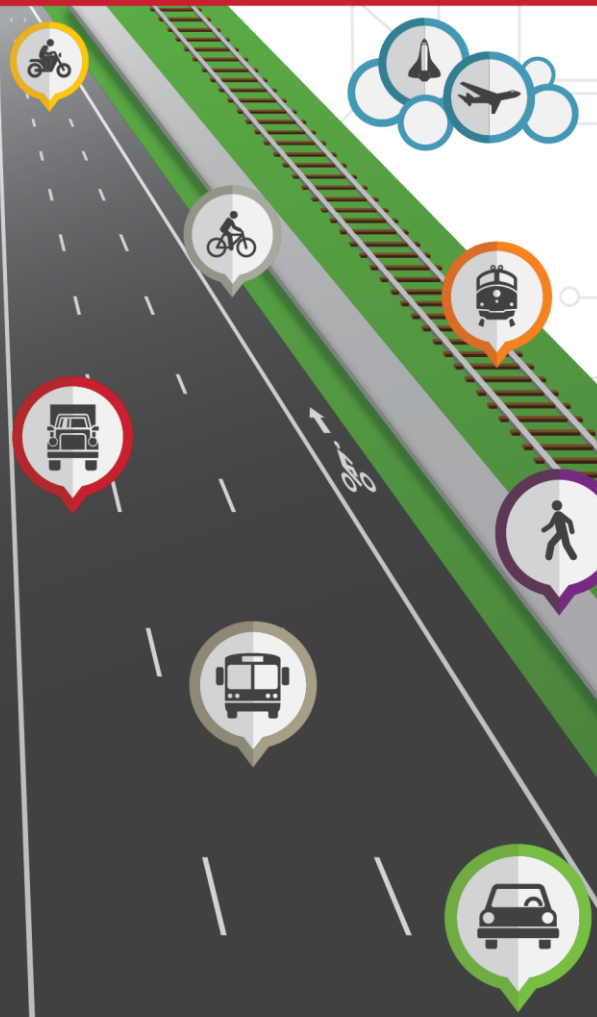


Truck Empty Backhaul Analysis



Innovations in Freight Data Workshop
Arnold and Mabel Beckman Conference Center

April 9, 2019



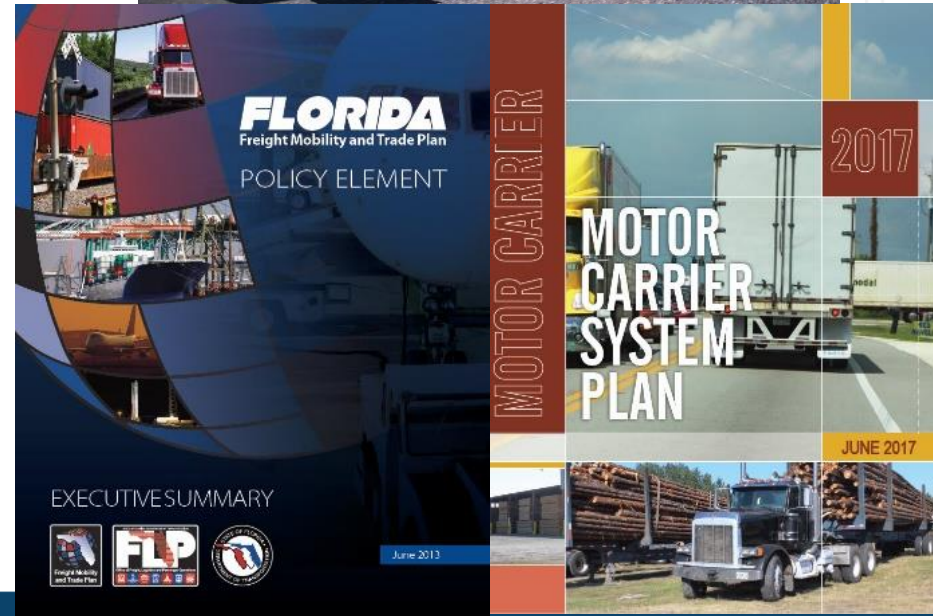
Study Objectives

- Develop a methodology to quantify truck empty backhaul movements
- Analyze FDOT's weigh in motion data
- Explain factors influencing truck empty backhaul movements
- Summarize findings and recommendations



