0-4013-P2

WORKSHOP ON FREIGHT MODAL COMPETITIVENESS

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Project 0-4013: Competitiveness of Alternative Transportation Modes

MAY 2004

Performing Organization:	**Sponsoring Organization:**
Center for Transportation Research The University of Texas at Austin 3208 Red River, Suite 200 Austin, Texas 78705-2650	Texas Department of Transportation Research and Technology Implementation Office P.O. Box 5080 Austin, Texas 78763-5080
Project conducted in cooperation with the Federal Highway Commission and the Texas Department of Transportation.	

Abstract:
In view of the study's main objective — to understand and document those factors and policies that have a significant impact on freight modal shares — a freight Delphi expert survey was administered to supplement the freight literature. Nine freight experts representing various public and private stakeholders responded to an invitation to participate in a one-day Freight Modal Competitiveness Workshop on April 27, 2004. Workshop participants were asked to provide insight on: (1) future freight flows in Texas, (2) the relative importance of factors influencing the shippers' mode choice, (3) anticipated logistic trends influencing freight flows, (4) policies aimed at operational improvements or infrastructure provision, (5) technological developments influencing modal competitiveness, and (6) the potential of legislative measures to facilitate a shift in mode utilization. This document includes the workshop material and results of the freight expert survey administered.

Keywords:	**No. of Pages:**
Mode competitiveness, freight mode choice, expert panel survey	86

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Workshop Invitation

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Dear Participant,

Over the past decades, freight traffic has been increasing faster than passenger traffic at a time when building additional road capacity has become more and more expensive and, in many cases, undesirable. Decision-makers have thus become increasingly concerned about the negative impacts (for example, hindering growth, traffic congestion, air quality, and environmental degradation) associated with the growing disparity between demand and capacity. In an effort to act proactively, the Texas Department of Transportation (TxDOT) is funding a research project to explore the competitiveness of alternative transportation modes. Specifically, the study's main objective is to understand and document those factors and policies that have a significant impact on freight modal shares. The final outcome will be a decision-support system to assist the agency in planning for an efficient, balanced, and robust multi-modal transportation system for Texas.

In an effort to understand the changing dynamics of the freight system in Texas and the factors that impact mode choice, the Center for Transportation Research is organizing a one-day workshop to discuss various factors and policies that impact mode choice. I am writing to confirm your participation in this event as you have been identified as someone who can provide valuable insights into the dynamics of modal choice and the factors that impact freight modal utilization in the state of Texas.

The workshop will take the form of an interactive discussion forum and can be attended by invitation only. Participants will be asked to share their perspectives on the growth in freight flows in Texas over time and the anticipated freight trends that may impact freight mode share. Various factors identified from the literature as determinants of freight mode choice will be presented to participants, who will then be asked to add to these and rank the factors in terms of their impact on mode choice. The scoring will be done electronically using a real time voting system that guarantees the anonymity of each voter. Once the scores have been recorded, participants will be given the opportunity to discuss the outcome and revise their scores if necessary. During the latter half of the workshop, participants will be asked to assess the significance of different policies that relate to the identified factors. A similar process of scoring and discussion will be followed. Finally, the participants will be asked to discuss the likelihood of implementing the highest ranked policies being implemented in Texas.

Please do not hesitate to contact me (Tel no: 512-471-4535, Fax no: 512-475-8744, or Email: bhat@mail.utexas.edu) or Ms. Jolanda Prozzi (Tel no: 512-232-3079, Fax no: 512-232-3070, or Email: jpprozzi@mail.utexas.edu) if you have any suggestions, questions, or comments.

Your participation in this workshop is important to provide accurate and useful information to TxDOT. I look forward to your participation and contribution in the workshop.

Sincerely,

Dr. Chandra Bhat
Fluor Centennial Teaching Fellow in Engineering
Associate Professor and Associate Chairman for Administration and Planning

Workshop Agenda

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-

AGENDA
Workshop on Freight Modal Competitiveness

8:30 **Breakfast**

9:00 **Welcome** ..... **Ron Hagquist**

9:10 **Project Objectives and Workshop Structure** ..... **Chandra Bhat**

9:20 **Freight Trends in the U.S. and Texas** ..... **Michail Xyntarakis**

Demonstration: Voting Equipment (10 min.) ..... Jolanda Prozzi

Expert Panel Voting: Future Freight Flows (10 min.)

Discussion of Results and Re-voting (25 min.)

10:15 **Coffee/Tea Break**

10:30 **Factors Influencing Mode Choice** ..... **Michail Xyntarakis**

Expert Panel Voting: Freight Mode Choice (10 min.)

Discussion of Results and Re-voting (25 min.)

11:15 **U.S. Logistic Trends** ..... **Michail Xyntarakis**

Expert Panel Voting: Logistic Trends (10 min.)

Discussion of Results and Re-voting (25 min.)

12:00 **Lunch**

12:30 **U.S. Freight Infrastructure** ..... **Michail Xyntarakis**

Expert Panel Voting: Freight Infrastructure (10 min.)

Discussion of Results and Re-voting (25 min.)

1:15 **Technological Developments** ..... **Aswani Yeraguntla**

Expert Panel Voting: Technological Developments (10 min.)

Discussion of Results and Re-voting (25 min.)

2:00 **Coffee/Tea Break**

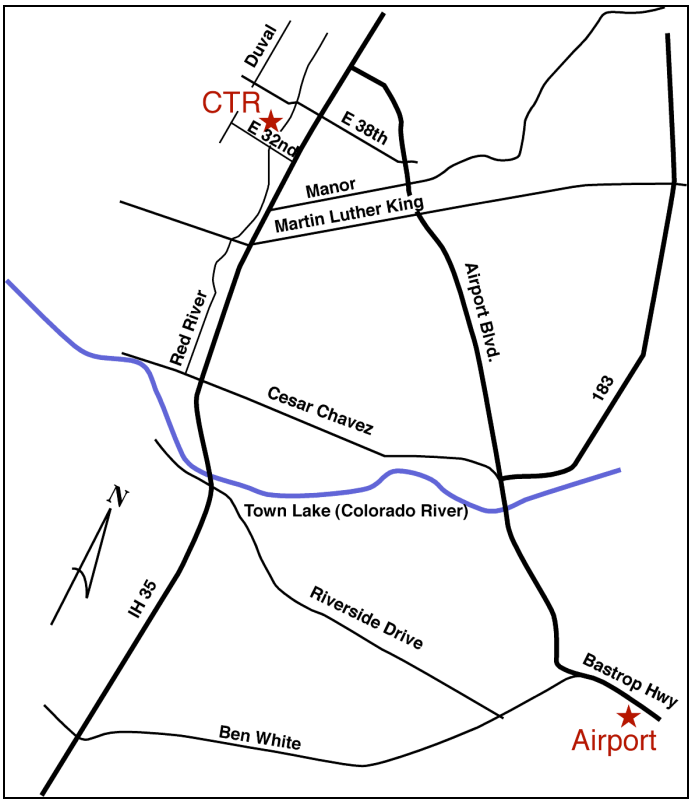
2:15 **Freight Legislation and Policy** ..... **Sudeshna Sen**

Expert Panel Voting: Freight Legislation and Policy (10 min.)

Discussion of Results and Re-voting (25 min.)

3:00 **Freight Mode Choice Scenarios**

Directions from **Austin Bergstrom International Airport** to
Center for Transportation Research



Exit AIRPORT toward **TX 71**

Turn LEFT (west) on **TX-71** stay in right hand lane

Continue on **TX-71** approx. **1.5** mi to **US-183 NORTH**

Exit RIGHT (north) **US-183 NORTH** approx **1.5** mi to **AIRPORT BLVD/ /1ST - 5TH - 7TH STS**

Exit RIGHT **AIRPORT BLVD**

Continue on **AIRPORT BLVD** approx. **2.4** mi

Turn LEFT (west) on **MANOR RD** approx. **0.9** mi

Continue on **DEAN KEETON ST** approx. **0.3** mi

DEAN KEETON ST becomes **26TH ST/ DEAN KEETON ST**

Turn right on **RED RIVER ST** approx. **0.3** mi

Arrive at **CTR, 3208 RED RIVER ST**

Workshop Presentation

Freight Modal Competitiveness

TxDOT Research Project
Research Director: Ron Hagquist
Research Supervisor: Chandra R. Bhat

Motivation

- Since 1970:
  - Population has increased 33%
  - VMT has increased 137%
  - Truck VMT has increased 216%
  - System capacity has moderately increased (18% since 1980)

Project Objectives

1) To provide TxDOT with a *forecasting methodology to anticipate changes in modal utilization* for inter- and intra-urban passenger and freight movements in Texas; and
2) To *translate this methodology into a practical decision-support capability* to identify and evaluate the impact of policies aimed at ensuring an efficient, balanced, and robust multi-modal transportation system in Texas.

Survey Objectives

1. Assess the effect of various policies, technological developments, and legislative measures on mode shares
2. Assess the impacts of different scenarios on mode utilization
3. Evaluate the relative significance of various measures of mode competitiveness
4. Provide an estimate on future freight flows

Workshop Structure

1. Future freight flows
2. Factors influencing mode choice decisions
3. Assess the effect of policies/technological developments/legislative measures on mode utilization
4. Assess the impacts of different scenarios on mode utilization

How the voting system works

Question 1: To ensure a lasting and loving marriage it is suggested that in the case of an argument, if you are wrong "accept it" and if you are right "don't mention it"?

Strongly Disagree				Strongly Agree
A	B	C	D	E

Delphi Expert Panel Survey

TxDOT Research Project
Research Director: Ron Hagquist
Research Supervisor: Chandra R. Bhat

Delphi Expert Panel Survey

Section 1:
Future Freight Flows

Future Freight Flows

- Objective
- Past growth
- Question overview

Future Freight Flows

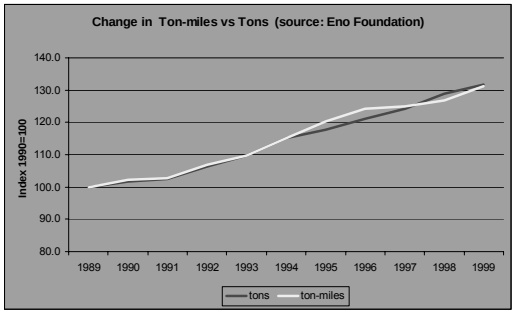
- Objective

Estimate a confidence interval in which future freight flows will most likely lie

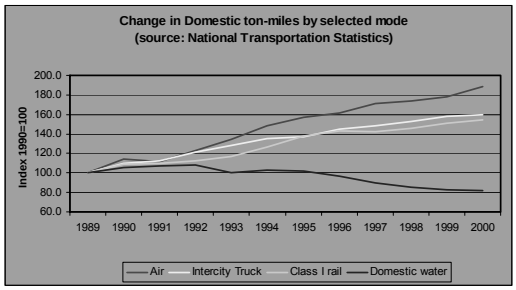
Future Freight Flows

- Objective
- Past growth
  - Eno Foundation
  - National Transportation Statistics

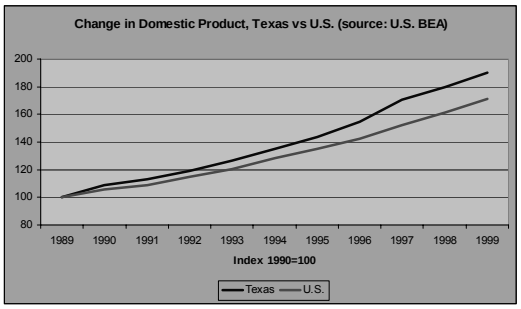
Future Freight Flows



Future Freight Flows



Future Freight Flows



Future Freight Flows

- Objective
- Forecasts used
- Question overview

US domestic
US international
Texas domestic
Texas international

Texas intercity truck
Texas intercity rail
Texas intercity water
Texas intercity air
Texas metropolitan areas

Future Freight Flows

Question 1: With what percentage will U.S. domestic freight ton-miles carried by all modes increase between now and 2015?

Less than 20%	20-30%	30-40%	40-50%	More than 50%
A	B	C	D	E

Future Freight Flows

Question 2: With what percentage will U.S. international freight ton-miles carried by all modes increase between now and 2015?

Less than 20%	20-30%	30-40%	40-50%	More than 50%
A	B	C	D	E

Future Freight Flows

Question 3: With what percentage will domestic freight ton-miles - carried by all modes - with either an origin or destination in Texas increase between now and 2015?

Less than 20%	20-30%	30-40%	40-50%	More than 50%
A	B	C	D	E

Future Freight Flows

Question 4: With what percentage will international freight ton-miles - carried by all modes - with either an origin or destination in Texas increase between now and 2015?

Less than				More than
20%	20-30%	30-40%	40-50%	50%
A	B	C	D	E

Future Freight Flows

Question 5: With what percentage will intercity truck ton-miles with either an origin or destination in Texas increase between now and 2015?

Less than				More than
45%	45-55%	55-65%	65-75%	75%
A	B	C	D	E

Future Freight Flows

Question 6: With what percentage will intercity rail ton-miles with either an origin or destination in Texas increase between now and 2015?

Less than				More than
40%	40-50%	50-60%	60-70%	70%
A	B	C	D	E

Future Freight Flows

Question 7: With what percentage will waterborne ton-miles with either an origin or destination in Texas increase between now and 2015?

Less than				More than
10%	10-20%	20-30%	30-40%	40%
A	B	C	D	E

Future Freight Flows

Question 8: With what percentage will airborne ton-miles with either an origin or destination in Texas increase between now and 2015?

Less than				More than
80%	80-90%	90-100%	100-110%	110%
A	B	C	D	E

Future Freight Flows

Question 9: With what percentage will metropolitan freight ton-miles increase in Texas between now and 2015?

Less than				More than
30%	30-40%	40-50%	50-60%	60%
A	B	C	D	E

Future Freight Flows

End of First Section

- Voting results
- Facilitated discussion
- Re-vote

Delphi Expert Panel Survey

End of Section 1

Delphi Expert Panel Survey

Section 2:
Factors Influencing Mode Choice
(Multi-criteria Measures of Mode Competitiveness)

Factors Influencing Mode Choice

- Objective
- Question overview

Factors Influencing Mode Choice

- Objective

Determine the relative significance of various factors influencing mode choice decisions

Factors Influencing Mode Choice

- Objective
- Question overview

Supply Related	Demand Related
Cost	Shipment size
Electronic data interchange (EDI)	Shipment value
Freight loss or damage	Distance
Flexibility	Provision of 3PL services
Reliability	
Transit time	

Factors Influencing Mode Choice

Question 1: How important will cost be to shippers when making mode choice decisions between now and 2015?

Cost	Transit time
EDI	Distance
Freight loss or damage	Shipment size
Flexibility	Shipment value
Reliability	3PL

Extremely Insignificant — Extremely Significant

A B C D E

Factors Influencing Mode Choice

Question 2: How important will web-enhanced EDI be to shippers when making mode choice decisions between now and 2015?

Cost	Transit time
EDI	Distance
Freight loss or damage	Shipment size
Flexibility	Shipment value
Reliability	3PL

Extremely Insignificant — Extremely Significant

A B C D E

Factors Influencing Mode Choice

Question 3: How important will freight loss or damage be to shippers when making mode choice decisions between now and 2015?

Cost	Transit time
EDI	Distance
Freight loss or damage	Shipment size
Flexibility	Shipment value
Reliability	3PL

Extremely Insignificant — Extremely Significant

A B C D E

Factors Influencing Mode Choice

Question 4: How important will flexibility be to shippers when making mode choice decisions between now and 2015?

Cost	Transit time
EDI	Distance
Freight loss or damage	Shipment size
Flexibility	Shipment value
Reliability	3PL

Extremely Insignificant — Extremely Significant

A B C D E

Factors Influencing Mode Choice

Question 5: How important will reliability be to shippers when making mode choice decisions between now and 2015?

Cost	Transit time
EDI	Distance
Freight loss or damage	Shipment size
Flexibility	Shipment value
Reliability	3PL

Extremely Insignificant — Extremely Significant

A B C D E

Factors Influencing Mode Choice

Question 6: How important will transit time be to shippers when making mode choice decisions between now and 2015?

Cost	**Transit time**
EDI	Distance
Freight loss or damage	Shipment size
Flexibility	Shipment value
Reliability	3PL

Extremely Insignificant — Extremely Significant

A B C D E

Factors Influencing Mode Choice

Question 7: How important will distance be to shippers when making mode choice decisions between now and 2015?

Cost	Transit time
EDI	**Distance**
Freight loss or damage	Shipment size
Flexibility	Shipment value
Reliability	3PL

Extremely Insignificant — Extremely Significant

A B C D E

Factors Influencing Mode Choice

Question 8: How important will shipment size be to shippers when making mode choice decisions between now and 2015?

Cost	Transit time
EDI	Distance
Freight loss or damage	**Shipment size**
Flexibility	Shipment value
Reliability	3PL

Extremely Insignificant — Extremely Significant

A B C D E

Factors Influencing Mode Choice

Question 9: How important will shipment value be to shippers when making mode choice decisions between now and 2015?

Cost	Transit time
EDI	Distance
Freight loss or damage	Shipment size
Flexibility	**Shipment value**
Reliability	3PL

Extremely Insignificant — Extremely Significant

A B C D E

Factors Influencing Mode Choice

Question 10: How important will third party logistics services be to shippers when making mode choice decisions between now and 2015?

Cost	Transit time
EDI	Distance
Freight loss or damage	Shipment size
Flexibility	Shipment value
Reliability	**3PL**

Extremely Insignificant — Extremely Significant

A B C D E

Factors Influencing Mode Choice

End of Second Section

- Voting results
- Facilitated discussion
- Re-vote

Delphi Expert Panel Survey

End of Section 2

Delphi Expert Panel Survey

Section 3:
Logistic Trends

Logistic Trends

- Objective
- Question overview

Logistic Trends

- Objective

Assess the impact of current and emerging trends in logistics and industry practices on freight traffic growth.

Logistic Trends

- Objective of this section
- Question overview
  - Geographical concentration of production
  - Geographical concentration of inventory
  - Relocation of production/warehousing
  - Rescheduling of manufacturing and distribution processes
  - Concentration of trade through international gateways
  - Expansion of market area
  - Decline in real cost of transportation
  - Increase in inventory cost

Logistic Trends

Question 1: How significant will the <u>geographical concentration of production</u> be to freight traffic growth (all modes) between now and 2015?

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Logistic Trends

Question 2: How significant will the <u>geographical concentration of inventory</u> be to freight traffic growth (all modes) between now and 2015?

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Logistic Trends

Question 3: How significant will the relocation of production/warehousing be to freight traffic growth (all modes) between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Logistic Trends

Question 4: How significant will the rescheduling of manufacturing and distribution processes be to freight traffic growth (all modes) between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Logistic Trends

Question 5: How significant will the concentration of trade through international gateways be to freight traffic growth (all modes) between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Logistic Trends

Question 6: How significant will the expansion of market area be to freight traffic growth (all modes) between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Logistic Trends

Question 7: How significant will the declining in real cost of transportation be to freight traffic growth (all modes) between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Logistic Trends

Question 8: How significant will the increase in inventory cost be to freight traffic growth (all modes) between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Logistic Trends

Question 9: How significant will the Security be to freight traffic growth (all modes) between now and 2015?

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Logistics Trends

End of Third Section

- Voting results
- Facilitated discussion
- Re-vote

Delphi Expert Panel Survey

End of Section 3

Delphi Expert Panel Survey

Section 4:
Infrastructure and Operations

Infrastructure and Operations

- Objective
- Question overview

Infrastructure and Operations

- Objective

Characterize the impact of various policies related to operations or infrastructure provision on truck and rail mode competitiveness

Infrastructure and Operations

- Objective of this section
- Question overview
  - Invest in highway bypasses around metropolitan areas
  - Improve highway geometrics/modify design standards
  - TransTexas Corridor
  - Texas Truck system for rural areas

Infrastructure and Operations

- Question overview
  - Lane restrictions for trucks
  - Time of day restrictions for trucks
  - Improved incident management
  - ITS strategies to facilitate truck flow
  - Improve connectivity to rail yards
  - Establishment of rural rail districts

Infrastructure and Operations

Question 1: How would you characterize the impact of providing highway bypasses around metropolitan areas on truck mode competitiveness between now and 2015?

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Infrastructure and Operations

Question 2: How would you characterize the impact of an improvement in highway geometrics or a modification of design standards on truck mode competitiveness between now and 2015?

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Infrastructure and Operations

Question 3: How would you characterize the impact of the TransTexas corridor on truck mode competitiveness between now and 2015?

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Infrastructure and Operations

Question 4: How would you characterize the impact of Texas truck system for rural areas on truck mode competitiveness between now and 2015?

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Infrastructure and Operations

Question 5: How would you characterize the impact of lane restrictions on truck mode competitiveness between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Infrastructure and Operations

Question 6: How would you characterize the impact of time of day restrictions on truck mode competitiveness between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Infrastructure and Operations

Question 7: How would you characterize the impact of improved incident management on truck mode competitiveness between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Infrastructure and Operations

Question 8: How would you characterize the impact of ITS strategies to facilitate truck flow on truck mode competitiveness between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Infrastructure and Operations

Question 9: How would you characterize the impact of an improvement in the connectivity of rail yards on rail mode competitiveness between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Infrastructure and Operations

Question 10: How would you characterize the impact of railroad districts on rail mode competitiveness between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Infrastructure and Operations

Question 11: How would you characterize the impact of the Trans Texas corridor on rail mode competitiveness between now and 2015?

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Infrastructure and Operations

Question 12: How would you characterize the impact of rail bypasses on rail mode competitiveness between now and 2015?

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Infrastructure and Operations

Question 13: How would you characterize the impact of _____ on rail mode competitiveness between now and 2015?

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Infrastructure and Operations

End of fourth section

- Voting results
- Facilitated discussion
- Re-vote

Delphi Expert Panel Survey

Section 5:
Technological developments

Technological developments

- Objective
- Technological developments overview
- Question overview

Technological developments

- Objective of this section

Assess the impact of various technological developments on mode utilization

Technological developments overview

Truck Technologies

- Improved IC engines and emission systems
- Use of web-brokers
- Automated routing and vehicle scheduling

Rail Technologies

- New AC locomotives
- Innovations in the maintenance of tracks, locomotives and railcars
- Centralized computer-aided dispatching and control
- IT to enhance logistic integration

Technological developments Overview

Air Mode

- Larger and efficient aircrafts
- Improvements in air traffic control

Water Mode

- Mega container ships

Intermodal

- Improvements in cargo transfer facilities

Technological developments

- Question overview
  - Improved IC engines
  - Use of web brokers
  - Automated routing and scheduling for trucks
  - New AC locomotives
  - Innovations in the maintenance
  - Centralized computer-aided dispatching and control
  - IT to enhance logistic integration
  - Larger and efficient aircrafts
  - Improvements in air traffic control
  - Mega container ships
  - Improvements in cargo transfer facilities

Technological developments

Question 1: How would you characterize the impact of improved IC truck engine technologies on truck mode competitiveness between now and 2015?

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Technological developments

Question 2: How would you characterize the impact of use of web-brokers on truck mode competitiveness between now and 2015?

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Technological developments

Question 3: How would you characterize the impact of automated routing and scheduling of trucks on truck mode competitiveness between now and 2015?

Extremely Insignificant — Extremely Significant

A B C D E

Technological developments

Question 4: How would you characterize the impact of new AC locomotives that improve efficiency on rail mode competitiveness between now and 2015?

Extremely Insignificant — Extremely Significant

A B C D E

Technological developments

Question 5: How would you characterize the impact of the innovations in the maintenance of tracks, locomotives and railcars on rail mode competitiveness between now and 2015?

