Key Factors and Trends in Transportation Mode and Carrier Selection

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ABSTRACT

Companies across the country must deal with the daily question of determining the best way to get their product in the hands of their customers. Weighing all of the various factors that play into this decision can prove to be very difficult at times, and these factors are ever changing as the market fluctuates with varying consumer demand which, in turn, affects the demand for transportation. This paper will look into these factors and relevant market trends to determine what factors play the largest role in a company's decision of how to deliver its products, focusing specifically on the modal and carrier choice decision process. Market trends such as shrinking capacity, tightening cost structures, and the growing importance of environmental friendliness all will be shown to play a significant role in this decision-making process.

TABLE OF CONTENTS

I. Introduction…….....5

II. Thesis…….....7

III. Methodology…….....7

IV. Results and Discussion……..9
- a. Structure……....9
- b. Cost……11
- c. Product……12
- d. Service……13
- e. Relationship……....15
- f. Capacity..……16
- g. Security.……..20
- h. Environment..…….....21

V. Conclusion……...22

VI. References……...25

VII. Exhibits……...27

I. Introduction

This thesis is a case study of the decision making process behind transportation mode and carrier selection. Data has been obtained primarily through qualitative methods, with the bulk of the research being interviews with industry experts. Data from the interviews will be supplemented by data gathered from existing publications related to the topic. The end result will be the identification of key factors and relevant trends related to transportation mode and carrier selection across multiple industries.

Transportation is typically viewed as the "most important single element in logistics costs for most firms" (Ballou, 2004 pp. 164). Currently, transportation accounts for approximately 62.8% of every dollar spent on logistics in the United States—that is equivalent to 5.2% of United States GPD (CSCMP 2011). It is also very important for businesses in creating time, place, and quantity utility, in addition to enabling larger scale production, geographic specialization, and increased competition.

As goods are moved throughout the market, it is important to have a well structured transportation system to create place utility by extending the boundaries of where a business can ship to. By increasing the geographic market, businesses are able to reach more customers and generate higher levels of demand (Coyle et al., 2006).

In addition to creating place utility, transportation also adds value to products by allowing them to reach customers exactly when they are wanted. This is especially valuable to products that may be time-sensitive, such as perishables or seasonable items. However, not only must the items get to the right place at the right time, but they must also be in the right quantity. A good transportation system will ensure that the right

amount of the product is on hand and delivered to the right customer. As transportation management systems improve, they enable businesses to produce on a much larger scale since they have the capability and demand levels to support more volumes. As more customers are reached, competition increases while prices fall—inevitably resulting in higher product availability and the need to continue improving transportation systems to keep up with the pace of growing customer demands (Coyle et al., 2006).

For these reasons, managers are interested in making sure they leverage transportation spend to the highest extent possible. This research has the potential to benefit managers who are involved in the strategic as well as day-to-day decision making process regarding which transportation modes and carriers to select by providing data on relevant factors and trends that have and will affect the overall level of value the firm realizes from these transportation choice decisions.

II. Thesis

This thesis is a case study of the decision making process behind transportation mode and carrier selection. The research will identify key factors and forward-looking trends related to transportation selection in the United States across multiple industries.

III. Methodology

The research process began with a review of applicable literature to assist in forming a foundation of background knowledge and topics of discussion for the interviewing process.

Purposeful sampling will be used to identify participants for this research study. A purposeful sampling technique allows the researcher to select participants "based on a specific purpose rather than randomly" (Tashakkori, 2003). Each of the individuals chosen to participate in this research has been identified as a person from whom one can learn a great deal about issues of central importance to the purpose of this research. Purposeful sampling enables the researcher to learn a great deal more by focusing in depth on understanding how a small number of carefully selected managers determine which transportation mode(s) or carrier(s) to use rather than by gathering standardized information from a large, statistically significant sample.

A grounded theory interviewing approach has been utilized for this research. The grounded theory allows the researcher to utilize information gained from interviews in forming a hypothesis, as opposed to the conventional method of first forming a hypothesis, then seeking to prove it through interviews (Allan, 2003). An interview guide

(Exhibit 1) was used as a prompt during interviews, but generally the interviews flowed as a semi-structured conversation between the interviewer and participant with little or no stress expected on the participant. The primary purpose of the interview was to understand the process by which managers determine which mode(s) and carrier(s) to use for freight transportation.

Interviews were audio recorded, with the permission of the participants, to allow the interviewer to focus on the conversation and to ensure a more complete record of the interview via later transcription. Audio recordings will be kept on the researcher's personal computer in digital format, and these recordings will be destroyed within three years of the conclusion of this research. The audio recordings were primarily used by the researcher to create written interview transcriptions/notes. The resulting transcriptions were analyzed using a variety of qualitative data analysis techniques including work/phrase coding. Names of participants and companies have been kept confidential to protect the intellectual property and reputation of firms willing to participate in the study. A description of each company can be found in Exhibit 2.

IV. Results and Discussion

Throughout the interview process, a number of factors came into play when inquiring about what went into the modal and carrier selection decisions. First, however, it is important to understand the general structure for how a transportation choice decision is made, such as how the company organizes its transportation group and the tools it uses to make this decision. Next, I will discuss each relevant factor with the accompanying industry trends that have been shown to affect the modal and carrier selection process. Finally, some additional key industry trends that will play a role going forward in the transportation choice decision are examined.

Structure

The general theme from the interviews conducted points towards a transportation management structure that is very centralized across the board. As companies grow larger in their respective industries, they are beginning to realize the benefit of leveraging their size in negotiating with carriers regarding issues such as rates, volumes, and contract terms. An upper level manager from a leading paper/consumer goods company stated that "Centralized management gives us enough size and scale to be able to leverage that in the marketplace" (Participant 1, Company B). This is a key example of the primary benefit of centralizing the transportation management process.

Another example of why more companies are moving towards centralizing the transportation management process is illustrated by the simple statement that "You can do more with less people" (Participant 1, Company A). This manager from another paper/consumer products company then went on to elaborate that having a centralized

group in one location allows them to allocate geographic areas to a single person, as opposed to having one or multiple people at each separate facility. This benefits the company from both a cost and control standpoint, allowing for a lower headcount while improving the consistency of how the transportation process is managed.

It can also be seen in the literature that this concept has been growing. A practitioner publication on current events and trends in the supply chain industry, states,"…the level of centralization in transportation management is increasing and evolving, with more and more companies moving to a Load Control Center model" (Supply Chain Digest, 2009 pp. 8). This Load Control Center model they refer to is the same concept as a centralized transportation management group, defined as "…an approach to transportation in which most transportation planning and sourcing functions, and some execution processes, are pulled together into a single group, rather than being managed regionally or at individual ship sites" (Supply Chain Digest, 2009 pp. 6).

In addition to centrally managing the transportation process, it is clear that a vast majority of companies have moved towards adopting some form of a Transportation Management System (TMS). Given the technological advancements in recent decades, this realization was very much expected—the importance of utilizing technology to keep up with the ever expanding level of complexity and competition has driven companies to invest in these high-tech solutions to manage the execution of their transportation strategies.

Cost

Given the recent economic downturn and slow recovery from the Great Recession, keeping costs at a minimum is still near the top of the list for many business's initiatives. This is a very important aspect of all areas within a business that will always gain a great deal of attention, for the simple fact that the bottom line is what keeps a business afloat. To stay competitive in a tough economy, as well as grow in a competitive environment, a business must always remain focused on increasing profitability. Writers of the Supply Chain Digest Letter suggest that "Companies in this current slump will be looking for every avenue to cut costs, and as always transportation will be one of the first functional areas where companies look for dollars" (Supply Chain Digest, 2009 pp. 6).This point definitely stood out throughout the qualitative research, with every interview participant mentioning in some way that cost was one of the primary factors in making a modal or carrier selection. For example, Participant 2 from Company B stated "…everyone will be concerned with the cost of transportation…it's just a matter of how high up on the totem pole this [factor] is compared to others…"

Specific to transportation, it has proven to be difficult given the current market conditions to continue reducing costs while adapting to growing volumes and shrinking capacity. A manager from a leading Paper/Consumer Products company states it simply: "It is rare that we would sacrifice cost for service" (Participant 2, Company B). This shows how important it has become to some companies to look for avenues by which they can shave costs away and improve their bottom line. However, there are a multitude of other factors that have been challenging the importance of cutting costs in the realm of transportation selection.