Motivation

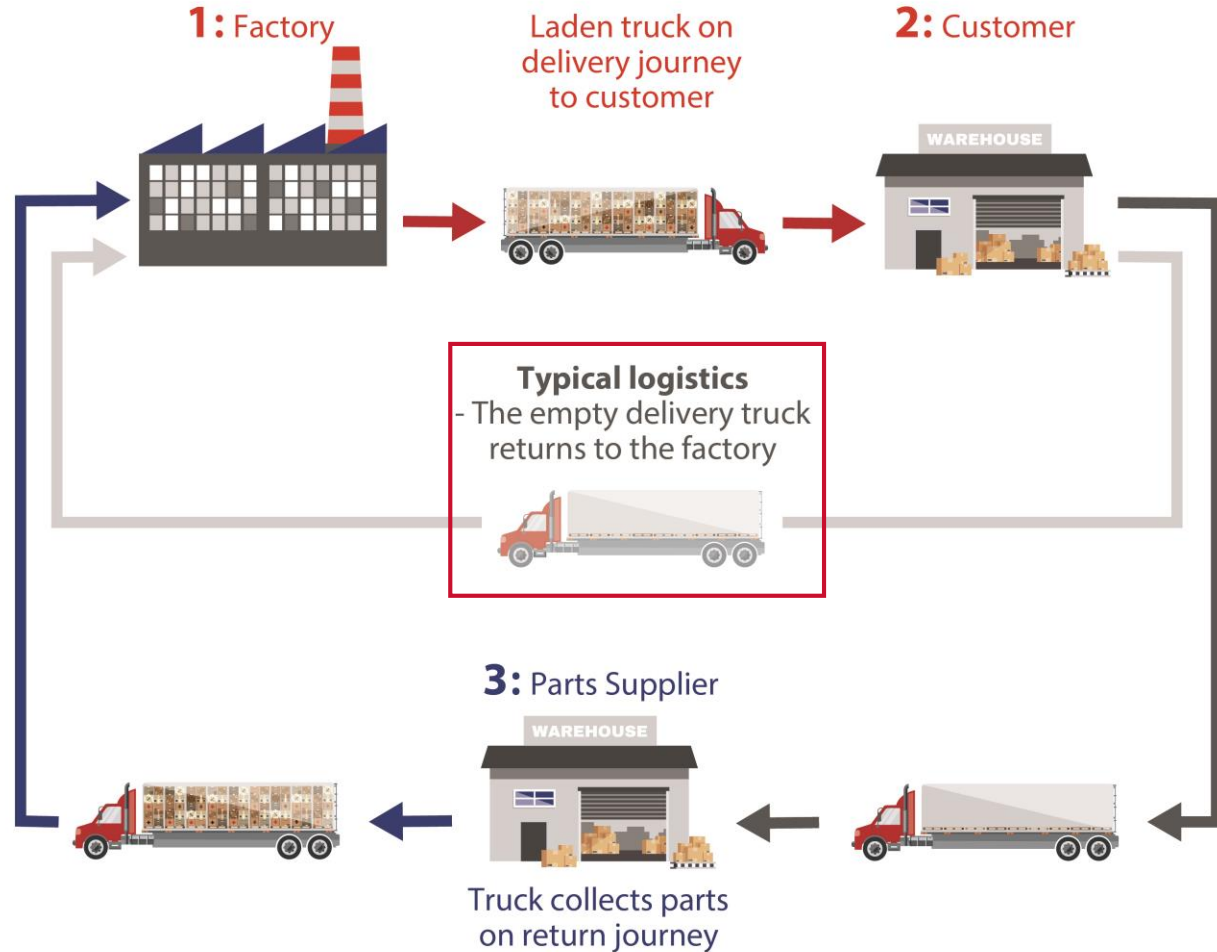
- Systematically quantify truck empty backhauls - objective assessment vs. anecdotal intel
- F.S. 334.044(33) (a) - FMTP should include “investments that capitalize on the empty backhaul trucking and rail market in the state”
- FMTP and Motor Carrier System Plan both rank TEBH as a major issue in Florida (3.8 / 5.0 average importance rating)



Definition

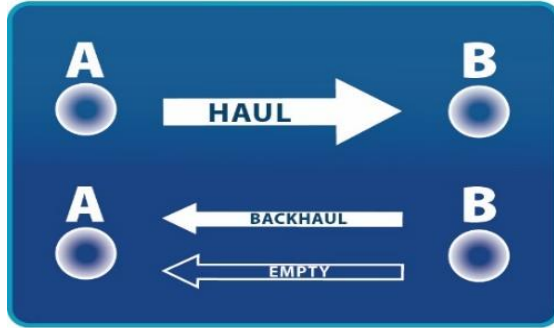
Truck Back Haul (TBH) is the return movement of a truck from its destination to its point of origin.

When the truck is not hauling cargo during this movement, it is considered **truck empty back haul (TEBH)**.

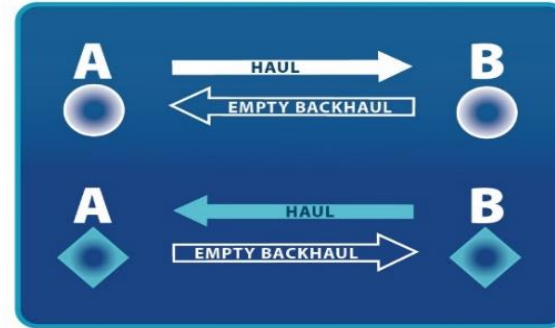


Industry (Logistics) Factors to Consider

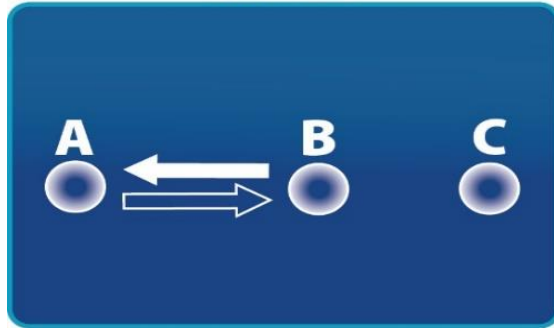
IMBALANCED FLOWS



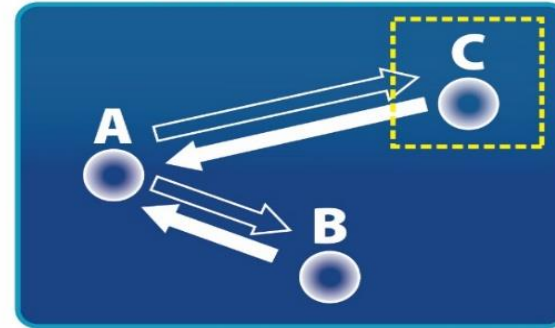
CARGO/EQUIPMENT SPECIALIZATION



SHORT HAULS



REGULATORY CONSTRAINTS



Methodology

1) Percent of Trucks per Vehicle Class

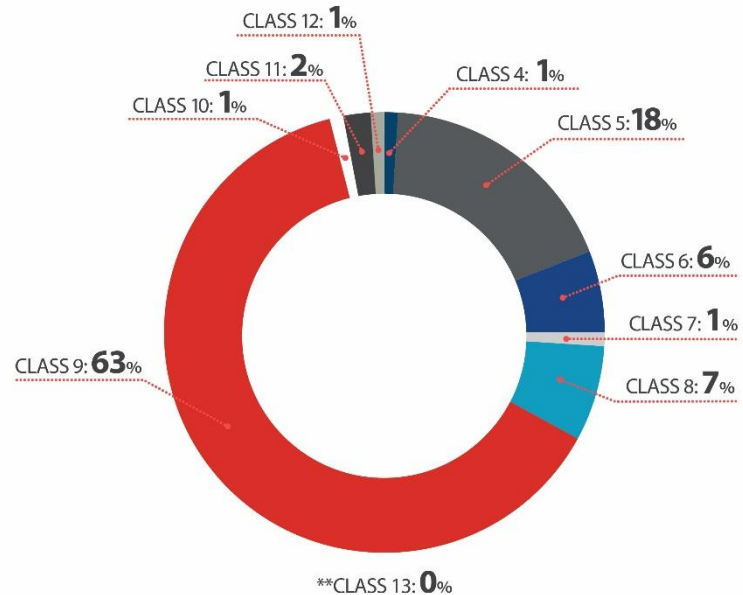
- Identify which class(es) the analysis should focus

2) Average Gross Vehicle Weight per Unit Length

- Identify which direction of travel has greatest freight flow by weight

3) Empty and Full (GVW)

- Empty = < 40,000 lbs.
- Full = > 60,000 lbs.



