

Online Freight Data Collection Effort in United States



Amir Samimi, Kouros Mohammadian, Kazuya Kawamura

University of Illinois at Chicago

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Objectives



INTRODUCTION

FRAMEWORK

DATA NEEDS

THE SURVEY

MODELS

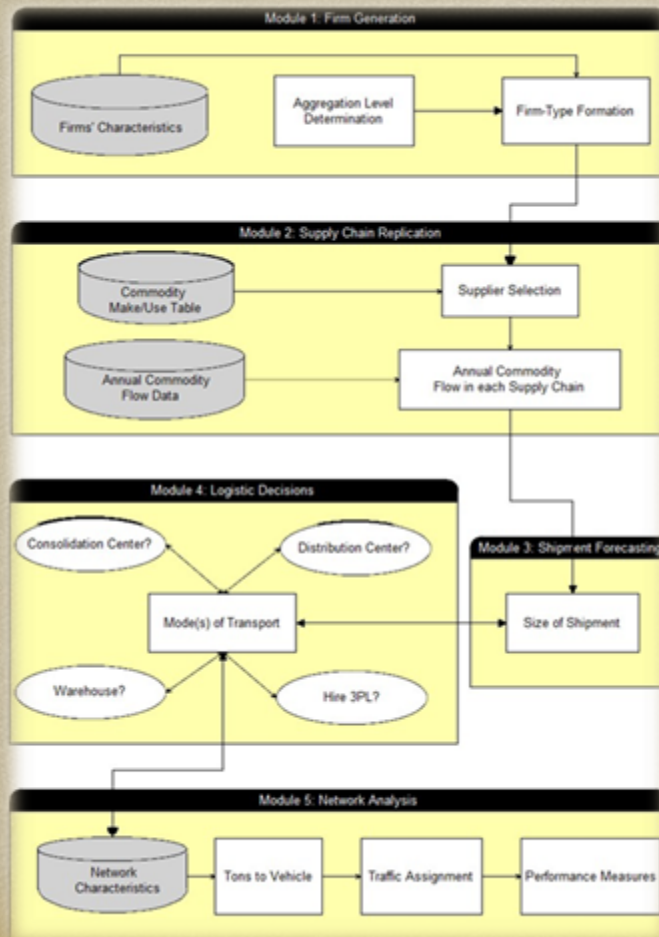
SIMULATION

CONCLUSION

Q/A

- To introduce a large-scale behavioral freight modeling framework with a focus on modal split.
- To utilize publicly available freight data in the U.S. for the framework.
- To conduct a survey and satisfy the data needs.
- To introduce a behavioral freight mode choice model.
- To run a microsimulation freight model for the U.S.