Product

Another factor that often is left out of discussions on transportation selection is looking at the actual physical characteristics of what is being shipped. For example, a manager from a raw materials company stated "We aren't really concerned too much with transit times because we are shipping a commodity…our primary concern [in modal selection] is cost" (Participant 1, Company E). Companies shipping very low-value products usually deferred to the answer of "product characteristics" when asked about the modal choice—they simply have no motivation to spend extra for service that is not needed or economically feasible.

This idea of looking at the physical characteristics and needs of a product is what creates the first threshold for modal selection, making it the primary factor taken into consideration. From the perspective of Company D, it would be very uneconomical to ship twenty tons of a chemical via truck when the origin and destination both have rail sidings. This is a very simple concept, yet extremely important when getting past the first level of making a modal decision.

In terms of carrier selection, product characteristics also play an important part if the product has a special trait, such as temperature or special handling requirements. These product characteristics will automatically limit the pool of carriers the company has to select from. For example, Company F ships a great deal of frozen products; therefore, they simply cannot select a carrier that doesn't have the capability to meet the temperature requirements to keep the product frozen. Another example comes from Company D, which ships some hazardous materials. They are forced to select carriers

that have the proper equipment and meet safety protocol necessary to ship the given material so everyone is in line with government regulations.

Service

As stated before, the research has indicated that companies often first take into consideration product characteristics before deciding on a mode or carrier. Yet, before they give significant thought to cost, many companies turn an eye towards the service levels that modes and carriers are capable of delivering. According to a supply chain expert, "The Internet, just-in-time operating procedures, and continuous replenishment of inventories have all contributed to customers expecting rapid processing of their requests, quick delivery, and a high degree of product availability" (Ballou, 2004 pp. 14). Ballou firmly believes that measures of service such as transit time and transit time variability should rank ahead of cost in the battle of mode and carrier selection. In a study by Michael McGinnis, he suggests the following:

"Nearly twenty years' empirical research into freight transportation choice, using a wide range of methodologies, before and after deregulation, in different industries, with regional and national samples, indicates that shippers in the United States generally valued service more highly overall than cost in the freight transportation choice process before and after deregulation" (McGinnis, 1990).

As convincing as both this statement by McGinnis and the opinion of Ballou may be, the business climate within the US is much different than it has been in years past. Within the past four years, the US has encountered numerous financial hardships that have

accompanied the global recession in addition to becoming an even more globalized, competitive marketplace with increasing pressures to drive costs down. This has caused a heavier weight to be placed on costs than ever before, making a strong argument that the priority may not be so strongly placed on service as opposed to cost. However, qualitative research has depicted an opinion similar to that of McGinnis and Ballou.

In regards to modal selection, service does have a very large role to play. Although as stated before, product characteristic seems to be the primary driving factor that "sets the stage" for the decision. However, similar to product characteristics, service levels also seem to create somewhat of a threshold for modal selection. If the mode does not meet a given level of service required by the company for a particular product, this mode simply will not be considered as an option. This, of course, is not always the case. For example, if an emergency arises with an important customer, the general trend is that service will instantly become the most important factor in modal selection because that relationship with an important customer is vital to any company's profitability.

When trying to determine whether cost or service takes precedence in carrier selection among interviewed companies, it is a difficult decision to make. While all of the companies interviewed have a focus on costs, many of them take into account a carrier's service capabilities before even considering the cost. This is in many ways the same type of decision made in regards to product characteristics for modal selection—a carrier's service capabilities is the first threshold for whether the carrier is even in contention for selection. For example, Companies D, E, and F all clearly indicated that before making a carrier choice, they limit the pool according to the carriers' ability to meet service

requirements. Once each company has determined that the carrier can deliver the service levels required, other factors then come into play.

Relationship

The development of relationships when making the carrier choice is an interesting factor that was not expected at the onset of this project. However, after the qualitative research, it is obvious that relationships play a very important part in the carrier selection decision. Company D holds what they call "Supplier Days" where they are able to meet with carriers to build the relationship, stay informed on industry trends, and determine how much volume they plan to assign to these carriers. Similar to this, Company C holds quarterly meetings with each of their carriers to ensure that both parties are aligned and informed of changing market conditions that could affect business going forward.

Another interesting factor involving relationships is the strategies by which companies tend to manage their carriers. A recurring trend that was noticed is the inclination to group carriers according to their importance to the firm and manage the relationships by that group. Company F has what they call three "tiers" of carriers, from the first tier being the largest and most important to the third being the smallest least important (yet, still of strategic importance). A Tier 1 carrier would have national capacity, the ability to move freight using more than one mode, and can move different types of freight according to the level of service required. A Tier 3 carrier would be a smaller (termed "Mom and Pop") carrier who might specialize in one particular type of load or be located in one geographic area. Managing carriers in this tiered system allows

Company F to reduce complexity by having to manage three different types of relationships instead of individually managing each and every carrier.

Another example of this grouping can be found in Company A's strategy, where they choose to partner with seven key carriers and assign the majority of their volume to these transportation providers. While these seven carriers move the bulk of Company A's volume, they stressed the importance of still maintaining a relationship with the smaller carriers that might not play as large of a role in the movement of their products. Participant 1 at Company A stresses that this relationship with the smaller carriers certainly isn't as instrumental to success as the relationship with the core carriers, but there always may be a day when something goes wrong and he may have to call in an unexpected favor.

The most significant factor playing a part in why all of these companies are pointing out the importance of building a relationship with a carrier is so that the business can rely on the relationship through a difficult, volatile market. When asked how they deal with volatility in the marketplace, all but one of the companies interviewed answered that they rely on their relationship formed with the carrier. This shows how important forming a bond with particular carriers can be, especially with uncertain market conditions and, most importantly, the tightening of capacity.

Capacity

Once the global recession hit in 2008, concerns about available capacity have been paramount to almost any individual involved in transportation. The Council for Supply Chain Management Professionals releases an annual report, titled "The State of

Logistics Report," that outlines industry performance and trends. According to this report, more than 16 percent of truck capacity has been permanently removed from the market since 2006 (CSCMP, 2011). In 2007, Class 8 truck sales slowed and fleet sizes were reduced as companies responded to an industry-wide reduction in shipments in addition to the uncertainty of what new equipment standards would come from environmental regulations expected in the future (Kirkeby 2007). On the rail side, the report states "…railroads are in very good shape from an infrastructure, equipment, and personnel basis" (CSCMP, 2011).So why is capacity tightening in the trucking sector? There are a number of factors that point to this, many of which were touched on within the qualitative research.

A manager from Company A states:

"Fuel and continuing government regulations around clean energy are going to continuously apply pressures on the carriers. Since it's very low margin anyways, this will make it tough for smaller carriers to survive. This takes capacity out of the market… which drives up the cost for everyone."

This manager mentions two major issues that are having large impacts on capacity within the U.S—fuel and government regulations. From the point that diesel fuel first reached over $2.00 per gallon in 2004, prices have raised steadily. Diesel reached a high mark of $4.70 per gallon in July of 2008, just as the global financial crisis began to unfold. From then, prices plummeted to $2.09 per gallon in 2009, but they have steadily risen since then to a current price of $3.80 per gallon (EIA, 2011). These steadily rising fuel prices are now increasing the costs for all carriers, forcing them to pass the burden along to their customers in the form of fuel surcharges. The costs to businesses for

trucking services was up 9.3 percent in 2010, but most of this additional cost came in the form of fuel surcharges, with most carriers not being able to fully recover the actual increase that they sustained from these additional fuel costs. (CSCMP, 2011).

In addition to the rising financial pressure from fuel costs, carriers must deal with government regulations that are warranting additional levels of investment. There are numerous environmental regulations to be discussed in a later section that are increasing equipment costs for carriers. In addition to this, regulations such as CSA-2010 are causing a negative effect on human resource management and recruitment. Before these new CSA regulations went into effect, less than two percent of motor carriers underwent compliance reviews (McCarty, 2009). The new CSA regulations are designed to monitor safety and compliance through measurement, evaluation, and intervention, forcing carriers to maintain data about any safety violations that occur in a central database for administrators to monitor (USDOT, 2011). It is estimated by industry observers that nearly 30% of current drivers could be out of a job after the new regulations are fully into effect due to deficient ratings in regards to safety (McCarty, 2009). In addition to losing bad drivers, carriers will also be forced to pay more for their good drivers, as these employees will now have reason to demand a higher wage for their more valuable driving skills.