Statewide average for trucks on interstates

Methodology

4) Axle Weight Distribution

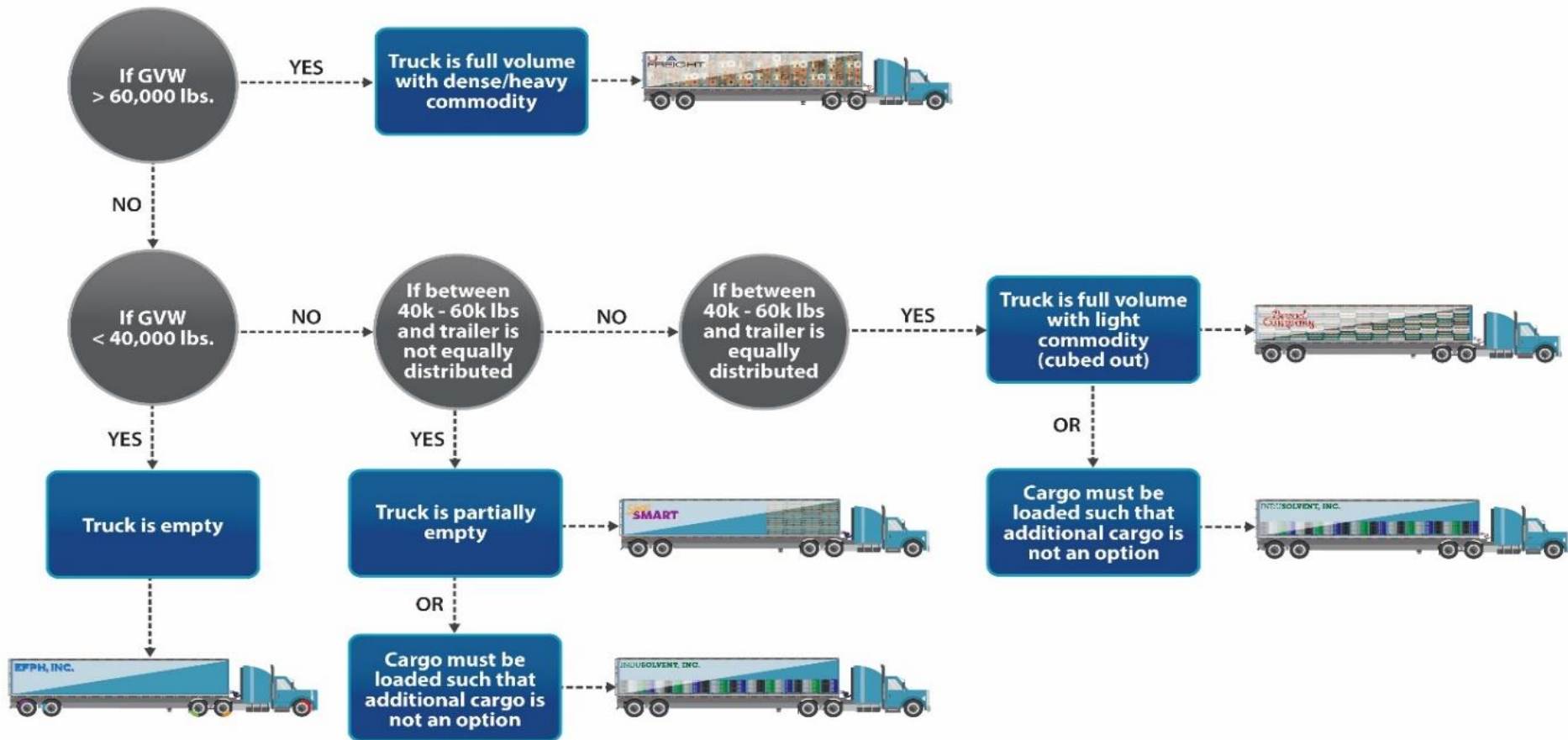
CUBED OUT: >40K, <60K
GVW: 53,040



PARTIALLY EMPTY: >40K, <60K
GVW: 58,280

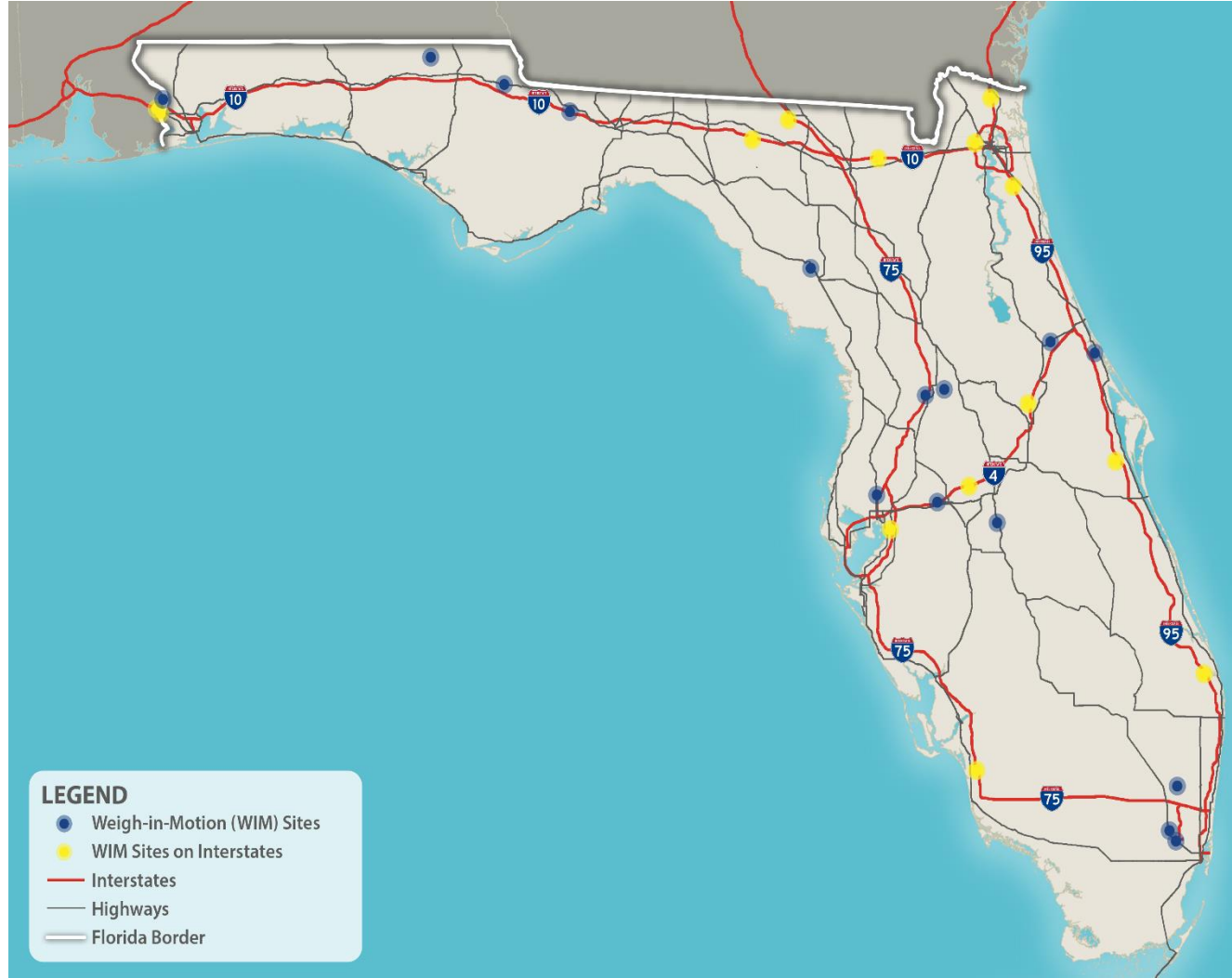


Methodology



Findings

- Data preparation – January 2015 through September 2017 (+100M records)