FRAMEWORK



FAME

FREIGHT

ACTIVITY

MICROSIMULATION

ESTIMATOR

- INTRODUCTION
- FRAMEWORK
- DATA NEEDS
- THE SURVEY
- MODELS
- SIMULATION
- CONCLUSION
- Q/A

Firm Generation



INTRODUCTION

FRAMEWORK

DATA NEEDS

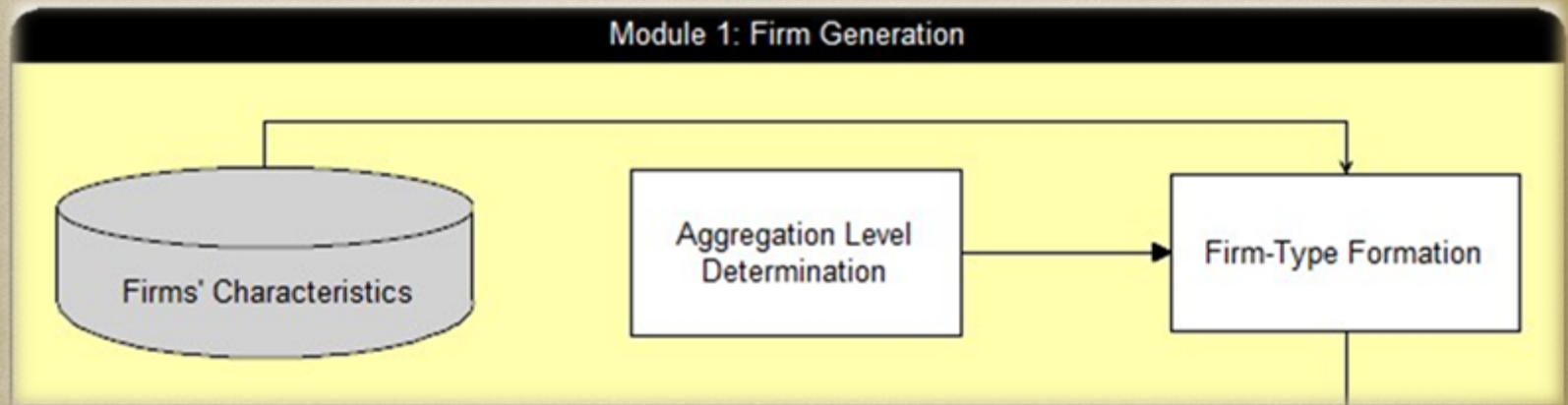