Extremely Insignificant — Extremely Significant

A B C D E

Technological developments

Question 6: How would you characterize the impact of centralized computer-aided dispatching and control of rails on rail mode competitiveness between now and 2015?

Extremely Insignificant — Extremely Significant

A B C D E

Technological developments

Question 7: How would you characterize the impact of IT that enables logistic integration on rail mode competitiveness between now and 2015?

Extremely Insignificant — Extremely Significant

A B C D E

Technological developments

Question 8: How would you characterize the impact of improvements in cargo transfer facilities on rail mode competitiveness between now and 2015?

Extremely Insignificant — Extremely Significant

A B C D E

Technological developments

Question 9: How would you characterize the impact of larger and efficient aircrafts on air mode competitiveness between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Technological developments

Question 10: How would you characterize the impact of improvements in air traffic control on air mode competitiveness between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Technological developments

Question 11: How would you characterize the impact of introduction of more and more mega container ships on water mode competitiveness between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Technological developments

Question 12: How would you characterize the impact of improvements in cargo transfer facilities on water mode competitiveness between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Technological developments

Question 13: How would you characterize the impact of _____ on _____ mode competitiveness between now and 2015?

Extremely Insignificant — A B C D E — Extremely Significant

Technological developments

End of first round

- Voting results
- Facilitated discussion
- Re-vote

Delphi Expert Panel Survey

Section 6:
Legislative Measures

Legislative Measures

- Objective

Legislative Measures

- Objective

Assess the impact of legislative measures on freight mode competitiveness

Legislative Measures

- Deregulations of 1980
  - Motor Carrier Act
  - Staggers Rail Act
  - Airline Deregulation Act
- ISTEA 1991
  - Vision for an intermodal system for freight

Legislative Measures

Funding for freight projects:

- Increase in funding for CMAQ projects
- Increase in funding for ITS projects
- Innovative financing
  - TIFIA, Tax incentives

Legislative Measures

ISTEA Reauthorization:

- Driver hours of service regulation
- Truck parking policy

Environmental regulations:

- Emissions control
  - Heavy truck engines
  - Rail locomotives

Legislative Measures

Other regulations:

- Security checks on HAZMAT truck drivers
- Changes in truck size and truck weight
- Increase in fuel tax
- Implementation of sales tax

Legislative Measures

Question 1: What would be the direction of mode shift if the CMAQ funding for highway projects is increased by 25% ?

Significant shift towards rail — Significant shift towards truck

A B C D E

Legislative Measures

Question 2: What would be the direction of mode shift if the CMAQ funding for rail projects is increased by 25%?

Significant shift towards rail — Significant shift towards truck

A B C D E

Legislative Measures

Question 3: What would be the direction of mode shift if ITS funding results in an average trip travel time saving of 5% for trucks?

Significant shift towards rail — Significant shift towards truck

A B C D E

Legislative Measures

Question 4: What would be the direction of mode shift if rail connectivity to ports is financed through innovative state financing?

Significant shift towards rail — Significant shift towards truck

A B C D E

Legislative Measures

Question 5: What would be the direction of mode shift if the diesel fuel tax is increased by 10%?

Significant shift towards rail — Significant shift towards truck

A B C D E

Legislative Measures

Question 6: What would be the direction of mode shift if the diesel fuel tax is increased by 10%?

Significant shift towards air — Significant shift towards truck

A B C D E

Legislative Measures

Question 7: What would be the direction of mode shift if a sales tax of 8.25% on transportation is implemented?

Significant shift towards rail — Significant shift towards truck

A B C D E

Legislative Measures

Question 8: What is the anticipated direction in mode shift given the 2004 driver hours of service regulation recently implemented?

Significant shift towards rail — Significant shift towards truck

A B C D E

Legislative Measures

Question 9: What is the anticipated direction in mode shift given the 2004 driver hours of service regulation recently implemented?

Significant shift towards air — Significant shift towards truck

A B C D E

Legislative Measures

Question 10: What would be the direction of mode shift if public rest areas are privatized to provide for adequate truck parking facilities?

Significant shift towards rail — Significant shift towards truck

A B C D E

Legislative Measures

Question 11: What would be the direction of mode shift if stricter emission controls are required for heavy duty truck engines that result in 5% increase in operating cost?

Significant shift towards rail — Significant shift towards truck

A B C D E

Legislative Measures

Question 12: What would be the direction of mode shift if stricter emission controls are required for rail locomotive engines that result in 5% increase in operating cost?

Significant shift towards rail — Significant shift towards truck

A B C D E

Legislative Measures

Question 13: What would be the direction of mode shift given increased security requirements on HAZMAT shipments in terms of the advanced provision of routing, driver, and shipment details?

Significant shift towards rail — Significant shift towards truck

A B C D E

Legislative Measures

Question 14: What would be the direction of mode shift if truck size and weight are increased to allow for trucks of 105000 lbs?

Significant shift towards rail — Significant shift towards truck

A B C D E

Legislative Measures

End of first round

- Voting results
- Facilitated discussion
- Re-vote

Delphi Expert Panel Survey

End of Section 6

Delphi Expert Panel Survey

How effective will the following "packages of measures" be in diverting inter-city truck traffic to rail?

Scenario Evaluation

- Objective
- Policy overview

Scenario Evaluation

- Objective

Assess the impact of “packages of measures” in diverting inter-city truck traffic to rail

Scenario Evaluation

- Objective
- Policy overview

The rail infrastructure of the TTC is built, requiring a rail user fee to operate on the facility

Improve rail connectivity to freight terminals (eg. ports, airports, inland ports, and rail yards)

Increase the diesel fuel tax

Innovative state financing of smart transfer technologies to facilitate more efficient loading/unloading of freight trains.

Stricter requirements for emissions control from heavy duty diesel engines

Scenario Evaluation

- How effective will the following “packages of measures” be in diverting inter-city truck traffic to rail?

The rail infrastructure of the TTC is built, requiring a rail user fee to operate on the facility

Extremely Insignificant				Extremely Significant
A	B	C	D	E

Scenario Evaluation

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Extremely Insignificant				Extremely Significant
A	B	C	D	E

Scenario Evaluation

End of first round

- Voting results
- Facilitated discussion
- Re-vote

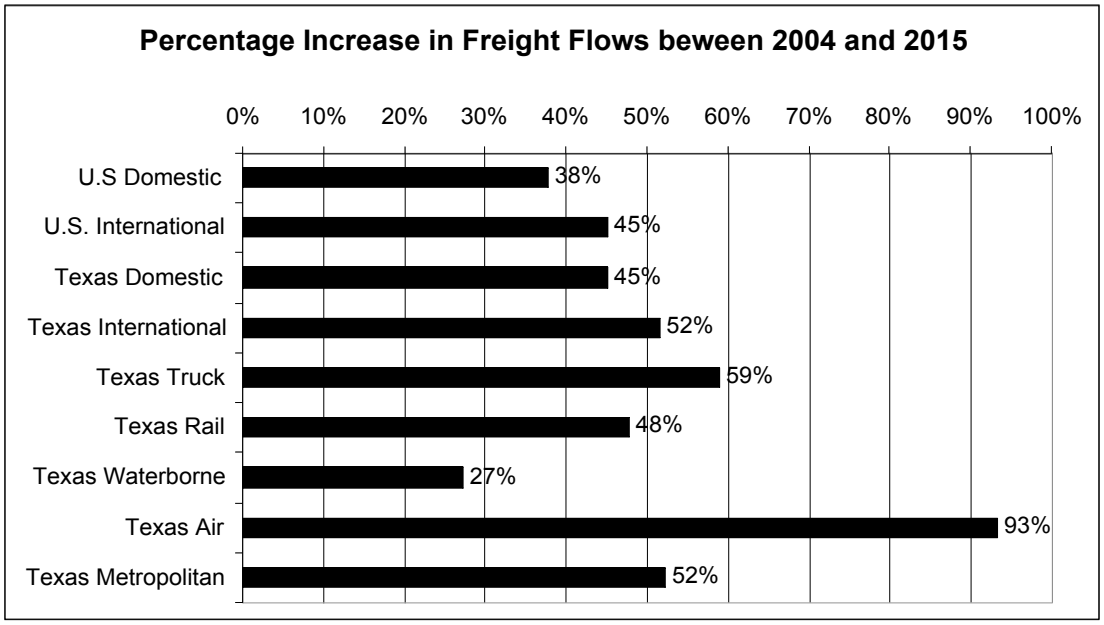
Expert Panel Survey

Thank You

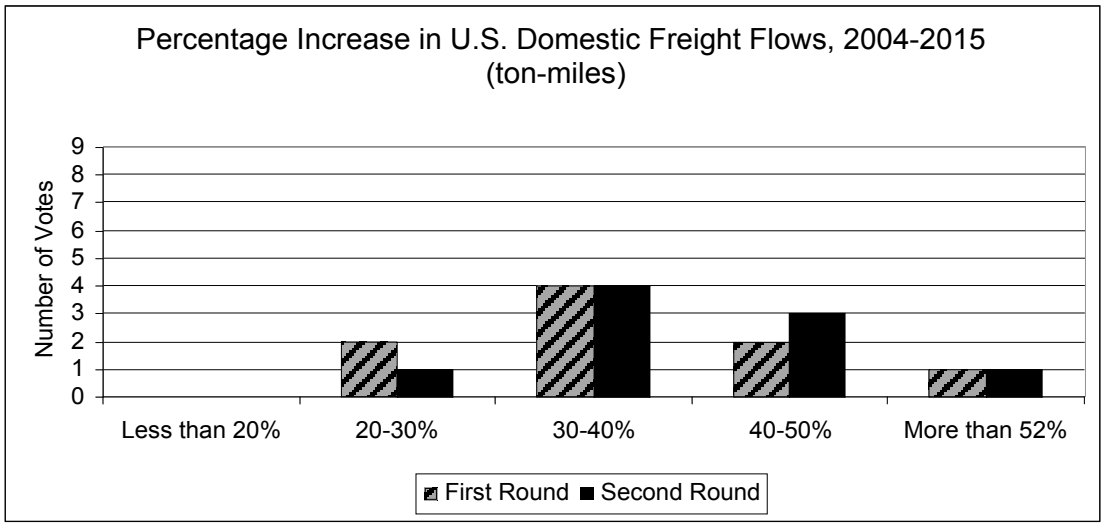
Workshop Outcome

Freight Trends in the U.S. and Texas

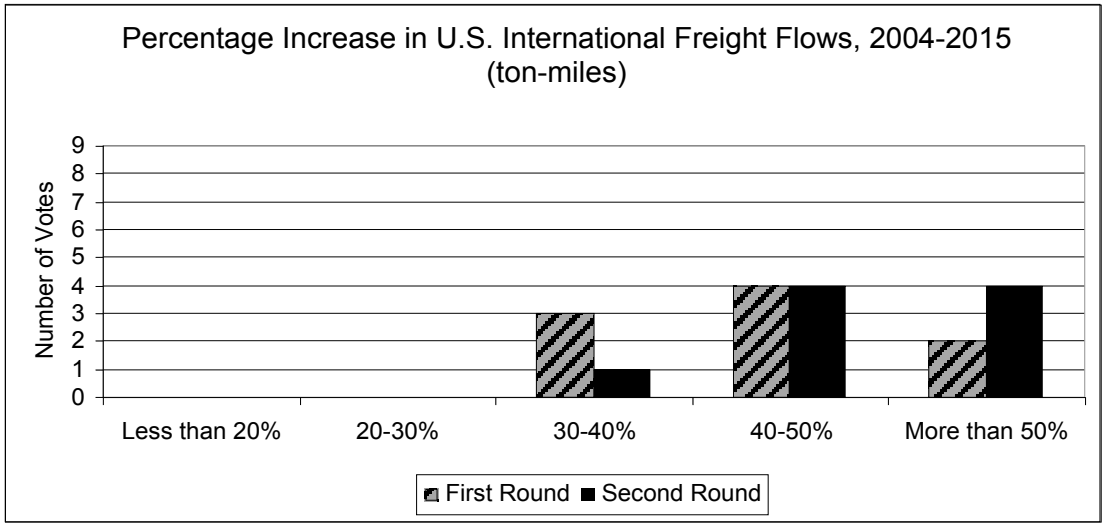
FREIGHT TRENDS IN THE U.S. AND TEXAS



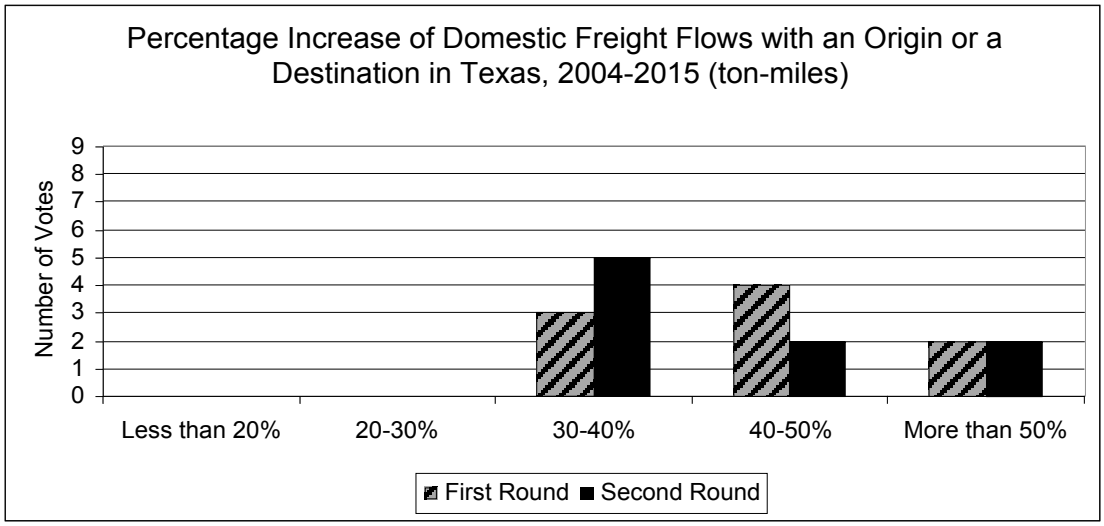
Question 1: With what percentage will U.S. domestic freight ton-miles carried by all modes increase between now and 2015?



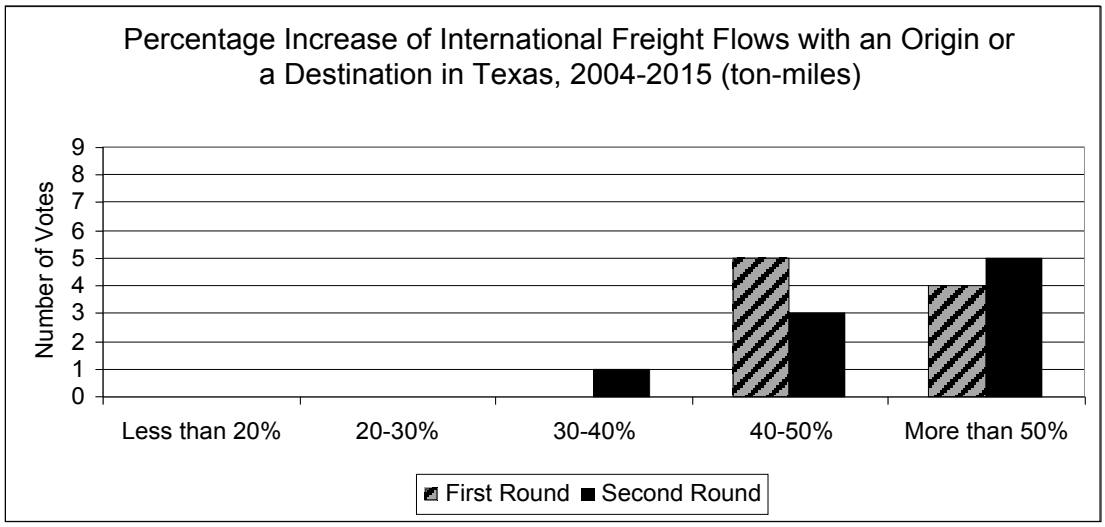
Question 2: With what percentage will U.S. international freight ton-miles carried by all modes increase between now and 2015?



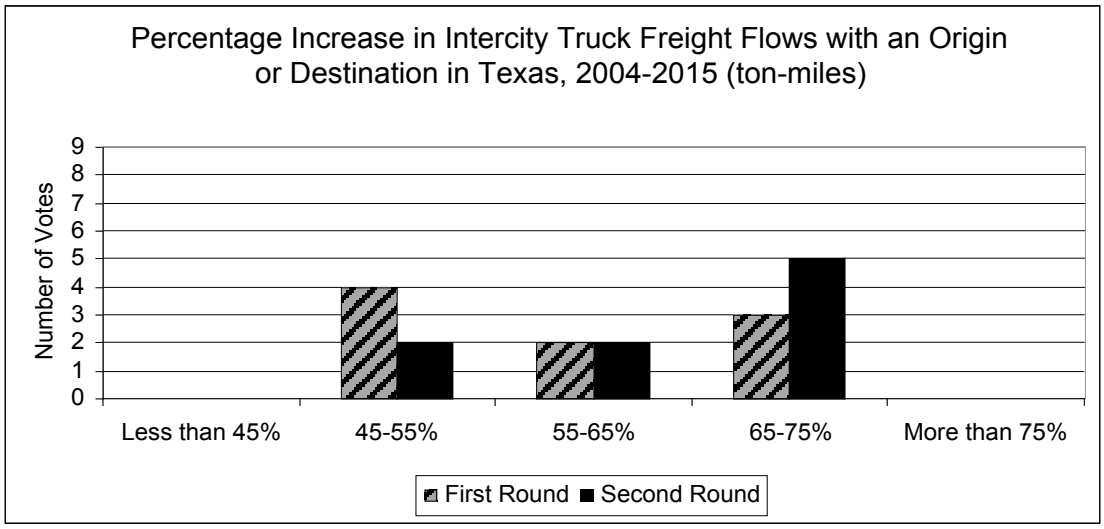
Question 3: With what percentage will domestic freight ton-miles - carried by all modes - with either an origin or destination in Texas increase between now and 2015?



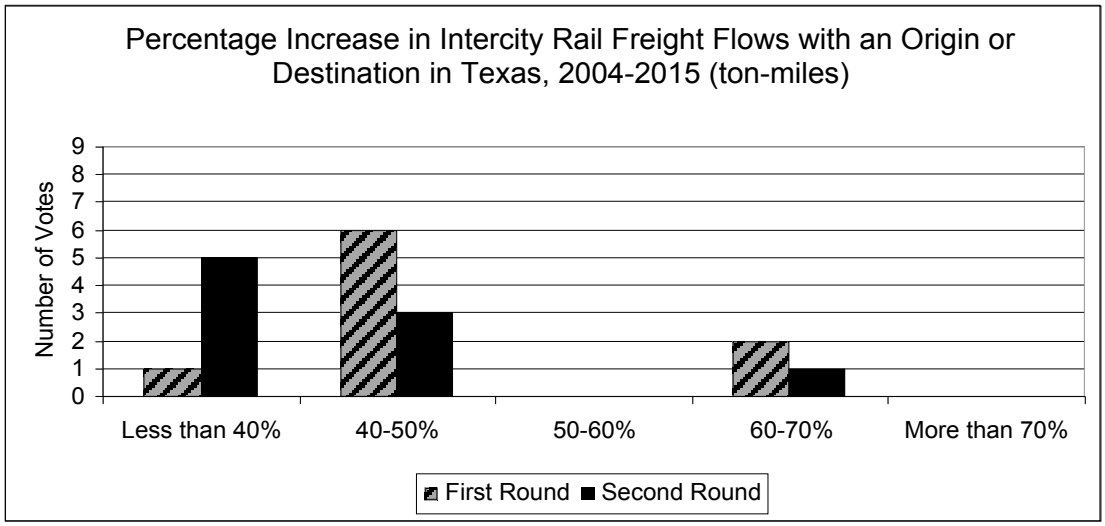
Question 4: With what percentage will international freight ton-miles - carried by all modes - with either an origin or destination in Texas increase between now and 2015?



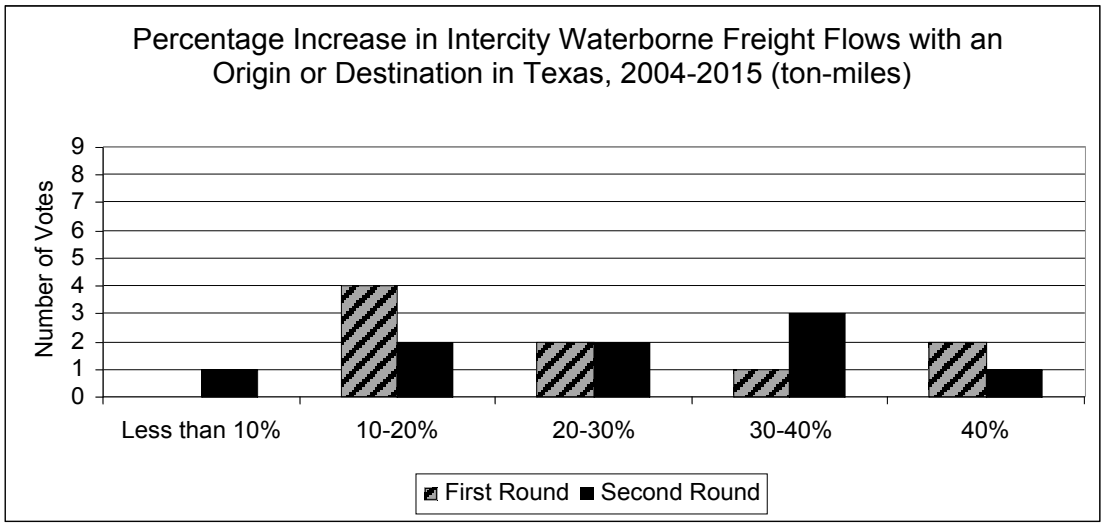
Question 5: With what percentage will intercity truck ton-miles with either an origin or destination in Texas increase between now and 2015?



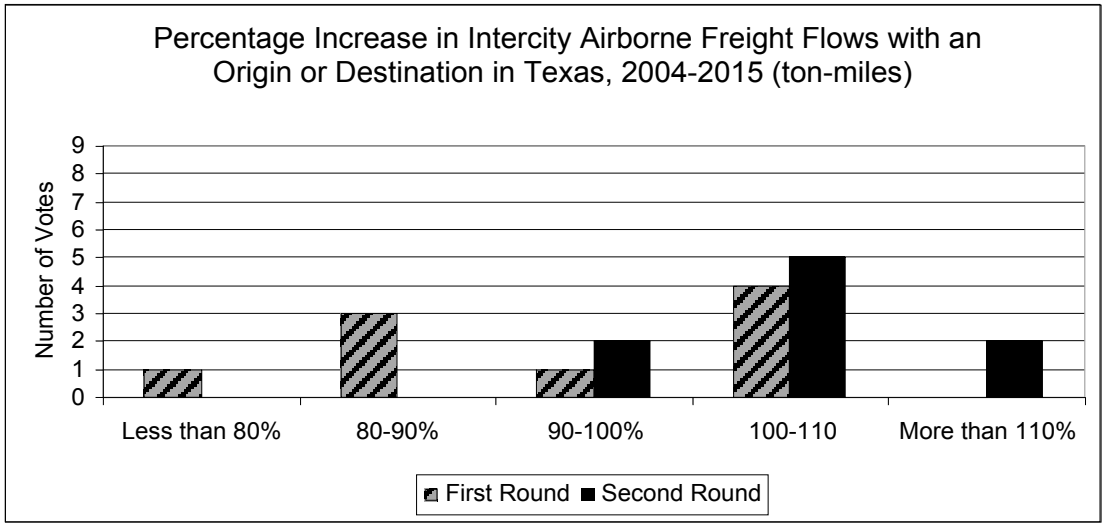
Question 6: With what percentage will intercity rail ton-miles with either an origin or destination in Texas increase between now and 2015?