- Data validation/ clean up – eliminate errors
- Conduct analysis using Statistical Package for the Social Sciences (SPSS)
 - Class 9 trucks
 - Interstate WIM sites
- Compare analysis to Private (Transearch) and Federal (FAF) datasets

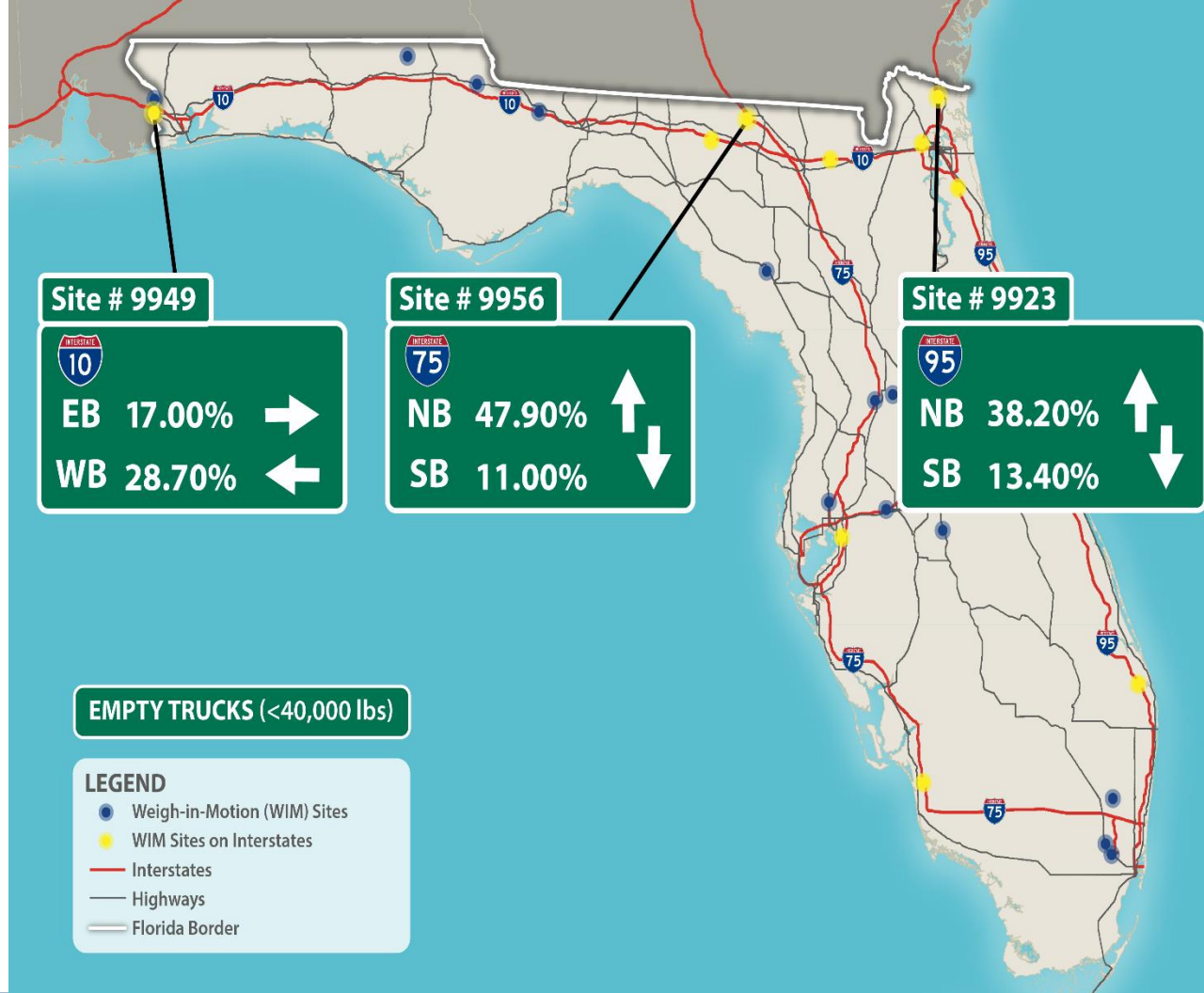
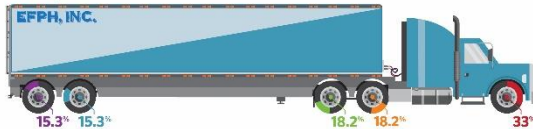