THE SURVEY

MODELS

SIMULATION

CONCLUSION

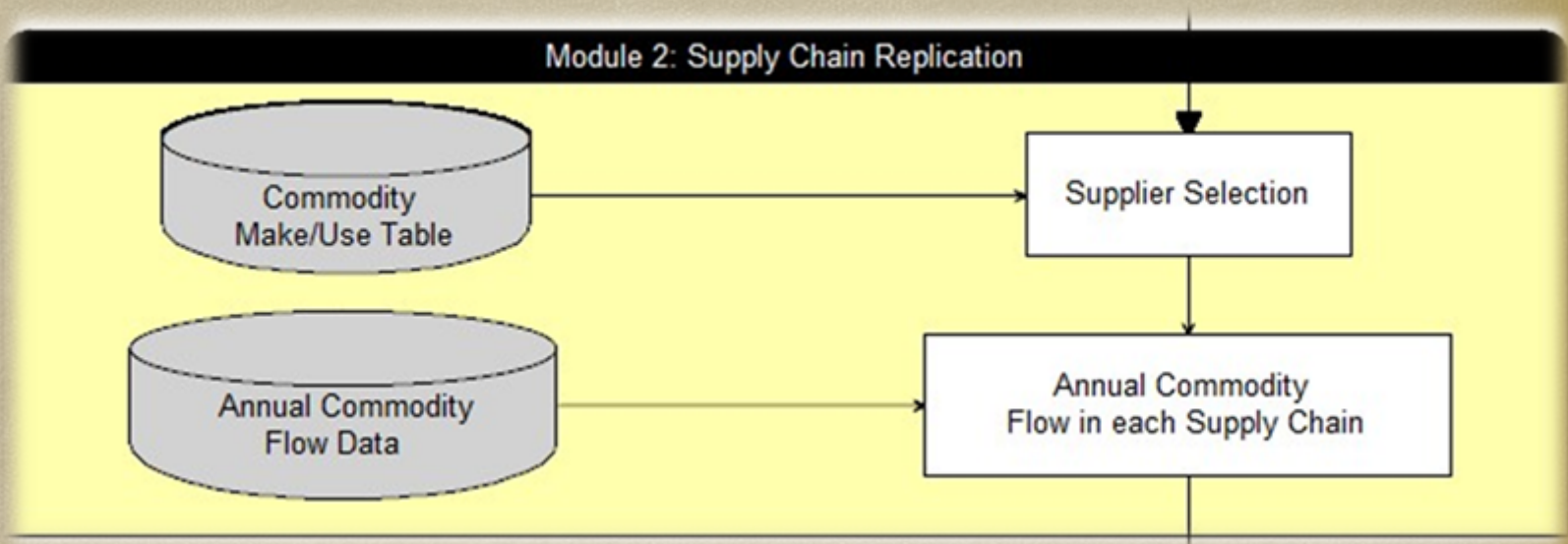
Q/A



Supply Chain Replication



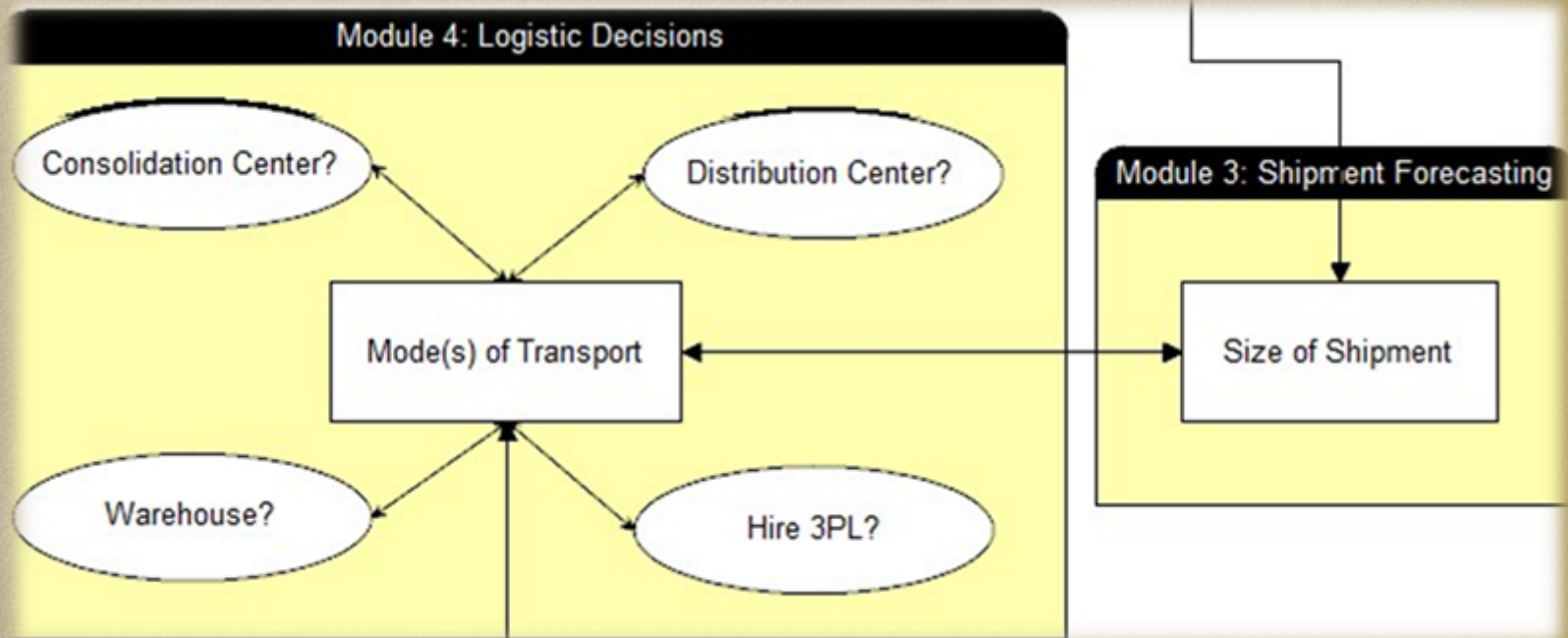
- INTRODUCTION
- FRAMEWORK**
- DATA NEEDS
- THE SURVEY
- MODELS
- SIMULATION
- CONCLUSION
- Q/A