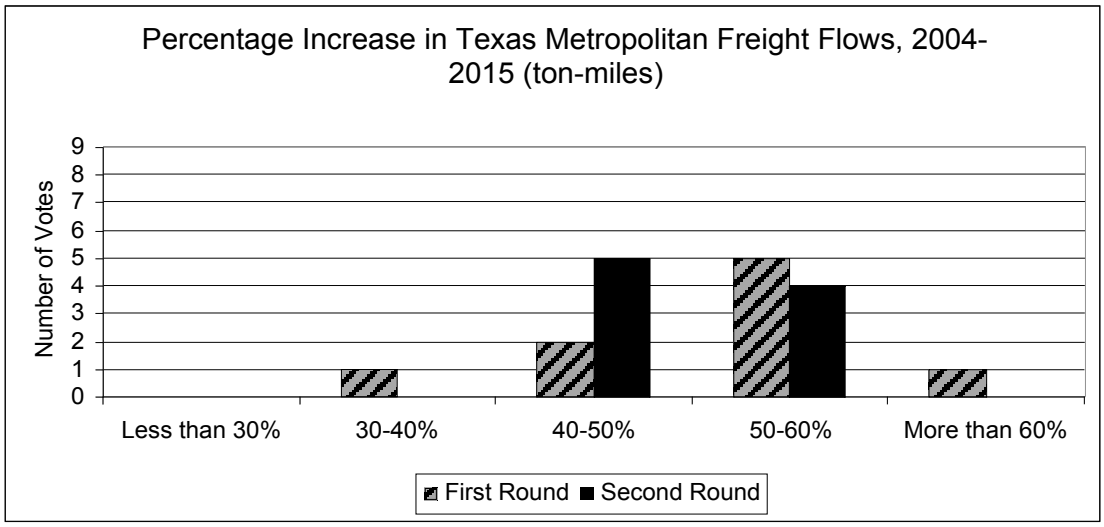
Question 7: With what percentage will waterborne ton-miles with either an origin or destination in Texas increase between now and 2015?



Question 8: With what percentage will airborne ton-miles with either an origin or destination in Texas increase between now and 2015?



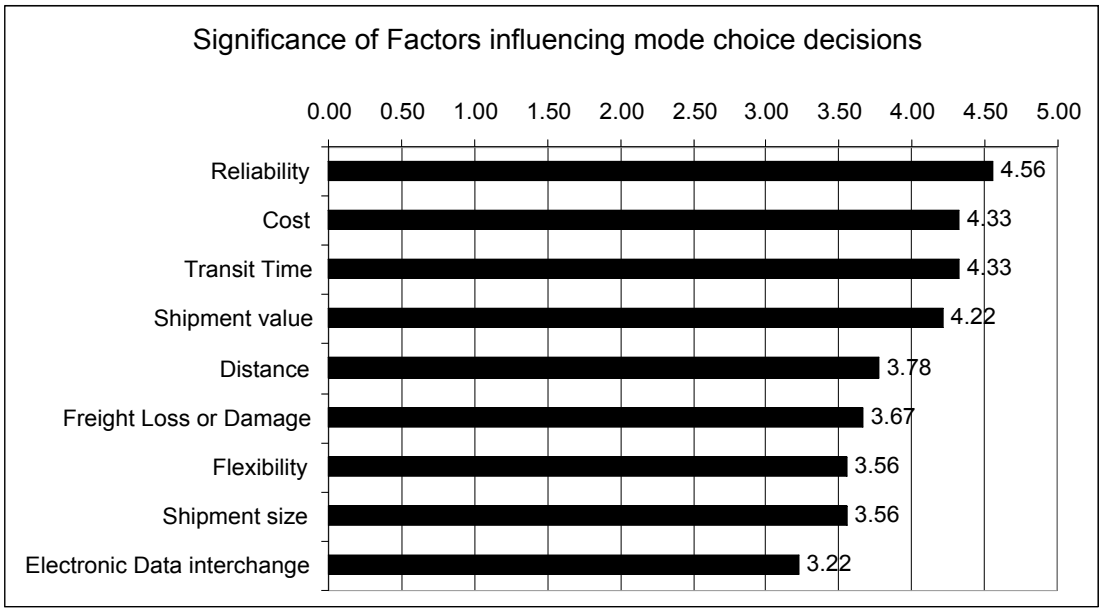
Question 9: With what percentage will metropolitan freight ton-miles increase in Texas between now and 2015?



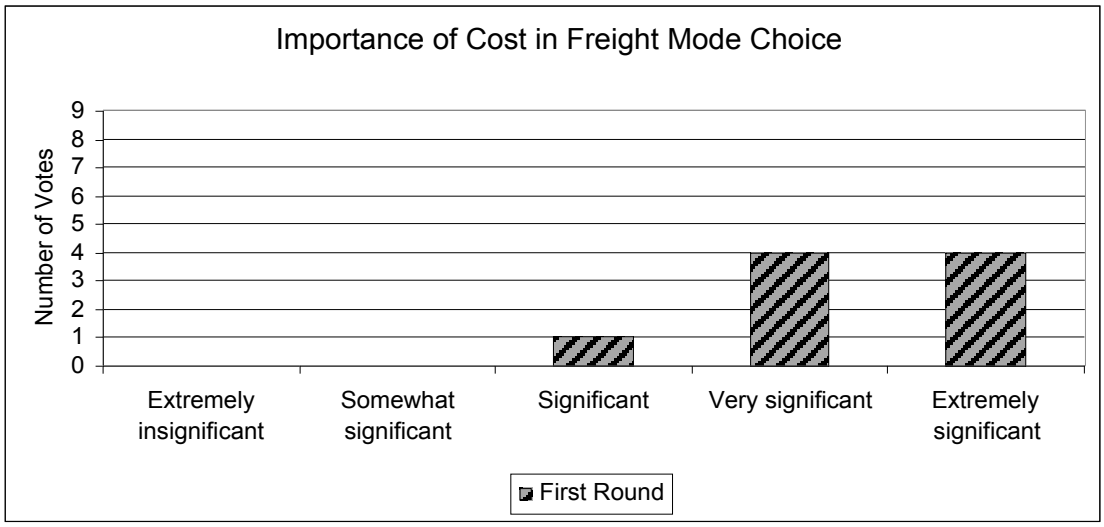
Factors Influencing Mode Choice

FACTORS INFLUENCING MODE CHOICE

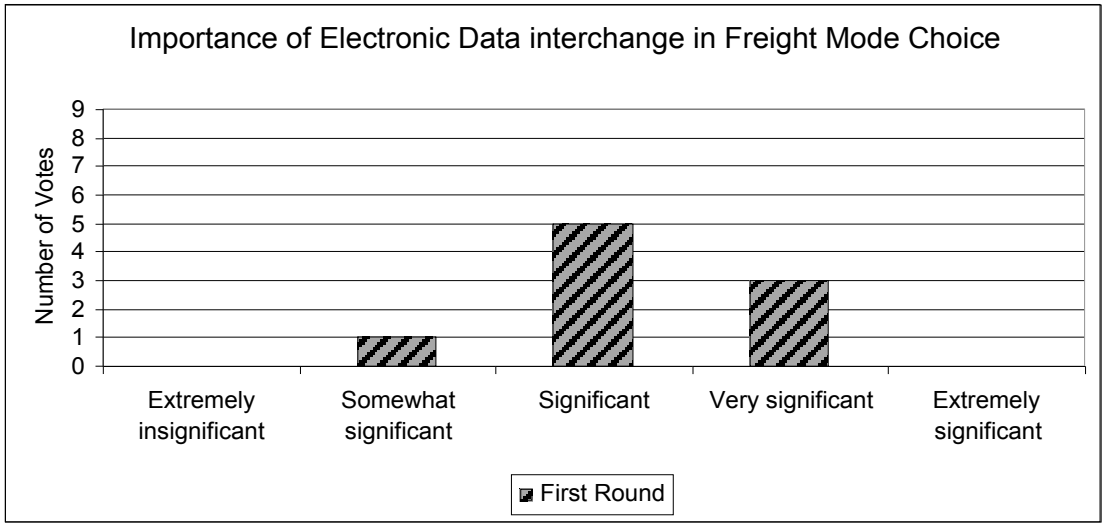
Scale: 1 – Extremely insignificant; 2 – Somewhat significant; 3 – Significant;
4 – Very significant; 5 – Extremely significant



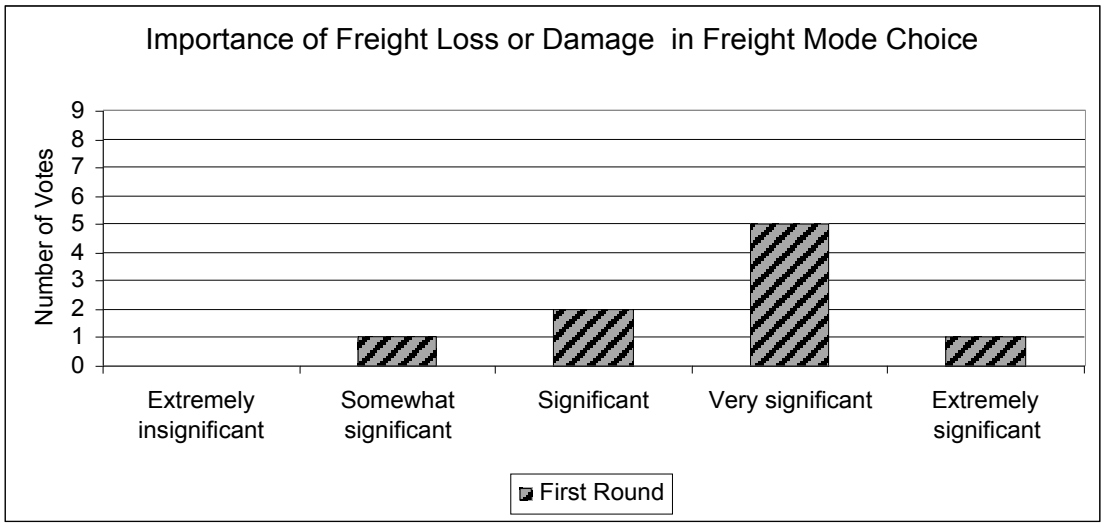
Question 1: How important will cost be to shippers when making mode choice decisions between now and 2015?



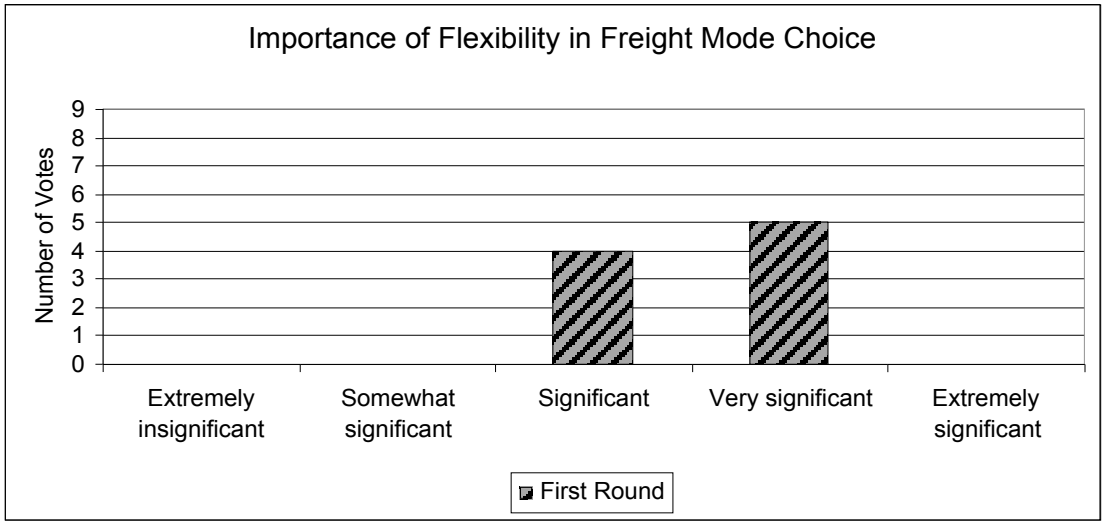
Question 2: How important will web-enhanced EDI be to shippers when making mode choice decisions between now and 2015?



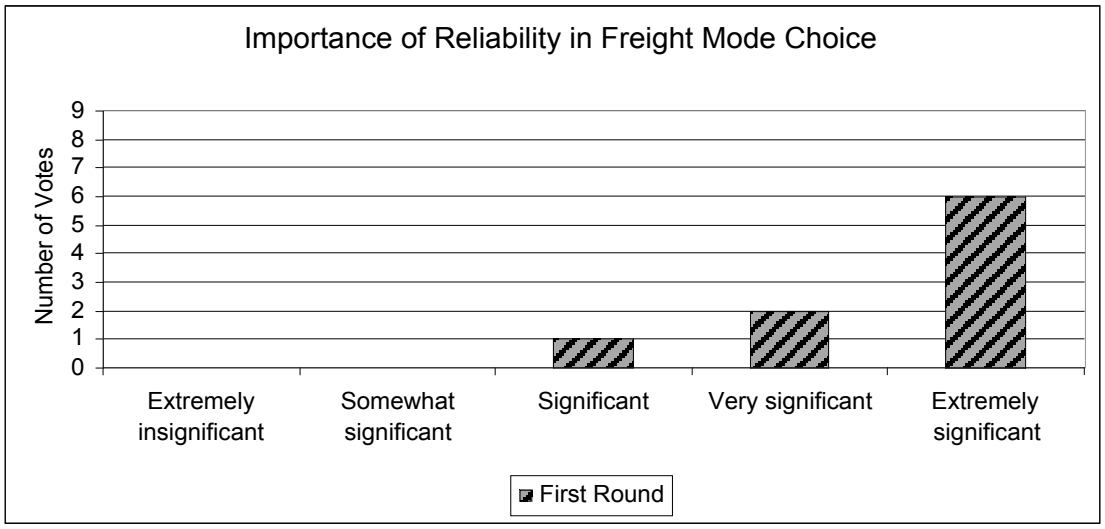
Question 3: How important will freight loss or damage be to shippers when making mode choice decisions between now and 2015?



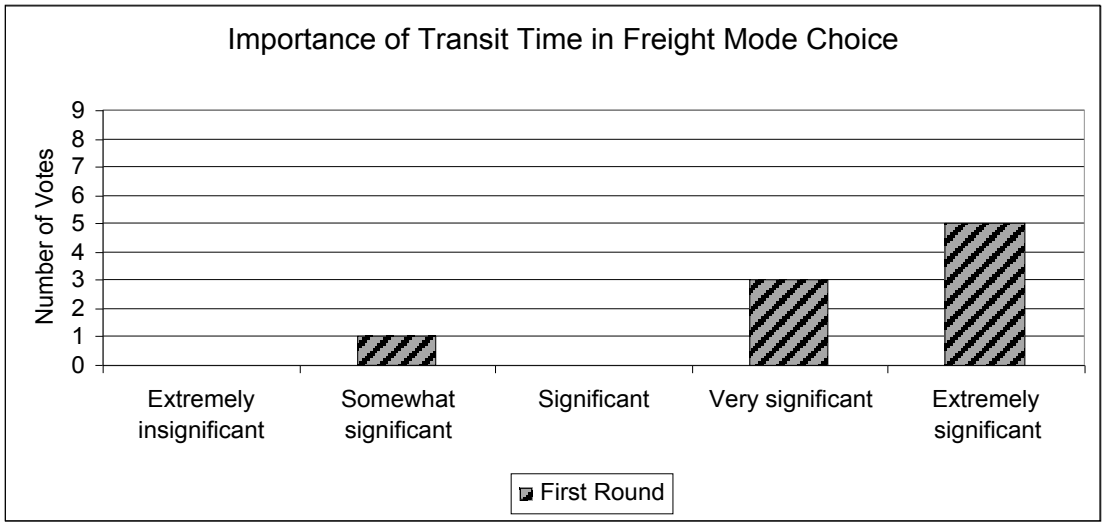
Question 4: How important will flexibility be to shippers when making mode choice decisions between now and 2015?



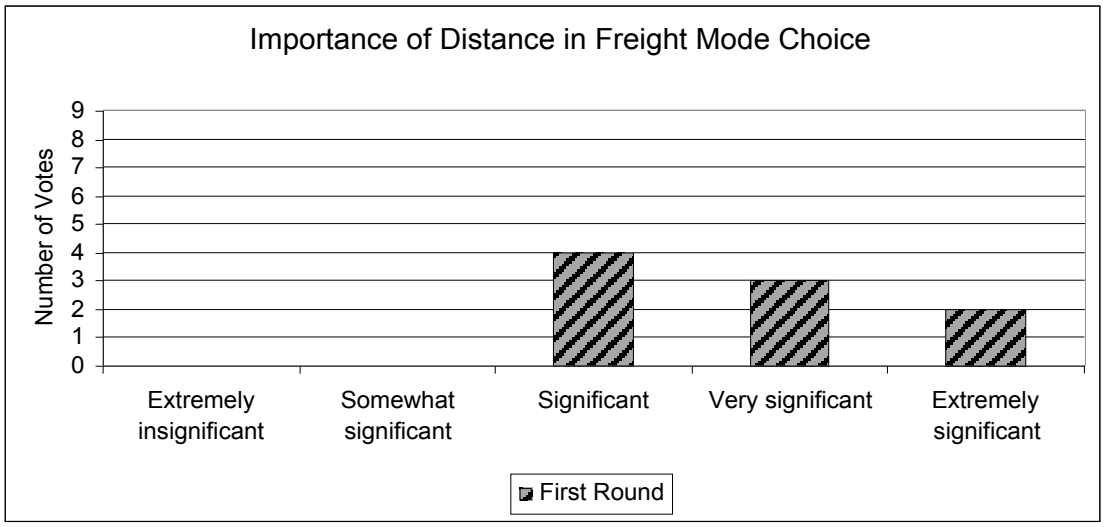
Question 5: How important will reliability be to shippers when making mode choice decisions between now and 2015?



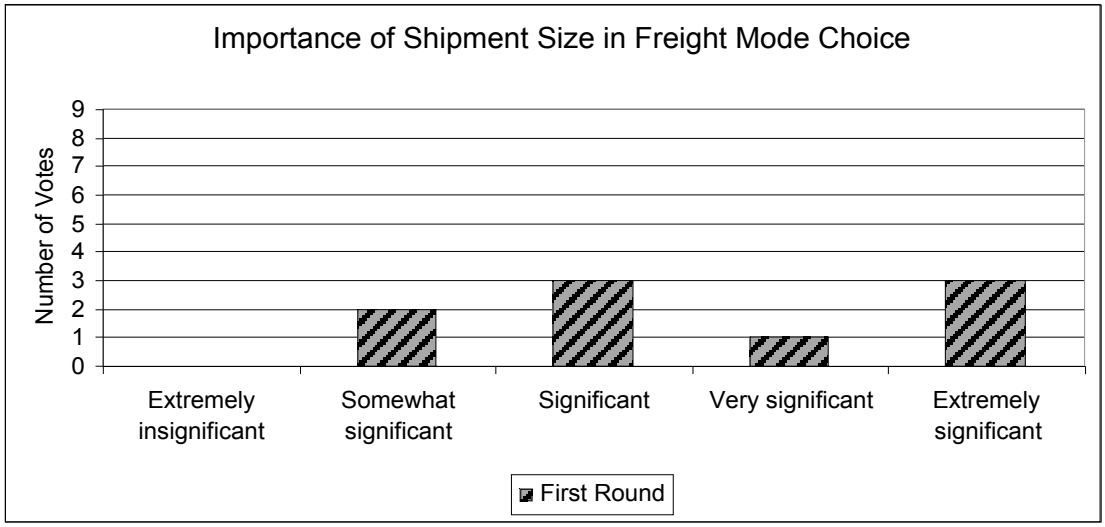
Question 6: How important will transit time be to shippers when making mode choice decisions between now and 2015?



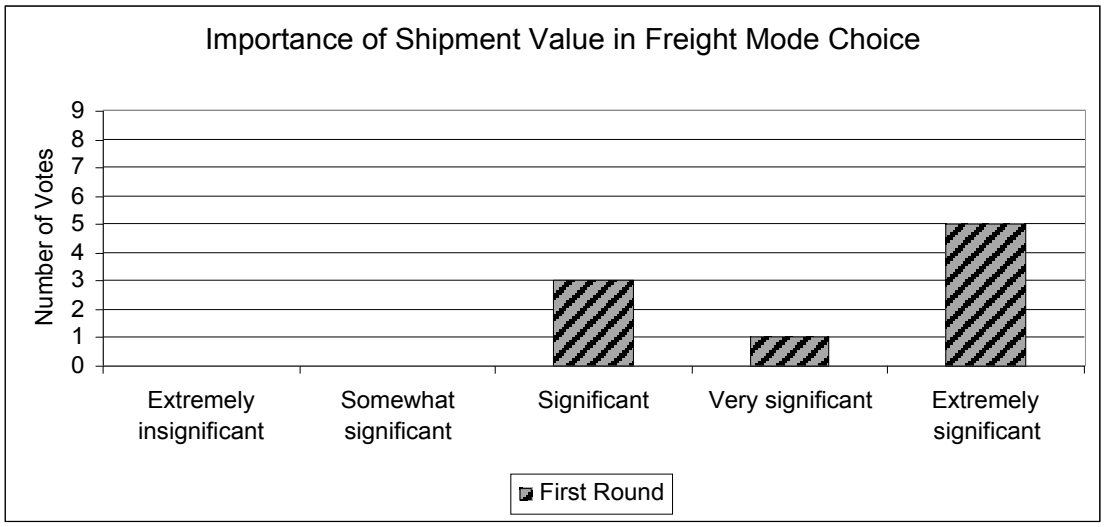
Question 7: How important will distance be to shippers when making mode choice decisions between now and 2015?



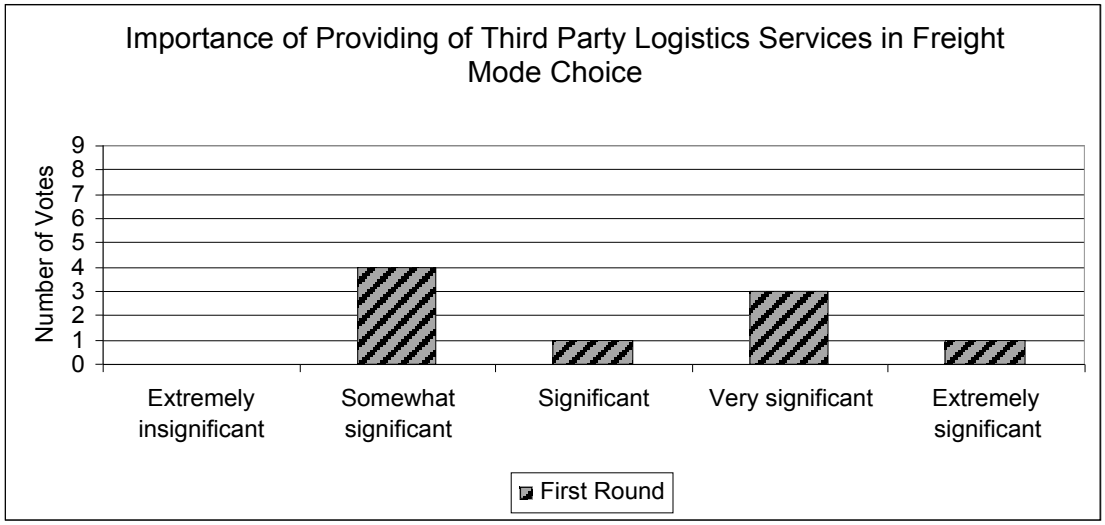
Question 8: How important will shipment size be to shippers when making mode choice decisions between now and 2015?