Even before the CSA legislation arrived, the labor scenario in the trucking industry was very grim. Over the last four years, the trucking sector has experienced the largest decrease of employees among all other modes of transportation, losing 13.4 percent of its workforce (CSCMP, 2011). Also, about one in six truck drivers is age 55 years or older, with less than one quarter of current drivers being under the age of 35 in

addition to declining growth in employment of that under-35 age segment (CSCMP, 2011). The manager from Company D touched on one reason for this lack of interest in trucking as a career: "We will not have enough [drivers]. Drivers want to be at home at night, not on the road for three weeks." A manager from Company C emphasizes that statement by saying, "Trucking is not a glamorous lifestyle…this will result in a shortage of capacity down the road."

In addition to the general lifestyle of the trucking industry being unattractive, with new Hours of Service regulations, carriers along with the drivers now will be less productive than before. These new regulations will only allow a maximum of thirteen consecutive driving hours before drivers are required to take a one hour break as opposed to the fourteen hours that was previously allowed (USDOT, 2011). It is also being considered to reduce maximum allowable driving hours within the "driving window" from the current eleven hours to ten, which would have a huge impact both on carriers and shippers (USDOT, 2011). A manager at Company F spoke about how many companies have created their distribution networks based on these eleven hours of driving, choosing to locate distribution centers and production facilities within a one day transit time range of any destination within a particular geographic region. Now, if there are fewer hours allowable for driving, companies will be unable to reach some locations in one day; this will cause problems with their existing network structures and will, assuredly, increase costs for both shippers and carriers going forward.

Thus, with costs rising and labor on the decline, shippers fear that capacity will become the most important issue in the coming years in terms of modal and carrier selection. This is why so many companies have turned towards the development of

relationships to hopefully mitigate the risk of losing their much-needed capacity. A manager from Company C states, "Not only is it important for us to have good partners, but it is important to understand who is feeding the capacity to us." Adding to this statement, a manager from Company F also commented, "We rely on constant communication and our relationship with the carriers to deal with the volatile market now and in the future."

Security

Transportation security is an issue that has created more buzz than usual over the past couple of years. In October of 2010, two packages coming from Yemen in route to Chicago were intercepted and found to contain bombs; one was shipped via FedEx, the other by UPS (Cole, 2010). This then sparked an outcry for tighter regulations on cargo screening and more attention to be paid to freight transportation in addition to passenger transportation. When asked about their views on enhanced security and whether or not this is a factor in the modal or carrier selection decision, most study participants stated that security is no more of an issue today than it has been in the past in regards to carrier selection. Of course, depending on the product being shipped, security has a varying level of importance to different shippers. For example, Company D ships hazardous chemicals—so they pay special attention to security and the carrier's ability to maintain the highest levels of compliance when transporting their products. Although, on the other end of the spectrum, Company C is the least worried about security since they ship canned food products with tamper-evident seals that automatically notify them if a product's security has been compromised. Therefore, the shipper's outlook on security is heavily dependent on the product being shipped—this determines how important this

factor is in the transportation selection process; however, as it stands today, companies are not willing to go out of their way or incur additional costs for safety as long as their product does not require it and the carrier meets all legal requirements.

Environment

Environmental concerns are becoming increasingly important in transportation selection as society becomes more concerned with energy conservation and reducing their carbon footprint. Many companies interviewed are concerned with becoming more environmentally friendly as well. Company F has an initiative of doubling its business while reducing its carbon footprint by 50% over the next ten years. Companies A, B, and D are all participants of a program called SmartWay, which is a program started by the Environmental Protection Agency to provide incentives to shippers for improving their fuel efficiency in order to reduce environmental impact (EPA, 2011).

A key driver that motivates companies to jump on board with environmental initiatives is government regulation. The transportation industry contributes to approximately 57% of the carbon monoxide that pollutes the air, so it obviously is a key target of the government as an area to improve upon (Coyle 2006). By 2018, most tractor trailers will be required to achieve up to a 20% reduction in fuel consumption and greenhouse gas emissions, resulting in a savings of up to four gallons of fuel for every 100 miles traveled (EPA Office of Transportation/Air Quality, 2011). For carriers, this means a significant investment in upgrading current equipment. The new regulation, as well as a few others of the same kind, is expected to cost the industry approximately $8 billion to adopt. Since this regulation requires an increase in fuel efficiency, it inevitably

reduces fuel consumption, which is expected to save vehicle owners up to $50 billion—however; this is over the lifetime of model 2014-2018 vehicles (EPA Office of Transportation/Air Quality, 2011). For many smaller carriers, these savings will not be realized because they will be unable to afford the initial costs of upgrading to meet the new fuel efficiency standards. This is yet another reason why the issue of capacity constraints is the number one concern on the mind of those involved in the transportation industry.

V. Conclusion

There surely are a number of factors that firms take into consideration when making the modal and carrier selection decision. Among these, the primary factors that have stood out during this research have been cost, service, product characteristics, relationships, and capacity. However, an important finding of this research is that many of these factors often tend to play a part in the modal and carrier selection decision simultaneously, and not as part of a stepped process as was previously assumed.

Modal Selection

The principal first level of choice depends on the nature of the product—it must make economic sense given product characteristics to ship on a given mode. If product characteristics allow a modal choice to exist, the decision is heavily weighted towards cost and capacity with firms being increasingly motivated, both by regulations and corporate citizenship, to factor in environmental concerns in their decision.

Carrier Selection

For carrier selection, the primary deciding factor tends to be service, with many shippers limiting the pool of carriers they can choose from based on a set service level threshold. All of the companies involved in this stud, however, are concerned about future capacity. Therefore, the issue of contracting capacity is a major factor that will play a part in the future of carrier selection. A prevalent yet unexpected trend is for shippers to form strong relationships with carriers in an effort to mitigate the ill effects of a volatile, highly competitive globalizing market. These relationships are often seen to take precedence over the all-important factor of cost. This is due to the fact that in an unstable market companies need to feel comfortable that a carrier will be there with the capacity needed to support growing volumes and an economy emerging from recession.

After determining exactly what factors play the most important roles in modal and carrier selection, a very important theme that has come from this research is the fact that these transportation selection decisions are not always made in a stepped process as was previously thought (Coyle et al., 2006). Instead of first making the modal decision, then making a carrier decision, results of this research indicate that the decisions are beginning to blend together, sometimes even being made simultaneously. For example, a company may choose mode and carrier primarily based on product characteristics—mode is not necessarily chosen first if the carrier has multi-modal capabilities. The most important fact in this example is that the carrier selected must have the physical capability to ship the product at the service level required—regardless, of mode, the company selecting a carrier is only concerned that their product arrives on time. This is a point that shows how the modal selection decision does not always occur directly before carrier selection. This

shift in the previously accepted process represents an emerging important trend regarding modal and carrier selection, and it will impact how this topic is studied and taught going forward.

Future opportunities for research could exist in looking at how the shipper-carrier relationships are formed and some of the factors taken into consideration on both ends when a long-term, structured relationship is in its infancy. In addition to this, more research opportunities exist in looking at how this transportation selection decision process may be evolving from a step-by-step process to a more flexible, fluid decision-making process. Also, new trends will need to be analyzed as the transportation industry and global marketplace continues to evolve, especially in regards to trucking capacity. The capacity problems plaguing the trucking industry are likely to have a very large impact on the structure of the industry as well as the modal split, so there are a number of research opportunities ahead as this scenario unfolds.

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VII. Exhibits

Exhibit 1: Interview Guide

Interview Guide
Keith Roberts

1. How would you describe your industry in terms of products, customers, competitors, etc?

2. How long have you been involved in transportation, and what is your role in the transportation selection process?

3. How is outbound transportation managed in your company? Does each division control its own transportation? What are the advantages/disadvantages of the strategy you currently employ?

4. What are the various transportation modes that you use? What percentage of each is used?

5. Can you walk me through process of how a typical modal decision is made?

6. Now, within the context of the previous question, can you explain how you choose specific carriers? Can you point out the most critical factor(s) that goes into this decision?

7. Do you currently use any types of private fleets or dedicated services in any of your transportation? If yes, what led to the choices to use private vs. dedicated vs. for-hire? Has it been profitable; do you see it continuing to be more/less profitable?

8. Explain the trade-offs that can go into making the modal/carrier selection decision?

9. How does volatility in the market affect your decisions?

10. What is your opinion of how the following issues have, do, or will factor into making mode and carrier selection decisions:

- Environmental and energy usage concerns
- Security
- International growth

11. Are there any key trends you can identify related to transportation?

Exhibit 2: Company List Descriptions

Company A: Paper and Consumer Products

Company B: Paper and Consumer Products

Company C: Foods

Company D: Raw Materials and Chemicals

Company E: Raw Materials

Company F: Consumer Product

Exhibit 3: Interview Notes

Participant 1 – Company A (Paper/Consumer Products)

1.How would you describe your industry in terms of products, customers, competitors, etc?

