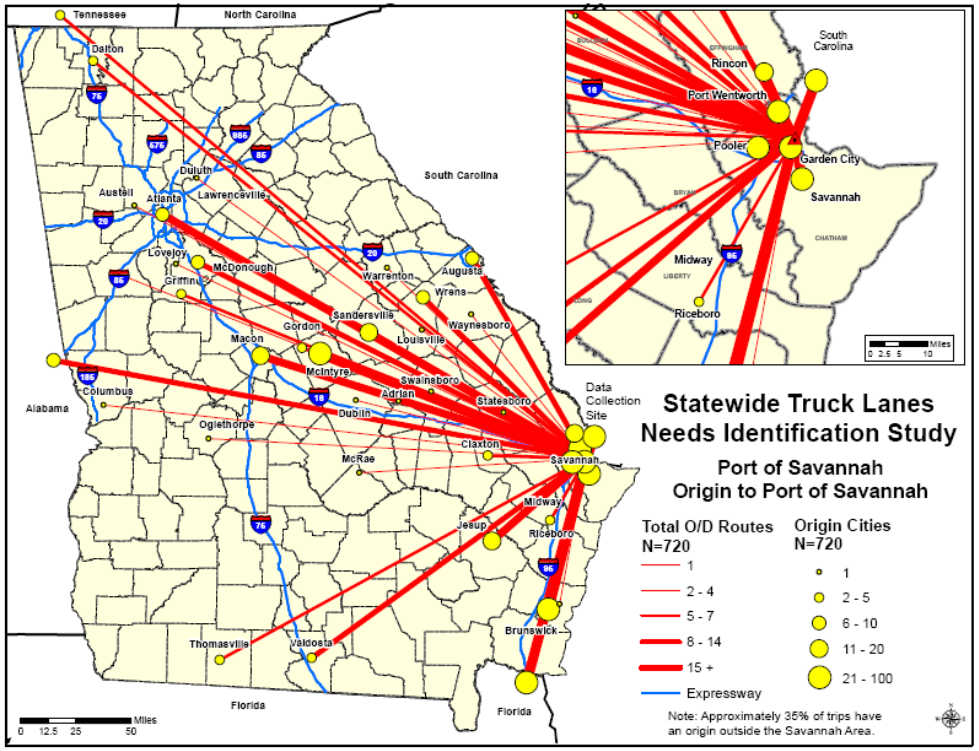
- Next generation truck activity data
  - Significant improvement relative to establishment surveys
- Millions of truck activity events
  - Speeds
  - Precise origins and destinations
  - Routing information
  - Multiple stop trips
  - Time-of-day stamp



All Trucks	April 2011
Total GPS Events	3,429,603
Total Trucks	22,657
Weekday Truck Tours	19,813
Weekday Truck Trip Ends	57,032

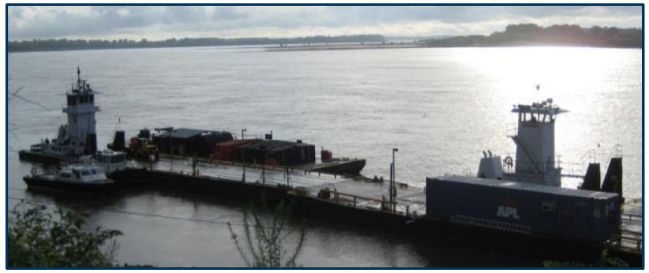
Freight Survey – Gate Surveys

- Gate surveys will be used for key freight generators in the Memphis region
  - Port gates
  - Intermodal rail yards
- Key information to include
  - Percent local v. through truck trips
  - Commodities and industries served
  - Origins / Destinations
  - Routes used