Question 9: How important will shipment value be to shippers when making mode choice decisions between now and 2015?



Question 10: How important will third party logistics services be to shippers when making mode choice decisions between now and 2015?



U.S. Logistics Trends

U.S. LOGISTICS TRENDS

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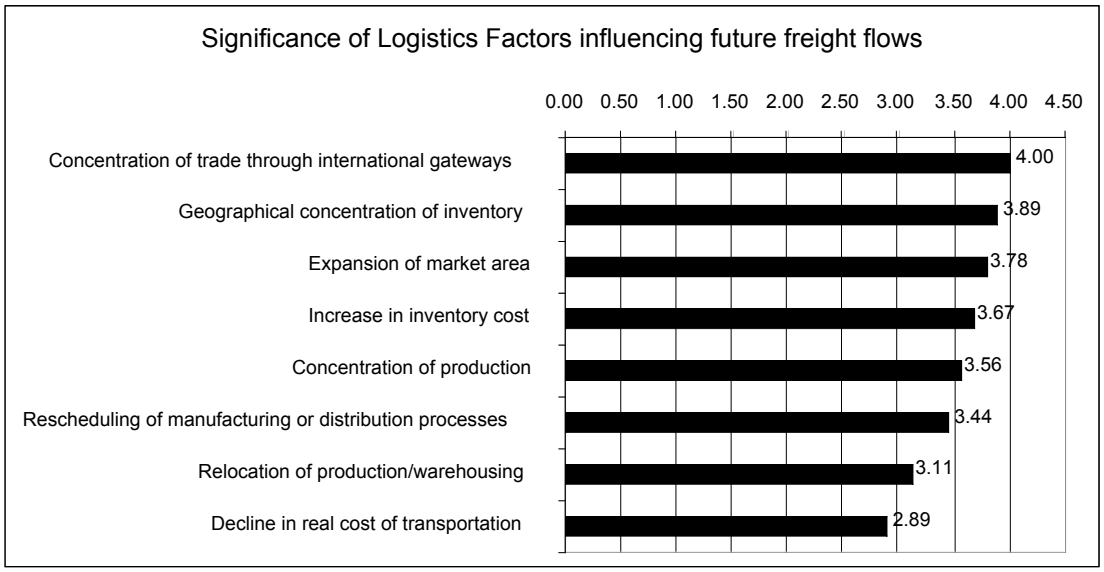
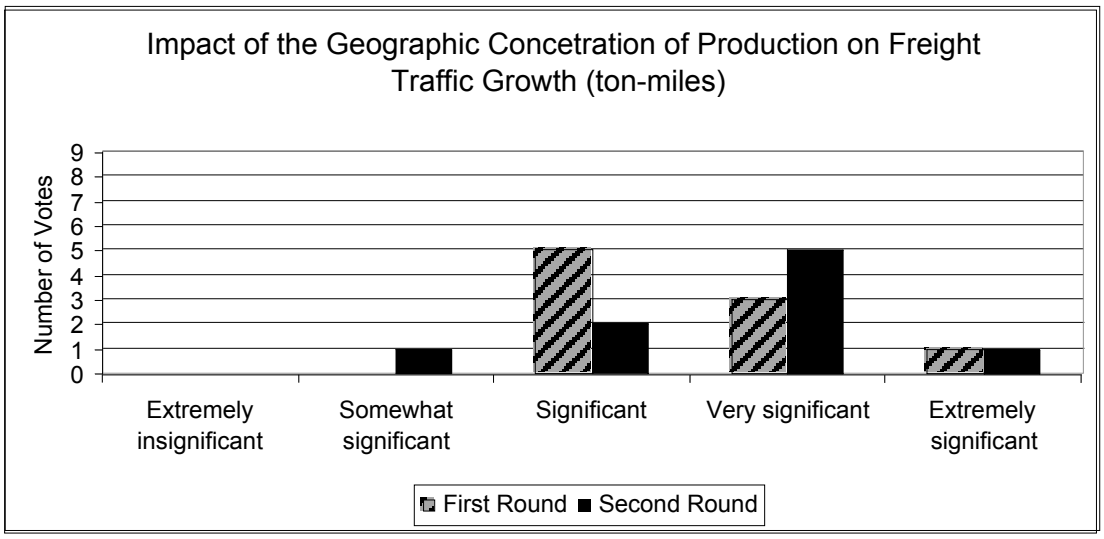
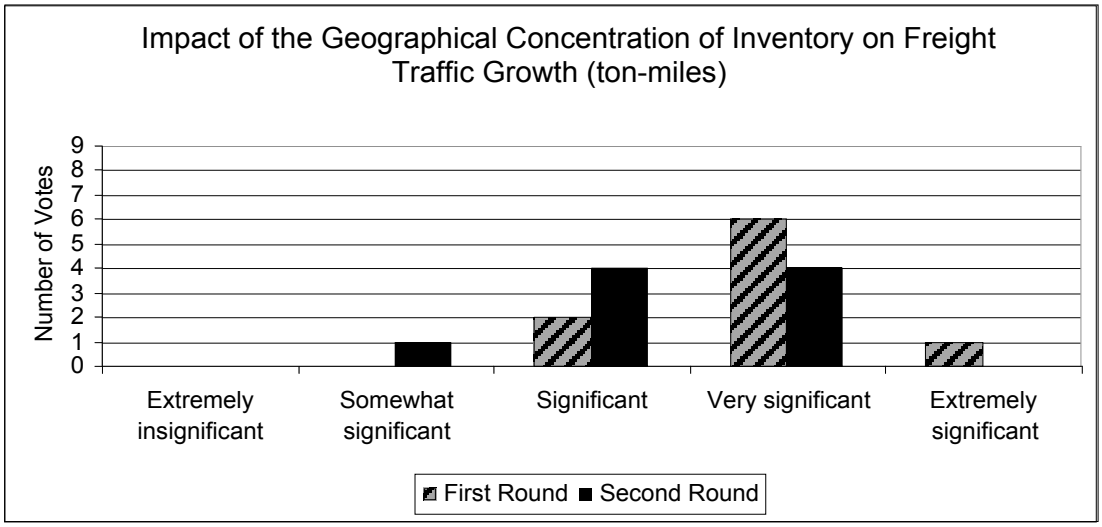


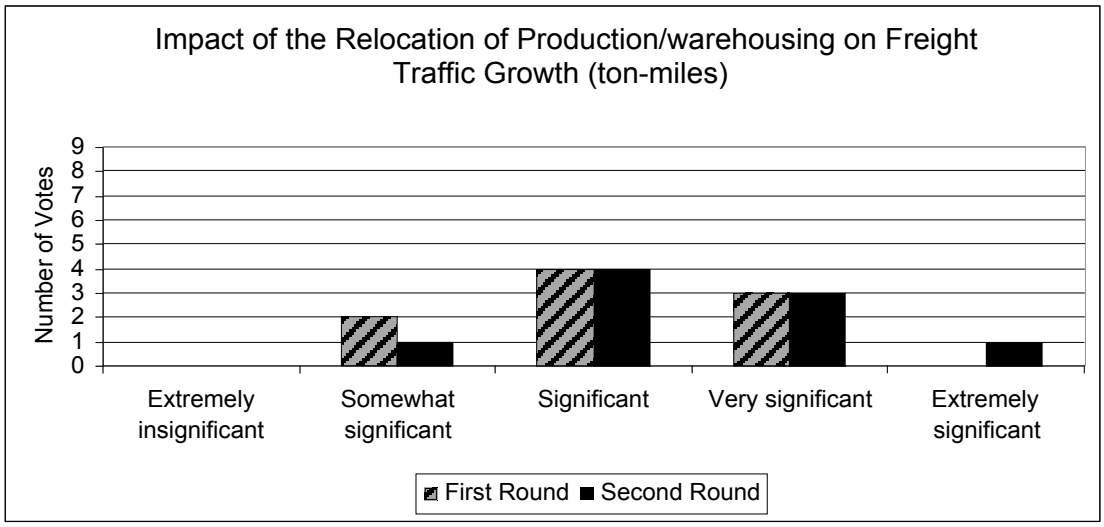
Question 1: How significant will the geographical concentration of production be to freight traffic growth (all modes) between now and 2015?



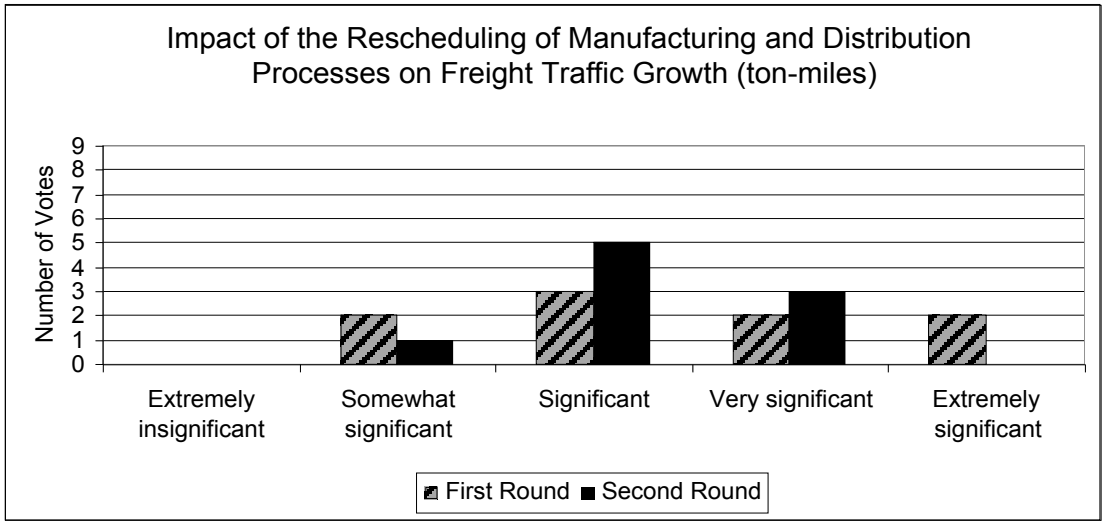
Question 2: How significant will the geographical concentration of inventory be to freight traffic growth (all modes) between now and 2015?



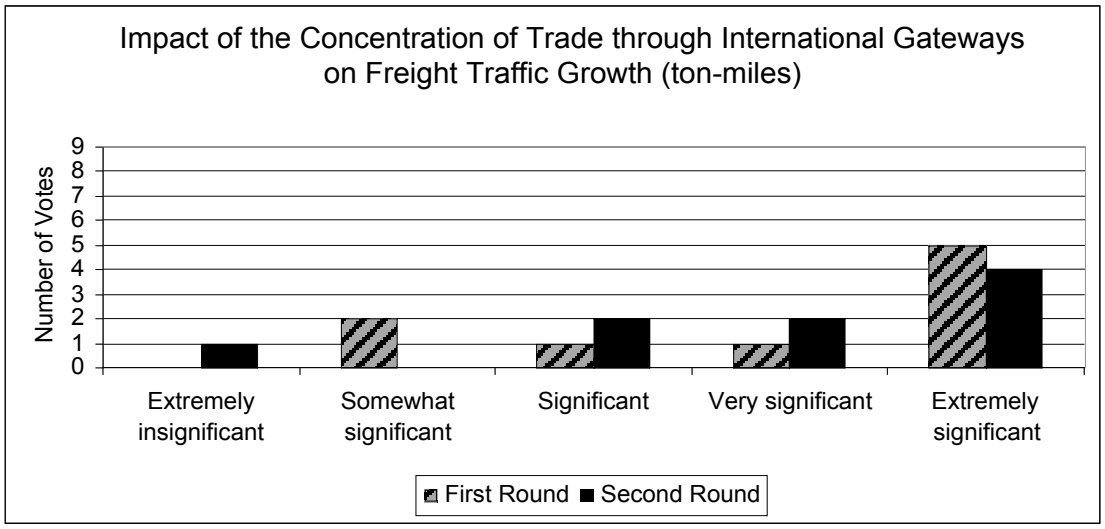
Question 3: How significant will the relocation of production/warehousing be to freight traffic growth (all modes) between now and 2015?



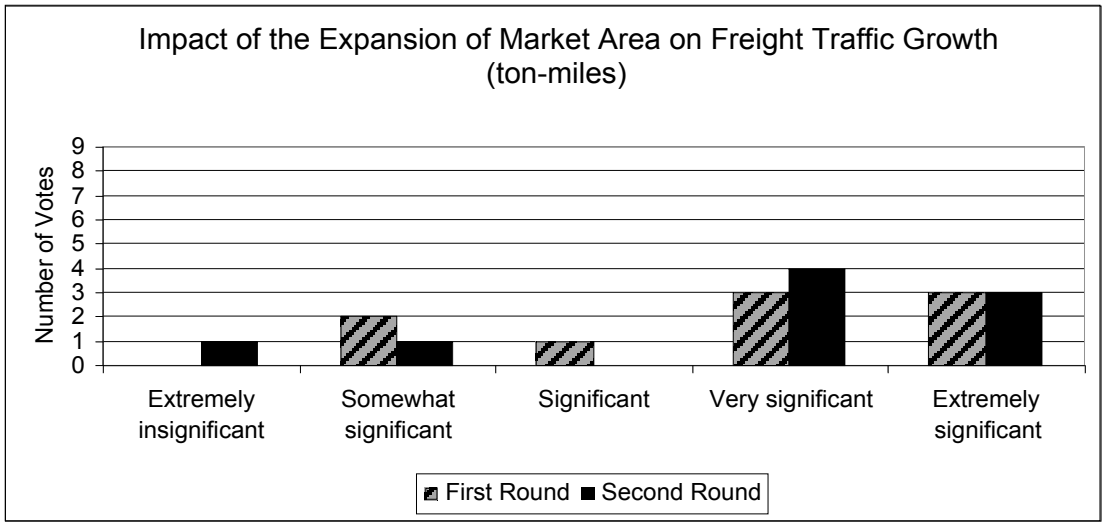
Question 4: How significant will the rescheduling of manufacturing and distribution processes be to freight traffic growth (all modes) between now and 2015?



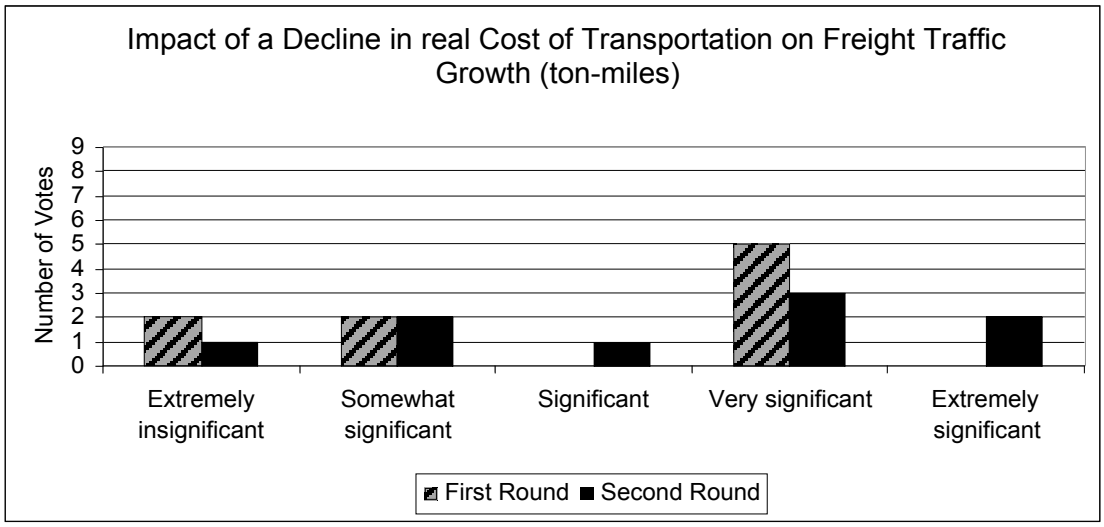
Question 5: How significant will the concentration of trade through international gateways be to freight traffic growth (all modes) between now and 2015?



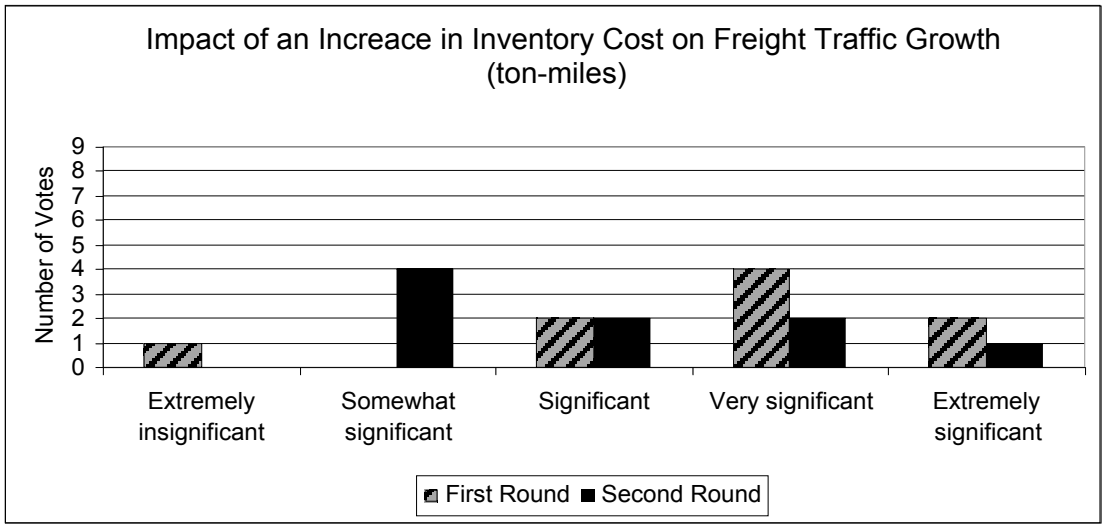
Question 6: How significant will the expansion of market area be to freight traffic growth (all modes) between now and 2015?



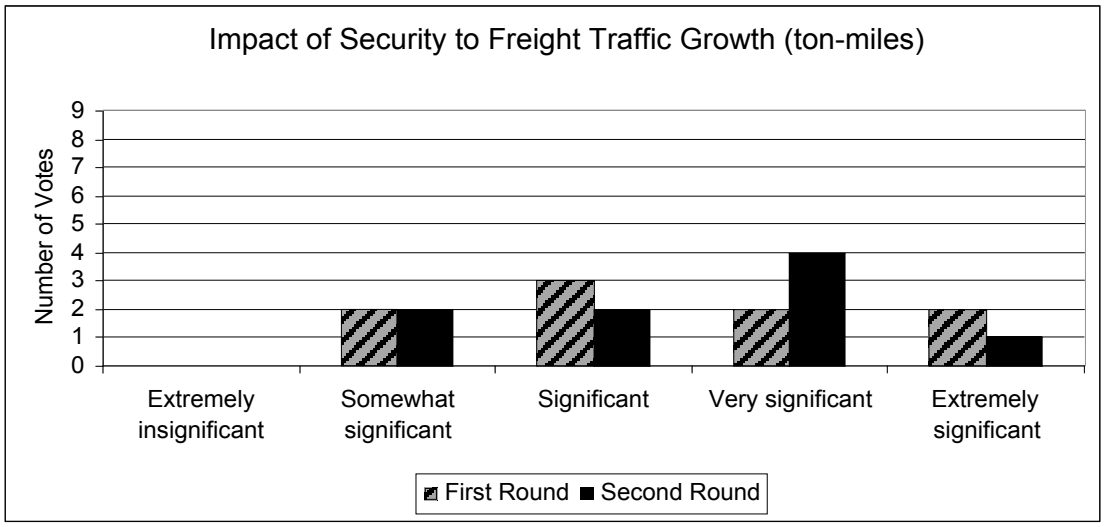
Question 7: How significant will the declining in real cost of transportation be to freight traffic growth (all modes) between now and 2015?



Question 8: How significant will the increase in inventory cost be to freight traffic growth (all modes) between now and 2015?



Question 9: How significant will the Security be to freight traffic growth (all modes) between now and 2015?