Logistics Planning



- INTRODUCTION
- FRAMEWORK
- DATA NEEDS
- THE SURVEY
- MODELS
- SIMULATION
- CONCLUSION
- Q/A



Network Analysis



INTRODUCTION

FRAMEWORK

DATA NEEDS

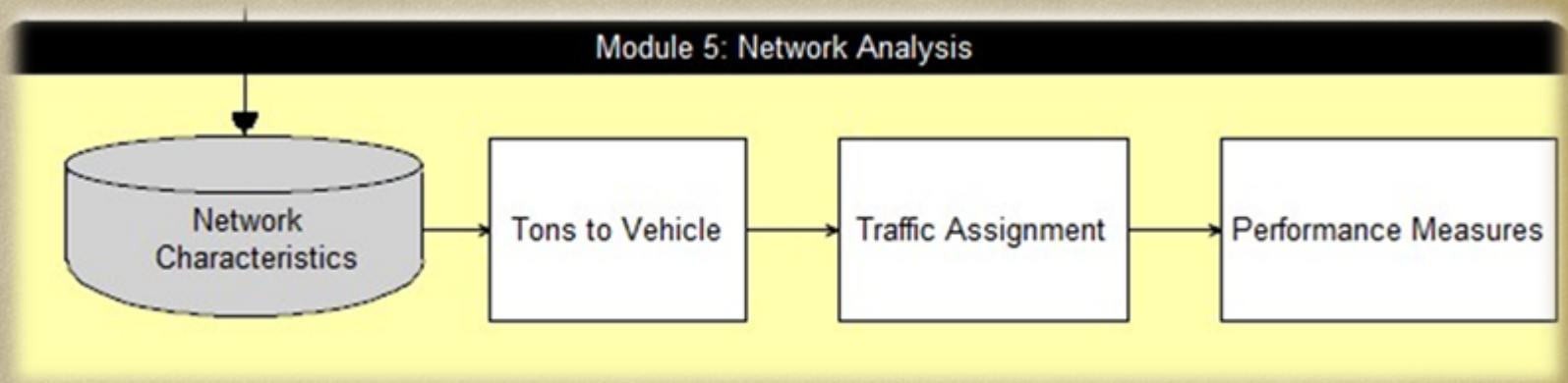
THE SURVEY

MODELS

SIMULATION

CONCLUSION

Q/A



DATA NEEDS



Four types of data are required for FAME:

- Information on Business Establishments,
- Aggregate Freight Movements,
- Information on Individual Shipments,
- Specifications of the Transportation Networks.

INTRODUCTION

FRAMEWORK

DATA NEEDS

THE SURVEY

MODELS

SIMULATION

CONCLUSION

Q/A

UIC SURVEY



- A person with comprehensive knowledge of the firm's supply chain and transportation activities was asked for this online survey.
- Around 9.3% of those clicked on the survey link.
- 316 establishments participated in the survey providing information on 881 shipments across the country.
- PART I: Establishment Information.
- PART II: Shipment Information.
- PART III: Contact Information.

UIC SURVEY



PART I: Establishment Information:

- Location,
- Employee Size,
- Number of IN/OUT shipments,
- Number of suppliers,
- Industry type,
- Potential use of each mode of transportation.
- Access to truck-rail intermodal facility.

UIC SURVEY



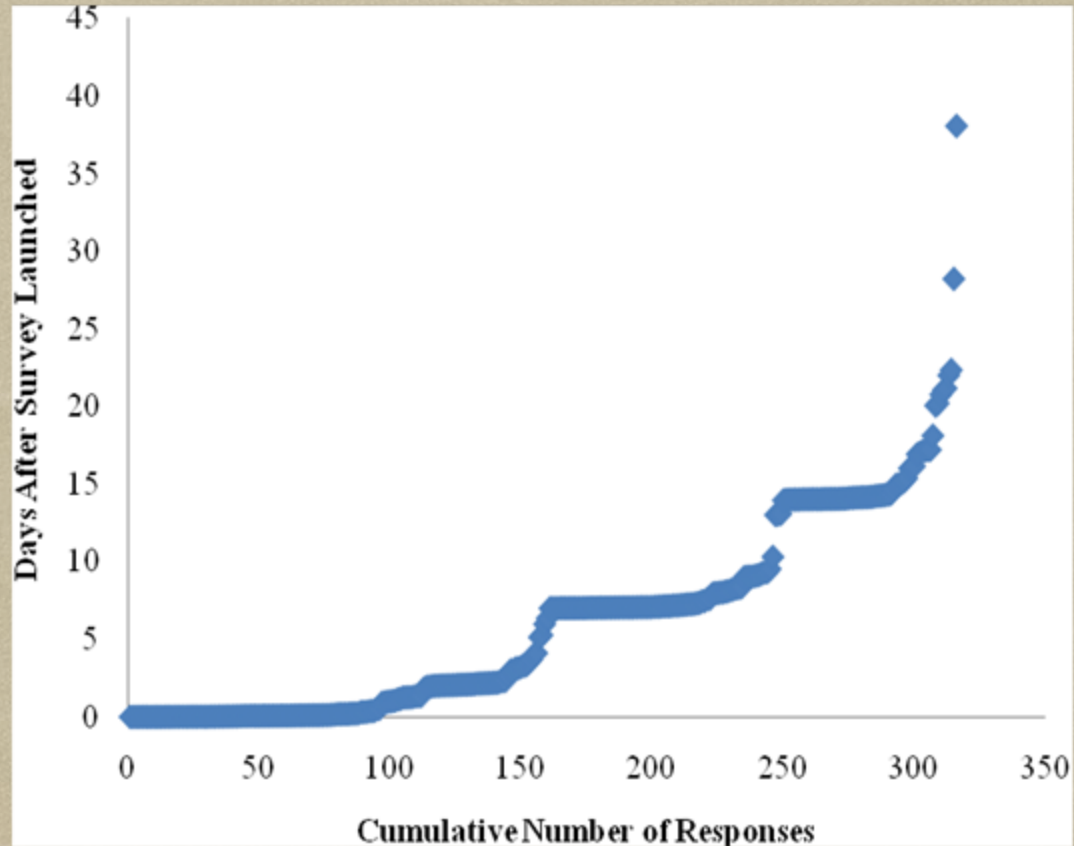
PART II: Shipment Information:

- Origin/Destination
- Commodity type
- Transportation Mode
- Value, weight, and volume of shipment
- Shipping cost and time
- Import / Export / Containerized / Damaged / Not delivered on time
- Expected delivery time window
- Unit of decision making (sender / receiver / 3PL)

UIC SURVEY



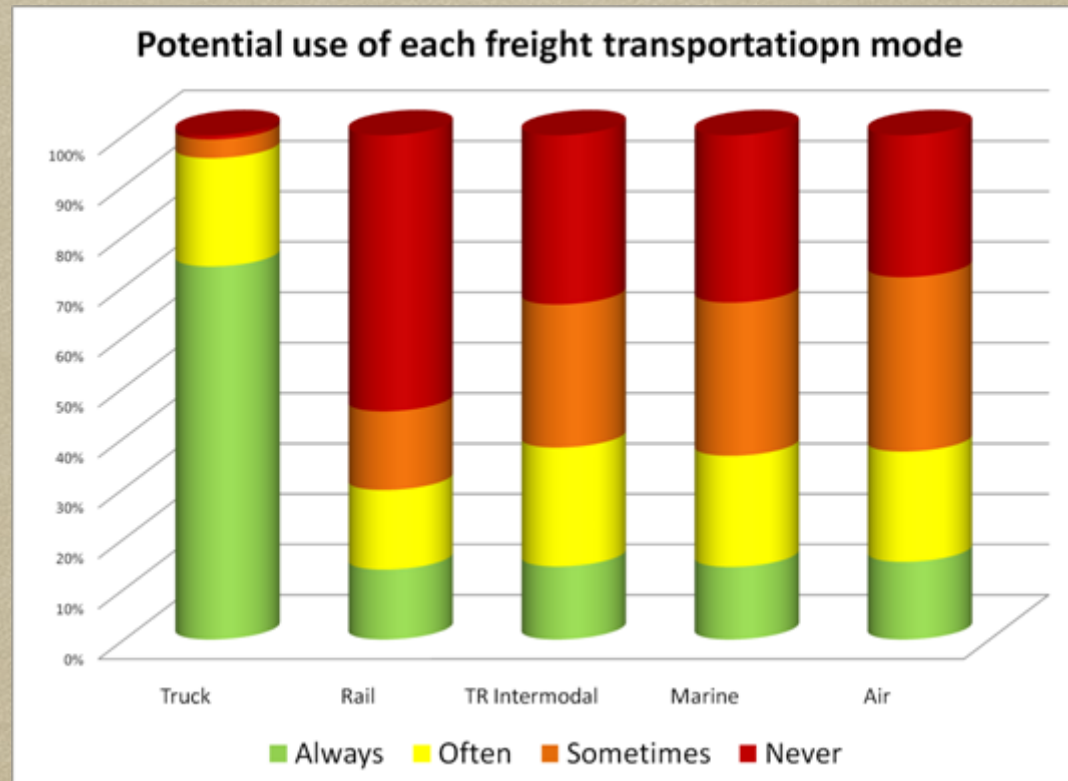
- INTRODUCTION
- FRAMEWORK
- DATA NEEDS
- THE SURVEY**
- MODELS
- SIMULATION
- CONCLUSION
- Q/A



