# Truckload Procurement: From State-of-the-Practice to State-of-the-Art

by

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ABSTRACT

The U.S. full truckload (FTL) market is uniquely challenging for shippers to navigate because of its high degree of market fragmentation, competitiveness, and magnitude. For these reasons, shippers have adopted various procurement behaviors to contend with the market's complexities. This study aims to establish "state-of-the-practice" behaviors in full truckload procurement as well as highlight "state-of-the-art" behaviors in full truckload procurement. Through surveys and semi-structured interviews with shippers of various industries and annual FTL spend sizes, data was collected on shipper practices in procurement strategy as well as the practices in the execution of that strategy. To evaluate shipper practices, a framework was developed to categorize behaviors into 3 categories: Technology, Process, and People. The Technology category focused on data availability and accessibility – "Do You Have It?" The Process category focused on an organization's discipline to use its data – "Do You Use It?" Lastly, the People category focused on an organization's willingness to share information with its business partners (carriers) – "Do You Share It?" Ultimately, the distinction between "state-of-the-practice" and "state-of-the-art" across the shippers interviewed consisted of small differences in each category evaluated. Therefore, shippers could experience increased effectiveness in their full truckload procurement practices with only small changes in their behaviors.

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# 1. INTRODUCTION

## 1.1 Motivation

Despite decades of research and marketplace innovations, there is a fundamental disconnect between theory and practice within the U.S. full-truckload market regarding shippers' procurement of truckload services. This is, in part, due to the nature of Full Truckload (FTL) contracts between shippers and carriers. Typically, most FTL services are procured through strategic, annual processes such as a Request for Proposal (RFP). An RFP is initiated by a shipper or a third party acting on behalf of a shipper. A shipper forecasts its freight needs and invites carriers to bid on a portion of that volume. Even if a shipper contracts all its forecasted volume through an RFP, there is no promise that all this volume will be executed according to the RFP strategy. Contracts between shippers and carriers do not guarantee load coverage, since carriers are neither required to accept a load tendered to them nor are shippers responsible when their forecasted volumes awarded to carriers do not materialize as expected. For these reasons, it is the execution of these contracts that poses the greatest challenge for shippers and carriers alike.

Because agreements between shippers and carriers do not require 100% load acceptance, it is critical for shippers to strategically source transportation on a lane-level basis, often through segmentation. Segmentation is the process in which lanes are identified by certain characteristics, such as service level needs, capacity needs, or volatility measures. These characteristics offer a means of further classification so that transportation can be procured strategically. For example, a shipper may classify a consistent, high-volume lane that supplies its major production facility as requiring high service levels. Based on these characteristics, the shipper may look to procure transportation for this lane like other service-critical, high-volume lanes, as opposed to a non-critical, low-volume lane. If lane segmentation is being used as a procurement tool, then lanes with similar qualities will use similar procurement methods. Lane segmentation allows carriers and shippers to categorize lanes quickly and more efficiently to secure the right form of transportation relationship; however, there is not yet an established best practice for lane segmentation in the industry. For this reason, the sponsor company is motivated to support further research in this area.

Closely related to lane segmentation is the portfolio approach to truckload procurement. The portfolio approach assumes that certain lanes share common features of density and volume

volatility and can be procured similarly. Lane segmentation is critical to the practice of this strategy since the identification of shared characteristics is a core concept of portfolio procurement. By segmenting the lanes based on these common features, shippers can pursue a more targeted procurement strategy (DAT Freight & Analytics, 2021). Once the features of each lane are understood, the portfolio approach allows for an individualized procurement strategy for each type of lane segment. The specialized approach contrasts with the traditional tactic of assigning a contract carrier for every single lane in the network. This blanket strategy is referred to as a "coverage" procurement strategy (Acocella & Caplice, 2022). There is not yet a best practice for implementing a portfolio approach across an FTL network. The absence of a "state-of-the-art" approach further underscores the need for additional research in this space.

Lane segmentation and the portfolio approach to transportation procurement are both central concepts to this project. The project will focus on two goals: surveying current practices of shippers regarding lane segmentation and evaluating best practices for shippers regarding lane segmentation. The results will be used in combination with a larger research project, the Relationship Portfolio Engine, to provide a view of "state-of-the-art" practices for segmenting an FTL network and utilizing a portfolio approach to truckload procurement. The Relationship Portfolio Engine project will offer a prototypical tool to evaluate new business (customer lanes and forecasted volume) and propose procurement strategies. The model will utilize lane segmentation insights from this research to guide its development. Evaluating the potential of the portfolio approach and its impact on the industry will be useful to any shipper that relies on truckload services in the U.S. It is especially significant for firms acting on behalf of shippers, such as lead logistics providers (4PLs).