U.S. Freight Infrastructure

U.S. FREIGHT INFRASTRUCTURE

Scale: 1 – Extremely insignificant; 2 – Somewhat significant; 3 – Significant;
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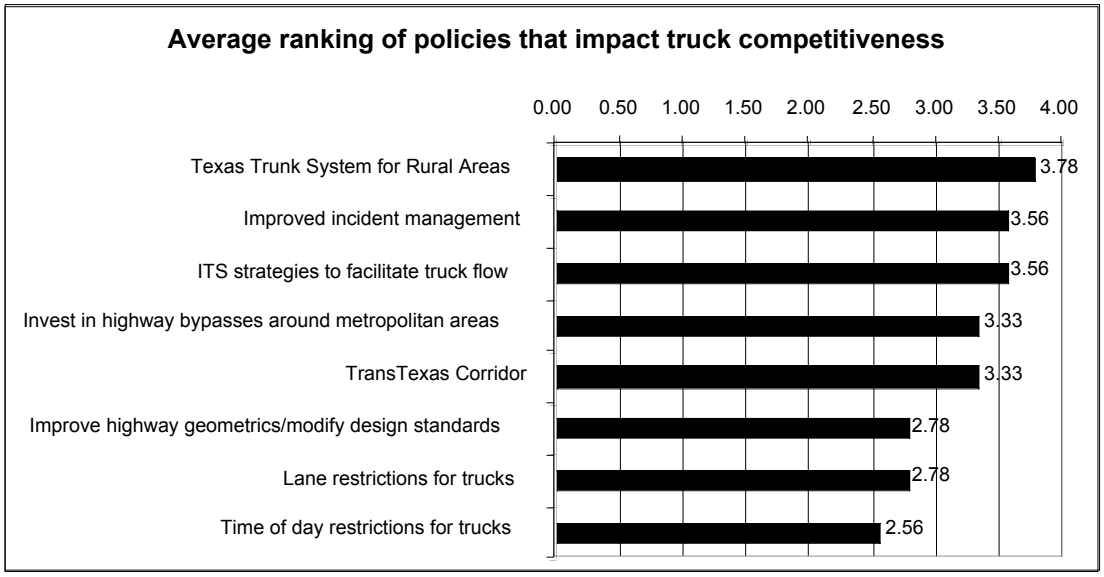
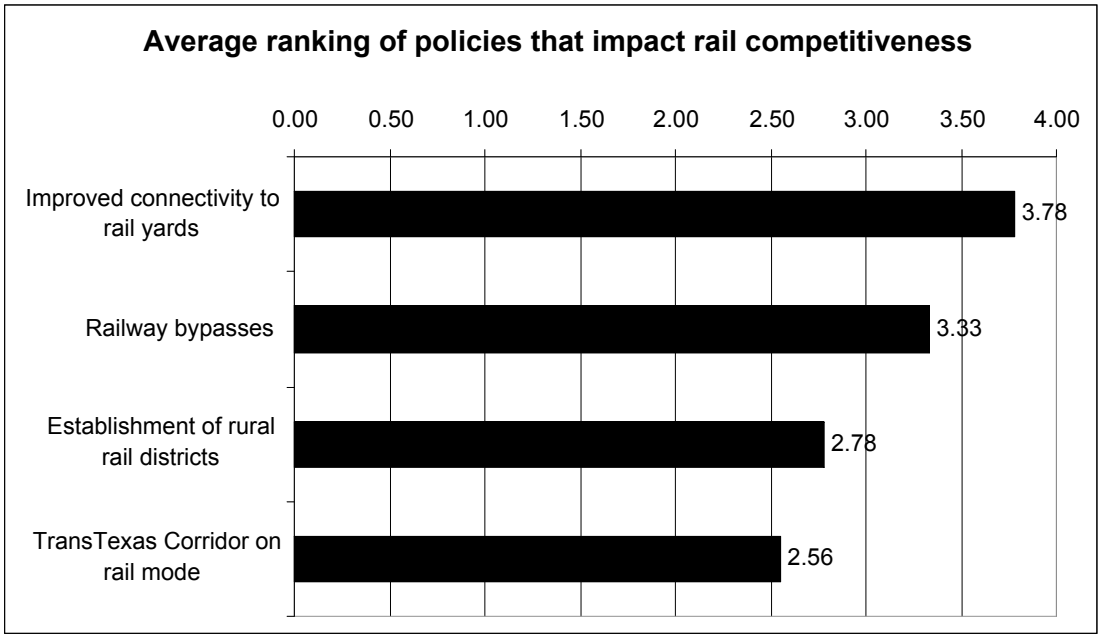
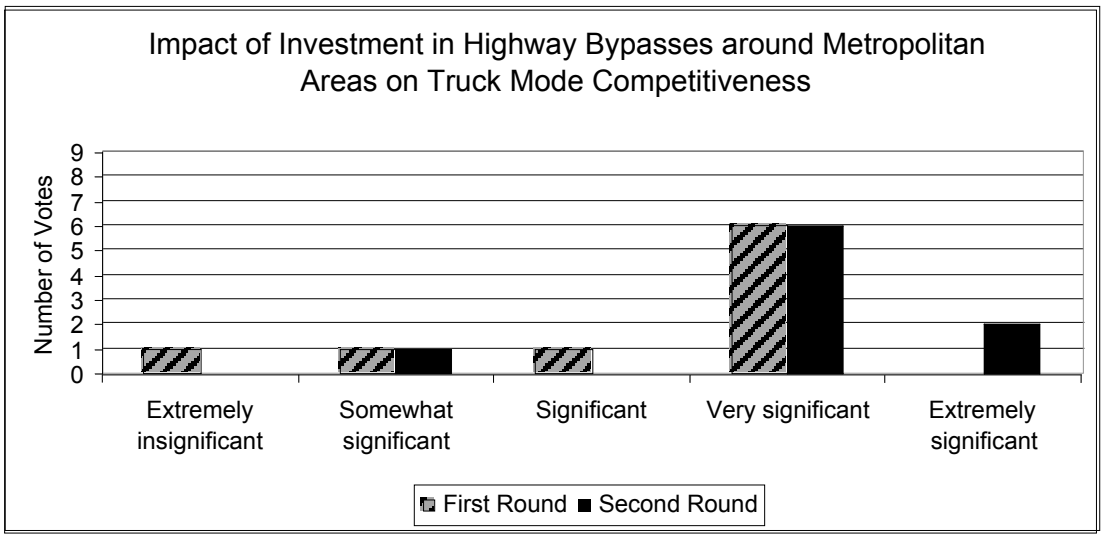
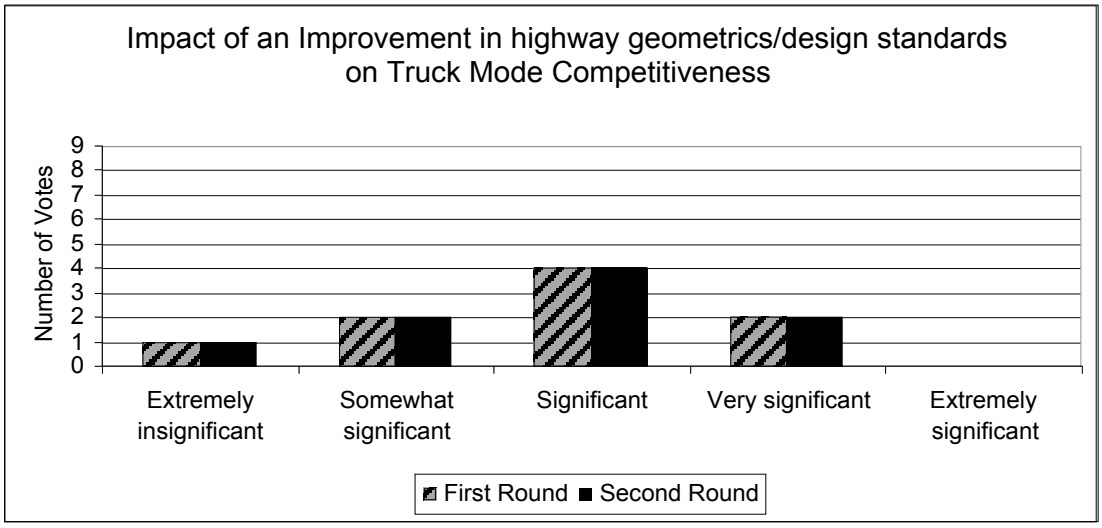




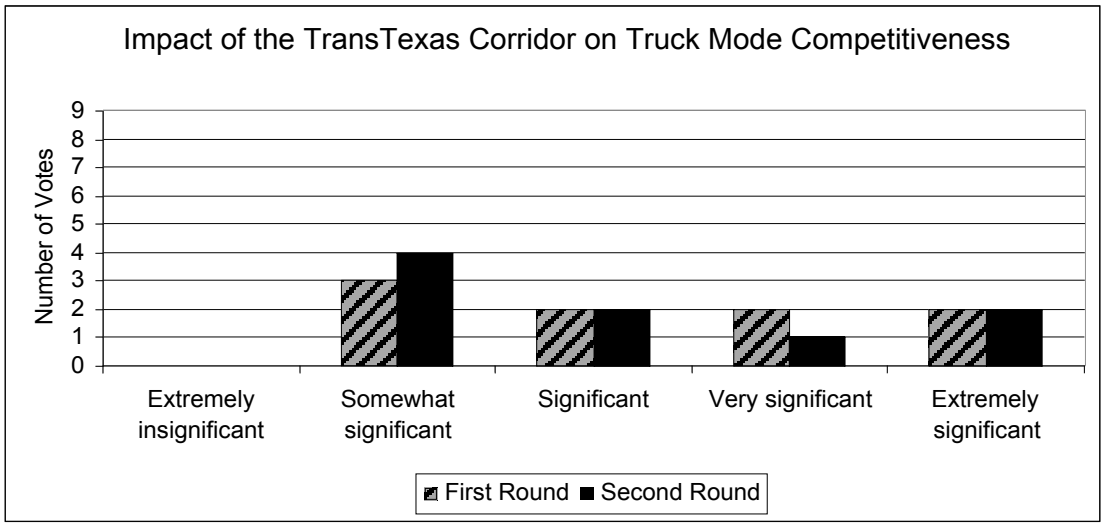
Question 1: How would you characterize the impact of providing highway bypasses around metropolitan areas on truck mode competitiveness between now and 2015?



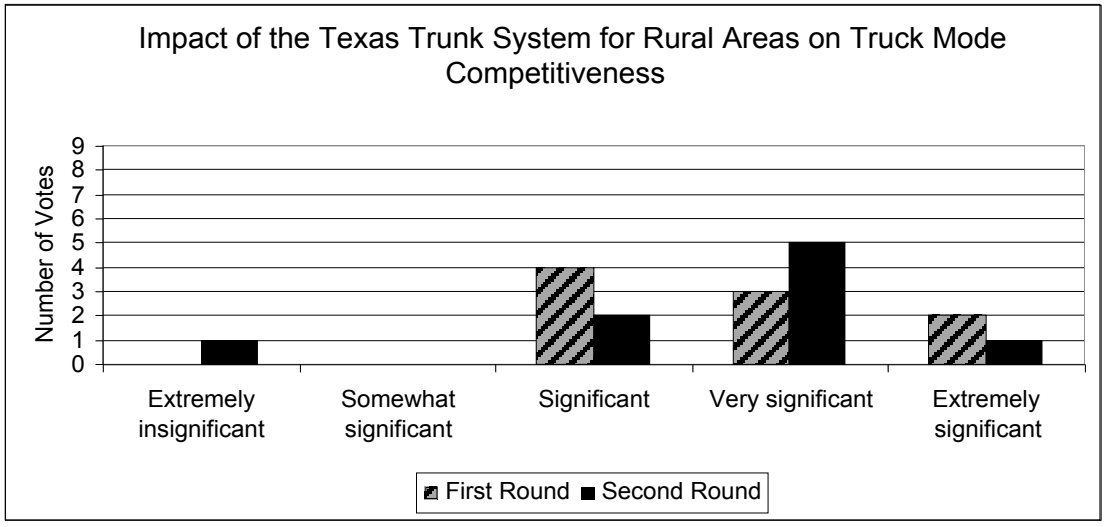
Question 2: How would you characterize the impact of an improvement in highway geometrics or a modification of design standards on truck mode competitiveness between now and 2015?



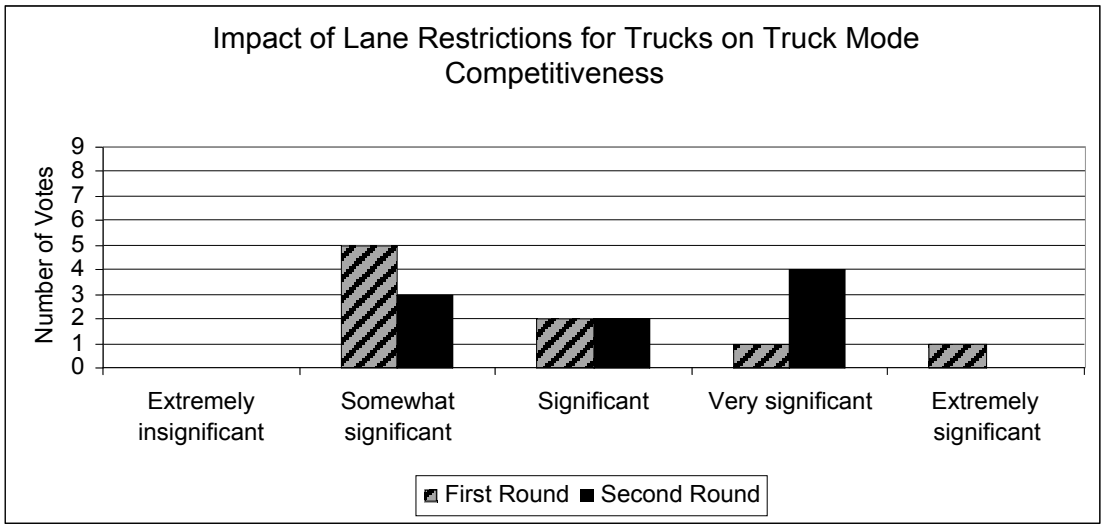
Question 3: How would you characterize the impact of the TransTexas corridor on truck mode competitiveness between now and 2015?



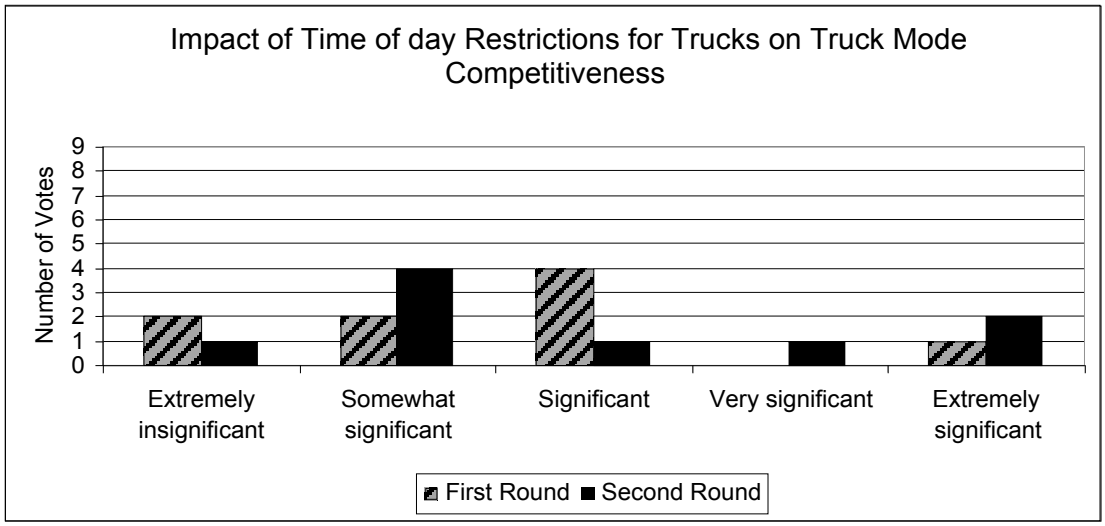
Question 4: How would you characterize the impact of Texas truck system for rural areas on truck mode competitiveness between now and 2015?



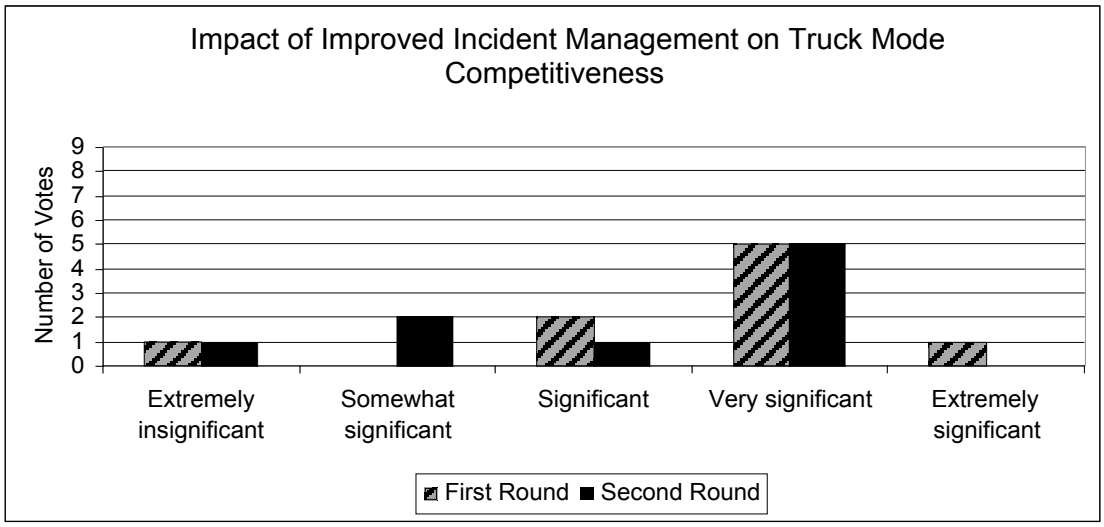
Question 5: How would you characterize the impact of lane restrictions on truck mode competitiveness between now and 2015?



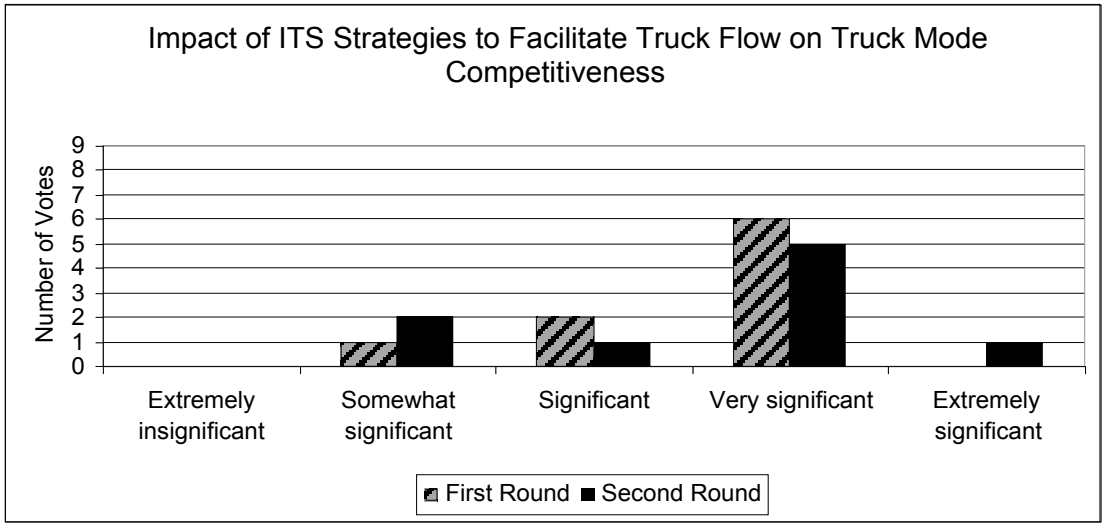
Question 6: How would you characterize the impact of time of day restrictions on truck mode competitiveness between now and 2015?



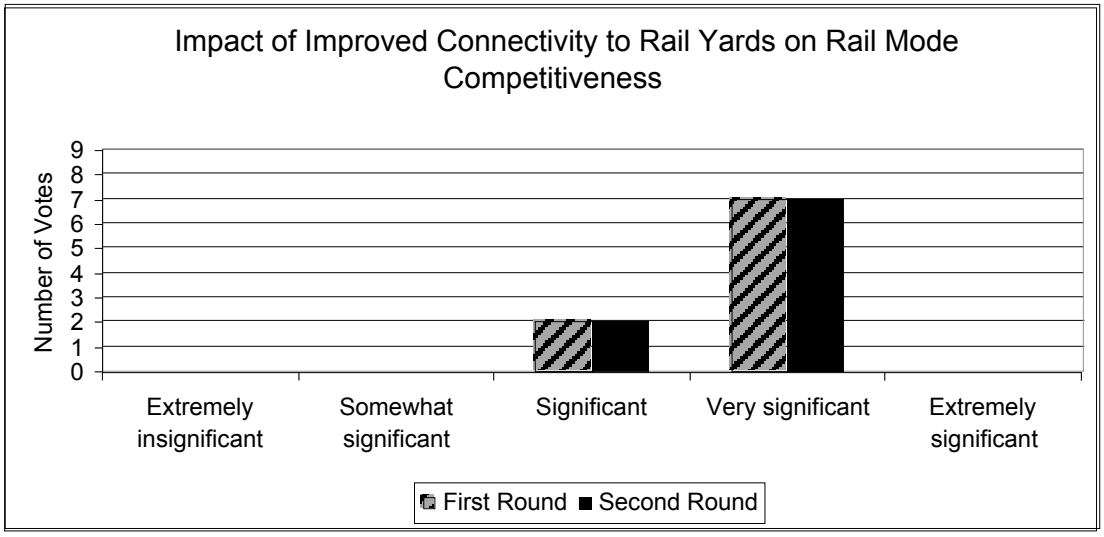
Question 7: How would you characterize the impact of improved incident management on truck mode competitiveness between now and 2015?



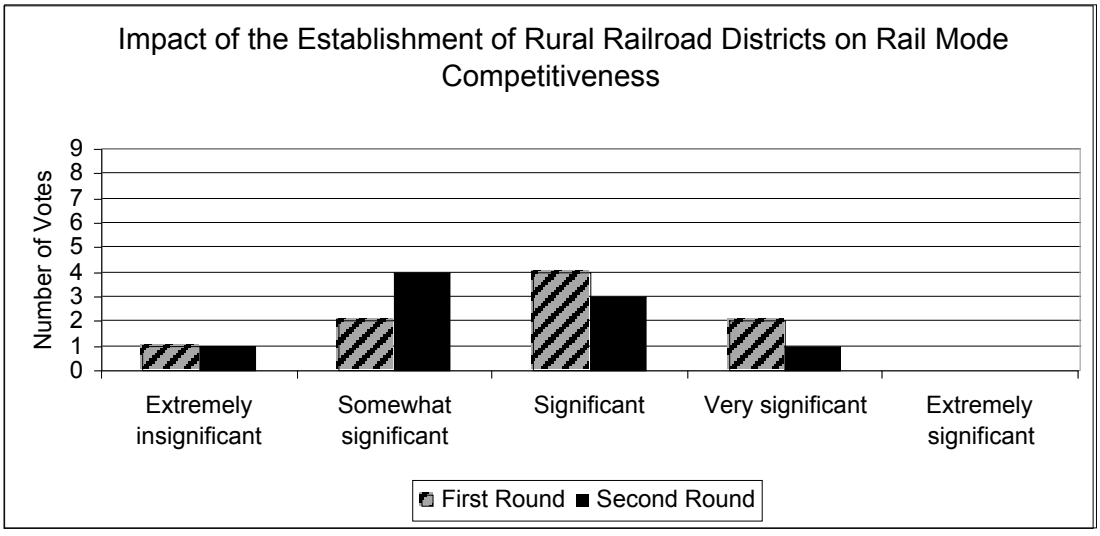
Question 8: How would you characterize the impact of ITS strategies to facilitate truck flow on truck mode competitiveness between now and 2015?



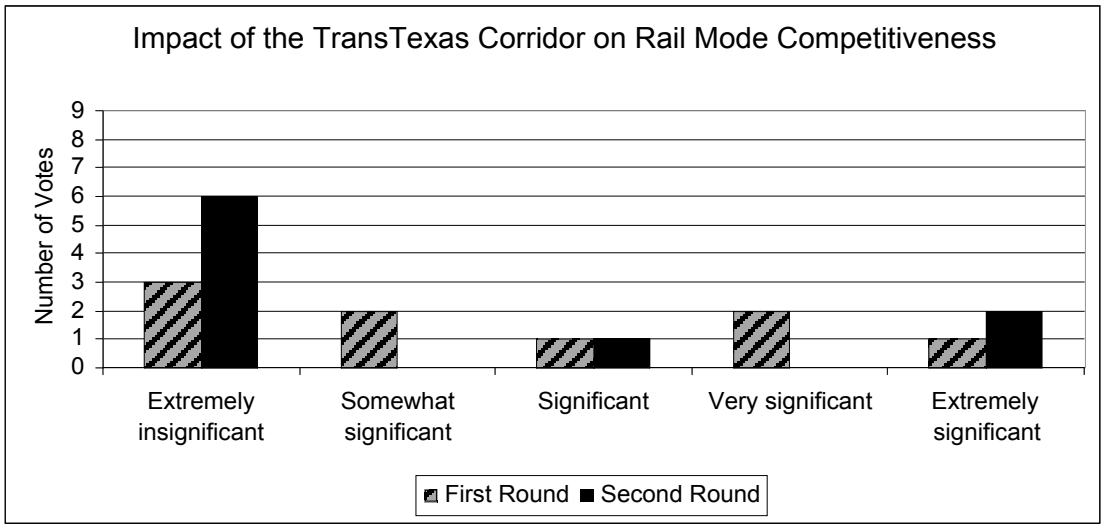
Question 9: How would you characterize the impact of an improvement in the connectivity of rail yards on rail mode competitiveness between now and 2015?