UIC SURVEY



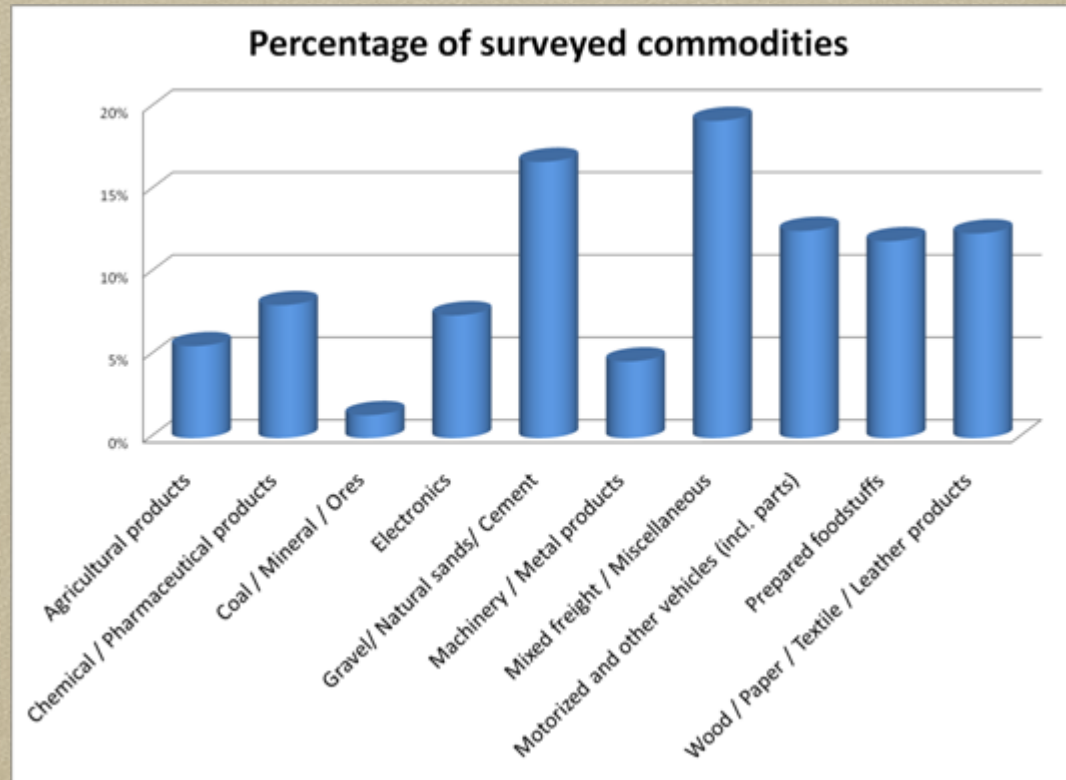
- INTRODUCTION
- FRAMEWORK
- DATA NEEDS
- THE SURVEY**
- MODELS
- SIMULATION
- CONCLUSION
- Q/A



UIC SURVEY



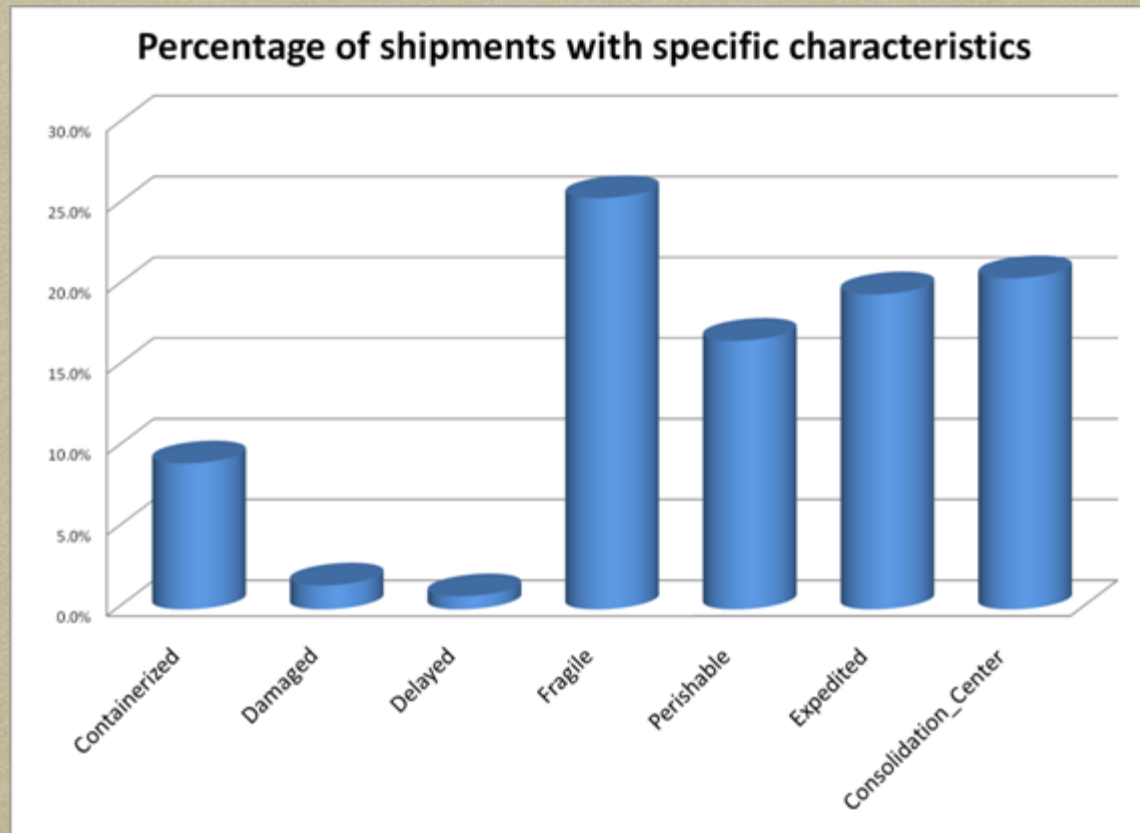
- INTRODUCTION
- FRAMEWORK
- DATA NEEDS
- THE SURVEY**
- MODELS
- SIMULATION
- CONCLUSION
- Q/A