### 1.2 Sponsor Overview – Company A

Company A has a heavy interest in the truckload transportation industry, as it represents a key revenue stream for its business. As a 4PL, it is invested in understanding how to best set up its customers for success in the procurement of truckload services. This is especially significant in an industry representing over $400B in annual revenues (Caplice, 2021). In 2022 alone, Company A earned $4.3B in revenues in total (*Company A | Company Overview & News*, 2022). Company A has multiple product offerings, including Supply Chain Planning, Warehouse Solutions, Transportation Solutions, and Global Logistics. However, this project's scope will be

limited to its Truckload Operations within the Transportation Solutions offering. Within this space, Company A's clients are primarily in the restaurant and food service industries.

In summary, Company A is investigating the strategy of transportation procurement and how it translates to the execution of loads at a lane level. The company is motivated to understand current practices in lane segmentation and portfolio approaches in FTL procurement so it can more efficiently and strategically procure transportation for its customers.

### 1.3 Problem Statement & Research Questions

Company A's goal is to understand "state-of-the-practice" as it compares to "state-of-the-art" truckload procurement practices in North America, focusing on lane segmentation. Today, the procurement of truckload transportation falls into three categories: dedicated, contract, and spot. A dedicated relationship is where the shipper controls the daily operations of the assets. Dedicated transportation is mostly used for consistent, high-volume lanes that are balanced within a network. A contract relationship is where the shipper has awarded a lane to a specific carrier for a period of time at a fixed rate. Between 80–90% of all freight transactions are conducted through contract relationships (Sullivan, 2022). Lastly, a spot relationship is where a load is sent to a marketplace or brokerage service to determine a price and select a carrier at the time of tender. The remaining 10–20% of truckload volume goes to the spot market, although this varies significantly based on market conditions (Caplice, 2007).

Despite utilizing annual, strategic procurement processes that assign all lanes to dedicated, contract, or spot transportation, shippers frequently see load rejections and service failures anyway. This research focuses on how existing procurement strategies fail when translated to load execution. Specifically, it examines the role of lane segmentation and portfolio analysis in these failures. To capture this gap, we first need to understand current procurement practices for FTL procurement in North America. Once current practices are understood, potential best practices can be outlined for use in Company A's 2025 procurement cycle.
The research questions to be answered include:

1. What is the "state-of-the-practice" for a shipper, or for a 4PL managing a shipper's freight, for segmenting their FTL network to utilize the portfolio of dedicated, contract, and dynamic forms?

2. What is the “state-of-the-art” for a shipper, or for a 4PL managing a shipper’s freight, for segmenting their FTL network to utilize the portfolio of dedicated, contract, and dynamic forms?

### 1.4 Project Goals & Expected Outcomes

The project’s goal is to provide Company A with a recommendation of potential best practices for FTL lane segmentation and procurement. The analysis could be used in Company A’s 2025 procurement cycle, enabling a more strategic approach toward securing capacity and protecting service-level requirements for its customers.

One hypothesis is that current truckload procurement strategies are misaligned with the realities of truckload transportation in practice. Qualitative research methods like surveys and semi-structured interviews provide context for a “state-of-the-practice” assessment. A quantitative evaluation of the semi-structured interview data supplements the qualitative analysis to support a “state-of-the-art” recommendation for Company A's truckload procurement strategy.

**Hypothesis 1 –** Shippers that display “state-of-the-art” procurement processes utilize lane segmentation analysis to guide their truckload procurement strategies. These characteristics include shipment frequency, total annual volume, customer, and seasonality.

**Hypothesis 2 –** Shippers that do not exhibit “state-of-the-art” procurement processes do not utilize lane segmentation analysis to guide their truckload procurement strategies.

Once current and best practices in truckload procurement are identified, the resulting insights will be inputs to the Relationship Portfolio Engine. The engine will serve as a prototypical model to prescribe lane-level procurement strategy based on segmentation characteristics identified in this research.

In that context, the deliverables to Company A include:

**Industry Survey:** An online questionnaire used to collect data on procurement event frequency, provider and equipment type usage, organizational structure, and willingness to participate in a semi-structured interview. All participants confirmed their experience with the North American FTL market.

**Semi-Structured Interviews:** A 45-minute virtual or in-person discussion with a flexible question path. The question path varied according to participant responses throughout the interview, although each focused heavily on lane segmentation. All participants confirmed they were part of organizations with operations utilizing the North American FTL market.

Once the recommendations are finalized, Company A will incorporate research insights into its annual procurement process in 2025. The expectation is that this new understanding of truckload procurement practices will enable Company A to proactively segment and source transportation for customer lanes. This could create value by improving transportation budget planning and reducing the number of total load rejections from carriers. Moreover, the research could have a wider impact on how FTL lanes are segmented, which type of relationship supports each segment, and how FTL procurement processes occur across the U.S.

# 2. STATE OF THE PRACTICE

This chapter provides a background on U.S. FTL market conditions, strategic FTL procurement processes, and how those strategic processes are executed. This section concludes with a discussion of how strategic procurement intersects with the reality of its execution.