Results

Depending on the Corridor:

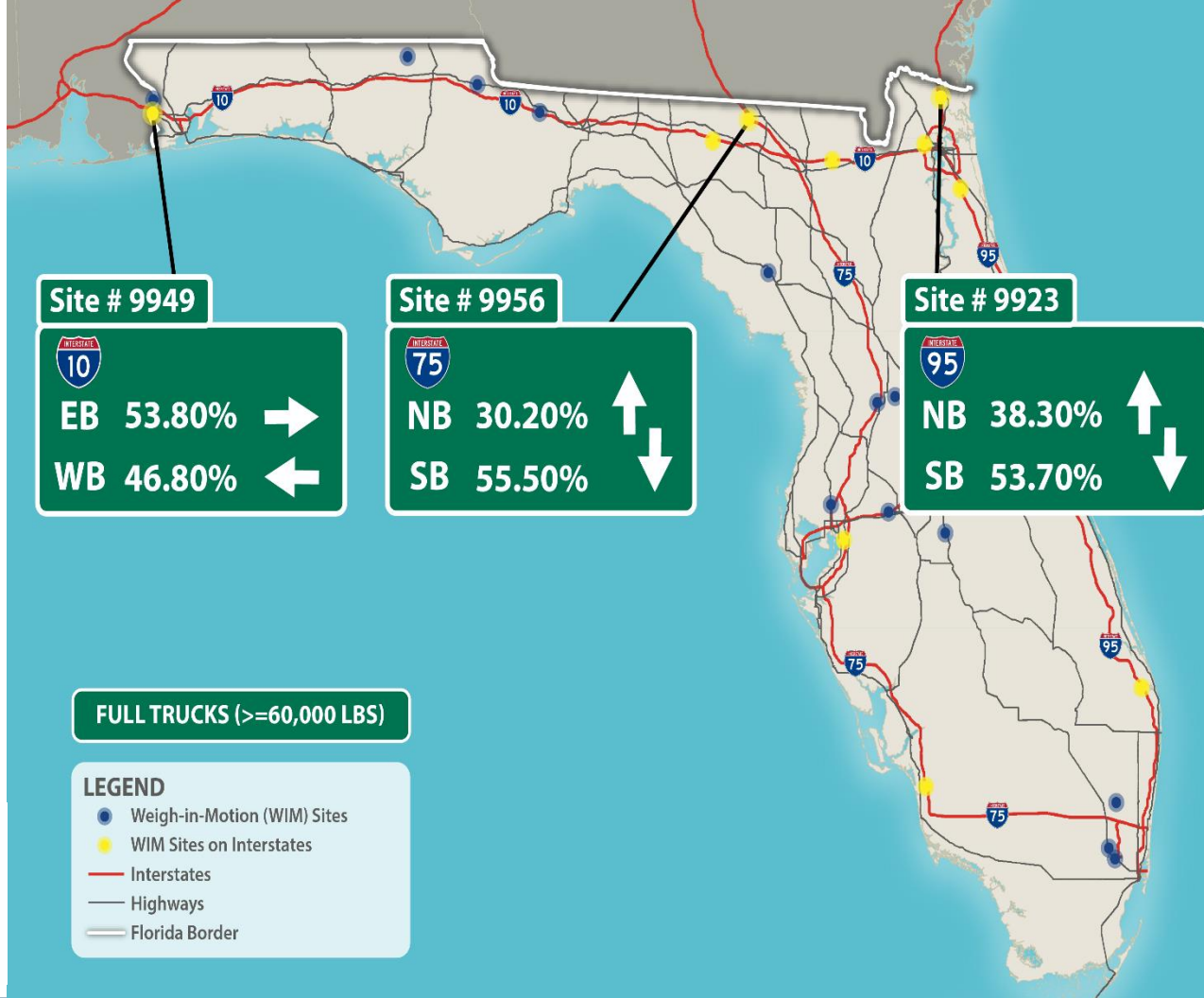
- 28% to 48% of trucks are *leaving* Florida empty
- 11% to 17% of trucks are *entering* Florida empty

EMPTY: <40K
GVW: 34,160



Findings

- Approximately 54% of all trucks *entering* FL are full
- Between 30% and 47% of all trucks *leaving* FL are full
- Validation of trade imbalance



