LESSONS LEARNED IN FREIGHT DATA COLLECTION

2015 AMPO CONFERENCE

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OVERVIEW

- Study Background
- Freight Facilities Database and Data Collection
- Survey Results and Analysis
- Project Findings

PIEDMONT TRIAD FREIGHT STUDY

Phase 1

- Freight facilities database
- Freight survey data collection

Phase 2

- Develop advanced freight model
- Integrate with existing PTRM

Phase 3

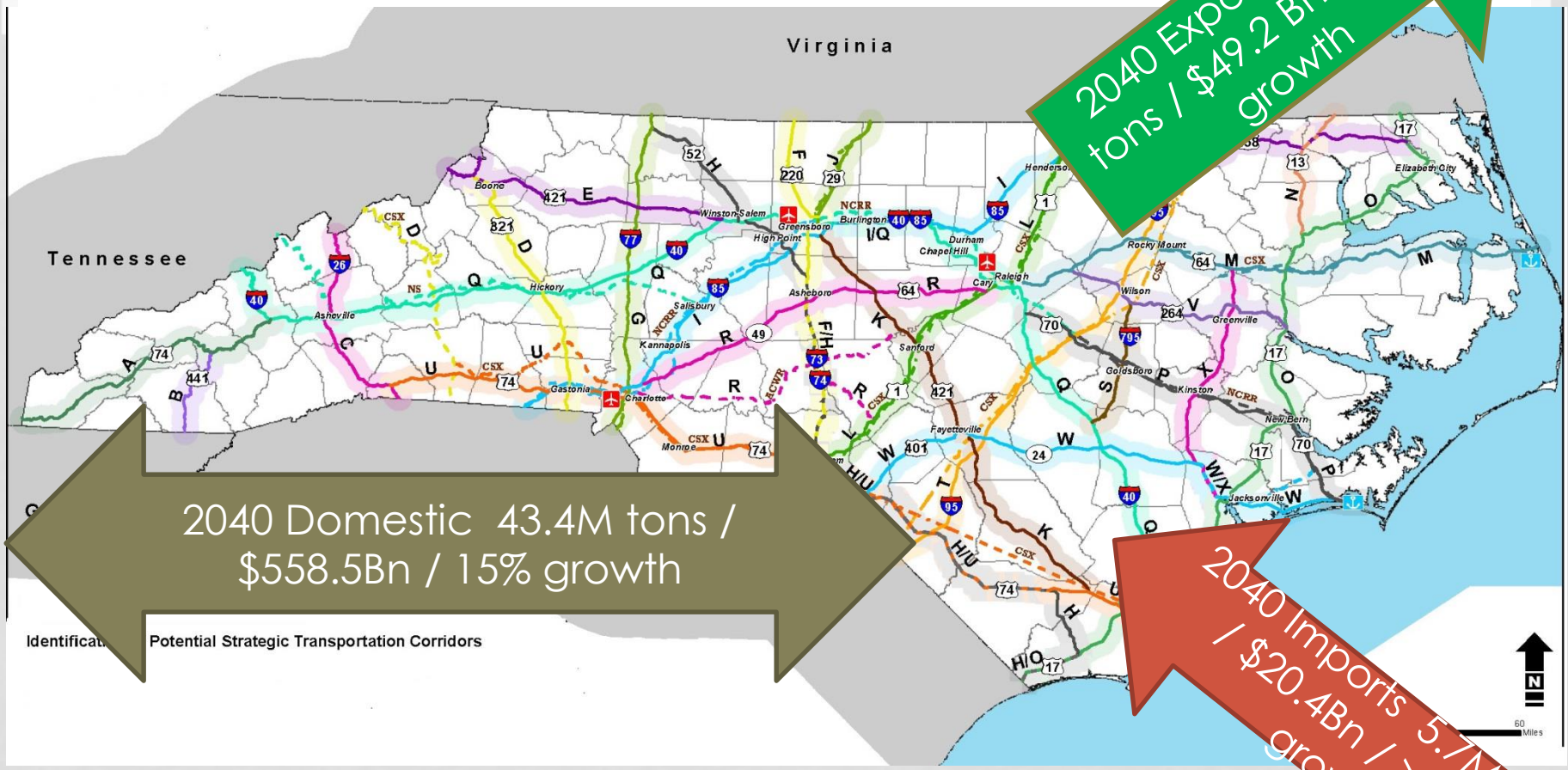
- Travel diary data collection
- Estimate freight model with local data

BACKGROUND

FREIGHT AND THE TRIAD

- Goods movement and the economy
- Considering Freight in Transportation Planning
- Role of Freight in the Triad
  - One of the worlds largest transportation and logistics clusters
  - Region is growing through diversification
  - I-85/I-40 gateway to major hubs in the north and south
  - Some of the highest truck flows in North Carolina
- Region is taking bold steps to understand freight and logistics

NC FREIGHT FLOWS



2040 Exports 14.5M tons / $49.2 Bn / 150% growth

2040 Domestic 43.4M tons / $558.5Bn / 15% growth

2040 Imports 5.7M tons / $20.4Bn / >200% growth

PIEDMONT TOGETHER

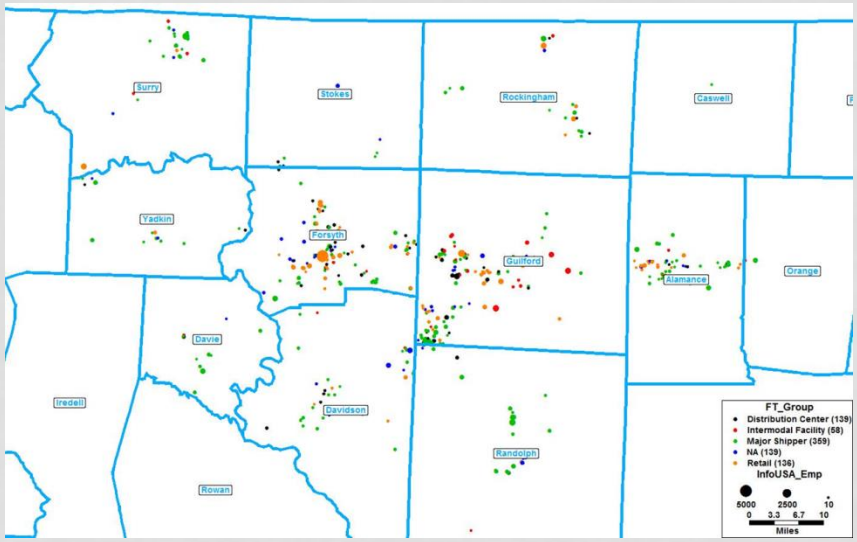
- **Goal 1: More transportation choices through the development of safe, reliable and economical transportation infrastructure and services**
  - Objective 1 Establish an enhance a robust network of multimodal transportation choices at the statewide, regional, county and municipal
  - Objective 2 Conduct local research and education on the benefits of a multimodal regional network.