## 2.1 Market Conditions

Understanding the landscape of the U.S. truckload market is core to addressing "state-of-the-practice" and "state-of-the-art" FTL procurement practices. The U.S. truckload environment is unique through its magnitude, market fragmentation, and competitiveness. In terms of size, full truckload movements accounted for 86% of total trucking revenue in 2021, the equivalent of over $700 billion (Statista, 2022). Market fragmentation is implied by the number of carriers supporting the market, reaching hundreds of thousands (*Federal Motor Carrier Safety Administration*, 2021). Beyond that, out of the 750k active US motor carriers that own or lease a tractor, 95.8% of them operate fewer than 10 trucks (American Trucking Association, 2023). Both the size of the market and its degree of fragmentation contribute to its unique level of competition, placing it well above the standard definition of an unconcentrated market (Caplice, 2022). By describing the size, complexity, and novelty of the market, we can begin to understand why a shipper could benefit from "state-of-the-art" truckload procurement practices.

## 2.2 Overview of Truckload Procurement

Reviewing the framework for the procurement decision process highlights potential gaps between "state-of-the-practice" and "state-of-the-art" concepts in truckload procurement. As outlined by Acocella and Caplice (2023), truckload procurement can be split into three different aspects: the decision to make or buy (in-house or outsource), the timing of the decision (strategic or execution), and the perspective of the party (shipper or carrier) making the decision. Company A, as described in Section 1.1, manages transportation for its customers to generate revenue. Since its customers are exclusively shippers, this research will be limited to the shipper's perspective on buying (outsourcing) truckload transportation. Specifically, the target of this research is the gap between the aspirations of strategic decision-making and the reality of those decisions in the execution space.

## 2.3 Overview of Truckload Procurement – Strategic Phase

The traditional method of strategic truckload procurement involves a reverse auction, referred to as a request for proposal (RFP) (Caplice, 2022). Once carriers submit their respective bids, shippers award volume based on price, incumbency status, and several other factors. These events typically occur on an annual basis due to their significant cost and time required to coordinate them. However, there is an increasing trend toward holding these procurement events more frequently or to hold smaller events, called "mini-bids," multiple times throughout each fiscal year (Acocella & Caplice, 2022). Once a bid is awarded, partial volume or all volume is assigned to one or multiple carriers, identified as primary carriers. Primary carriers will enter a contract with the shipper that is awarding its volume. In some cases, shippers will also contract with backup carriers as a contingency plan (Sullivan, 2022). A contingency plan is required when the primary carrier on the lane rejects a tender. It is common for shippers to practice a "coverage" procurement strategy (Acocella & Caplice, 2022). In a coverage strategy, a shipper includes all its lanes with any amount of forecasted volume in its RFP to carriers. No lanes are excluded from the reverse auction in the hope that all forecasted freight will move at the contracted rates, offering predictability to the shipper's overall transportation costs.

## 2.4 Overview of Truckload Procurement – Execution Phase

A shipper's formal strategic procurement process, such as an RFP, will heavily influence its decision-making in execution. It is standard for shippers to take the results of their RFP and create routing guides at the lane level. A routing guide enables automated tender execution

through a “waterfall” process (DAT Freight & Analytics, 2022). In a waterfall, the load is first tendered to the primary carrier(s), and if the load is rejected, it is offered to subsequent backup carriers in the routing guide.

There are four paths for a tender (Zheng & Oliver, 2023). The first path is that a primary carrier accepts the load at the previously contracted rate per the strategic RFP. This is the only scenario where the tender is executed as strategically forecasted and planned. It is the desired outcome for any shipper that holds strategic procurement events.

The second path is that the primary carrier rejects the tender and a backup carrier accepts the load at the previously contracted rates per the strategic RFP. Backup carriers tend to have higher contracted rates than primary carriers (Aemireddy & Xiyang, 2019), so this path is a less desirable outcome for a shipper.

The third path occurs if the load is rejected by both primary and backup carriers. Once this happens, the load will go “off-waterfall” to the spot market. In this situation, loads materialize on an awarded lane but cannot be supported by any carrier under contract. Typically 10–12% of all contracted freight follows this path to the spot market due to primary and backup carrier rejections, although this number can reach 20–25% in tight markets (Berman, 2022). The spot market typically operates on a load-by-load basis where the price is determined at the time of transaction unlike an annual RFP (Acocella & Caplice, 2023). Moreover, spot market rates tend to be, but are not always, more expensive for shippers, requiring a 25–35% premium above a typical contract rate (Sullivan, 2022). Shippers can engage with the spot market in several ways: non-asset carriers (brokers), digital exchanges, and asset-based carriers that are not under contract. In this scenario, the tender is not executed per its procurement strategy.