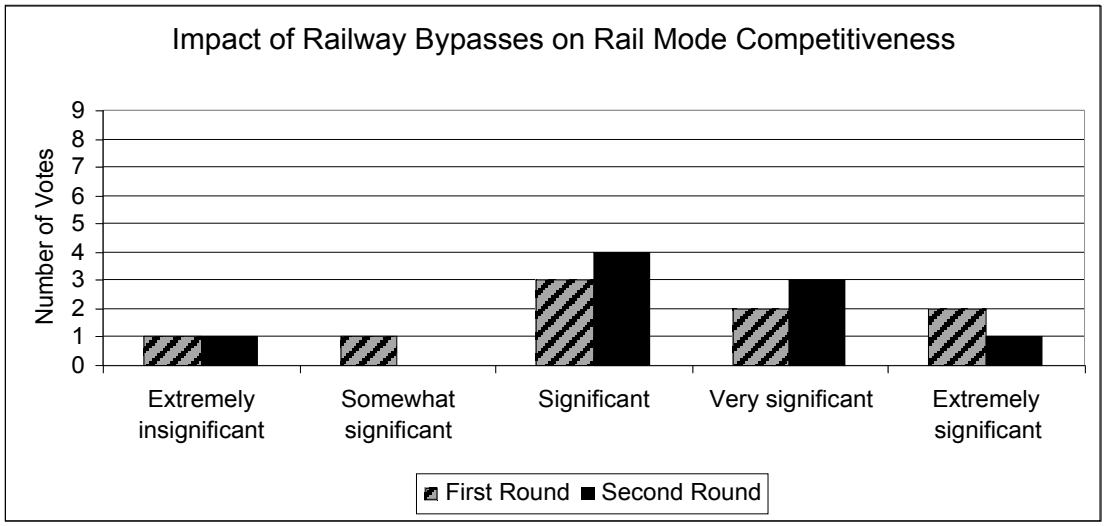
Question 10: How would you characterize the impact of railroad districts on rail mode competitiveness between now and 2015?



Question 11: How would you characterize the impact of the Trans Texas corridor on rail mode competitiveness between now and 2015?



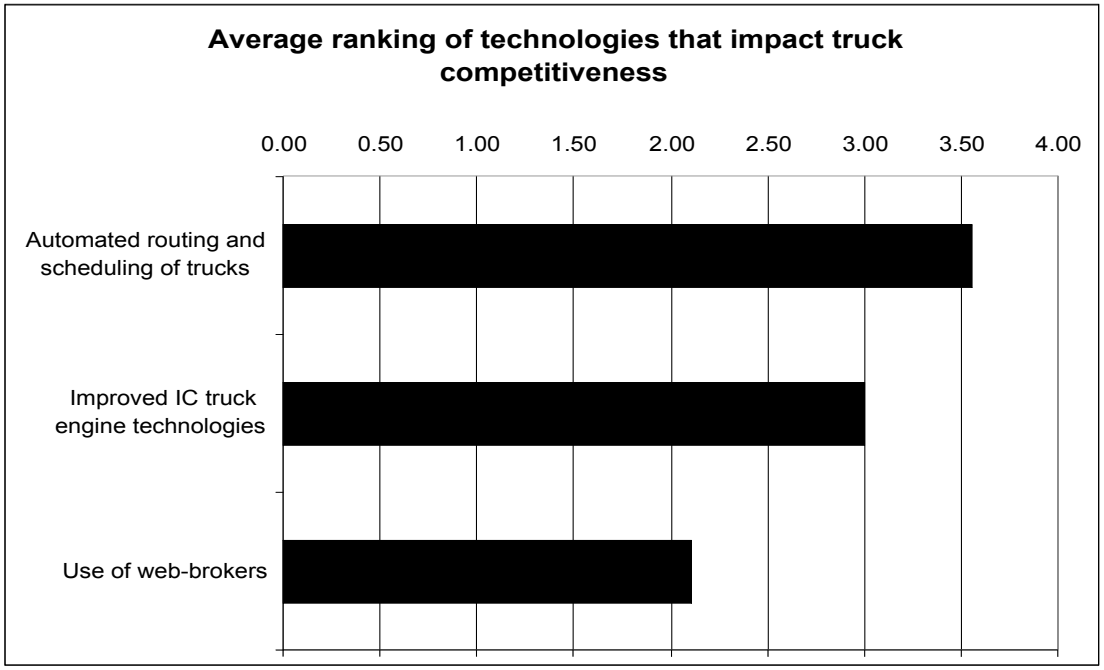
Question 12: How would you characterize the impact of rail bypasses on rail mode competitiveness between now and 2015?

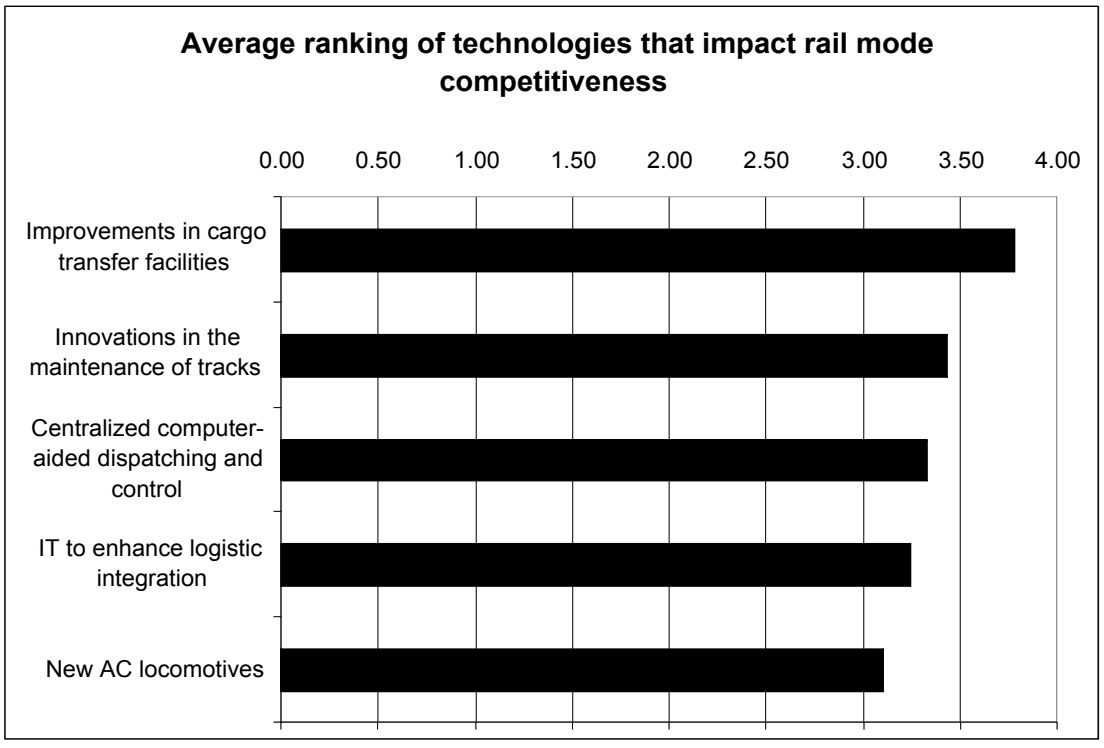


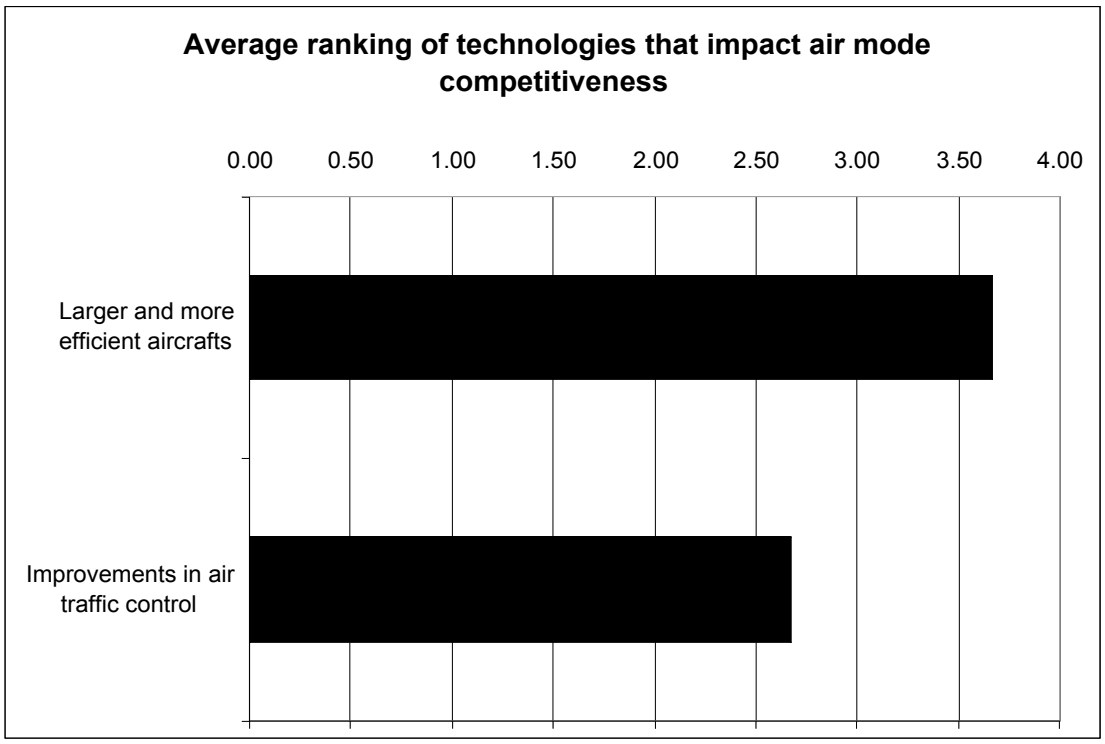
Technological Developments

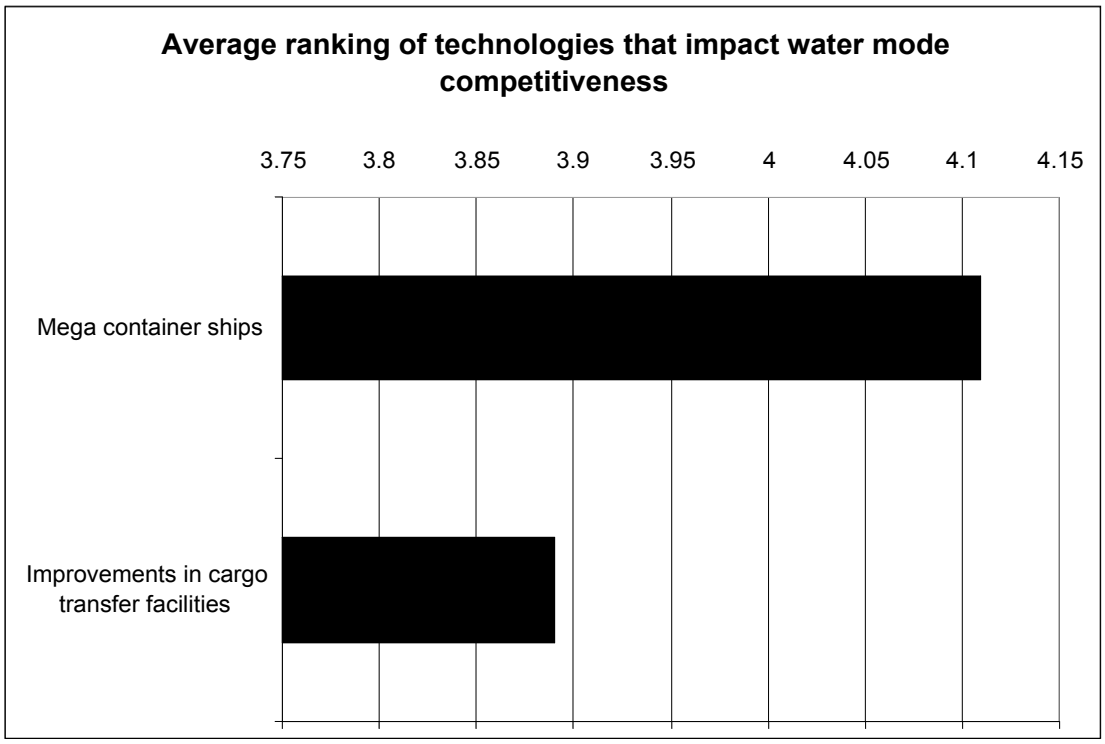
TECHNOLOGICAL DEVELOPMENTS

Scale: 1 – Extremely insignificant; 2 – Somewhat significant; 3 – Significant;
4 – Very significant; 5 – Extremely significant

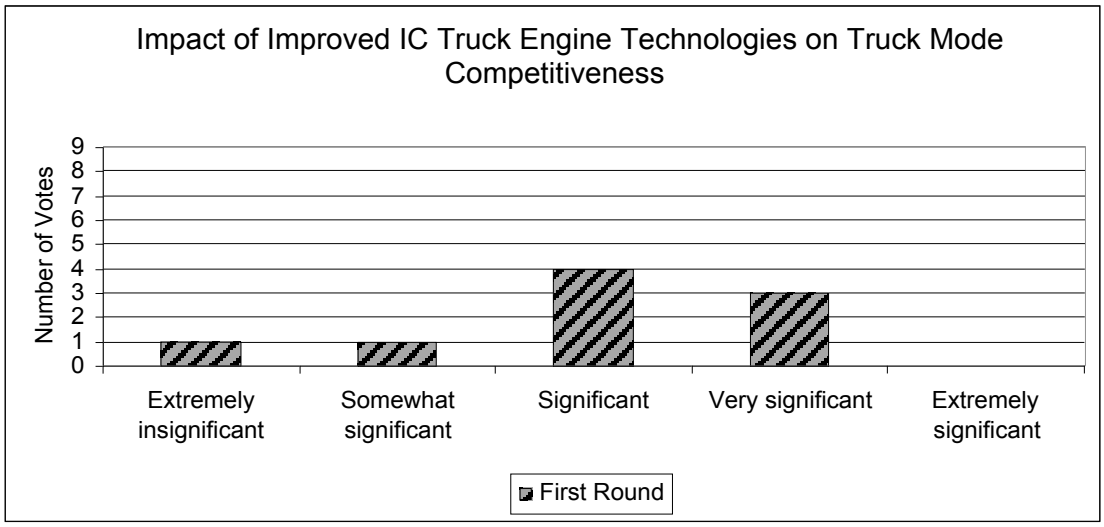




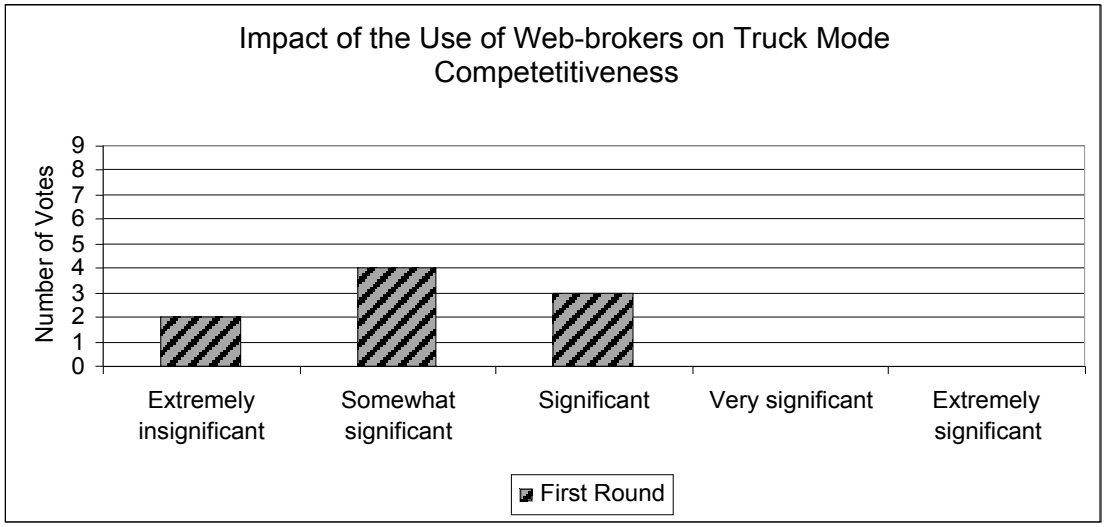

Average ranking of technologies that impact air mode competitiveness
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
Larger and more efficient aircrafts
Improvements in air traffic control


Average ranking of technologies that impact water mode competitiveness
3.75
3.8
3.85
3.9
3.95
4
4.05
4.1
4.15
Mega container ships
Improvements in cargo transfer facilities

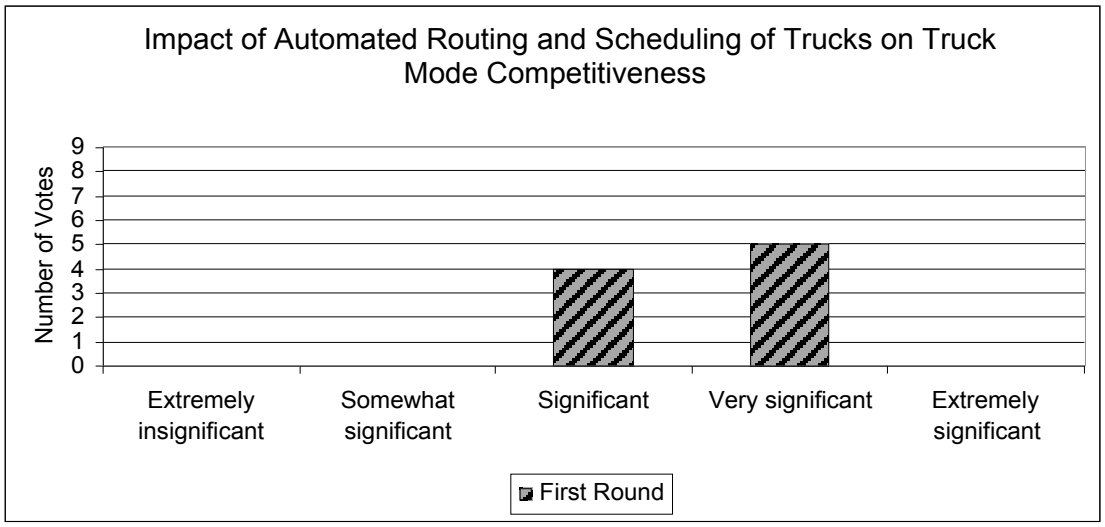
Question 1: How would you characterize the impact of improved IC truck engine technologies on truck mode competitiveness between now and 2015?



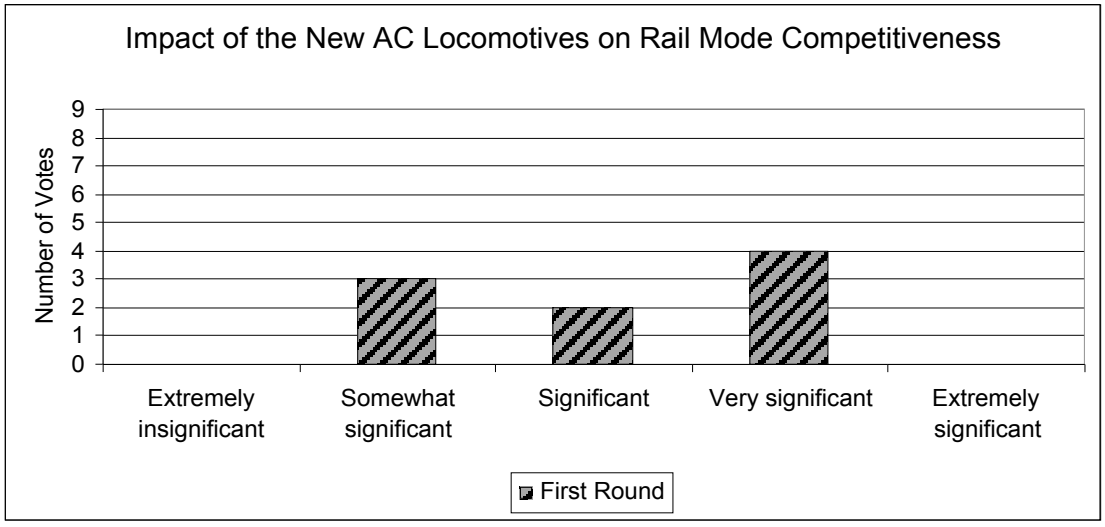
Question 2: How would you characterize the impact of use of web-brokers on truck mode competitiveness between now and 2015?



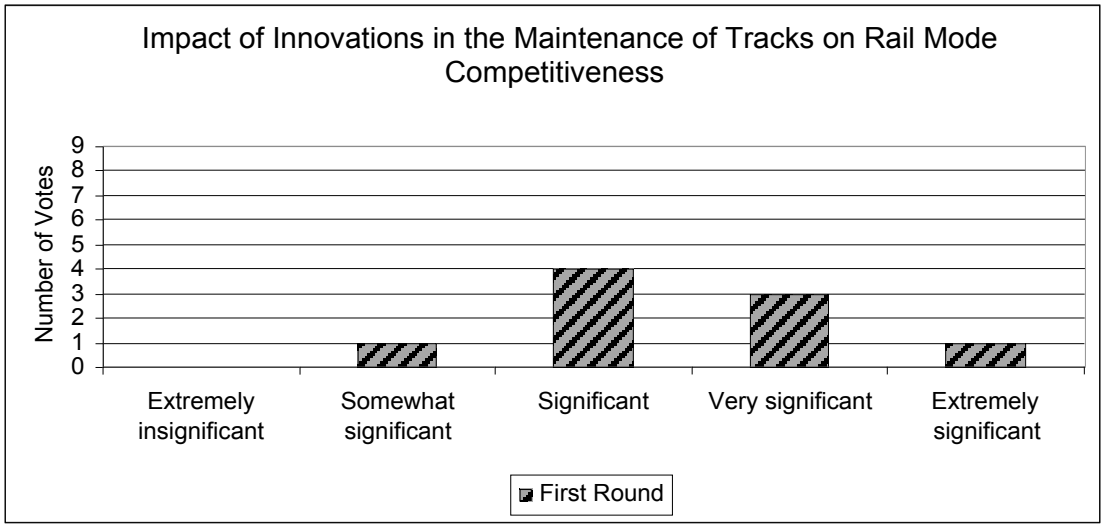
Question 3: How would you characterize the impact of automated routing and scheduling of trucks on truck mode competitiveness between now and 2015?



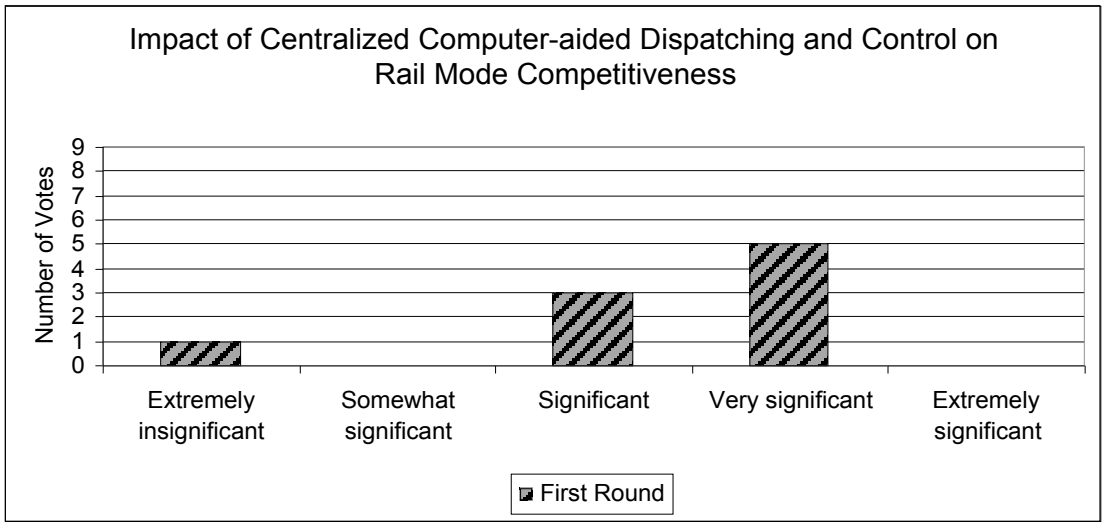
Question 4: How would you characterize the impact of new AC locomotives that improve efficiency on rail mode competitiveness between now and 2015?