UIC SURVEY



- INTRODUCTION
- FRAMEWORK
- DATA NEEDS
- THE SURVEY**
- MODELS
- SIMULATION
- CONCLUSION
- Q/A

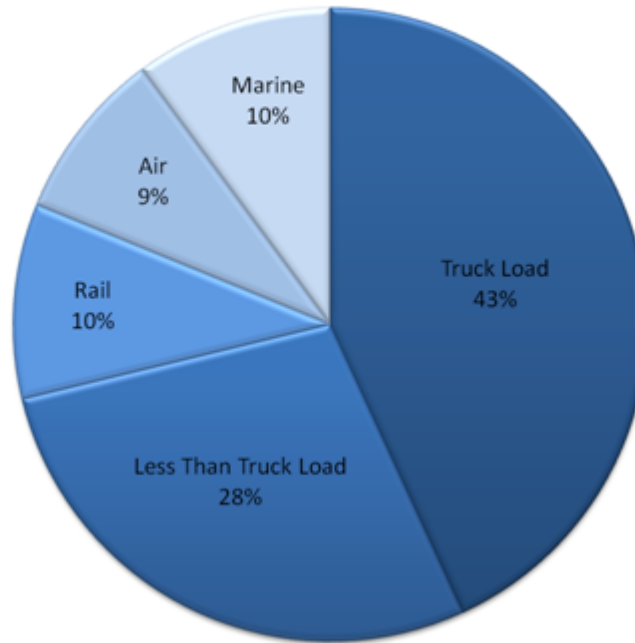


UIC SURVEY



- INTRODUCTION
- FRAMEWORK
- DATA NEEDS
- THE SURVEY**
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Observed mode share in the survey



Biasness



Value and weight share of each mode:

Mode	Dollar Value		Weight		Shipments
	CFS	UIC	CFS	UIC	UIC
Truck	68%	67%	60%	49%	69%
Rail	3%	4%	10%	12%	5%
Water	1%	8%	4%	8%	5%
Air, air & truck	5%	9%	0%	1%	11%
Intermodal	15%	12%	7%	30%	11%
Pipeline & unknown	9%	-	20%	-	-

MODELS



Models that are used in FAME:

- Supplier selection,
- Shipment size,
- Mode Choice.

INTRODUCTION

FRAMEWORK

DATA NEEDS

THE SURVEY

MODELS

SIMULATION

CONCLUSION

Q/A

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Research Contribution:

- FAME is mainly based on public freight data and therefore data collection costs are substantially low.
- It is one of the early efforts in freight demand modeling with a separate component for supply chain configuration.
- Almost all the industry classes are covered in FAME.
- To the best of the author's knowledge, it is the first comprehensive nationwide freight microsimulation in the U.S.

CONCLUSION



Future Works:

- Obtain more information on supplier selection preferences, and expand the second module,
- Consider international shipments as well,
- Implement econometrics models or logistic cost minimization approaches for shipment size,
- Network analysis.

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FRAMEWORK

DATA NEEDS

THE SURVEY

MODELS

SIMULATION

CONCLUSION

Q/A

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FRAMEWORK

DATA NEEDS

THE SURVEY

MODELS

SIMULATION

CONCLUSION

Q/A