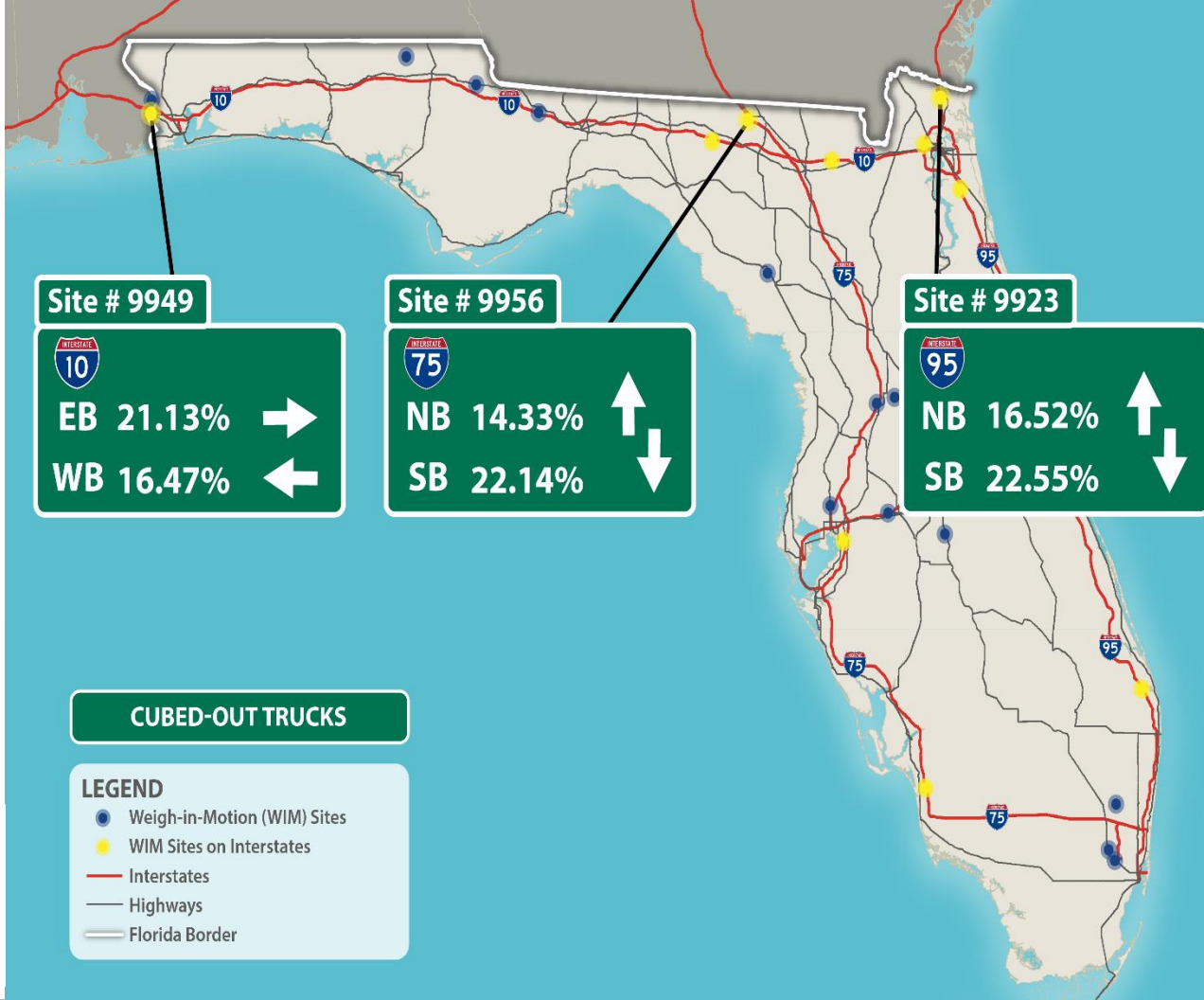
Findings

- Cubed out trucks make up approx. 20% of all truck traffic
- Higher percentage of Cubed Out trucks enter FL, as compared to leaving FL