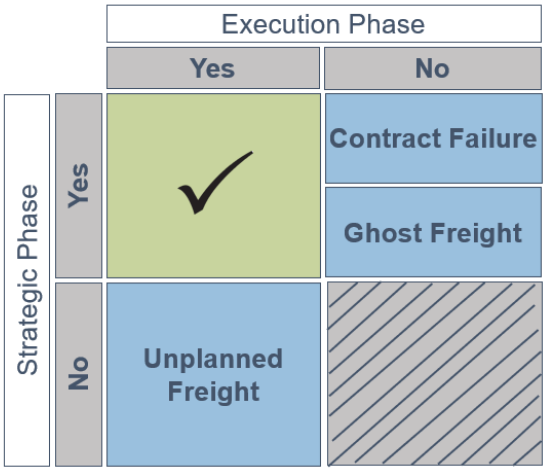
The fourth path to consider is a load that appears after the strategic procurement event, referred to as an unplanned lane (Acocella & Caplice, 2022). This type of volume does not have a contracted rate as part of an RFP but needs to be serviced from the shipper’s perspective. Again, this is a case in which the tender was not executed per its procurement strategy as it was unplanned volume not captured in the RFP.

Outside of these four paths for a tender, there is an alternative scenario to consider in which a load never materializes. Because a tender does not exist, it cannot follow one of these paths. In this scenario, volume is awarded to a carrier during an RFP, and a routing guide is established with primary and backup carriers, but no loads ever materialize to be tendered

(Acocella & Caplice, 2022). This type of freight is known as “ghost freight.” In this case, the tender is not executed following the shipper’s procurement strategy.

In this research, the focus will be on the second, third, and fourth scenarios outlined: contracted volume that had to go “off-waterfall” to the spot market (contract failure), contracted volume that was awarded but never actually materialized (ghost lane), and volume that was not known about at the time of the strategic procurement event but appeared later in the fiscal year (unplanned lane)**.** The research is targeting these scenarios because they highlight the disconnect between strategy and execution in truckload procurement. For example, a firm following the “coverage” strategy assumes that, after its RFP, all its forecasted freight costs are accurately represented through its newly contracted rates. When the rubber meets the road, though, these three scenarios will cause severe deviations from the contracted rates that feed into a shipper’s transportation budget (Bandaru, 2020). These instances of failure are depicted in Figure 1’s matrix. This matrix was created solely for the purpose of this research.

Figure 1: Instances of Strategic Failure Upon Load Execution




## 3. METHODOLOGY

This chapter outlines both types of primary research methods used in the analysis: surveys and interviews. All analysis relies on empirical observations within the given data sources. The chapter first summarizes data collection across the research methods, then reviews each data source separately in the following sections: Data Collection & Analysis, Survey, and Semi-Structured Interviews.

### 3.1 Data Collection & Analysis

A survey of shippers served as the primary data source to identify "state-of-the-practice" behaviors in truckload procurement (see Research Question One in Section 1.3). Semi-structured interviews with shippers served as the primary data source to highlight "state-of-the-art" behaviors in truckload procurement (see Research Question Two in Section 1.3). All data sources utilized were limited in scope to full truckload movements in North America.

### 3.2 Survey

The survey contained a series of multiple-choice, multiple-select, matrix, constant-sum, and open-ended questions on truckload procurement. Survey distribution occurred via LinkedIn and email, resulting in 396 unique responses. Anonymity was guaranteed for all participants. Of the 396 responses, only 299 participants had experience with truckload procurement in North America. The analysis utilized data from all 299 participants; however, the response rate varied with questions later in the survey. Therefore, not every question received 299 submissions. For a detailed report on the question response rate, please refer to Appendix A.

Of those 299 participants, 172 submitted their respective industry, annual FTL spend, and job title information. Participants with less than 50MM in annual FTL spend were categorized as Small. Shippers with spend between 50MM and 500MM were categorized as Large. Any response above 500MM in spend was classified as Mega.

Overall, the survey result is skewed towards larger firms, as 74% of participants who reported this information reported spend greater than 50MM. Job titles of respondents included, but were not limited to, Director of Transportation, Director of Logistics, Logistics Manager, Director of Procurement, Chief Logistics Officer, and Transportation Sourcing Analyst. A breakdown of survey participants' industry and annual spend categories can be found in Figure 2. All industry types are straightforward with the possible exception of Industrial. For this research, Industrial includes aerospace, cement and metal fabrication, construction, and automotive parts.

Figure 2: Survey Participants by Industry and Annual FTL Spend

| FTL Spend Category | Food & Beverage | Industrial | Consumer Goods | Retail | Paper/Packaging | Other | Grand Total |
|---|---|---|---|---|---|---|---|
| Small | 25.0% | 25.0% | 22.7% | 9.1% | 6.8% | 11.4% | 100.0% |
| Large | 30.6% | 25.9% | 14.1% | 16.5% | 5.9% | 7.1% | 100.0% |
| Mega | 39.5% | 9.3% | 11.6% | 18.6% | 2.3% | 18.6% | 100.0% |
| **Total** | **31.4%** | **21.5%** | **15.7%** | **15.1%** | **5.2%** | **11.0%** | **100.0%** |

Examples of the survey questions are outlined below (see Appendix A for the complete list):

- How would you describe the frequency of your procurement process? Select all that apply. [Multiple Select]
- What is the typical length of contracts resulting from a procurement event? [Multiple Choice / Open-Ended]
- How much annual volume does a lane need to have to be included in an annual RFP? [Open-Ended]

While the survey collected data on truckload procurement practices, it also identified participants willing to engage in semi-structured interviews. In total, 91 participants volunteered for an interview.