[redacted]

2. How long have you been involved in transportation, and what is your role in the transportation selection process?

Graduated from UT in 1992, started with Company A right out of school in production planning. Went back to Knox as a trans analyst in load planning, moved to rate analyst, became pricing manager, and now is in IT. Moved to business partner position supporting the transportation group, responsibility is to enhance current capabilities and look for new capabilities of the transportation team.

3. How is outbound transportation managed in your company? Does each division control its own transportation? What are the advantages/disadvantages of the strategy you currently employ?

Centralized trans group—biggest advantage is <u>you can do more with less people</u> (one planner doing multiple locations instead of a planner physically at each location)
More effectively can use a TMS since everything can be optimized together
Easier to scale rate negotiations making it easier to leverage corporate position

4. What are the various transportation modes that you use? What percentage of each is used?

No outbound rail, some inbound raw materials go rail
50% of what they ship, they ship to themselves, mostly Truckloads, 10% intermodal
B2B: orders are in smaller quantities, so more LTL….
Healthcare: is prob. 80% small package/LTL, 20% TL
Professionals: 60% TL, 40% small

5. Can you walk me through process of how a typical modal decision is made? Be sure to explain some of the factors (*including most critical factor*) that go into your decision making process in selecting the mode of transportation. Highlight any specific software or corporate driven decision making framework you use.

- Customer places order (what he wants, where to deliver, when to be delivered)

- All info goes into order processing system and interfaces over to their in-house TMS.
- OMS decides what is shipped where
- TMS then optimizes routes based on the shipment attributes (destination, delivery window, weight). This selects right mode, right carrier base, and right ship time.

*All starts with the **rate**, first thing it looks at in optimization is the mode to ship by, then the carrier to ship with….then it is **size of the order** to determine which mode*

Maybe 30% of what is planned requires an analyst to take another look at it to be sure the plans look right

6. Now, within the context of the previous question, can you explain how you choose specific carriers? Can you point out the most critical factor(s) that goes into this decision?

Have a group of 7 core carriers that do 85-90% of volume, maintain <u>intense relationships</u> with them, like partnerships
*--they must have **price, capacity, service***
--also must be financially stable

7. Do you currently use any types of private fleets or dedicated services in any of your transportation? If yes, what led to the choices to use private vs. dedicated vs. for-hire? Has it been profitable; do you see it continuing to be more/less profitable?

Some dedicated, but this mostly is around local moves. Had private fleet until 1995 but decided this wasn't the right direction (too costly, not within core competencies)

8. Explain the trade-offs that can go into making the modal/carrier selection decision.

9. How does volatility in the market affect your decisions?

- Capacity volatility affects optimization

"the more capacity you have, the better chance you've got at having a lower cost optimization"

- Everyone tries to get the same capacity when things tighten up in the market
- Partnership with the core carriers helps mitigate risk of no capacity, they try to treat carriers not as much like a commodity to keep things balanced through volatile times. - Pays off to be nice to the carriers when capacity ends up tightening.

10. What is your opinion of how the following issues have, do, or will factor into making mode and carrier selection decisions:

- Environmental and energy usage concerns
    - *When fuel goes up, distribution expenses go up (transportation).*
    - *Specific to consumer packaging, they make a lot of petroleum based products—fuel prices have an effect on these costs*
    - *<u>Gov't regulations affect rates because carriers have to comply to new</u>*

regulations (ex: engines trucks can use, driver background, driving time, etc)
- Company A is a member of SmartWay, which stresses using more intermodal to take more trucks off the road.

- Security
  - companies are having to do more to secure trailers/yards and pass that cost along

- International growth
  - importing makes more sense since labor-intense jobs are most cost-effectively done outside of the US
  - not a lot of pressure from outside companies coming in because not many others make our products

11. Are there any key trends you can identify related to transportation?

- "Fuel and continuing government regulations around clean energy are going to continuously apply pressures on the carriers. Since its very low margin anyways, this will make it tough for smaller carriers to survive. This takes capacity out of the market… which drives up the cost for everyone."

Participant 2—Company A (Paper/Consumer Products)

1.How would you describe your industry in terms of products, customers, competitors, etc?

[redacted]

2. How long have you been involved in transportation, and what is your role in the transportation selection process?

Went to UT, joined Company A in 1993 as production diaper planner…moved to corp transportation in Knox, spent 5 yrs doing trans planning, then moved into IT organization---now supports trans. application through optimization, freight payment, fulfillment. Currently responsible for distribution, trans., and demand planning

3. How is outbound transportation managed in your company? Does each division control its own transportation? What are the advantages/disadvantages of the strategy you currently employ?

Corporate transportation has domestic operations team, international operation team, optimization team, rate/analysis team, and freight payment team.
- advantages- more commonality in how trans is managed, able to do all training/development in same location, allows same load planners to manage multiple sites as opposed to someone at each site doing each site's transportation
- disadvantages- sometimes they have less knowledge of what is occurring at each particular site than someone physically located at that site might have

4. What are the various transportation modes that you use? What percentage of each is used?
Guess: 70% TL, 20% LTL, 10% IM

5. Can you walk me through process of how a typical modal decision is made (not carrier, but mode)? Be sure to explain some of the factors (*including most critical factor*) that go into your decision making process in selecting the mode of transportation. Highlight any specific software or corporate driven decision making framework you use.

Most critical factors
- ***Lead Time*** *(can mode handle time that order needs to be shipped within)*
  -work with customers to find out when they can be allowed more time to move within a particular lane. Systems identifies if there is enough time to use a particular mode
- ***Cost*** *is next most important factor*
- ***Service*** *is next –service level that the customer requires dictates the*
- ***Expanding transport capacity base*** *– intermodal provides option to get more freight moved across the market without stressing about capacity, so when they need the capacity they have it.*

*- **g=Green practices** also play a part in this selection process…not as large, but still significant*

Transportation system used in Knox manages all freight in NORAM and Europe...different system used in LATAM/APAC

6. Now, within the context of the previous question, can you explain how you choose specific carriers? Can you point out the most critical factor(s) that goes into this decision?

- TMS system evaluates both mode and carrier choice.
*- It looks at what carrier is the **cheapest** in a particular lane AND provides the right level of **service** for that lane. Takes into consideration how many total shipments that carrier has the **capacity** handle in a given lane as well*
*- Also considers **service,** system will assign more cost to carriers that have lower service so they can easily be compared to others that may have a higher rate but higher service.*
- Set up relationships with 6-7 core carriers, don't bid out freight because they think the relationships are too important
- May not necessarily always get lowest cost, but they always stay competitive and never pay above industry average
- Differentiating factors that set carriers apart: history, safety, collaboration, price negotiations, info sharing, service, capacity
- Still maintain relationships with non-core carriers to keep everyone happy, just in case these carriers still get some shipments

*Modal—top 2 factors are **time and cost***
*Carrier—**cost, capacity, service***

7. Do you currently use any types of private fleets or dedicated services in any of your transportation? If yes, what led to the choices to use private vs. dedicated vs. for-hire? Has it been profitable; do you see it continuing to be more/less profitable?

8. Explain the trade-offs that can go into making the modal/carrier selection decision?

9. How does volatility in the market affect your decisions?

- Currently, demand exceeds supply (usually happens in the summer for their business)
- Smaller companies are going out of business, truck-driving becoming less attractive which decreases capacity since they can't find drivers
- Optimization model picks cheapest carrier that can provide the required service level, but if no capacity exists these carriers charge higher rates---costs Company A more money
- With longer lead times and the need to lock in capacity, his then causes them to plan farther out, which reduces flexibility and costs more money

10. What is your opinion of how the following issues have, do, or will factor into making mode and carrier selection decisions:

- Environmental and energy usage concerns

- regulations affecting corporate America in a bad way, but affects citizens positively (ex: CSA 2010 costs companies, has removed 3% or capacity off the road…legislation to reduce hours of service will remove 4% of capacity from the market…all of this forces costs to go up, buy freight sooner, be willing to change purchase requirements)

– yet, all legislation is for citizens because it is making roads safer

- Company A green initiatives—desire to move towards intermodal, probably would not go to be green if it costs them a significant amount of money.

- Security

-having to look at additional capabilities to do restricted party screening, never had to think about this as much a few years ago but have to comply with these regulations now, costs money.

-biggest concerns are around healthcare products (ex: when shipping something to a hospital, could be tough to get things through ports because of screening—have to spend more money adding more lead time so products arrive on time)

- International growth

-lately been mixing freight with other shippers to deliver to common customers—this leverages capacity so they can fill trucks better to save everyone money. Takes at least 1 truck per week off the road.