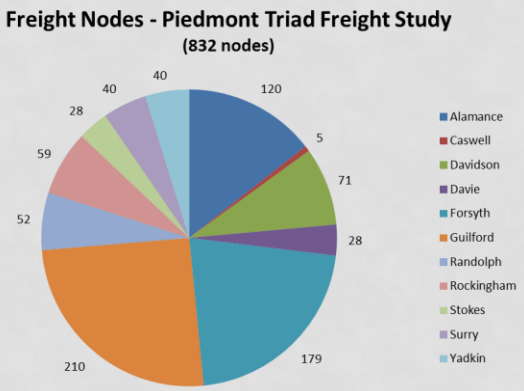
- **Goal 2: Maintain and enhance the region's competitive edge as a freight transportation and logistics hub on the Eastern Seaboard**
  - Objective 1 Develop a comprehensive vision for freight infrastructure in the region.
  - Objective 2 Develop a multimodal freight network strategy in the region designed to create, protect and maintain transport links, connecting intermodal facilities and appropriate modes, both public and private.
  - Objective 3 Maintain a low level of traffic congestion in the region along Unlimited Truck Routes.
  - Objective 4 Expand logistics education and career opportunities for the Piedmont Triad workforce.

FREIGHT FACILITIES DATABASE AND DATA COLLECTION

FREIGHT NODE DATABASE

- Data sources
- Geocoding and challenges
- Populating the database
- Key data elements
  - Location
  - Contact
  - Type





INITIAL DATA COLLECTION STRATEGY

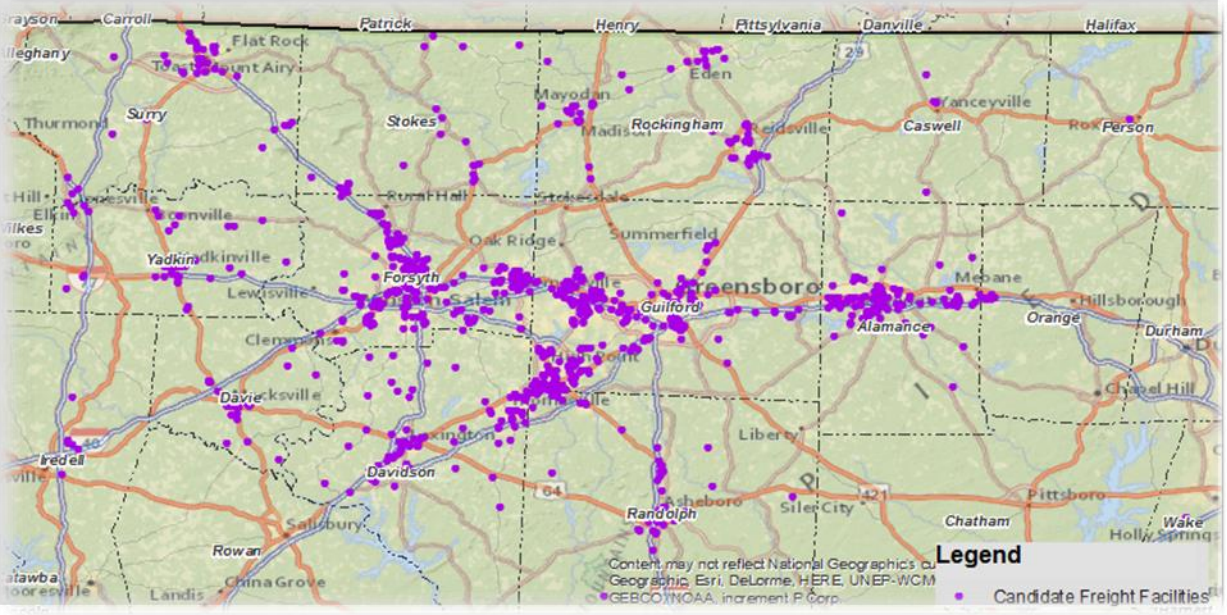
- Sampling Plan
  - Considers facility type and scale
    - Distribution center, intermodal, major shipper, retail
    - Large, medium, and small with respect to freight traffic
  - Considers geographic distribution
  - Considers strong relationships with industry representatives
    - But within the constraints of the sample plan
- Freight Node Surveys
  - Contact by phone to schedule in-person interview
  - 4 teams of 2 conducting interviews
  - Goal: 2 – 3 interviews per day

REVISED FREIGHT NODE DATABASE

- Challenges encountered during data collection phase
  - Database did not include all freight nodes
  - Contact information was outdated
- Enhancements were necessary
  - Google Earth/Maps
  - Intensive visual review
    - Building SQFT
    - Truck Bays
    - Truck Parking
  - 969 Freight Nodes

FREIGHT FACILITIES DATABASE

- 968 Facilities classified by type
  - Distribution center, intermodal facility, major shipper, retail
- Basic information available for most facilities
  - NAICS classification code, number of truck bays, primary commodity