**3.3 Semi-Structured Interviews**

The semi-structured interviews provided greater context and detail of shipper behaviors identified through the survey. Each interview had three focus areas:

1. Capture each shipper's truckload procurement practices, in both the strategic and execution phases of truckload procurement (outlined in Sections 2.3 and 2.4).
2. Highlight truckload procurement practices, in both the strategic and execution phases of truckload procurement, that may represent "state-of-the-art" shipper behaviors.
3. Identify the utilization, or lack thereof, of lane segmentation analysis in each shipper's truckload procurement practices.

Out of 91 survey respondents who signaled interest in further research participation, 47 engaged in a semi-structured interview. Interviews were considered valid for analysis if at least 60% of possible questions were asked and answered (see the full list of questions in Appendix B). After setting this threshold, only 44 of the interviews remained viable for analysis. From the 44 viable interviews, 41 participants consented to audio and visual recording as well as automated transcript capture. Each interview lasted between 45 minutes and one hour. Complete anonymity was guaranteed to all participants.

To identify "state-of-the-art" procurement behaviors across shippers, each interview was scored using a framework consisting of three categories: Technology, Process, and People (see Research Question Two in Section 1.3). Technology as a category focuses on data availability and access. Process as a category focuses on organizational discipline to utilize data and recognize differentiated network needs. People as a category focuses on the level of information

shared with carriers. Each category consists of questions aimed at measuring a shipper's truckload procurement capabilities in that category. Example questions in each category are outlined below (see Appendix B for a complete list).

Technology Category (Yes = 1, No = 0, Unasked/Unanswered = Excluded from Category Score)

- Does your organization utilize historical shipment data to generate procurement events?
- Does your organization utilize secondary analysis or data cleaning to the historical data before hosting the procurement event?
- Does your organization utilize output from a Sales & Operations Planning cycle to define freight needs in procurement events regularly?

Process Category (Yes = 1, No = 0, Unasked/Unanswered = Excluded from Category Score)

- Does your organization have a defined strategy for procurement of low-volume lanes?
- Does your organization have a defined strategy for procurement of highly seasonal lanes?
- Does your organization utilize characteristics other than total volume to segment your network?

People Category (Yes = 1, No = 0, Unasked/Unanswered = Excluded from Category Score)

- In your procurement events, do you share more information than the minimum requirements needed to run a lane?
- Does your organization provide directional feedback to carriers during or after a procurement event?
- Are changes in the network (increased or lost volume on a lane) monitored and communicated to carriers before the carrier reaches out?

Shippers received a score in each category based on the number of questions in that category that were asked and answered during the interview. The lowest possible score was 0, and the highest possible score was 1. This suggests that shippers who exhibit a greater number of the identified procurement capabilities are represented in the sample as "state-of-the-art." In contrast, shippers who exhibit fewer "state-of-the-art" practices earn lower scores and instead represent "state-of-the-practice" in the sample. The category score per shipper interview formula is: $\frac{Sum\ of\ Binary\ Responses\ to\ Answered\ Questions\ (1=Yes,0=No)}{Count\ of\ Total\ Answered\ Questions}$ Therefore, a shipper's category score was not penalized if the number of asked and answered questions differed from that of

interviews with other shippers. This process resulted in a "contribution per question, per category" in each shipper interview. The difference in "contribution per question, per category" among two shipper interviews in the People category is demonstrated in Figure 3.

Figure 3: Contribution Per Question, Per Category Calculation

```
Category: People, Interviewee: ID__1
Total Questions: 13
Contribution per Question: 0.08
Score: 0.64
Category: People, Interviewee: ID__10
Total Questions: 14
Contribution per Question: 0.07
Score: 0.98
```

Once a shipper received a score for each category, an aggregate score was calculated using a weighted sum. For the initial analysis, each category received an equal weight of .33 in the calculation of the aggregate score. Each aggregate score is a continuous number between 0 and 1. Consistent with the category calculation, shippers with scores closer to 1 are considered in the sample to exhibit "state-of-the-art" behaviors. Shippers with aggregate scores closer to 0 are considered in the sample to exemplify more common "state-of-the-practice" behaviors.

## 4. RESULTS

Once the Technology, Process, and People scoring framework was applied to each interview, the shippers could be compared by both category and aggregate scores. By assigning a numerical value to each shipper, practices that frequently influenced scores could be used to differentiate between "state-of-the-practice" and "state-of-the-art" behaviors. Combined with the survey response data, it is these differentiating practices that address Research Questions 1 and 2 (see Section 1.3).

### 4.1 Establishing "State-of-the-Practice"

Practices that appeared most often in the survey and interview data are outlined in sections 4.1.1, 4.1.2, and 4.1.3 according to their assigned framework category. To further emphasize the focus of each category, questions have been added to the categories. For example, "Do You Have It?" is associated with the Technology category. The "It" alludes to data, information, and systems. Subsequently, the Process category follows with "Do You Use It?" This implies that using data to understand differentiated network needs is required to effectively build out procurement processes. Lastly, the People category trails with "Do You Share It?" This

suggests that the final piece of this framework is to share the data with a shipper's carriers. Each question is meant to refer to ideal shipper behaviors in that category.