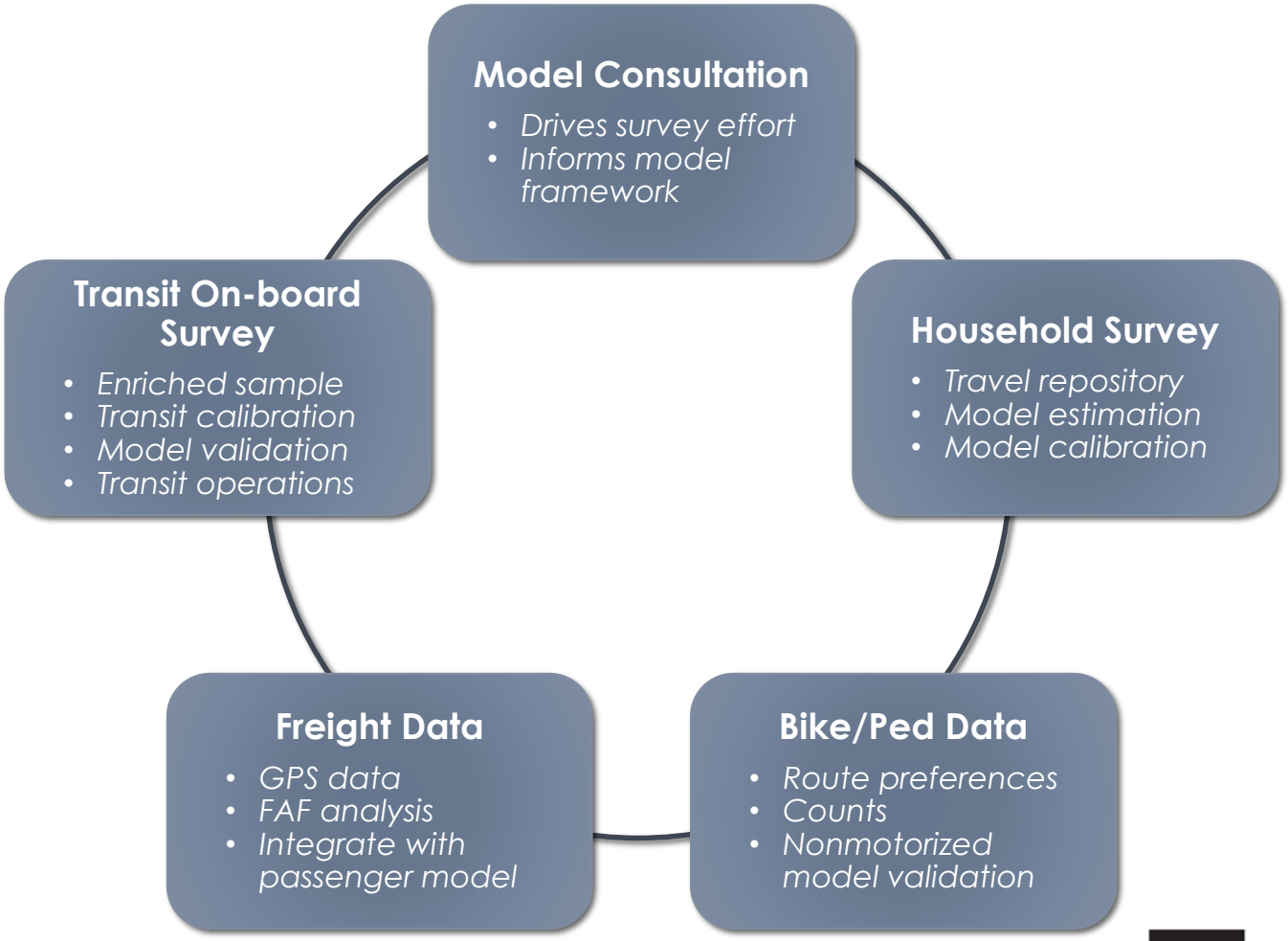
Freight Survey – Data Analysis

- Adds significant depth and breadth to existing data sets
- Supports regional travel demand model
- Enables project-level analysis of major freight investments
  - Traffic impacts
  - Economic impacts
- Informs broader freight planning efforts
  - Regional freight studies, TN Freight Plan, MAP-21



Travel Demand Model Update

How Do All the Pieces Fit into the Model?



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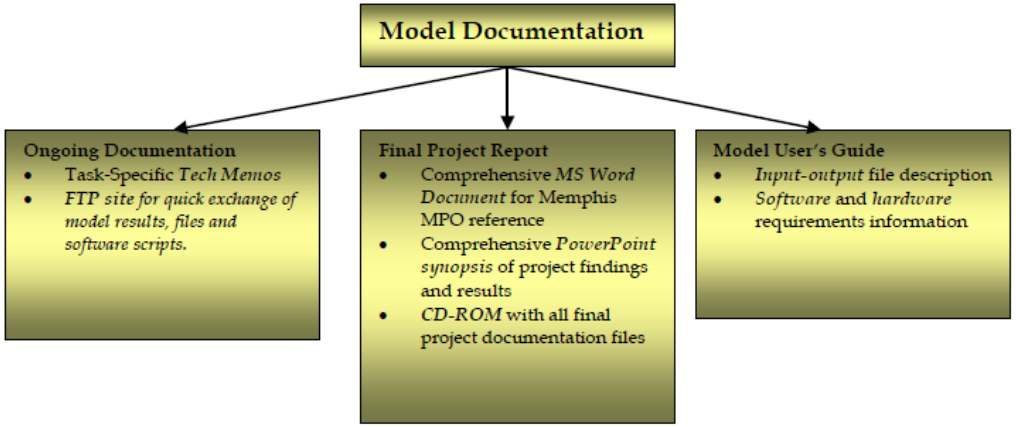
Travel Demand Model Update

- Updated demographic data and base year
- Increased focus on freight and bike/ped
  - Access and mobility
  - Mode shift
- Additional functionality
  - Scenario analysis
  - Rapid transit capabilities
  - Performance measures
  - Air quality post-processor



Questions & Discussion

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