-a lot of companies, including us, don't factor in the total landed cost with international growth (ex: crossing borders, bribes, security regulations, etc)

-Company A is a top 100 exporter, top 40 importer (opinion)

11. Are there any key trends you can identify related to transportation?

If economy grows somewhat quickly, we will be in a very constrained market in NORAM. Truckload industry will not be able to recreate capacity, especially in light of government regulations. Tough for trucking industry because drivers may not want to be driving a truck away from their families when they could be doing another job.

Recession will continue to have an impact on us, will take time to rebuild infrastructure…might give way to more intermodal or creative/innovative ways to transport things. "As we are challenged with a continuance of more demand and not enough supply, we will get creative and figure out a way to recover from that."

Participant 1, Company B (Paper/Consumer Products)

1. How would you describe your industry in terms of products, customers, competitors, etc?

[redacted]

2. How long have you been involved in transportation, and what is your role in the transportation selection process?

VP-Transportation, responsible for consumer products, packaging, and waste
- role is to lead transportation procurement and trans. ops for all of those divisions, responsible for NORAM and for systems worldwide

3. How is outbound transportation managed in your company? Does each division control its own transportation? What are the advantages/disadvantages of the strategy you currently employ?

Managed through centralized transportation group.
*- Using proprietary software, developed in-house, that allows them to run the transportation process (optimization, consolidation, deliveries, **everything from tendering to freight payment)*
- 1.2 million TL shipments per year
- centralized management gives them enough size and scale that allows them to leverage that in the marketplace
- Want to be in the top 10 of large carrier customer bases (over 400 trucks) and number 1 or 2 customer of small carrier operations (less than 400 trucks)

4. What are the various transportation modes that you use? What percentage of each is used?

Consumer products—39% dedicated, the rest one-way (10% of this one-way is intermodal)
Packaging—85% dedicated, 15% one-way
Containerboard--60% boxcar, 38% one-way TL, 2% dedicated TL
Bleachboard—70% truck (12 of this dedicated, 6 intermodal, 30% rail)
Recycling—almost everything TL (30% dedicated, 70% one-way)

5. Can you walk me through process of how a typical modal decision is made? Be sure to explain some of the factors (*including most critical factor*) that go into your decision making process in selecting the mode of transportation. Highlight any specific software or corporate driven decision making framework you use.

Carrier optimization takes into account carriers available and mix of equipment needed—this then tells which loads go to which carriers
portion of business that you already know which carrier will take this because of* ***unique requirements of the load* *or* ***special characteristics of route***
- get updates each hour shipment is in route (called an X6) so they can track where things are.
- System runs algorithm based on the time left on the shipment so they know what can deliver on time and what can't so they are alerted to call the consignee to inform them that something is wrong and shipment may be late (87% of volume has the capability to follow this process)

*****most critical factors in Mode Selection are product characteristics, cost, and capacity***

6. Now, within the context of the previous question, can you explain how you choose specific carriers? Can you point out the most critical factor(s) that goes into this decision?

- Relationships don't play much of a part in carrier selection
- *if there is someone with a better rate, always go with them*

- Before they even look at the ***service*** *options of the carriers*
- Once these carriers who have the ability to service the business correctly are identified, then ***rates*** *are looked at and the lowest one is chosen*
*****Top two factors in Carrier Selection are service requirements, then rates***

7. Do you currently use any types of private fleets or dedicated services in any of your transportation? If yes, what led to the choices to use private vs. dedicated vs. for-hire? Has it been profitable; do you see it continuing to be more/less profitable?

For the most part, they don't own any trucks. Do own about 200 trailers that they are trying to get rid of.
Vast majority of transportation is through dedicated truck fleets.
-Reason for this as opposed to private is because: you can contract for services instead of doing everything yourself (hiring drivers, maintenance of equipment, etc).
- Another benefit is the avoidance of long-term commitments…generally only contract for 1-2 years, so they have flexibility to change to new business and adjust with the market.
- Last benefit is less liability risk of owning and running your own trucks

- Many dedicated services on dry-van, trucks in rotation to keep costs down
- All tank cars are private fleets, many wood chips and logs private as well

8. Explain the trade-offs that can go into making the modal/carrier selection decision?

- Most common <u>tradeoff between modes</u> is the ***transit time*** *(short lead times require faster modes (truck as opposed to intermodal)…Second would be* ***order quantity*** *(don't want to send a full TL if they only bought 50 boxes)*

9. How does volatility in the market affect your decisions?

- They look at options of either buying capacity in the spot market or contracting long-term for capacity depending on what capacity is looking like.
- Generally, it is more economical to buy extra capacity in the spot market when needed.

10. What is your opinion of how the following issues have, do, or will factor into making mode and carrier selection decisions:

- Environmental and energy usage concerns
    -vendors selected must be in compliance with all environmental regulations
    -energy prices going up doesn't affect them much because everyone is in the same situation (if prices go up for us, they go up for everyone, so there isn't much of an effect relative to competition since everyone is in the same boat)
    -cost of fuel going up impacts them more because often times, they drive more miles relative to competitors

**Quality of Infrastructure
    -will of course cost more money to upgrade, likely to be passed on through carriers to the customers.
    - Unlikely to create more efficiency, so rates will most likely go up for everyone

- Security
    -items are low value, don't require much.
    - "the poorer the country, the more likely things will be stolen" For example, in Mexico, people will often hijack shipments for the value of the tractor, not necessarily the shipment. However, again, not a big concern since their shipments aren't highly targeted.

- International growth
    -paper industry in US is very efficient, so there aren't many paper imports…therefore, very minimal external pressure, tough to import such lightweight items
    -however, if government intervened and put incentives or regulations that promote more of these types of imports, this could allow more pressure
    -US makes more pulp than it consumes, so the rest of the world would have to get to a point where they are making more pulp than us for them to be able to compete here

11. Are there any key trends you can identify related to transportation?

"People are holding less inventory, so order cycle times continues to get shorter and shorter...we have seen this already in consumer products…when will it spread to other industries too?"

At some point, improvements in containerboard and bleachboard lead times need to be made to make things more competitive, because they are super long (6 weeks sometimes).

Every industry study shows that manifest train boxcar shipments are getting less frequent because smaller railroads don't want them. These types have 13.5%, probably endup at 12% within the next few years.
Intermodal may grow from 1.1% to 1.7%
Truck will move from 67-68% to probably 70-71%
Trucks grow, boxcar smaller, intermodal grows along with unit trains

Participant 2, Company B (Paper/Consumer Products)

1. How would you describe your industry in terms of products, customers, competitors, etc?

[redacted]

2. How long have you been involved in transportation, and what is your role in the transportation selection process?

- been in transportation for 15 years with multiple companies
- role at Company B is Director of Rail Marketing Procurement

3. How is outbound transportation managed in your company? Does each division control its own transportation? What are the advantages/disadvantages of the strategy you currently employ?

- Managed centrally by each division
- Some commodities have to ship by rail, given their characteristics (inbound chemicals, coal)
- Shipping requirements mainly depend on the existence of ***special characteristics of the product*** *(mainly weight)*
- Cost per Unit *is primary driver of mode selection, secondary consideration is* ***service****, but mainly focused on COST*

4. What are the various transportation modes that you use? What percentage of each is used?

- *depends on the product, some are 100% truck (consumer products),others may be almost 100% rail*

5. Can you walk me through process of how a typical modal decision is made? Be sure to explain some of the factors (*including most critical factor*) that go into your decision making process in selecting the mode of transportation. Highlight any specific software or corporate driven decision making framework you use.

- Transport selection is done by division, they look at the past 90 days of freight history (actual cost), divide this by total tons shipped during that period by that mode to come up with cost per ton.
- Use simple If/And Statement to select the lowest cost mode based on the last 90-day average rate cost/ton
- Mainly use past data to compare costs of modes in order to make this decision.

6. Now, within the context of the previous question, can you explain how you choose specific carriers? Can you point out the most critical factor(s) that goes into this decision?

*- Rail, not much of a carrier choice due to **geography**. Where competitive options do exist, the decision between carriers are purely based on **price***
*- Motor (van), use mainly larger national carriers as opposed to regional carriers because they want **capacity** nation-wide instead of just in niche markets. Fits business model to partner with these for van loads*
*- Motor (flatbed), use more regional carriers because this is more of a niche market, they **cost** less*

- It is rare that cost would be sacrificed for service

7. Do you currently use any types of private fleets or dedicated services in any of your transportation? If yes, what led to the choices to use private vs. dedicated vs. for-hire? Has it been profitable; do you see it continuing to be more/less profitable?