### 4.1.1 Technology – Do You Have It?

The analysis of practices in this category illustrated the importance of "having" data in truckload procurement. A few of the most relevant insights in the Technology category are highlighted in this section.

A core element of all truckload procurement events is data; therefore, many of the significant takeaways in the Technology category are related to the underlying data used to support procurement events. Shippers are largely using historical data to generate procurement events – 91% report relying solely upon the previous year's data. Furthermore, only limited analysis is done on this historical data before an event. According to the interviews, 85% of shippers apply simple arithmetic such as percentage changes at the lane or aggregate level to spot any errors before opening the procurement event. Lastly, shippers tend to engage other functions beyond transportation/logistics in collecting and analyzing the data. Roughly 67% of the shippers interviewed stated their data was cross-functional.

### 4.1.2 Process – Do You Use It?

The analysis of practices in this category showed the importance of discipline and "using" data in procurement processes. A few of the most relevant insights in the Process category are highlighted in this section.

While data may act as the foundation for a successful procurement strategy, the organizational discipline needed to take advantage of this data is also critical for success. Shippers realized this level of discipline when their processes were directly tied to available data within their organization. For example, 80% of shippers utilize their historical lane data to tailor a low-volume strategy to their networks. A low-volume strategy is defined in this research as the setting of a threshold for a lane's annual volume. This threshold then influences the truckload procurement strategy of a given lane. The most common threshold among research participants was 50-52 loads per year. The perception was that if a lane had approximately one load per week, the volume had both the consistency and business criticality required to be included in a procurement event. Another major focal point of the Process category was the frequency of procurement events as well as the length of contracts resulting from those events. The most common practice of event frequency was the combination of an annual event with standing or

ad-hoc “mini” events (bids) throughout the year to account for changes in a shipper’s network. An annual event typically covered a shipper’s entire network and required several months of preparation. A “mini” bid was usually confined to a small number of lanes that needed new contracts due to volume changes, origin/destination changes, or carrier performance concerns. Lastly, the resulting contracts from those procurement events also tended to be 12 months (annual) in length. Although 12-month contracts are still the most prevalent, shorter contracts are becoming more common. The second most popular practice in contract lengths was a 6-month term.

### 4.1.3 People – Do You Share It?

The analysis of practices in this category demonstrated the importance of willingness to collaborate and “share” information with business partners (carriers). A few of the most relevant insights from the People category are highlighted in this section.

Data, and the discipline to put that data to work, lay the groundwork for the ability and willingness to share those findings with a shipper’s business partners. Shared visibility is the central theme in the People category, and this is demonstrated primarily through the common practices of carrier relationship management in truckload procurement.

This visibility begins at the procurement event. Shippers start by sharing the minimum information necessary for a carrier to service a lane. This includes expected annual volume, origin/destination, hazardous materials classification, and equipment specifications. Within the multiple rounds of an event, 89% of shippers claim they share directional feedback with carriers regarding their bids. The most common example of this feedback was a “stoplight” approach, where green meant the carrier was competitive on their bid, yellow meant the carrier could be competitive if the submitted rate was reduced, and red meant the carrier’s bid was not competitive due to rate or service. Other examples of this between-round feedback were ranking systems based on submitted rates for the lane.

Once the event is over, shippers do not reach out to carriers with feedback first. Carriers are typically the party following up to understand why they were or were not awarded volume. Roughly 85% of shippers state they provide feedback to carriers if the carrier reaches out first. In this example, visibility and shared information are reactive. Following the procurement event, the next opportunity for collaboration is carrier performance management. Nearly all (88%) of shippers communicate and report on KPIs to their carriers. While terminology varied from firm

to firm, tender acceptance and on-time delivery (OTD) were the most commonly tracked measures. The target for 58% of shippers for tender acceptance is between 95-100%. The target for over 72% of shippers for OTD is also between 95-100%.

### 4.2 Identifying "State-of-the-Art"

Summary statistics against the shipper aggregate scores demonstrated that 75% of the interviews had an aggregate score of .80 or lower. For this reason, .80 became the distinction between "state-of-the-practice" and "state-of-the-art" in the sample.

#### 4.2.1 Technology – Do You Have It?

The differentiating factors in this category became the availability and accessibility of data for a shipper. The shippers that 1) had the data in the first place, and were 2) able to access that data quickly ultimately excelled in this category. These qualities highlight "state-of-the-art" behaviors in this space.