REVISED DATA COLLECTION STRATEGY

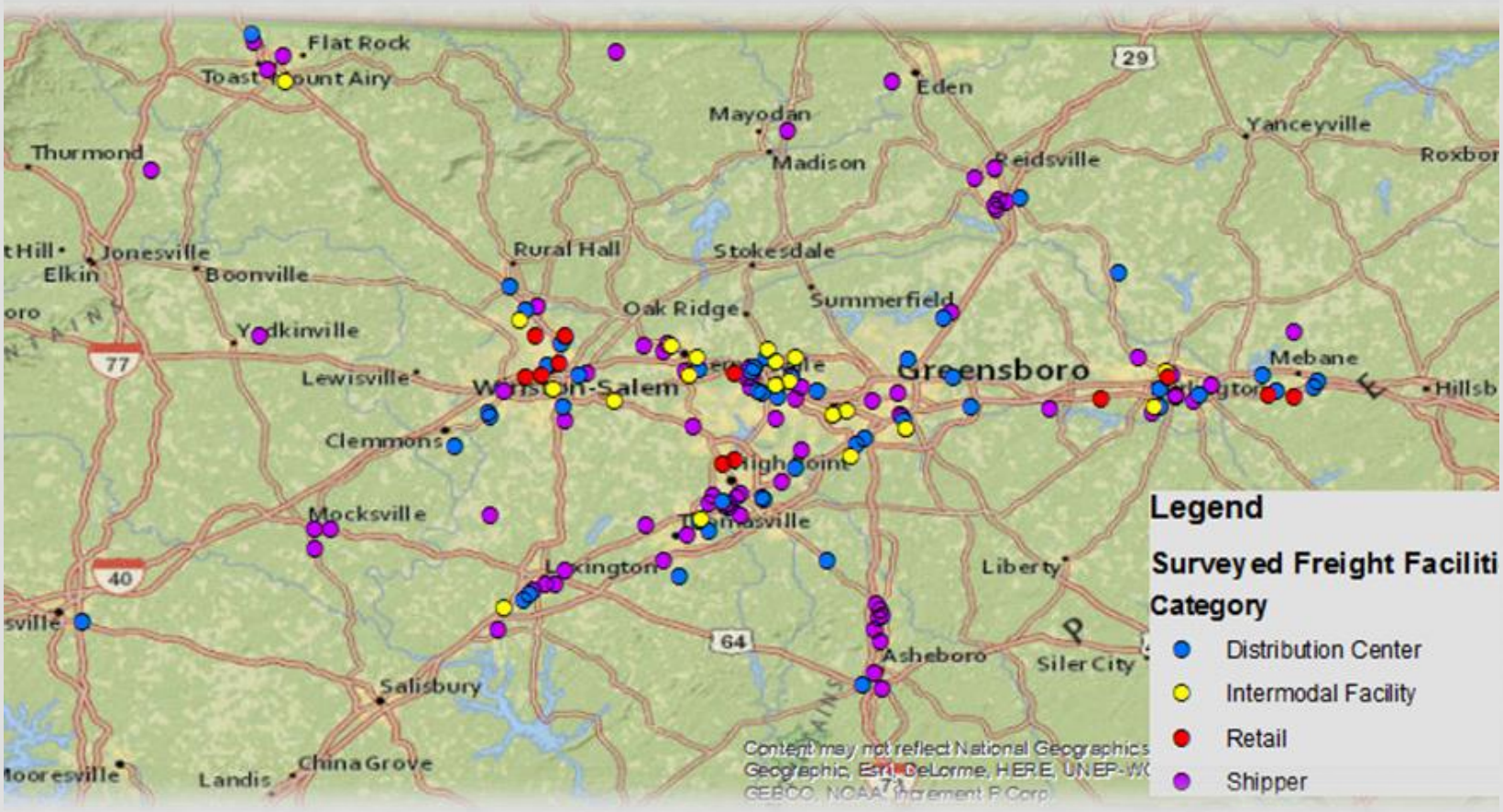
Challenges

- Absence of key freight nodes
- Scheduling of interviews was difficult due to lack of contact information for key individuals
- Available phone numbers often resulted in dead ends
- Success rate made it clear that revisions were needed

Revised Approach

- Visit each facility in person to establish in-person contact
- Speak with facility operation manager
- Leave addressed and stamped survey form to complete and return later
- Response rate moved from ~7% to nearly 30%
- 76% of surveys received in this manner