CUBED OUT: >40K, <60K
GVW: 53,040



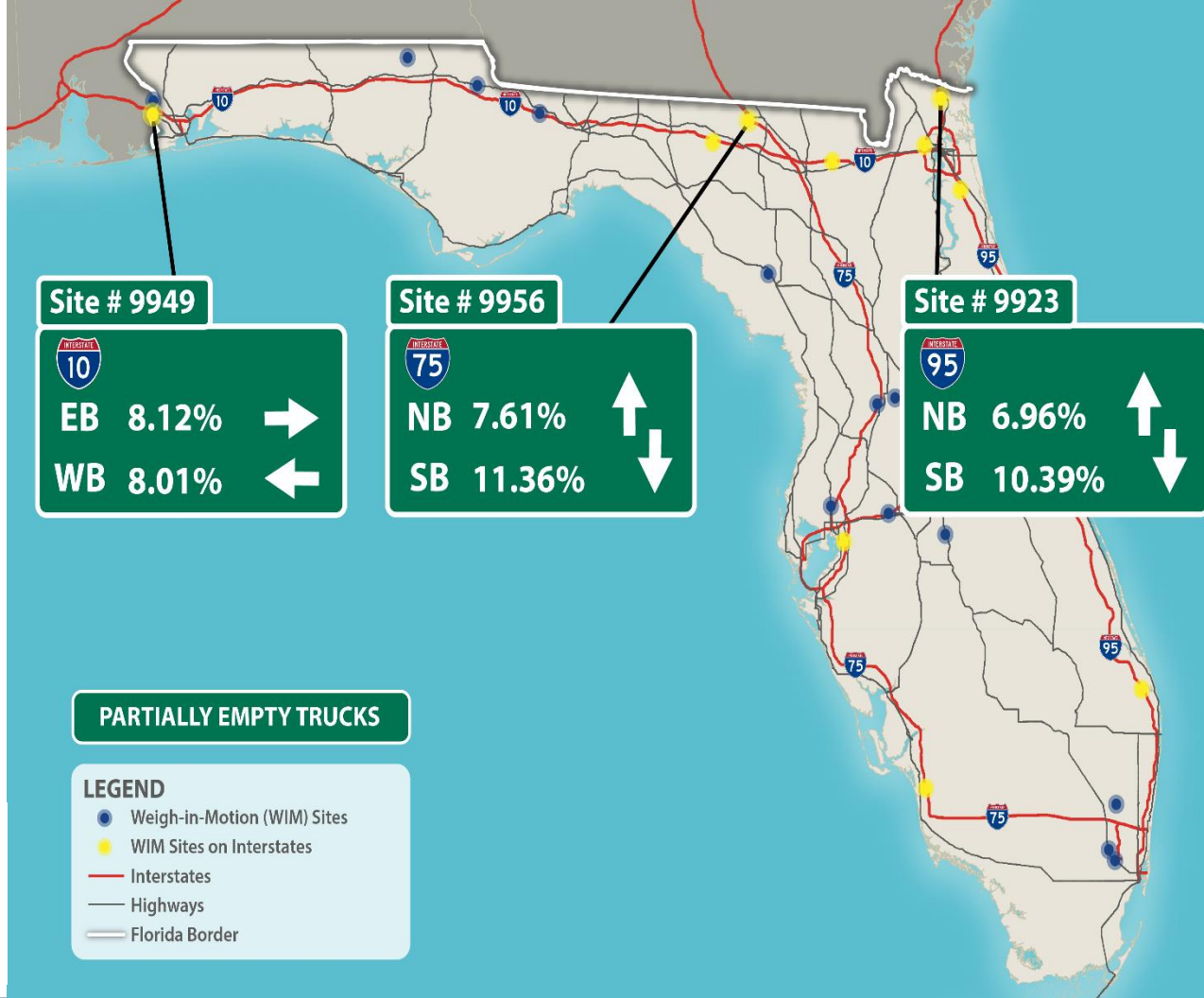
CUBED OUT: >40K, <60K
GVW: 57,040



Findings

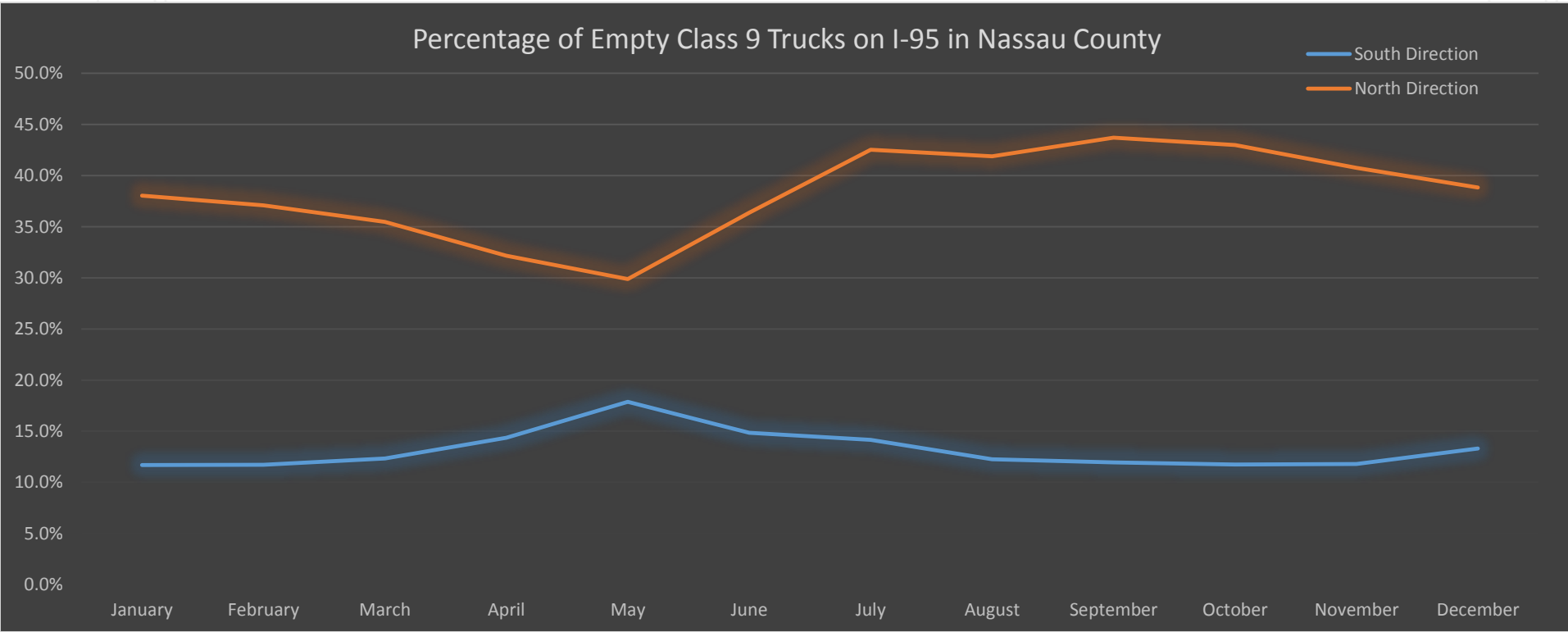
- Partially empty trucks make up nearly 10% of all trucks