Availability and accessibility of data in this vertical are emphasized by practices like updated forecasts, ghost lane reporting (see Section 2.4 for term definition), and the regular utilization of Sales and Operations Planning (S&OP) output. First, only 33% of shippers are providing regular forecast updates to carriers regarding their freight needs. This practice's execution is not hinged on forecast accuracy; instead, it relies upon discipline and realistic planning horizons. For example, any given forecast for the next 13 weeks is likely more accurate than any given forecast for the next 52 weeks. Interviewee 16 emphasizes how an organization can be practical about updating forecasted freight needs in the Retail industry: "Forecast volume for everyone in retail is terrible … it is less terrible in a 13-week window." By providing updated forecasts for seasonal volume every 13 weeks, this shipper can procure freight more effectively than its peers.

Second, only 37% of shippers are tracking ghost lanes. Ghost rates are detrimental to shippers in two ways: 1) they represent time and resources spent procuring capacity for volume that was never needed and 2) ghost lanes in a network lead to higher contract rates in following years (Acocella & Caplice, 2022). This is exemplified by Interviewee 30, who wants to begin tracking ghost lanes and states, "It'd be nice to track ghost volume—we're probably lying to our carriers."

Third, many shippers do not trust forecast data from their respective S&OP cycles. However, the highest-scoring shippers were able to consistently reference the latest S&OP

output and translate it to the truckload equivalent. This sentiment is expressed by Interviewee 11, who said, “The forecast was always historicals plus 10%, but that never works … I just don’t trust it.” While many shippers would prefer to incorporate S&OP data into their procurement events, many lack the trust in that data to justify its use.

#### 4.2.2 Process – Do You Use It?

The distinguishing factor in this vertical was a shipper’s recognition of differentiated needs in its network. The shippers who 1) understood that not every lane is created equally, and 2) developed processes to differentiate between lanes with dissimilar needs outperformed in this category. These characteristics highlight “state-of-the-art” behaviors in this category.

A shipper’s understanding of network differentiation was demonstrated in this category by practices like the implementation of a seasonal volume strategy and the segmentation of lanes by characteristics other than total volume. Only 38% of shippers reported having a process in place to address seasonal or surge volume within their network. Interviewee 16, a shipper that represented “state-of-the-art” practices across each category, stated, “[we] take out inconsistent freight from the annual bid and it allows us to be flexible in the market and the business…we carve out everything we think is seasonal.” By separating seasonal lanes as well as any seasonal volume within lanes from the rest of the network, this shipper was able to cater specifically to the surge in volume with a distinct procurement event. Interviewee 16 went on to discuss how this process benefits the procurement process for the more predictable volume in the network. With the variability removed from these lanes, the shipper claims to experience fewer mid-cycle rate adjustment requests as well as fewer tender rejections.

Shippers also demonstrated success in this category through lane segmentation by characteristics other than annual volume. These characteristics ranged from hard-to-serve facility locations, customer priority, volatility in volume, frequency of volume, and type of transportation leg (first-mile, middle-mile, or last-mile). In this research, first-mile represented inbound loads from a vendor to a shipper facility. Middle-mile usually referred to a move within a shipper’s network, such as a manufacturing facility to a distribution center. Last-mile meant a load moving from a shipper facility to a customer facility, such as a shipper distribution center to a customer’s physical store. Interviewee 32 suggests that segmenting lanes by some of these characteristics has saved significant amounts of time for its organization, time that can be spent on more strategic and business-critical initiatives, “We found segmentation of lanes to be

helpful, [we discovered] that if the volume is just not worth our time…it helped us focus on what matters." This same shipper claimed to reduce the time it takes to complete its RFP by one full week in addition to reducing the time required to update its routing guides by three weeks through segmentation analysis.

### 4.2.3 People – Do You Share It?

The deciding factor in this category was a shipper's awareness that providing more information enabled carriers to better service their network. The shippers who 1) recognized that a carrier knows its capabilities best and will make decisions accordingly and 2) realized that information sharing can mitigate risk scored well in this category. These qualities highlight "state-of-the-art" behaviors in this category.

A shipper's awareness of the importance of information sharing with carriers is demonstrated by the degree to which data is shared about its network in a procurement event. Information is shared at multiple parts of a procurement event.

The first opportunity for shippers to exemplify "state-of-the-art" visibility with carriers is at the time data is provided on a given lane for bidding to occur. For example, detailed information that shippers can share at this stage includes facility dwell time, facility hours of operation, and shipment actuals of the previous procurement cycle. If a carrier bids on and is awarded a lane after receiving only basic information, sometimes the carrier is surprised by the lane's requirements in reality. The actual requirements of the lane may cause a lane to no longer be appropriate business for that carrier, so that carrier may need to re-negotiate a higher rate on the lane, otherwise begin rejecting loads tendered to it. This is personified by Interviewee 42, "give carriers as much information as you possibly can so they give you the most competitive and accurate rates—hiding those things causes the most pain after an RFP." Similarly, from a carrier's (#3) perspective, "If we don't get that [dwell time] data, is it because they don't have it – or do they not want to share it? We get suspicious."