SURVEY RESULTS AND ANALYSIS

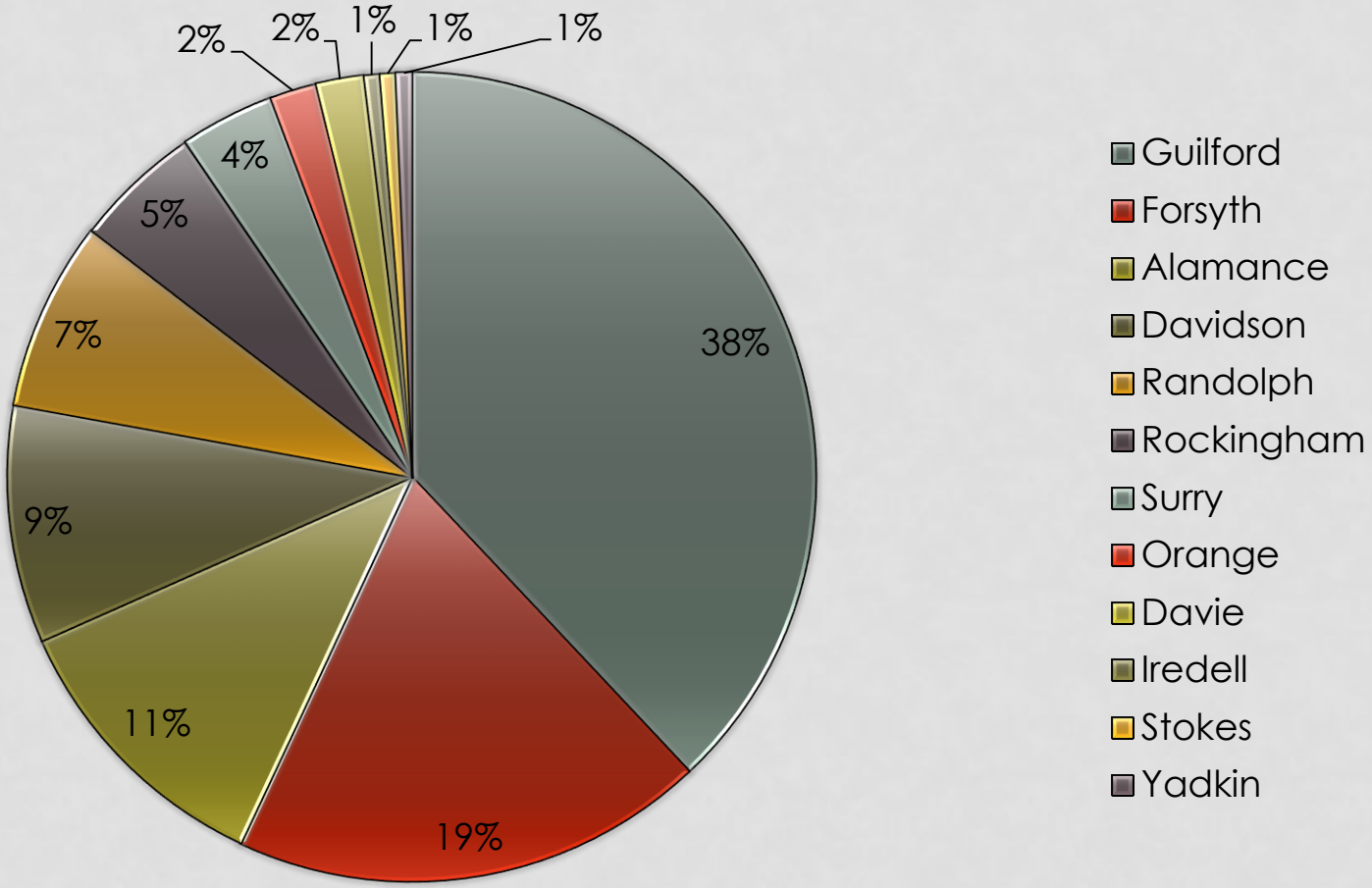


SURVEY RESULTS

OVER 800 FACILITIES VISITED, SURVEY DATA FOR 158

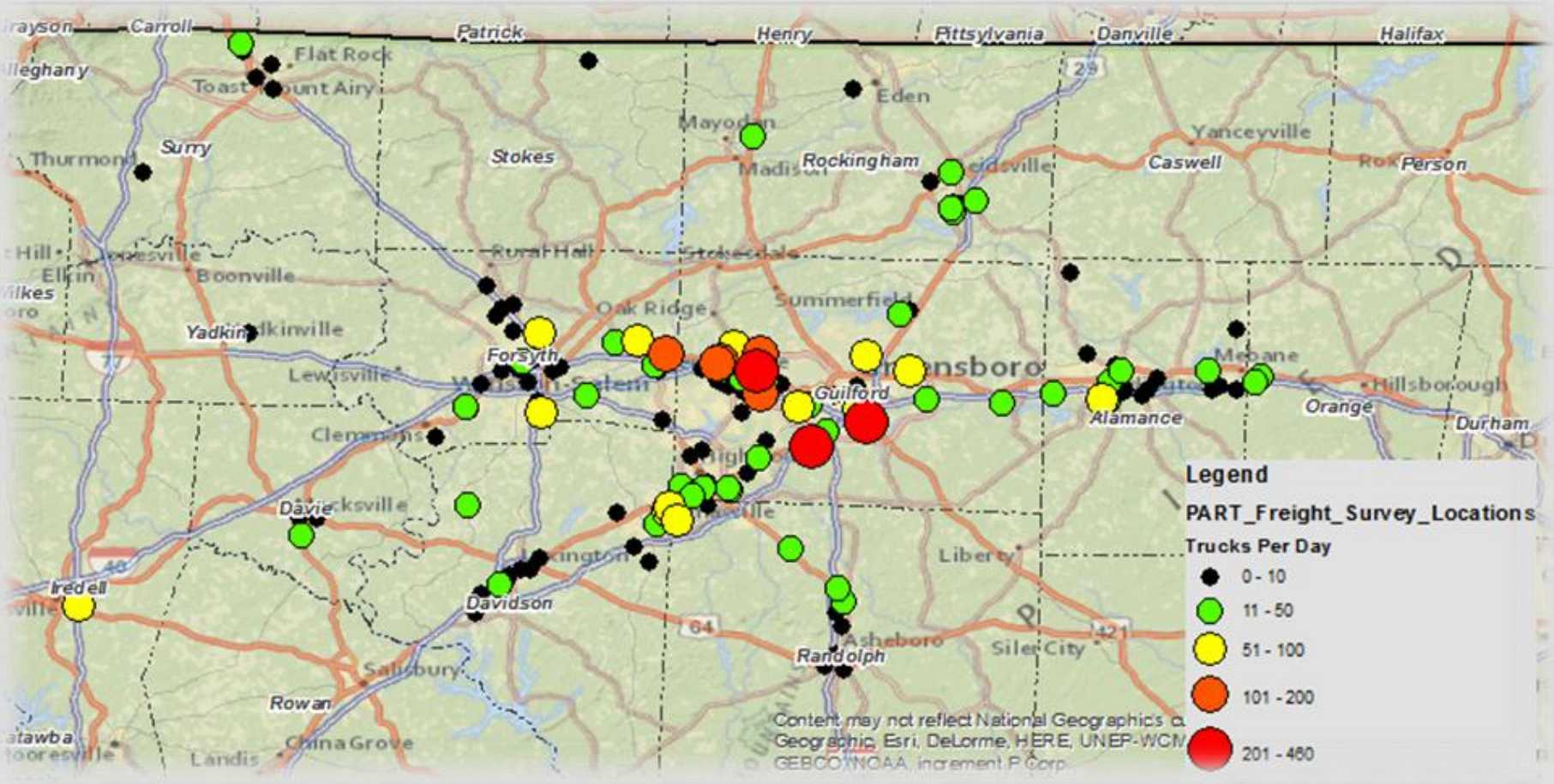
EXAMPLE DATA RECORD

RecordID	2775
County	Iredell
Type	Warehouse
Category	Distribution Cen
PTRM_NAICS_Group	Retail
FT_Empl	75
Bldg_SF	24000
TrkBays	0
IB_Comm1	Scrap metal
IB_Comm2	
IB_Comm3	
OB_Comm	Prcessed scrap metal
DailyTrk	80
Cntainer	20.00%
Conv5axl	50.00%
SingUnit	5.00%
Del_Vans	20.00%
OtherTrk	5.00%