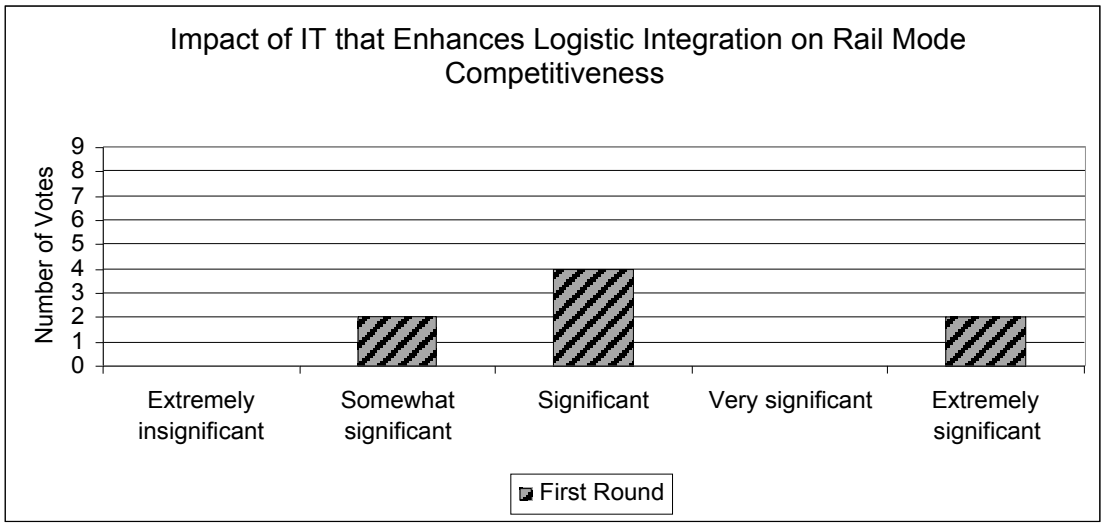
Question 5: How would you characterize the impact of the innovations in the maintenance of tracks, locomotives and railcars on rail mode competitiveness between now and 2015?



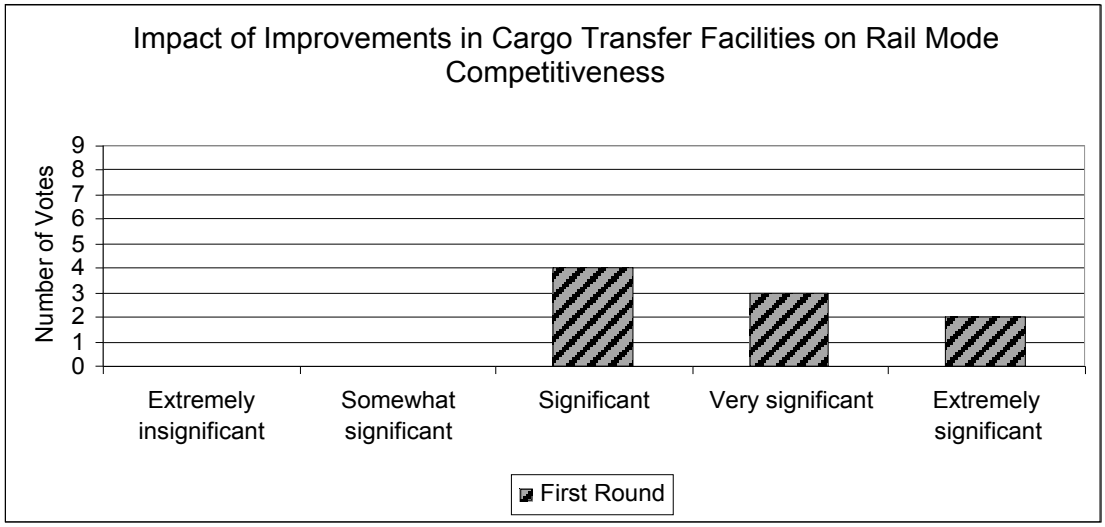
Question 6: How would you characterize the impact of centralized computer-aided dispatching and control of rails on rail mode competitiveness between now and 2015?



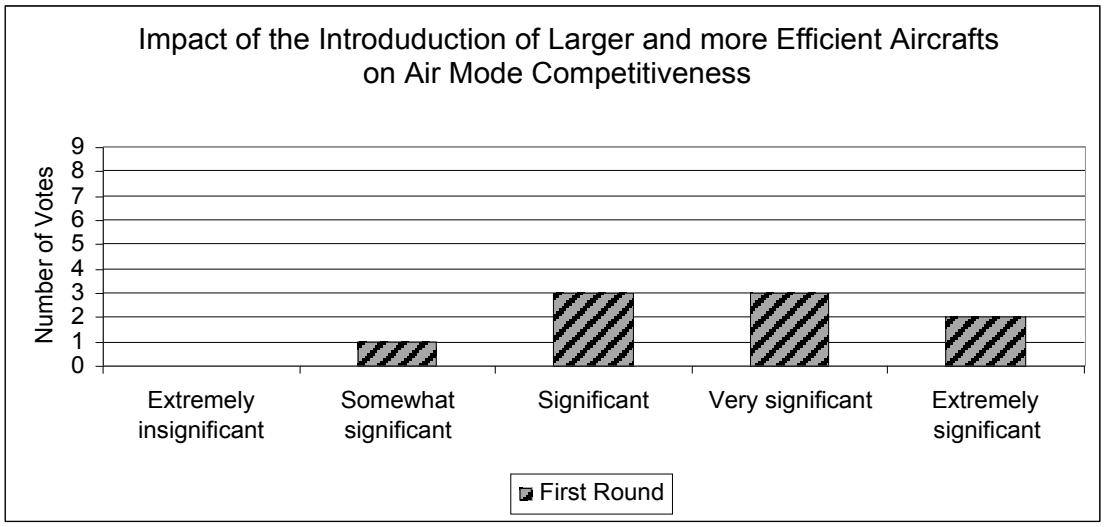
Question 7: How would you characterize the impact of IT that enables logistic integration on rail mode competitiveness between now and 2015?



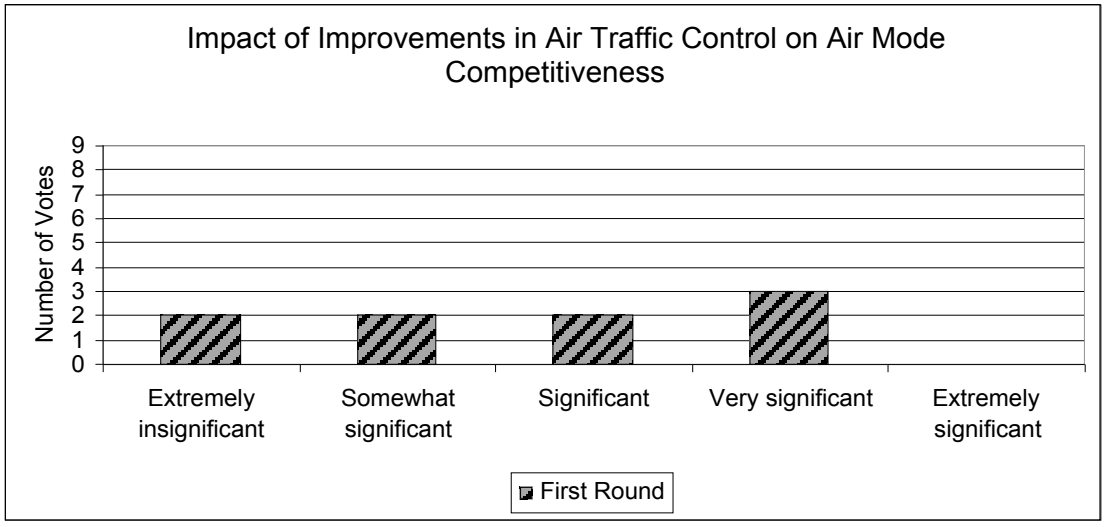
Question 8: How would you characterize the impact of improvements in cargo transfer facilities on rail mode competitiveness between now and 2015?



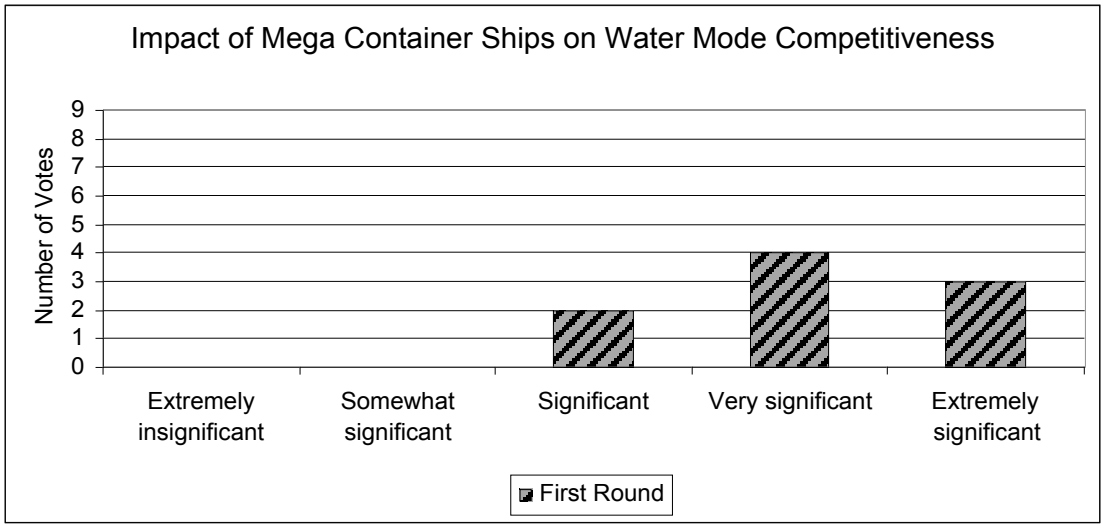
Question 9: How would you characterize the impact of larger and efficient aircrafts on air mode competitiveness between now and 2015?



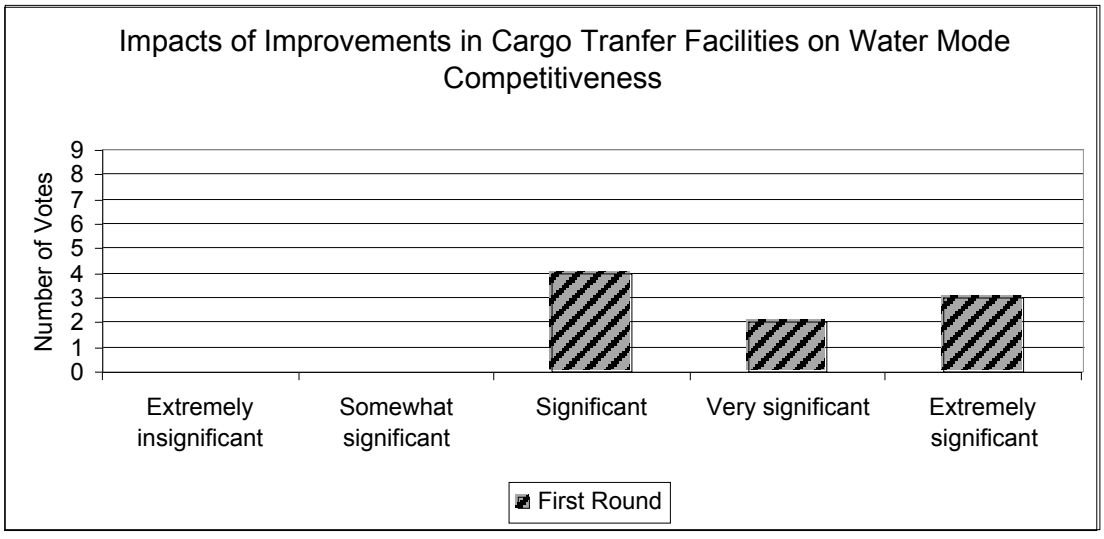
Question 10: How would you characterize the impact of improvements in air traffic control on air mode competitiveness between now and 2015?



Question 11: How would you characterize the impact of introduction of more and more mega container ships on water mode competitiveness between now and 2015?

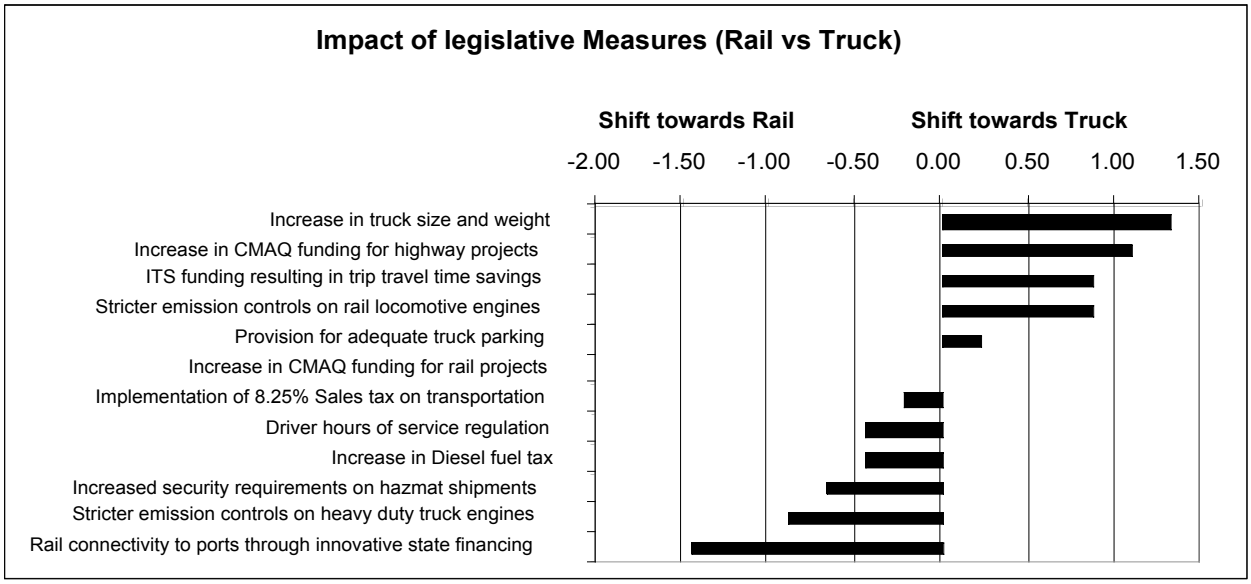


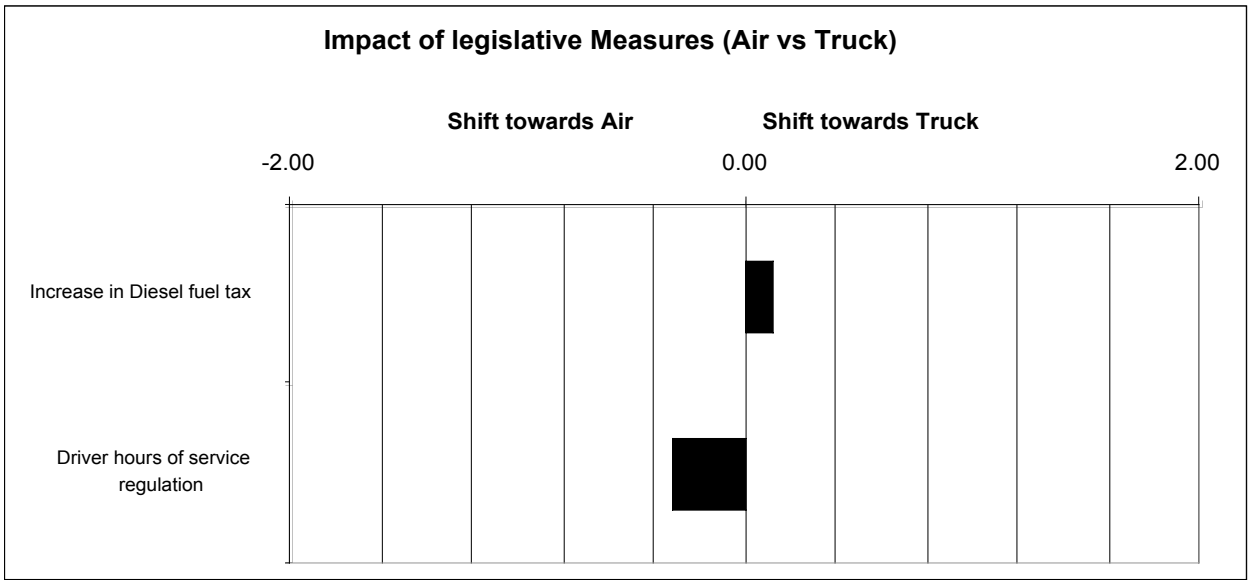
Question 12: How would you characterize the impact of improvements in cargo transfer facilities on water mode competitiveness between now and 2015?



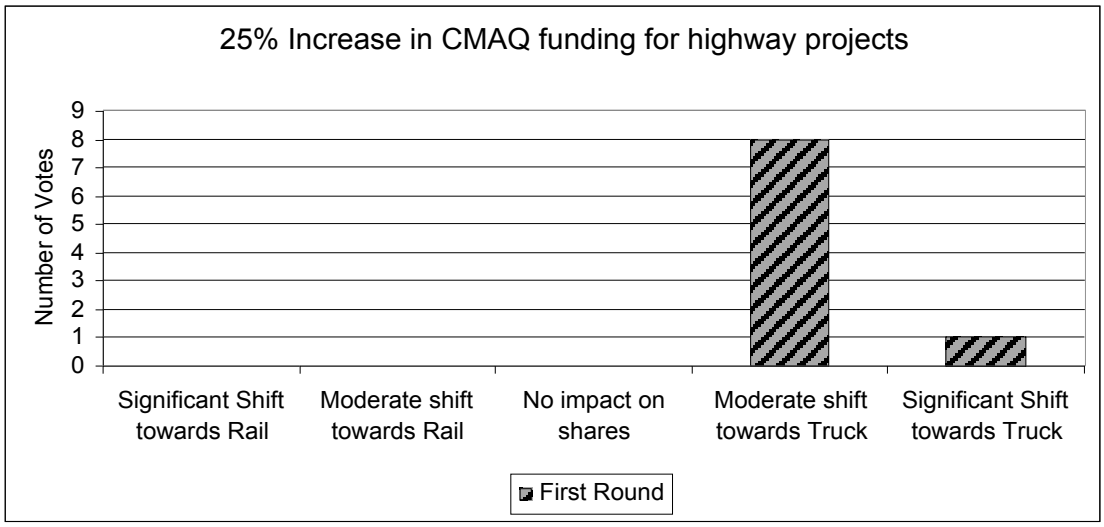
Freight Legislation and Policy

FREIGHT LEGISLATION AND POLICY

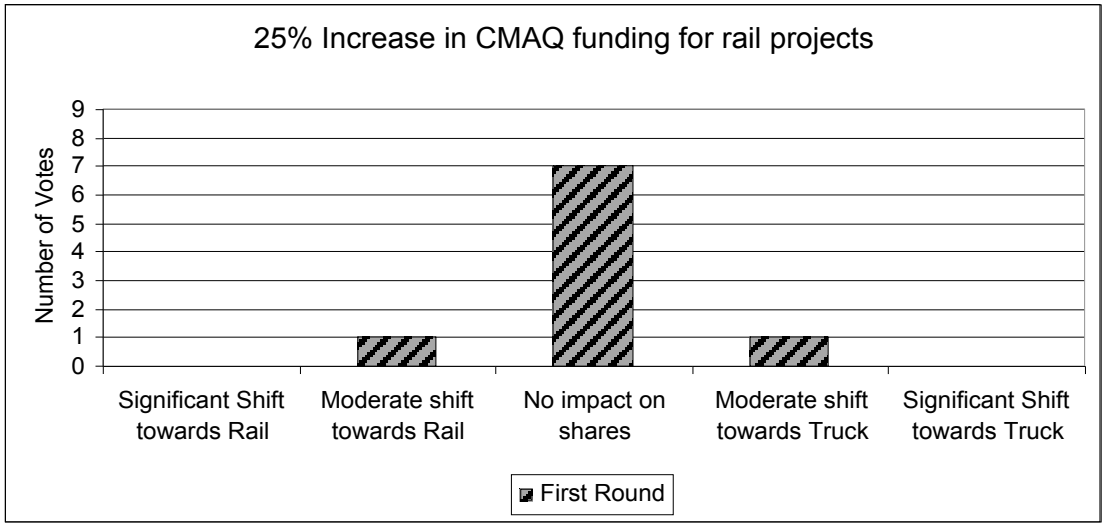




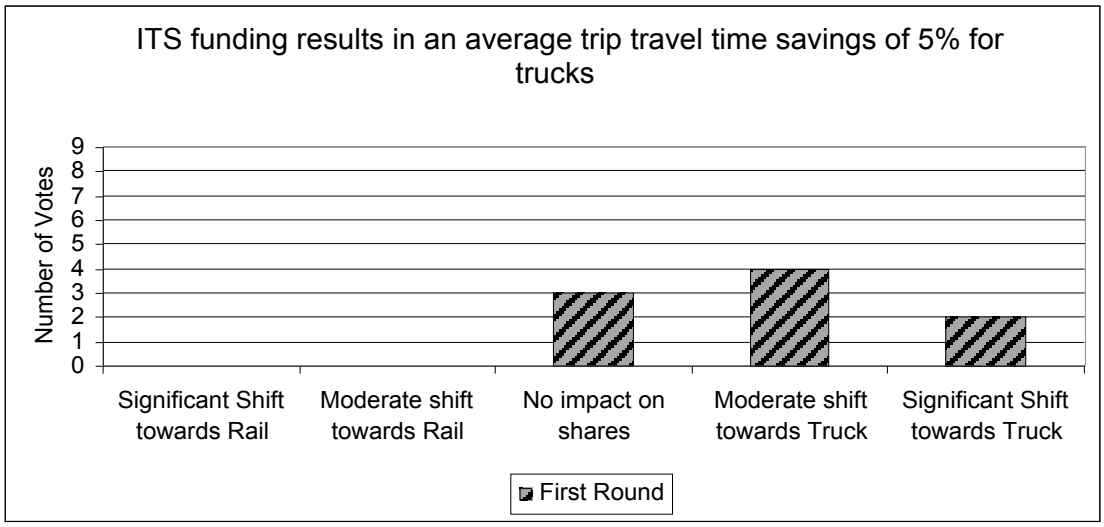
Question 1: What would be the direction of mode shift if the CMAQ funding for highway projects is increased by 25%?