- use a lot of dedicated services on the dry van side of the business, some one-way, some triangular moves

- Private fleets include tank cars, wood chip/log cars (due to specialized equipment requirements), center beam cars
- generally speaking, specialty equipment requirements are the only reason for having a private fleet

8. Explain the trade-offs that can go into making the modal/carrier selection decision?
- Sometimes they ship out of mode (normally goes truck to a particular customer, but ship rail instead and visa-versa)
- Had 2 carrier options to get to a particular mill, could have shipped CSX-UP or CSX-KCS. Agreed to give this volume to UP in exchange for a deal at another mill. Giving them this initial volume cost more money than shipping via KCS, but the savings at the other location outweighed this initial raise in cost. Overall savings was positive.
- Very focused on costs, however relationships to play a role in rail since they have a geographic monopoly on some locations

9. How does volatility in the market affect your decisions?

- Relationship is meaningful since you want to know that your servicing partner is telling you the truth.
"Relationships go a long way on a truck side because there are so many carriers out there"
"We would never sacrifice value for a relationship, you would just work harder at building a relationship with a cheaper priced guy"

- Capacity and surges in demand play into decisions all the time. After downtime in machines, everything is a rush and a surge in demand always happens. This happens every year when downtime in factories is taken. The question is, should we build capacity now prior to shutdown and pay more for it today in order to avoid having to get into the spot market for services later and risk paying substantially more or not having capacity.

10. What is your opinion of how the following issues have, do, or will factor into making mode and carrier selection decisions:

- Environmental and energy usage concerns

-She thinks it will affect these decisions in the future

- Being more conscious of use of diesel fuel, rise of trading carbon credits. More companies will be willing to pay for rail to take trucks off the highway.

- Government intervention could play a part to pushing more product into rail (trying to get trucks off the road)

- Does not know if truck carriers have the money to invest in the equipment upgrades necessary to keep up with government regulations being imposed on them.

- This could cause consolidation of truck carriers going forward, changing the makeup of the industry

- Quality of Infrastructure

-As trucking capacity tightens and truck rates go up (because of new regulations coming down on trucking companies), volume will shift from the roads to rail

- Security

- Example of truck carriers trying to go through ports must have a special TWIC card to show they have been cleared to go into these ports.

- Security requirements have effects on price, so this plays into mode/carrier selection decisions.

- Hours of service regulations coming down on truck carriers may effect price going forward

- Ex: when national security is heightened, rail shippers go into secret mode and freeze waybill information so nobody except the consignor and consignee can see origin, destination, contents, etc. of shipments

- Not likely for a carrier focus on security to market to customers, nobody will sacrifice price for security.

- Customer drives security

- International growth

International sales are growing faster than what they can produce.

11. Are there any key trends you can identify related to transportation?

- Seems like transportation is very cyclical by nature. Capacity constraints in '04-'05 got worked out, but will be rolling back around again soon when the economy recovers (maybe by 2013). 8-10 year cycle in regards to capacity that seems to repeat itself over and over again.

- Value of lifestyle will make a difference in trucking industry

- Not as many people are lured to working on the long-haul trucks. Industry is shifting towards more short hauls just because most people do not want to be away from home for the lengths of time that long-hauls require.

Participant 1 and Participant 2, Company C (Foods)

1. How would you describe your industry in terms of products, customers, competitors, etc?



2. How long have you been involved in transportation, and what is your role in the transportation selection process?

Participant 1—graduated UT, spent 3 yrs in Dandridge, past 2 years at headquarters working in transportation and warehousing
Participant 2—started in warehousing working his way through college, been involved in almost every role in supply chain (manu, procure, planning, custserv, warehousing, trans, inventory) …been with Company C for 7 yrs, responsible for trans and warehousing… must create tools/infrastructure/systems so end-users can execute.

3. How is outbound transportation managed in your company? Does each division control its own transportation? What are the advantages/disadvantages of the strategy you currently employ?

Transportation network supported by four 3PL's
Use an external, subscription based TMS system

4. What are the various transportation modes that you use? What percentage of each is used?

5. Can you walk me through process of how a typical modal decision is made? Be sure to explain some of the factors (*including most critical factor*) that go into your decision making process in selecting the mode of transportation. Highlight any specific software or corporate driven decision making framework you use.

- 50% of business is between April-July
- Have to pre-build inventory so it can flow during consumption season, start building this at tail end of the year for consumption in April-July
- Make inventory, move to warehouses on rail cars, allow to sit until customers order what they want
- shipping a very dense product, always weigh out first so they have been trying to find partners to utilize the extra cube space.
- 30-40% of customer shipments are from VMI or CRP (cont. replenishment planning)
- Most orders come in via EDI from customers, hits their TMS system, check for

pricing/promotional activities before assigning carrier
- Carrier accepts the order, shows up at yard

- Trucks always move the last mile—this comes from how their network is set up. So modal choice is primarily determined by ***product characteristic***

6. Now, within the context of the previous question, can you explain how you choose specific carriers? Can you point out the most critical factor(s) that goes into this decision?

Focus on carrier is on ***relationships****, want to build partnerships with carriers*

4 things they look at in selecting carriers:
capacity, service, value (cost), strategic relationship

"Not only is it important for us to have good partners, but it is important to understand who is feeding the capacity to us" –Participant 2

7. Do you currently use any types of private fleets or dedicated services in any of your transportation? If yes, what led to the choices to use private vs. dedicated vs. for-hire? Has it been profitable; do you see it continuing to be more/less profitable?

No—business identified what it wanted to be good at, and this was not included

8. Explain the trade-offs that can go into making the modal/carrier selection decision.

Loss of control from maintaining such high levels of relationships, turning over the tools/info they have to let the carrier figure things out

9. How does volatility in the market affect your decisions?

"Fuel is what it is, everybody is going to suffer through it"
"Until we decide to start sinking oil rigs in our back yard, there isn't a lot we can do about it"

- ***Partnership*** *allows them to not have to be terribly worried about capacity, always know they have trucks because of those relationships. May have to work harder to get the service they want, but they know they will have trucks*

10. What is your opinion of how the following issues have, do, or will factor into making mode and carrier selection decisions:

- Environmental and energy usage concerns
    - *Had an instance where they split 1 DC into 2 separate DC's and took ¼ million miles out of their transportation network, reduced footprint*
    - *People can do things like this*

- Security
    - *value of product is relatively low, so security issues aren't there—also, once*

product is sealed, it is sterile and nothing can really go bad with it.

- International growth
    -Testing the waters a little (Canada, Mexico)

11. Are there any key trends you can identify related to transportation?

- Understand that shortages in capacity is cyclical, always goes up and down, so don't undercut people when times are tough because they will return the "favor" when the ball switches courts.

- One of the biggest challenges is on the driver side---lifestyle of drivers is not fun, pay not good—going to be a shortage of good drivers, driving into a marketplace that is radically different

Participant 1, Company D (Raw Materials)

1. How would you describe your industry in terms of products, customers, competitors, etc?



2. How long have you been involved in transportation, and what is your role in the transportation selection process?

- Went to UT, from Knoxville, been with Company D 32 years—started in Longview, TX (15 yrs) in shipping offices/material handlings, spent a few years in Miami, then came back to TN around 2000
- Director for global logistics, responsible for NA, LATAM, EURO, ASIA
-Daily operations, materials handling, HAZMAT, international trade, distribution cost analysis, process improvement…supervises all these groups, manages 110 people in Kingsport. 12 in EUR, 7 in ASIA, 3 in LATAM, 20 for supply chain in LATAM

3. How is outbound transportation managed in your company? Does each division control its own transportation? What are the advantages/disadvantages of the strategy you currently employ?

4. What are the various transportation modes that you use? What percentage of each is used?

- 30th largest exported in the US, so they ship a lot of containers
- Tank/hopper cars, some box cars for incoming raw materials, and coal (huge user of this, 50+ railcars/day).
- Marine—bulk parcel, isotainers
- Trucks
****Volume----Rail (45%), Truck (31%), Marine (24%)..small fraction of air for global business*

5. Can you walk me through process of how a typical modal decision is made? Be sure to explain some of the factors (*including most critical factor*) that go into your decision making process in selecting the mode of transportation. Highlight any specific software or corporate driven decision making framework you use.