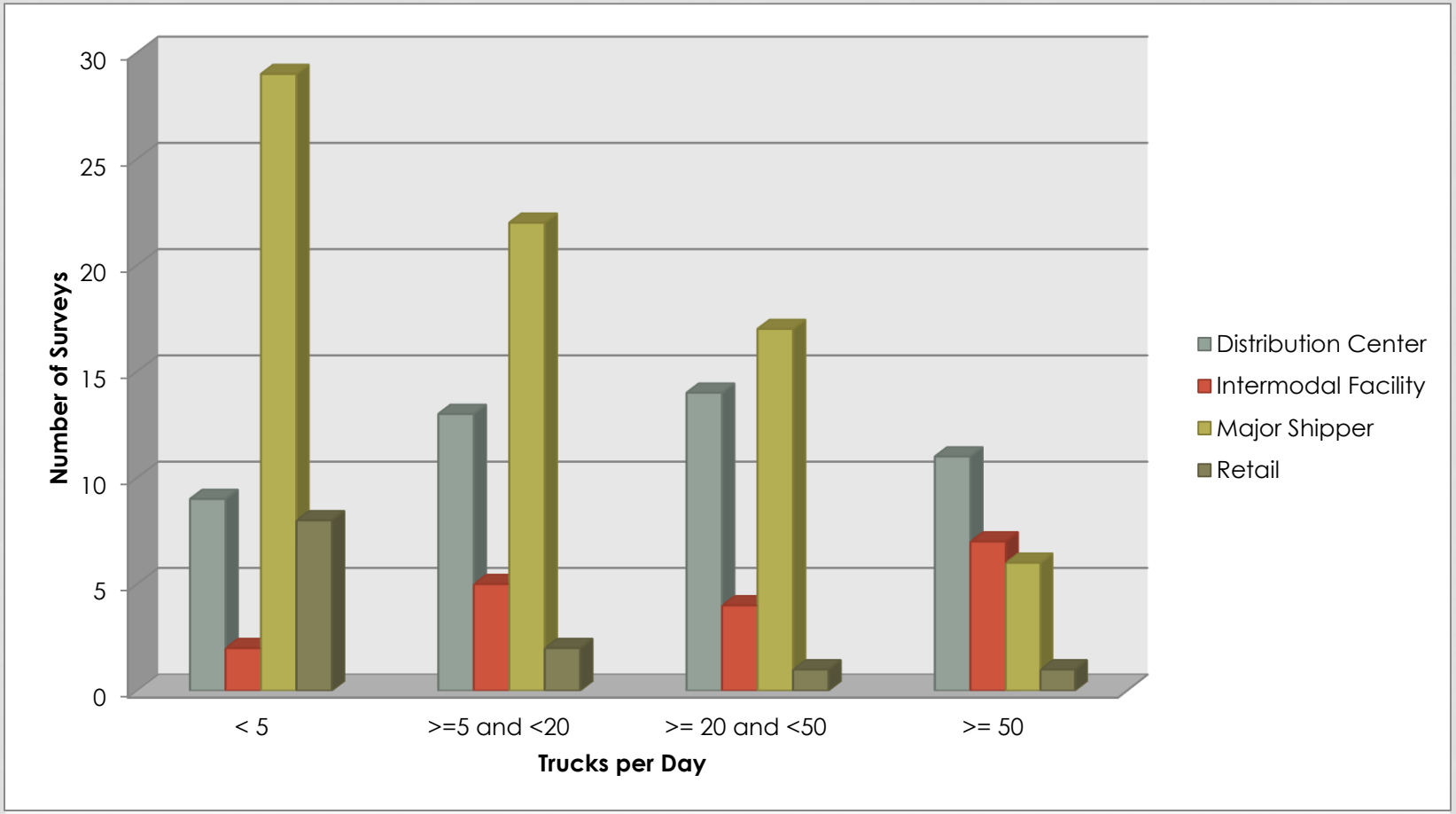
SURVEY RESULTS

DISTRIBUTION OF SURVEYS BY COUNTY



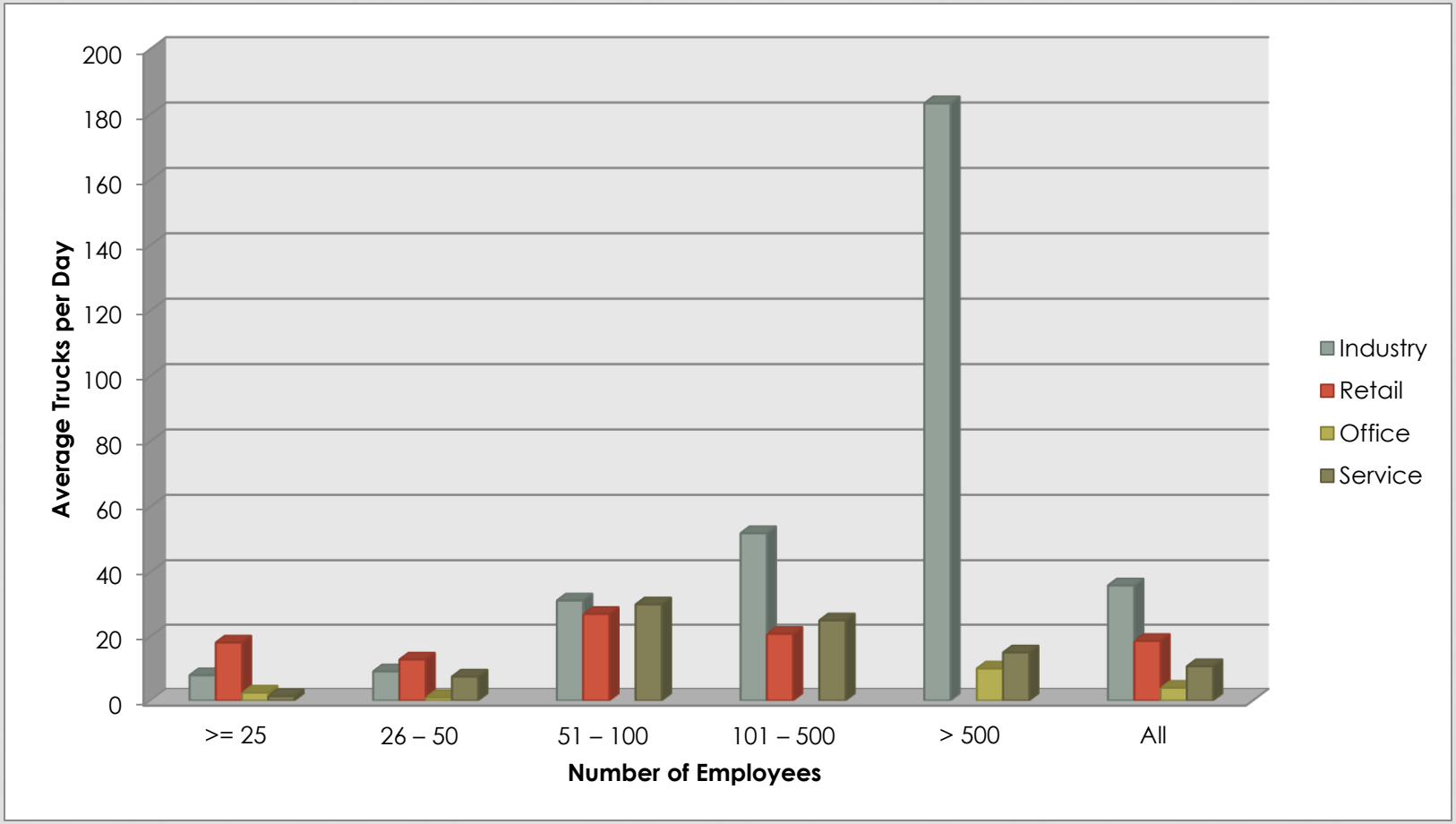
SURVEY RESULTS

SURVEY LOCATION BY NUMBER OF TRUCKS PER DAY



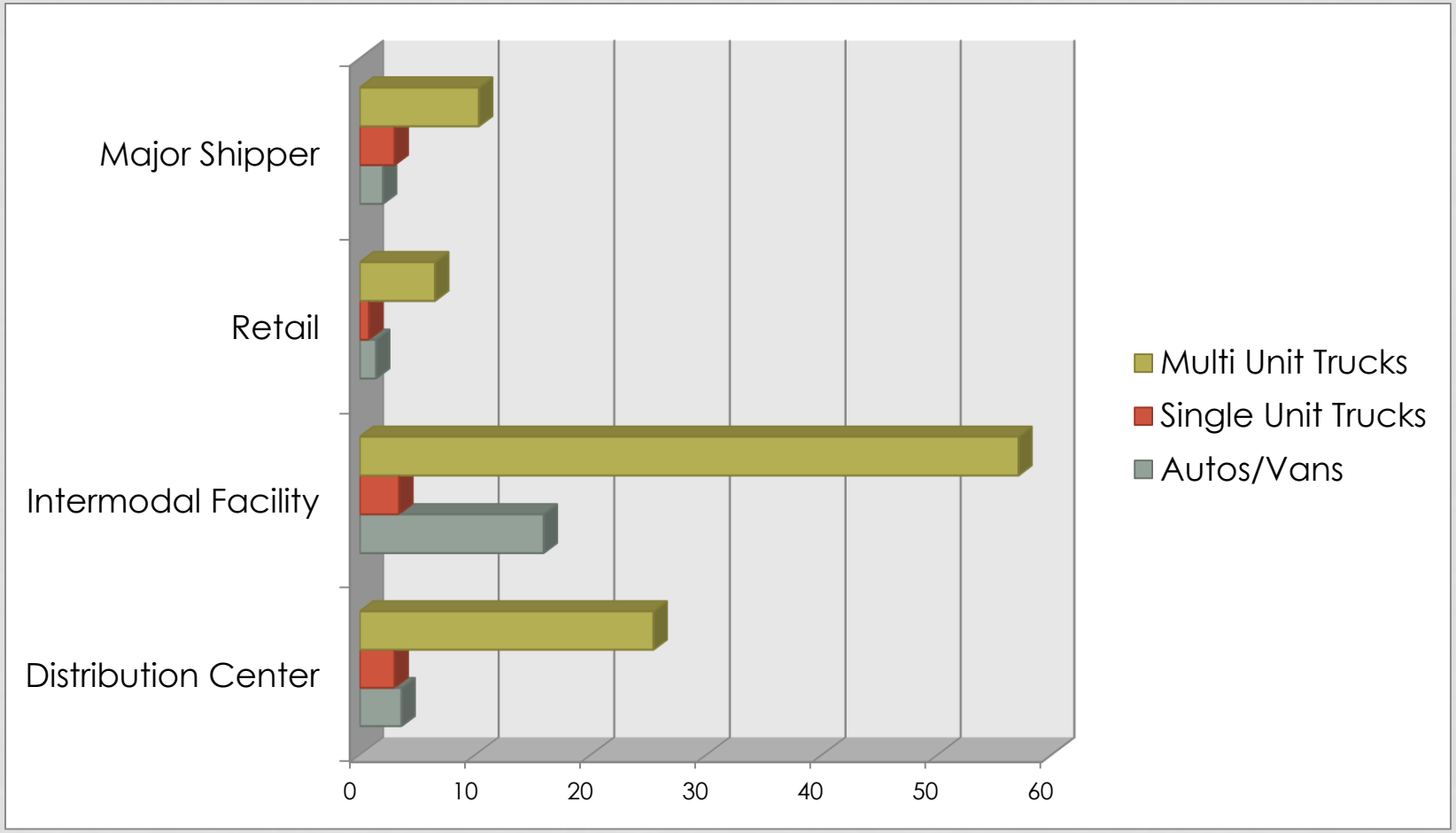