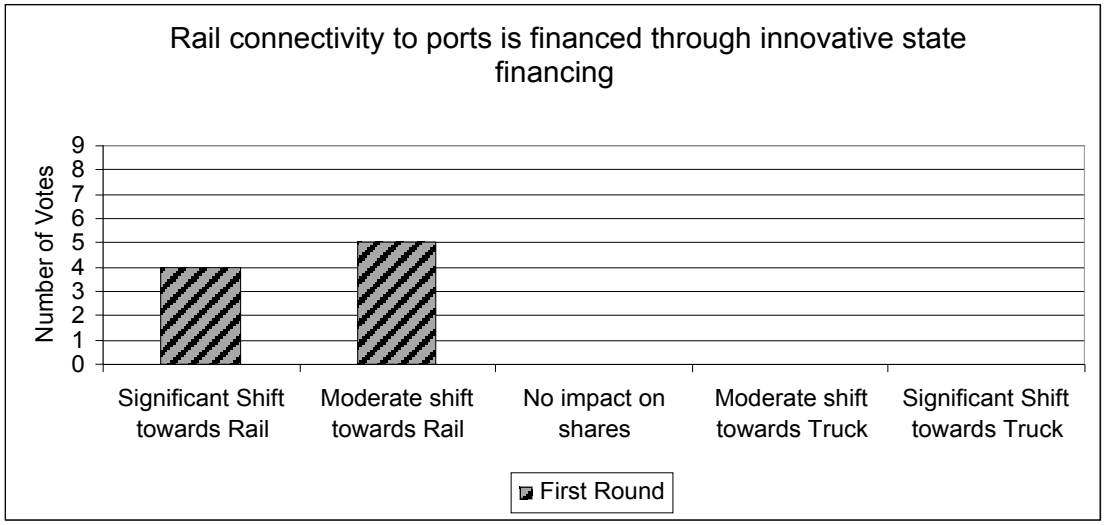
Question 2: What would be the direction of mode shift if the CMAQ funding for rail projects is increased by 25%?



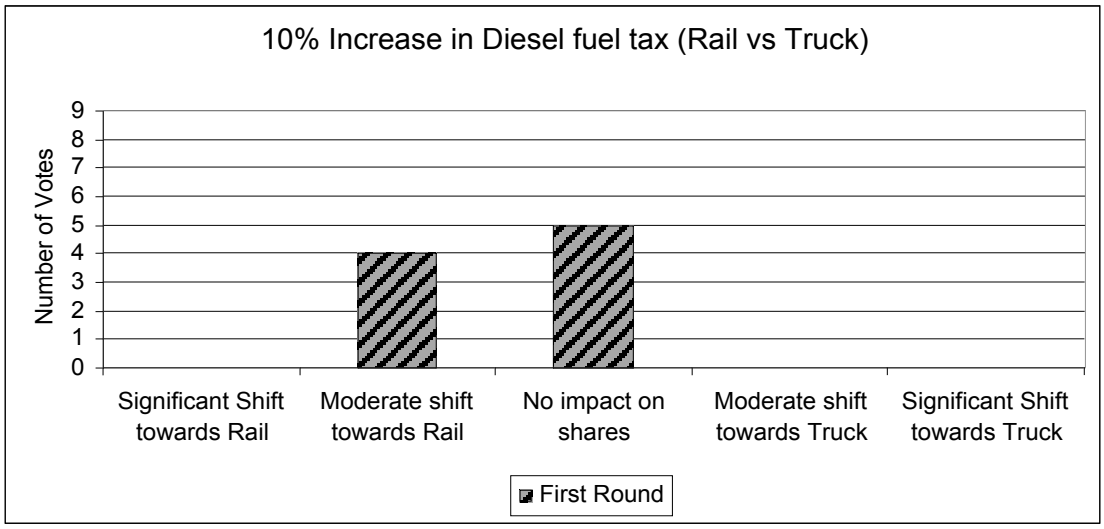
Question 3: What would be the direction of mode shift if ITS funding results in an average trip travel time saving of 5% for trucks?



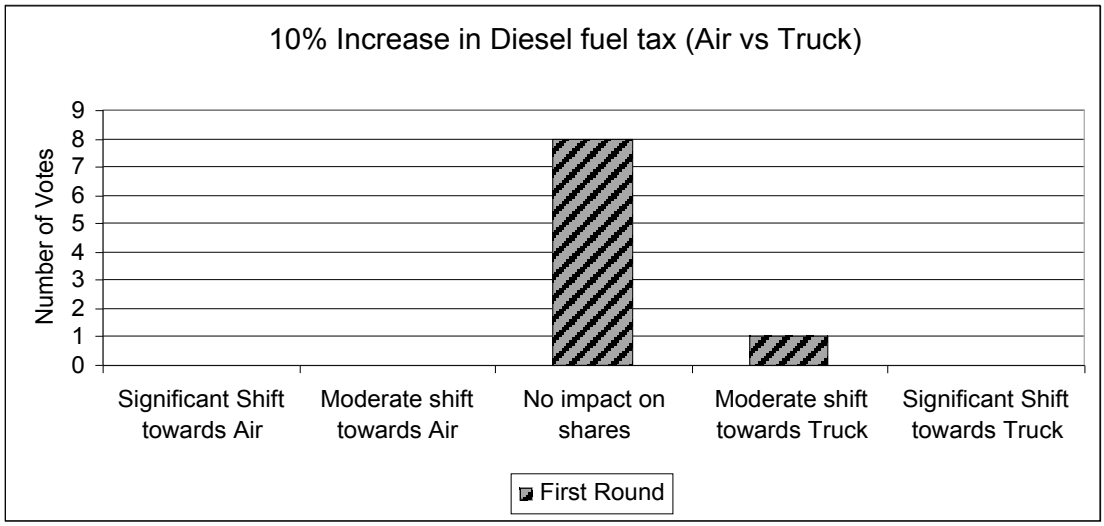
Question 4: What would be the direction of mode shift if <u>rail connectivity to ports is financed through innovative state financing?</u>



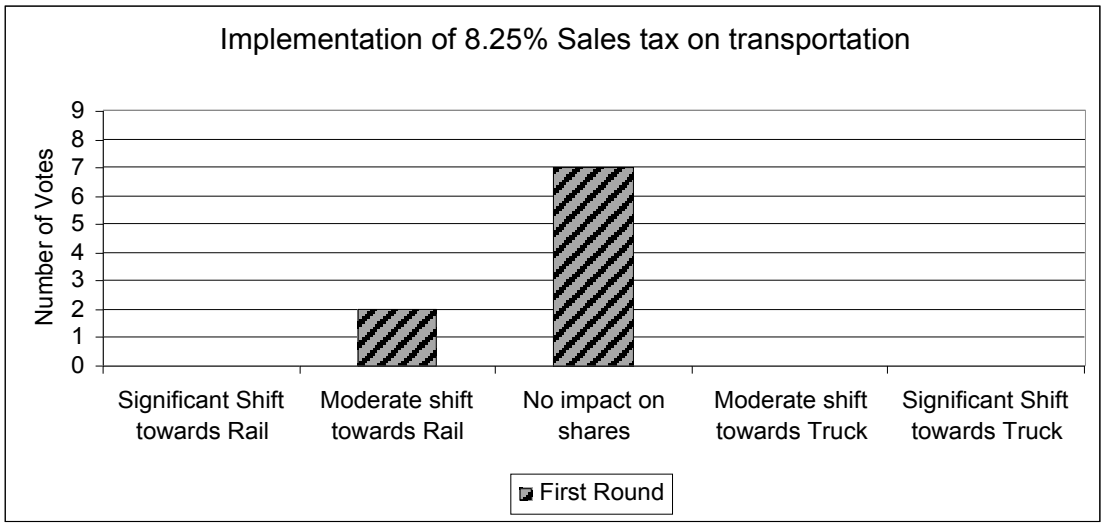
Question 5: What would be the direction of mode shift if the diesel fuel tax is increased by 10%?



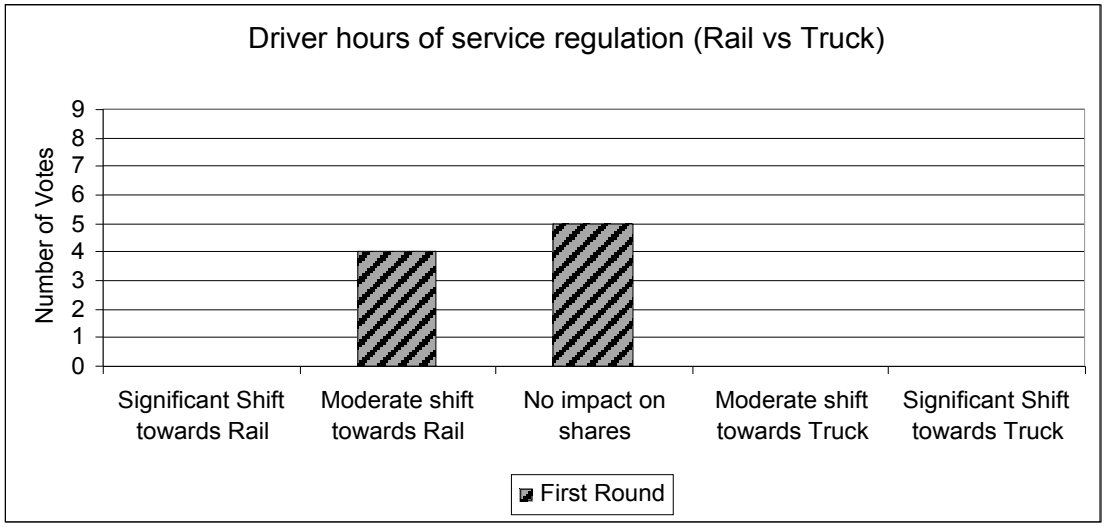
Question 6: What would be the direction of mode shift if the diesel fuel tax is increased by 10%?



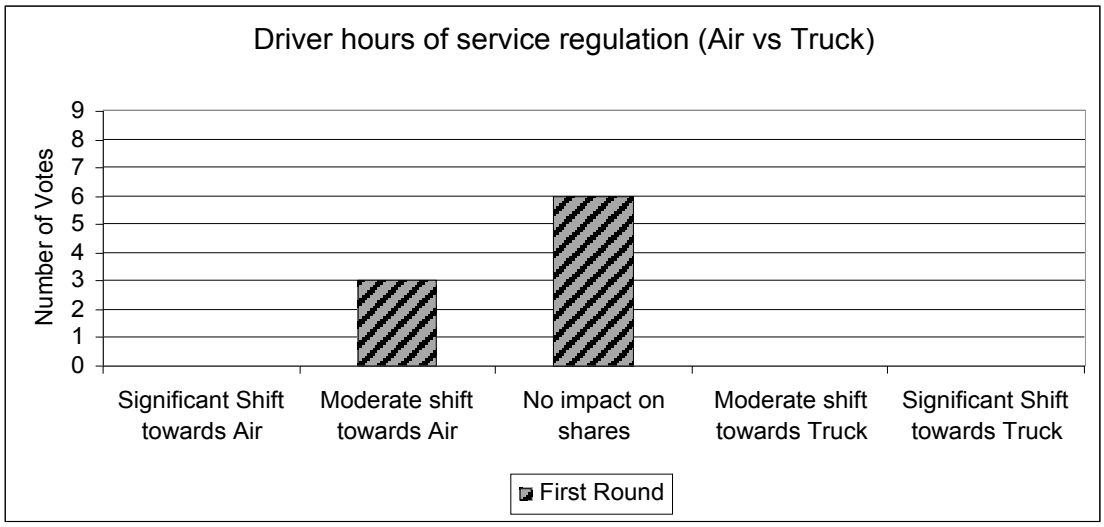
Question 7: What would be the direction of mode shift if a sales tax of 8.25% on transportation is implemented?



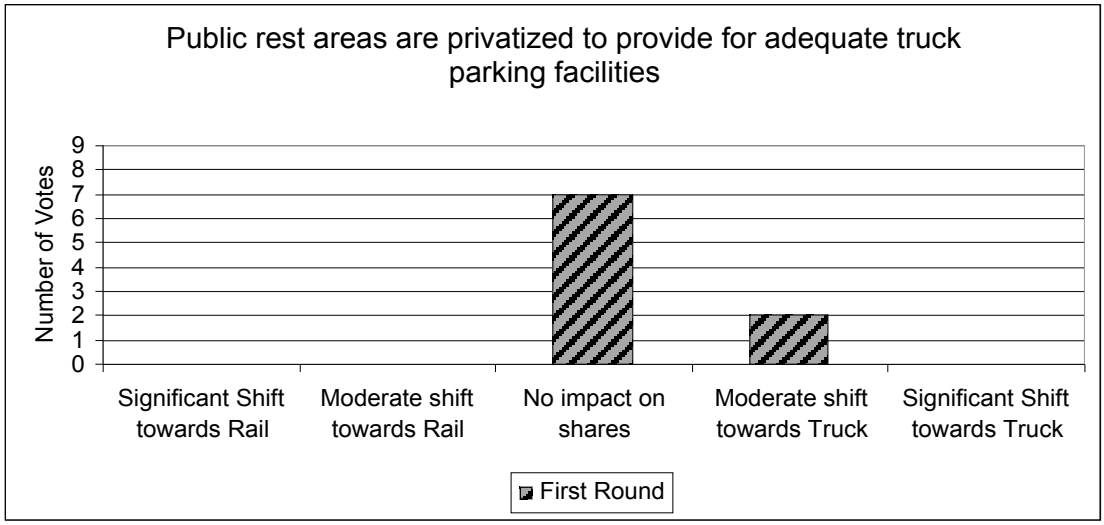
Question 8: What is the anticipated direction in mode shift given the 2004 driver hours of service regulation recently implemented?



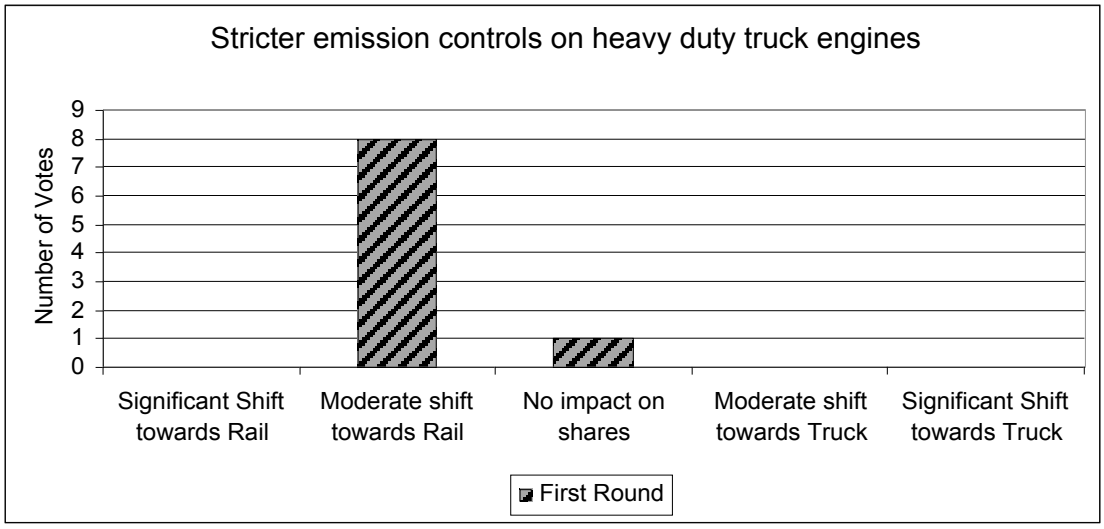
Question 9: What is the anticipated direction in mode shift given the 2004 driver hours of service regulation recently implemented?



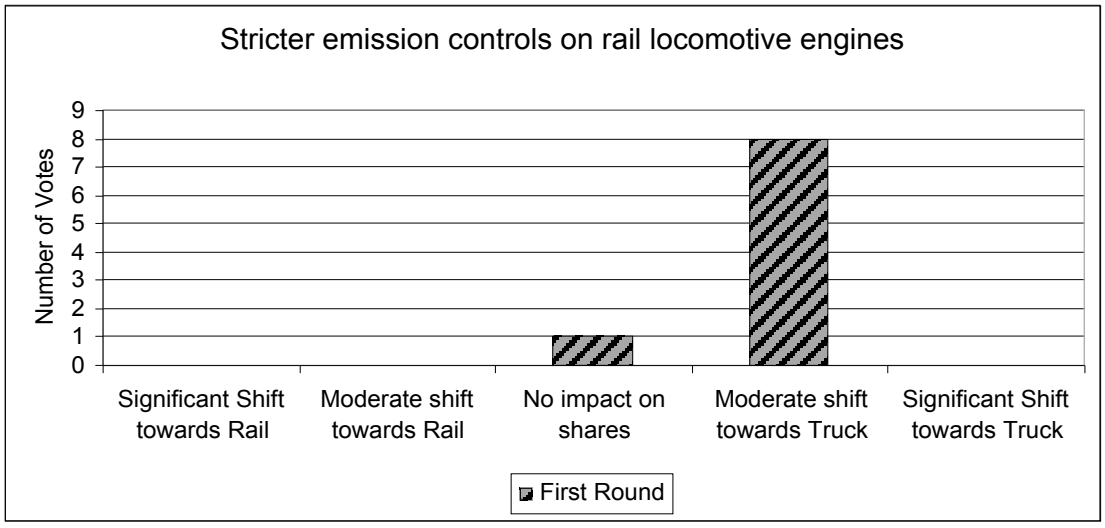
Question 10: What would be the direction of mode shift if public rest areas are privatized to provide for adequate truck parking facilities?



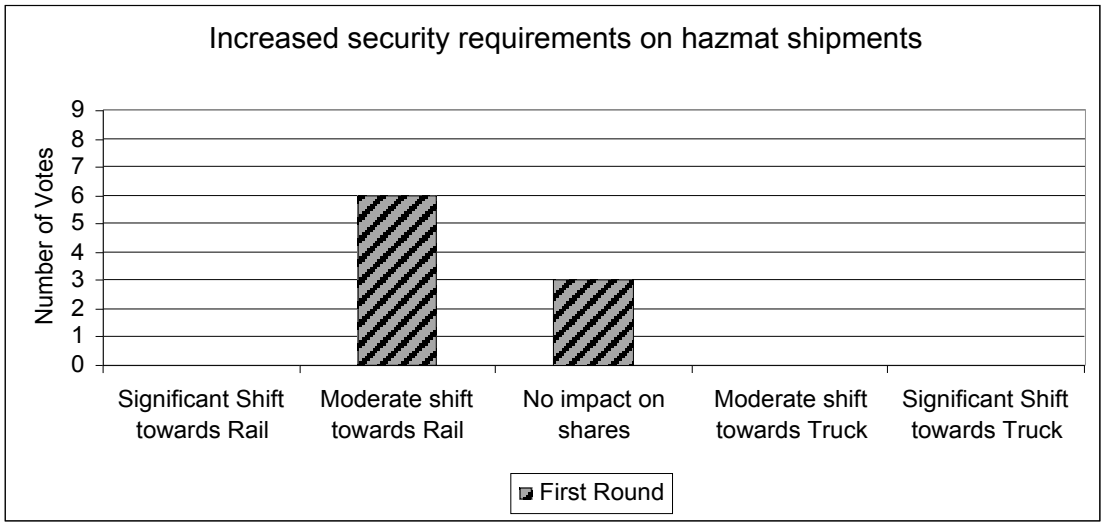
Question 11: What would be the direction of mode shift if stricter emission controls are required for heavy duty truck engines that result in 5% increase in operating cost?



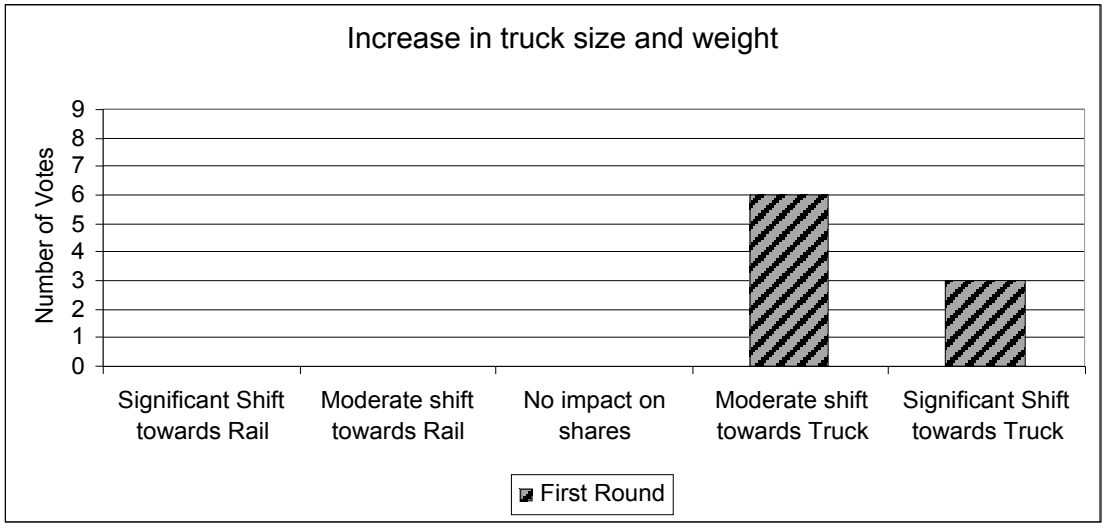
Question 12: What would be the direction of mode shift if stricter emission controls are required for rail locomotive engines that result in 5% increase in operating cost?



Question 13: What would be the direction of mode shift given increased security requirements on HAZMAT shipments in terms of the advanced provision of routing, driver, and shipment details?

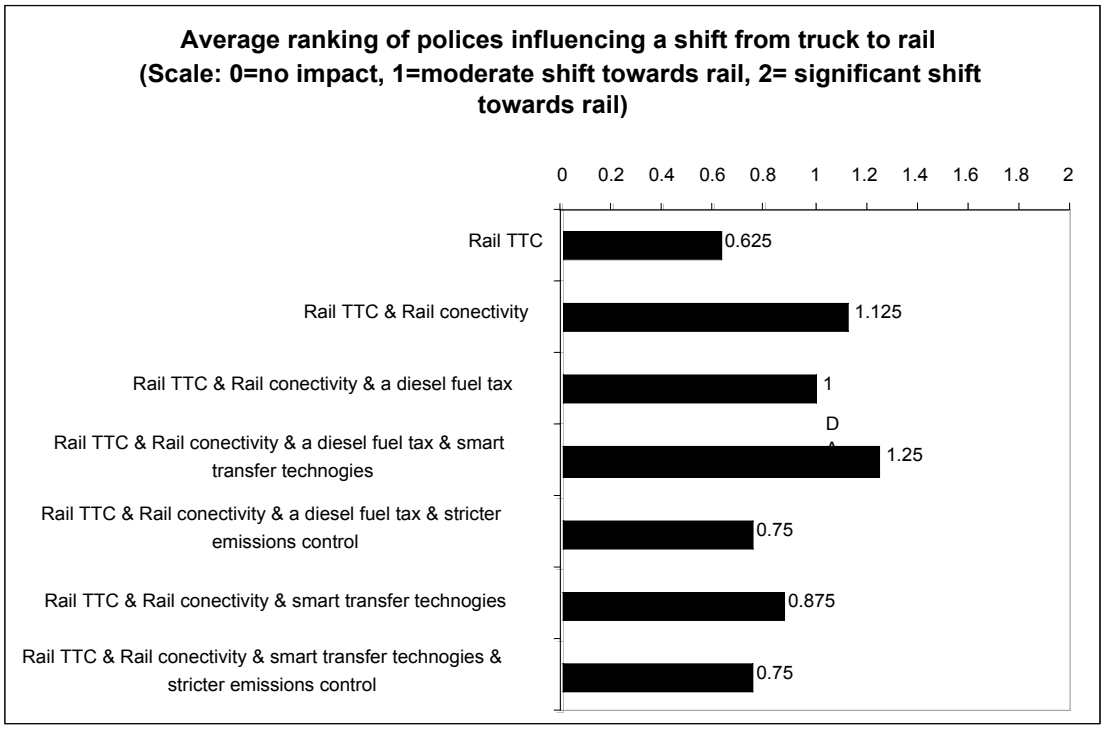


Question 14: What would be the direction of mode shift if truck size and weight are increased to allow for trucks of 105,000 lbs?



Freight Mode Choice Scenarios

FREIGHT MODE CHOICE SCENARIOS



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-
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-

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