PARTIALLY EMPTY: >40K, <60K
GVW: 58,280



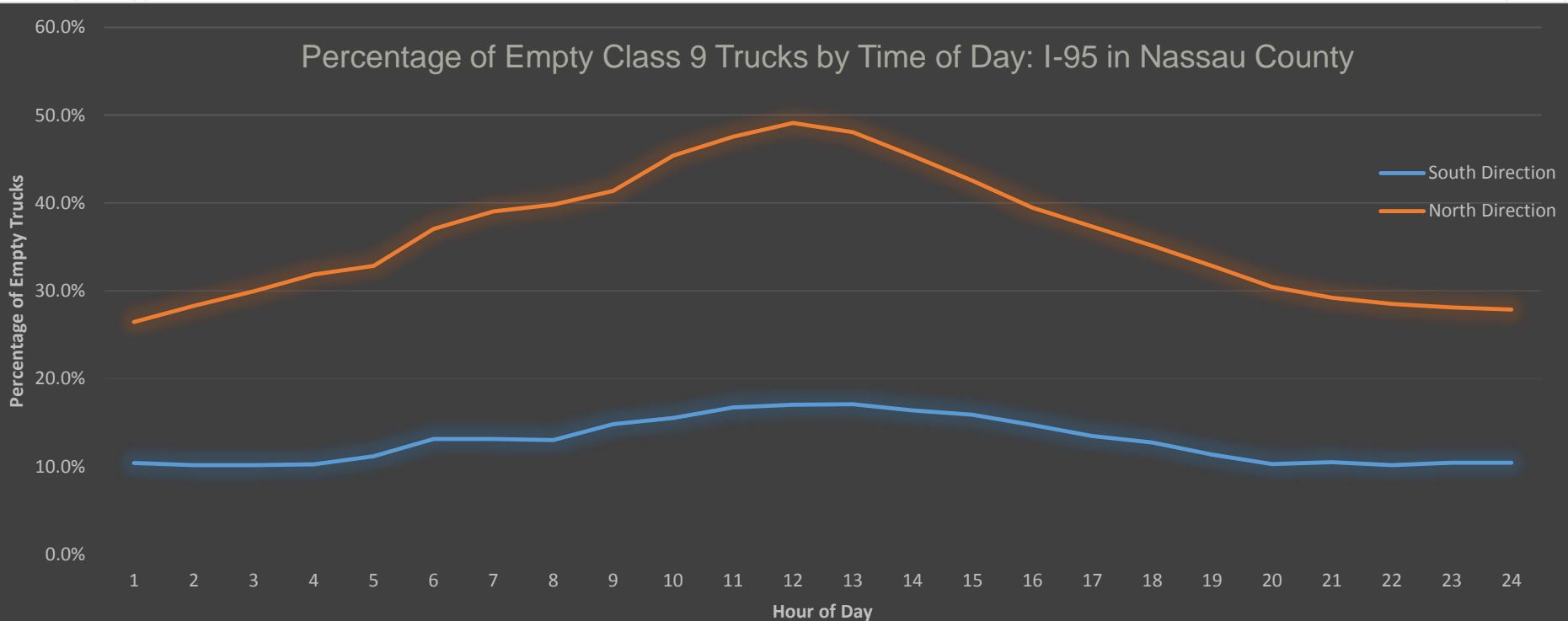
Findings

- Percent empties are highest during May in the inbound direction, while percent empties are lowest in the outbound direction during the same month



Findings

- The percentage of empty trucks increases during the middle of the day as compared to hours in the night.



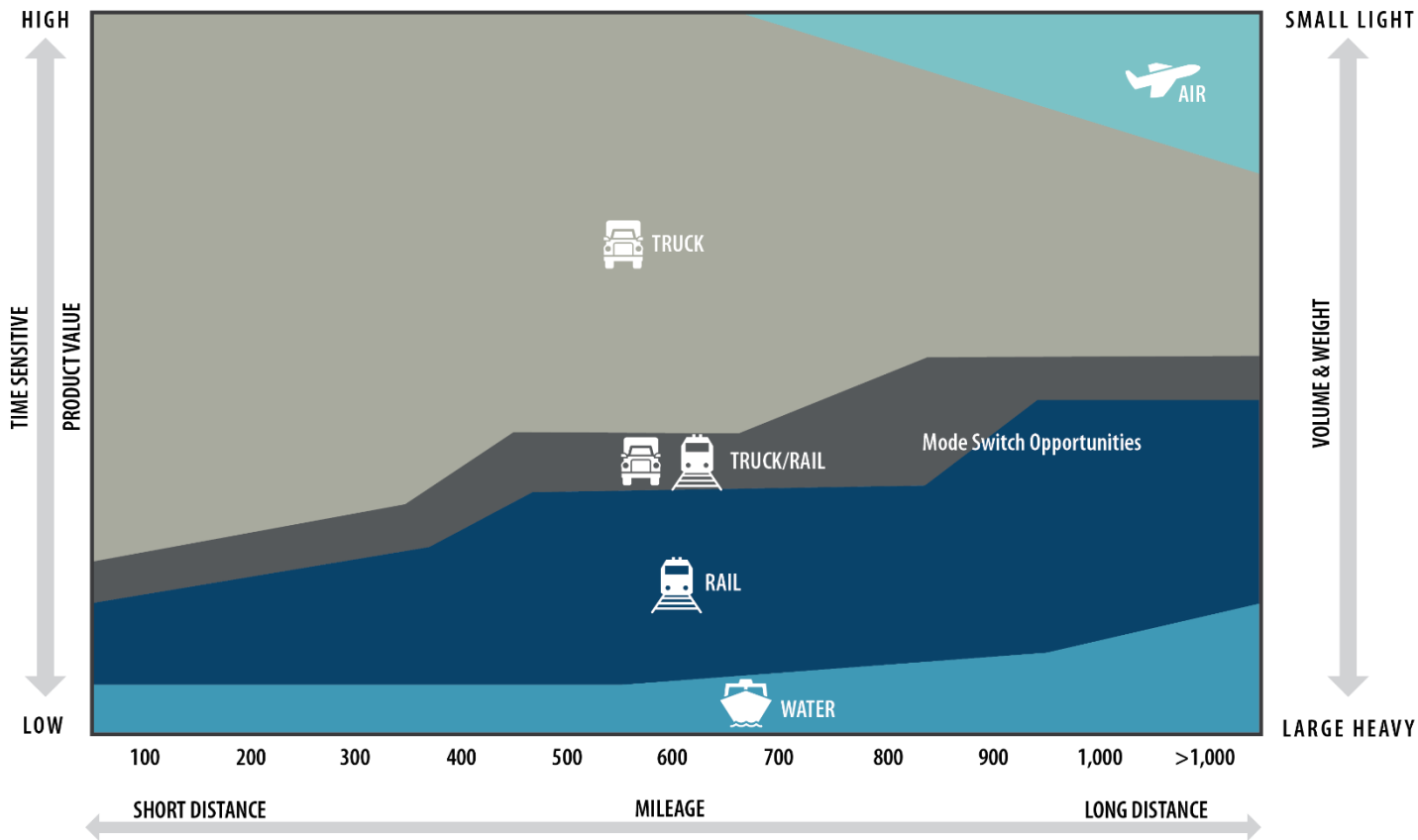
Factors Contributing to TEBH

Florida specific factors:

- 3rd most populous state in the nation (21M+)
- Geography – peninsula, not a regional hub
- Visitors (3M+ per day)
- Retirees
- Service sector economy – lack of manufacturing



Multi-Modal Considerations



Potential Solutions

- Attract manufacturing industry
- More “pony express” loads, rather than full loads
- Incentivize ‘value added’ manufacturing/ import of semi-processed goods for products consumed in FL
- Invest in projects that facilitate expedient outbound movements of freight
- Collapsible cargo containers



Project Considerations

- Develop multiple freight modes in future analysis
- Obtain industry data to better understand private sector perspective – supply chain optimization
- Investigate Department traffic database improvements to improve the robustness of the WIM data (*bobtails in Class 6, additional field attributes (i.e., GVW/UL)*)
- Deploy Florida Freight Commodity Survey to understand commodity flows at a micro-level





Joel Worrell
Florida Department of
Transportation
Transportation Data
Inventory Manager

Joel.Worrell@dot.state.fl.us

(850) 414-4715