SURVEY RESULTS –TRIAD REGION

DISTRIBUTION BY TYPE AND TRUCKS PER DAY



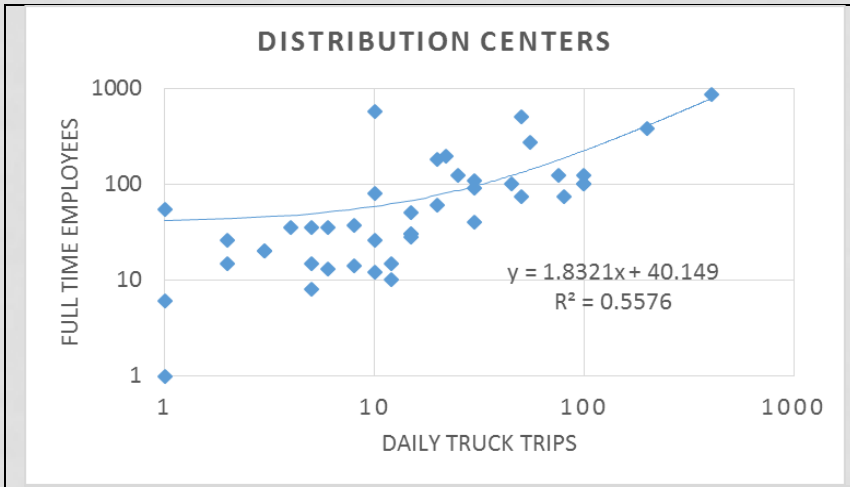
SURVEY ANALYSIS – TRIAD REGION

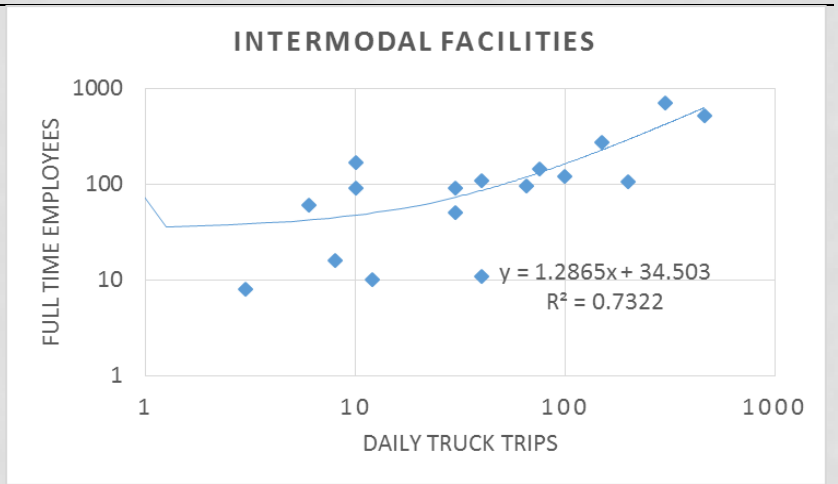
AVERAGE TRUCKS/DAY BY TYPE AND # OF EMPLOYEES