Order comes in from customer (verbally/electronically, more electronic), creates order in SAP, gets approved, then logistics planners get a delivery note and are ready to start

planning shipment.
- ask themselves: Is it domestic, is it in bags, is it a liquid product, are they wanting bulk?
*- **Nearly all of the time it specifies on the order how the customer wants it to be shipped.***
- Work with SAP (planning automation), they may have multiple modal choice and 1, 2, 3, 4th choice carriers
- Carriers organized by rates/service programmed in SAP, planner selects carrier within SAP based on what SAP suggests.
- Once loaded, someone from the plant enters weight, can prepare online BOL's to send to material handling group. Print that out and give to carrier, then it ships.
- Once it delivers, Company D get EDI feed advising that its delivered
- Company D helped to develop much of the ORACLE software, but shoved it in a drawer and now run the entire company on SAP to be sure they understand needs

Main factors that go into modal decision
--Know modal changes ahead of time—see more of this in chemicals industry because of unloading capabilities, concerns with liquid/hazmat
--They have influence on location/customer ahead of time, they may decide to transfer rail to truck, but that decision is made with sales/supply chain to get that customer set up. Sometimes they will go back to the customer if they see a better opportunity and ask if they can change the mode
*--All rests on **customer requirements** and **customer preference***

6. Now, within the context of the previous question, can you explain how you choose specific carriers? Can you point out the most critical factor(s) that goes into this decision?

- main sites served by multiple RR's
- Legislation out there with railroads that forces them to be competitive, RR's fighting that. Also fighting the banning of the RR antitrust immunity
*- first, be sure they are a **financially stable** company with good track record and **safety** record.*
- Some carriers may can do it cheaper, but they will not do business with them if they are not financially stable and good safety track record
*-Once they pass that test, carrier becomes an approved carrier. These approved carriers are assigned certain lanes, which is based on a logical mix between **cost** and **service**. This is then loaded into the SAP system, planners then select the carrier based on what is recommended*
- Each carrier is measured monthly on how they perform (delivery reliability, accidents, claims, loading times, customer complaints).
- Each year they have a supplier day to build relationships with carriers
*- **Performance** scorecard and **relations** is main factor that dictates how much business carriers get, <u>plays more of a part than rates by far</u>*

7. Do you currently use any types of private fleets or dedicated services in any of your transportation? If yes, what led to the choices to use private vs. dedicated vs. for-hire? Has it been profitable; do you see it continuing to be more/less profitable?

--own several thousand tank cars and hoppers—some carbon steel, some stainless steel, some coiled/insulated, some pressure
--they lease from companies, or own themselves
--better to own given the hazardous nature and immense liability of what they ship

8. Explain the trade-offs that can go into making the modal/carrier selection decision.

9. How does volatility in the market affect your decisions?

--This time last year, they faced a marine crisis that they battled for about 6 months…steam ship lines took a lot of ships out of service and hadn't brought them back because they were doing bad in 2009….capacity was seriously constrained because of this (term "slow steaming")…due to this artificial capacity reduction, government got involved…over time, market got better and they came up with some solutions

- Currently, there are a lot of capacity constraints in rail/truck, particularly with rail cars right now.
- Capacity constraints cause domino effect if you can't get the product out the door
- Marine capacity is doing ok in certain areas, sometimes weather or port locations
- Rely on carriers to have your back through thick and thin

10. What is your opinion of how the following issues have, do, or will factor into making mode and carrier selection decisions:

- Environmental and energy usage concerns
    - *Affected by hazmat compliance, DOT audits, (export business---customs compliance)*
    - *Intense focus on safety*

- Security
    - *Must get CTPAT certified, proves that Company D knows who they are importing from and that its imported correctly, DEA watches things related to materials being used for drugs*
    - *Shipping documents, plackarding, labeling all has to be perfect in their industry*

- International growth
    - *a lot of swaps and agreements happen between chemical companies in transportation. Things change rapidly from this standpoint because you have to build in forecasting for these exchange agreements*
    - *more assets still in North America, but they export a lot and continuously look at opportunities overseas*

11. Are there any key trends you can identify related to transportation?

*--**Driver availability** issue will impact the industry dramatically,*

"We will not have enough [drivers]. Drivers want to be at home at night, not on the road for 3 weeks."
--Highway infrastructure, congestion has gotten overwhelming and this limits business
--Rail congestion on specific corridors.
-- Seeing a lot of intermodal growth. Coal exports into China/Australia continue to grow, which is sucking up rail capacity, causing other rail shipments not to move
--Keeping up with port infrastructure is proving difficult, lagging behind in the US
--Within chemical, trends lie in creating a more ***sustainable supply chain*** *with more swaps and agreements*

Participant 2, Company D (Raw Materials)

1.How would you describe your industry in terms of products, customers, competitors, etc?

2. How long have you been involved in transportation, and what is your role in the transportation selection process?

Started at Company D in 1991 (worked for trucking company before that), done all kinds of jobs, came to transportation in 1995-96
- Background in rail, sales, procurement
- Right now—manager of logistics operations, responsible for making shipments happen

3. How is outbound transportation managed in your company? Does each division control its own transportation? What are the advantages/disadvantages of the strategy you currently employ?

His group controls all trans that originates out of the US, including marine shipments going overseas
- Arranged by geographic origin and centralized on those geographies

4. What are the various transportation modes that you use? What percentage of each is used?

40% of freight probably goes by rail

5. Can you walk me through process of how a typical modal decision is made? Be sure to explain some of the factors (*including most critical factor*) that go into your decision making process in selecting the mode of transportation. Highlight any specific software or corporate driven decision making framework you use.

- Customer calls customer service rep, rep enters the order with product wanted and expected delivery date the customer needs it by.
- Order is entered in SAP and automatically tells you when to ship it based on how long it takes to get to that particular location.
- Planner works off list of shipments they know has to be shipped, works with materials handling to select the correct railcar for that particular order.
- System automatically picks route (based on historical shipments), applies route in system, system then auto-generates BOL transmitted by EDI to rail carrier.
- Trans. department also receives notification to switch railcar out of the yard to an interchange track.
- People track/trace railcar by exception using an in-house system, tracing it to destination to be sure it is constantly moving and on schedule. If it is late, planners work with RR to understand why and communicate this to the CSR.

Truck is a little different—they use an internet portal (called Intra) where they tender to first choice carrier based on origin/destination lane. Carrier then accepts/declines tender.

*Mode selection----**determined by customers** as to how they want to receive the shipment. Order of preferred modes in chemicals is to first get it in a railcar, then bulk truck, then TL, then LTL.*

6. Now, within the context of the previous question, can you explain how you choose specific carriers? Can you point out the most critical factor(s) that goes into this decision?

*Carrier selection----set up initially as well, automatically known from the start when you initially set up customer as to which rail carrier gets the shipment (the (typically based on **geography**).*
TRUCK---based on Request for Proposal process done annually, try to match carriers to lanes that the carriers are particularly strong in.
*- Factors playing into RFP---**historical** service **performance**, claims, on-time delivery, equipment, **cost**. Pretty heavy weighting on rates, but everything is somewhat equal.*

7. Do you currently use any types of private fleets or dedicated services in any of your transportation? If yes, what led to the choices to use private vs. dedicated vs. for-hire? Has it been profitable; do you see it continuing to be more/less profitable?

- Contract with Penske to provide some fixed capacity in container/drayage arena
- Small group of drivers that are leased (not Company D drivers or trucks)

8. Explain the trade-offs that can go into making the modal/carrier selection decision

- Been trying to target best service towards higher segment customers—
"When the market is loose, dollar is king—when market is tight, service is king"

9. How does volatility in the market affect your decisions?

Very unpredictable, something new comes up every year. Ex: Tsunami, flooding, railcar shortages/driver shortages…
2-3 million in air.

10. What is your opinion of how the following issues have, do, or will factor into making mode and carrier selection decisions:

- Environmental and energy usage concerns
    - *Causing driver pool to shrink a lot*
    -Rule of thumb---better to go truck if you are within 100-150 miles of origin, better to go rail if outside of 150 miles. Financially, trade off occurs around this point. Fuel is big component, as well as labor

- Quality of Infrastructure
    - *Rail carriers maintain infrastructure very well, spend millions to maintain main lines every year, do not budge on this very much—their number one goal*

is safety. (has seen steam ship lines smudge on container maintenance…not sure about highway maintenance)

- Security
  - *Spend a lot of time on security, don't ship a lot of toxic products, but do ship some highly flammable products.*
  - *Very important to be sure railcars are safe and secure (ex: putting bolts on right, correct fittings to detect leaks, etc)*
  - *They meet a lot with truck carriers to look at what is being done to prevent leaks.*
  - *They spend a lot of company time/money securing shipments and parameters of plants. A lot of security around where carriers are allowed to drop loaded trailers*
  - *Background checks on drivers are required*
  - *Cannot ship to certain countries, all customers must be qualified… (*denied party screening---that's where you can't ship certain things to certain customers.)*

- International growth
  - *Seen more regulation coming from other regions that are hurting them a little bit. Ex: 72 hour rule that Europe just put in place--steam ship lines want to know 72 hours before a vessel arrives at a port (ex: Charleston) so they can report it to Europe (regulation coming from EU)*
  - *Shipping direct-to-customer is best because you avoid all of the additional costs*

11. Are there any key trends you can identify related to transportation?

Participant 1 & 2, Company E (Raw Materials)

1.How would you describe your industry in terms of products, customers, competitors, etc?