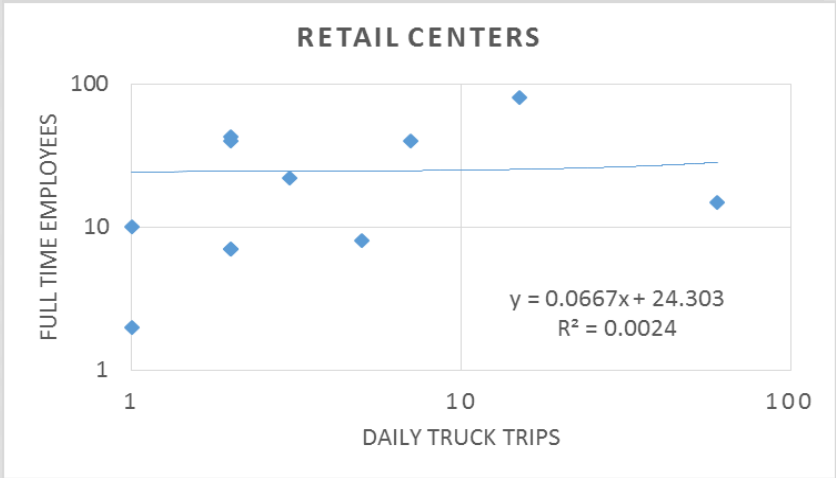


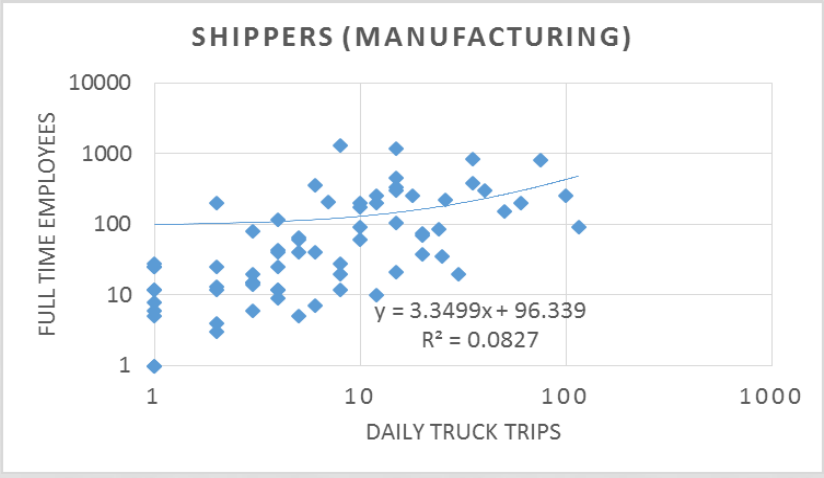
SURVEY ANALYSIS – TRIAD REGION

AVERAGE TRUCKS/DAY BY CLASSIFICATION AND TRUCK TYPE



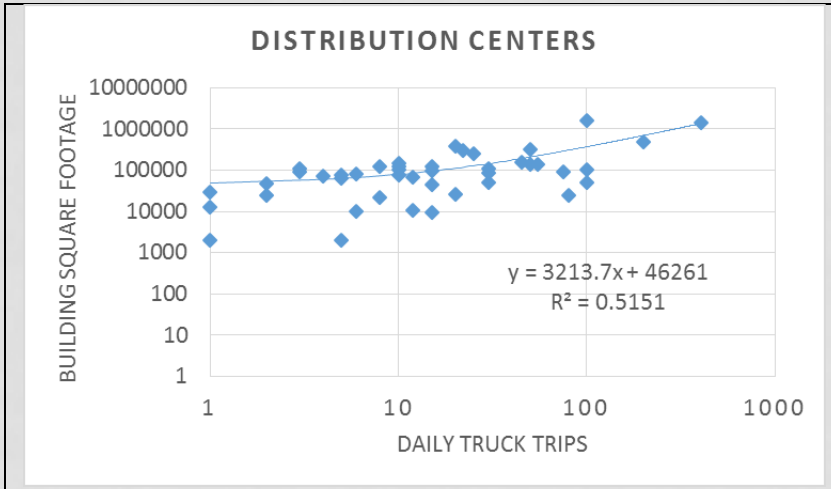


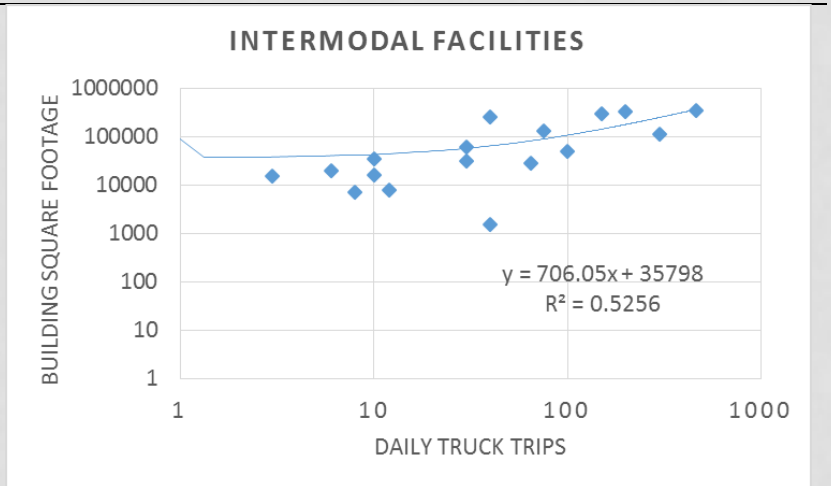


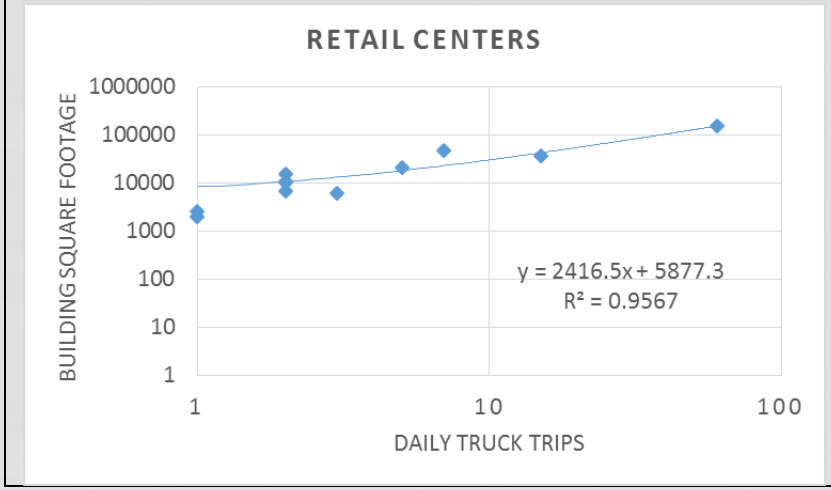


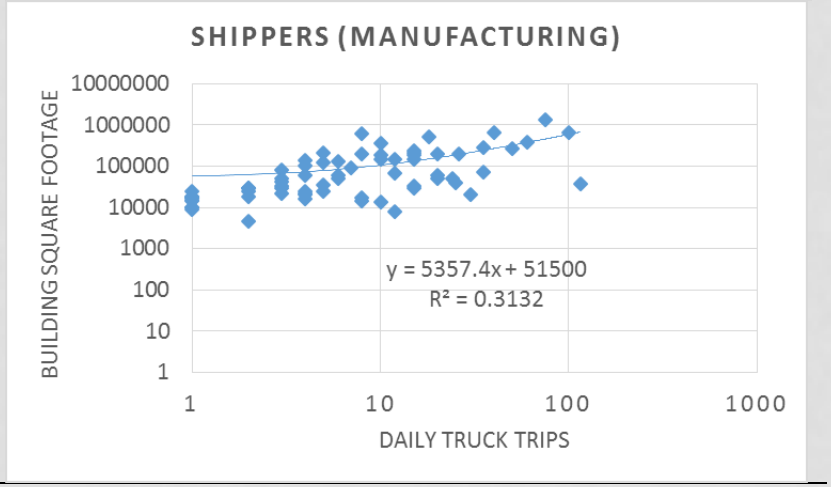
SURVEY RESULTS

EMPLOYMENT AND TRUCK TRIPS BY FACILITY TYPE









SURVEY RESULTS

BUILDING SQFT AND TRUCK TRIPS BY FACILITY TYPE

Employment Type/Number of Employees	Less than 25 (n=64)	26 – 50 (n=25)	51 – 100 (n=24)	101 – 500 (n=36)	Greater than 500 (n=9)	All
Industry	7.9	9.1	31.2	51.9	183.4	35.9
Retail	18.1	12.8	27.0	20.8	NA	18.6
Office	2.5	1.0	NA	NA	10.0	4.0
Service	1.4	7.5	30.0	25.0	15.0	10.7
All	10.2	9.6	30.4	46.1	145.4	29.0

SURVEY ANALYSIS

AVERAGE TRUCKS/DAY BY TYPE AND # OF EMPLOYEES

Freight Node Classification	Average Trips by Autos/Vans	Average Trips by SUT	Average Trips by MUT
Distribution Center (n=48)	3.6	3.0	25.4
Intermodal Facility (n=20)	15.9	3.4	57.1
Retail (n=12)	1.4	0.8	6.5
Major Shipper (n=78)	2.0	3.0	10.3

SURVEY ANALYSIS

AVERAGE TRUCKS/DAY BY CLASSIFICATION AND TRUCK TYPE

Triad Freight Survey				
Employment Grouping	**Autos/Vans**		**SUT**	**MUT**
Industry (n=105)	0.04		0.01	0.20
Retail (n=35)	0.05		0.13	0.12
Service (n=14)	0.02		0.01	0.06
Office (n=4)	0.00		0.01	0.02

1995 Piedmont Triad Commercial Vehicle Survey			
Employment Grouping	**Autos/Vans**	**Pickups**	**Trucks**
Industry	0.01	0.01	0.09
Retail	0.04	0.06	0.19
Service	0.02	0.03	0.07
Office	0.04	0.03	0.08

FHWA QRFM Table 4.1			
Employment Grouping	**4-tire trucks**	**SUT**	**MUT**
Agriculture, Mining, and Construction	1.11	0.29	0.17
Manufacturing, Trans, Comm, Utilities, Wholesale	0.94	0.24	0.10
Retail Trade	0.88	0.25	0.07
Office and Services	0.44	0.07	0.01

SURVEY ANALYSIS

AVERAGE TRIPS RATES/DAY BY EMPLOYMENT AND VEHICLE TYPE

PROJECT FINDINGS

EXISTING PATTERNS

- Highest concentration of freight facilities in Guildford County followed by Forsyth and Alamance
- By Classification:
  - Major Shipper (~55%)
  - Distribution Centers (~21%)
  - Retail (~16%)
  - Intermodal (~8%) – highest average number of truck trips
- Strong relationships:
  - Building square footage and average truck trips
  - Number of truck bays and average truck trips
- Freight facilities tend to cluster

LONG TERM FREIGHT PLANNING

- Increased freight flows as population increases:
  - NC population to increase by 3 million in next 25 years
  - NC freight traffic in 2040 will be 120 million tons higher
- Economic competiveness:
  - Freight supporting policies
  - Investments in infrastructure
- Triad Freight Study helps address critical freight related questions:
  - Where are the highest concentrations of freight generators
  - What types of vehicles do they use
  - How many trucks visit the site on an average day

TAKE HOME MESSAGE

What we have

Freight focused information system

Big picture benefit

Used to inform land use planning, transportation planning, and project prioritization

Specific applications

Investigate freight clusters

Estimate truck trips

Project prioritization

Inform land use and rezoning decisions

Identify characteristics supporting freight clusters

What comes next

Policy scenario analysis

Mode choice

Understanding of dynamics between congestion and freight

Impacts of land use decisions

ACKNOWLEDGEMENTS

- Billy Bachman, Westat, Inc.
- Charles Edwards, North Carolina Center for Global Logistics
- Rolf Moeckel, University of Maryland
- Triad Partners
  - PART
  - MPOs for Greensboro, High Point, Winston-Salem, Burlington-Graham
  - NCDOT
  - FHWA

QUESTIONS

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