[redacted]

2. How long have you been involved in transportation, and what is your role in the transportation selection process?

1: Over 11 years, UT grad, been in transportation entire career—started on rail, worked in truck, now in international side of things…all global logistics projects

3. How is outbound transportation managed in your company? Does each division control its own transportation? What are the advantages/disadvantages of the strategy you currently employ? (Responsiveness, clarity, visibility, financials, accountability)

Focusing on North America, transportation is fairly decentralized, some units almost operate as different companies…
3 largest businesses:
- lifeblood products (Global Primary Products): aluminum, alumina
- North America Rolled Products Group---roll aluminum into various forms (cars, aircraft, thin sheets for aluminum cans
- Engineering Products and Solutions---specialized business that gets closer to end customer (wheels, turbines, fasteners/rivets)

- Business doesn't play directly in consumer products, mainly stays in upstream
- Big factor in transportation is ***cost of goods***
--Transportation managed centrally by materials management, they procure transportation, manage sourcing
- TMS used for entire corporation, businesses pay for this service

4. What are the various transportation modes that you use? What percentage of each is used?

5. Can you walk me through process of how a typical modal decision is made? Be sure to explain some of the factors (*including most critical factor*) that go into your decision making process in selecting the mode of transportation. Highlight any specific software or corporate driven decision making framework you use.

Look at four components: ***cost, safety, time, quality***
- Depends on product, but ranking mainly is cost first because of commodity products…not as worried about transit time/inventory because of the ***nature of the product****.*
- Minimum is full TL, railcar, barge quantity.

6. Now, within the context of the previous question, can you explain how you choose specific carriers? Can you point out the most critical factor(s) that goes into this decision?

- Specialized needs *of their business limit pool of carriers*
- Have a short list of players that they have ***relationship****s built with...partnerships play a big role in the carrier selection*

7. Do you currently use any types of private fleets or dedicated services in any of your transportation? If yes, what led to the choices to use private vs. dedicated vs. for-hire? Has it been profitable; do you see it continuing to be more/less profitable?

Barge—contract all business out, own about 8 vessels of steamships
Rail—own railcars, lease railcars, and take some from railcars
Truck—for the most part, contract out all business
-Run one private fleet of 20-30 trucks (auto parts daily replenishment business)

- Don't want to be in transportation business unless it is strategically beneficial, isn't what they are good at

8. Explain the trade-offs that can go into making the modal/carrier selection decision?

- Depends on business and customers you serve---want to build consistency when you can, commit business to carriers when you can…Opposed to a spot market approach

9. How does volatility in the market affect your decisions?

- See the benefit to working with carriers, ***forming relationships***
- Need to have on-going dialogue and have conversations with carriers. At the end of the day, work close with customers and carriers, have constant communications

10. What is your opinion of how the following issues have, do, or will factor into making mode and carrier selection decisions:

- Environmental and energy usage concerns
    - *Huge energy consumer, big impact on manufacturing. Rising energy costs hit directly to them with fuel components*
    - *Sees big payoff to being environmentally friendly, look at these initiatives to help reduce costs while reducing emissions*

- Quality of Infrastructure
    - *Losing competitive advantage as a nation by not keeping infrastructure up to date, seems like we band-aid things too much instead expanding what we have.*
    - *Sees more congestion in certain areas from time-to-time, would like to see more clear rules across states for certain things (ex: truck waiting times)*
- Security
    - *Sees a lot of increasing worry of cargo theft, always an issue.*
    - *Issues with cargo screening, could make sense to do that in-house going*

forward

- Must stay aware of legislations and stay in front of it to make sure you are prepared

- International growth

11. Are there any key trends you can identify related to transportation?

- Will be interesting to see where we go. Currently in a change period in the US, as more industries move out of the country, we will need much more flexibility in supply chain going forward.

Participant 1, Company F (Consumer Products)

1. How would you describe your industry in terms of products, customers, competitors, etc?

[redacted]

2. How long have you been involved in transportation, and what is your role in the transportation selection process?

- Involved in transportation since he was young, started as an Operations manager for parent's company for 9 years, owned his own transportation company for 8 years, been in supply chain for Company F for almost 3 years
- Currently in control of over 20 carriers with annual spend of over $60 million

3. How is outbound transportation managed in your company? Does each division control its own transportation? What are the advantages/disadvantages of the strategy you currently employ?

- Centralized, decisions controlled all within 1 group. Advantage is ease of oversight, disadvantage is that each carrier might have different touchpoints within the organization

4. What are the various transportation modes that you use? What percentage of each is used?

- Utilize Dry, Temp-controlled, Frozen, Deep Frozen, TL, LTL, Intermodal, Bulk, Customer Pickup
- Outbound rail from plants to DC's in their network
- Inbound rail into all plants
- Ships 15% intermodal

5. Can you walk me through process of how a typical modal decision is made?

- Product comes off the line into storage at the plant, orders come through SAP, logistics department sees inventory and where it needs to go in the network, then goes into the TMS, carrier is selected, carrier gets 48 hours notice to pick the load up, delivers to the DC. DC stores, then when an order comes in, operations team coordinates delivery to the customer and pulls the inventory from the DC

- Modal Decision: Primarily based on ***product characteristics***
- When product characteristics are even, next they look at ***cost***, ***distance****/site location, green impact*

6. Now, within the context of the previous question, can you explain how you choose specific carriers? Can you point out the most critical factor(s) that goes into this decision?

*- Carrier Decision: Also must look at **product characteristics** (temp, weight) when making the carrier decision*
*- Then, carriers are selected in a bidding process: once it is known that the carrier has the **capability** and **capacity**, it comes down to **cost** as to who gets the volume for a particular lane*

7. Do you currently use any types of private fleets or dedicated services in any of your transportation? If yes, what led to the choices to use private vs. dedicated vs. for-hire? Has it been profitable; do you see it continuing to be more/less profitable?

- All transportation is contracted out, own nothing and use no dedicated services.
- Everything is contracted out, no carriers are in control of particular regions
- All shipments are managed on a per shipment basis

8. Explain the trade-offs that can go into making the modal/carrier selection decision?

- Different tiers for carriers based on the level of business they do with that carrier, Tier 1 carrier can handle multiple modes, multiple types of shipments, very large capacity, national footprint. Tier 3 providers are the small mom/pop carriers with a couple of trucks.
- All tiers important because each can bring a different capability to the table

9. How does volatility in the market affect your decisions?

*- See data on what current industry trends are like (**driver capacity**, rate increases)*
- Must take this data into consideration when bidding carriers and determining rates
- Hold quarterly meetings with carriers to discuss trends, things coming up to expect

10. What is your opinion of how the following issues have, do, or will factor into making mode and carrier selection decisions:

- Environmental and energy usage concerns
    - *Company F has a goal to reduce carbon footprint by 50% and double the size of their business within the next 10 years.*
    - *Really want to ship more intermodal, currently ships 15% intermodal*
    - *Looking into changing DC footprints to possibly reduce miles and allow more customer-direct shipments*

- Security
    - *Low-value products, doesn't affect them much*
    - *Have strict policies on keeping products sealed, processes in place to ensure that quality is maintained and product is secure*

- International growth
    - *Looking to grow exports, report that China is beginning to lose their edge in manufacturing. Could have more imports then exports soon because it is costing so much to ship products to the US and other markets*

11. Are there any key trends you can identify related to transportation?

- CSA 2010, reducing driver hours from 11 to 10, will create tremendous amount of constraint. DC network is based on 11 hours so things are within 1 day of driving, if this changes this may not be possible anymore
- Also means capacity will be more constrained since there is less time to drive, and less appealing to drivers since they make less money now
- Shift towards intermodal across the industry to reduce environmental impact
- Seeing shift to reduce overall suppliers and reduce carriers so complexity is reduced and capacity/economies are leveraged