Another opportunity for shippers to share information with carriers in a procurement event is between rounds or after the conclusion of the award process. Shippers that shared the most data regarding event feedback went a step beyond the "stoplight" approach considered "state-of-the-practice." Instead, shippers shared target rate information of a like-carrier profile. For example, an asset-based carrier bidding on a lane would be provided with a target rate from a comparable, asset-based carrier. A rate from a broker or niche operator would not be considered.

Another instance of detailed procurement event feedback is what Interviewee 42 explains, "We may use our 3rd round to make sure our [strategic] partner doesn't get clobbered." This shipper will review the result of each procurement event to ensure their strategic carriers largely remain whole year-to-year. The reasoning provided by Interviewee 42 was this: if they drastically reduce a partner's volume to chase cost savings one year, the carrier won't help them the next year when the market inevitably changes.

**4.3 An Example: "State-of-the-Practice"**

While the Technology, Process, and People framework provides the structure for shippers to review their truckload procurement practices, it is critical to examine how these practices work together in aggregate for any given shipper. By identifying a single shipper in the sample and reviewing its practices in detail, the research supplies a realistic benchmark for comparison. Figure 4 highlights a shipper, Interviewee 39, that exemplified a "state-of-the-practice" aggregate score of .72, a median score within the sample. Interviewee 39 represented a firm in the Retail industry with annual FTL spend greater than 500 MM. The shipper held an annual procurement event with ad-hoc "mini bids" as required throughout the cycle.

To earn a "state-of-the-practice" score across the Technology, Process, and People categories, Interviewee 39 demonstrated "having," "using," and "sharing," in the following ways:

<u>Technology – "Do You Have It?"</u>

1. Nearly all data used in a procurement event is historical.
2. S&OP output is not considered unless a significant network change is expected, a rare occurrence.
3. Consistency metrics or additional lane characteristics are neither captured nor reported.

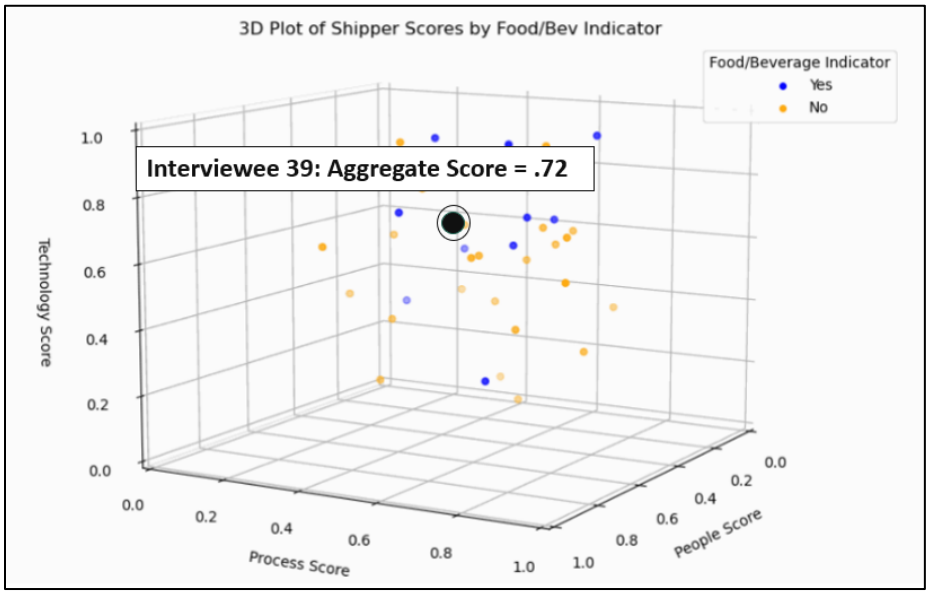
<u>Process – "Do You Use It?"</u>

1. The entire network is reviewed and included in a procurement event, regardless of volume or unique lane characteristics.
2. A low-volume strategy is in place, so any lane in the procurement event with < 12 loads/year is not awarded via contract after bidding.
3. When asked about network segmentation, the shipper stated, "No formal segmentation exists – we struggle with how to handle our tail spend." The differentiated need across its network is not yet understood or captured.

People – "Do You Share It?"

1. A monthly average of tenders on each lane is shared with carriers in a procurement event from the previous 12 months of lane history. This is instead of a single, annual average.
2. A multi-stop percentage of tenders on each lane is shared with carriers in a procurement event. For example, 10% of the tenders in the previous 12 months required two or more stops.
3. Feedback to carriers after a procurement event is only shared with incumbents and only upon carrier request.

Figure 4: 3D Plot of Shipper Aggregate Scores – "State-of-the-Practice" Example




### 4.4 An Example: "State-of-the-Art"

To emphasize the nuance between "state-of-the-practice" and "state-of-the-art," this section provides a review of a "state-of-the-art" shipper in the sample. While Section 4.3 identified a realistic benchmark for comparison, this section highlights idealistic behaviors to strive for. Figure 5 highlights a shipper, Interviewee 42, that exemplified a "state-of-the-art" aggregate score of .93, the highest score within the sample. Interviewee 42 represented a firm in the Retail industry with annual FTL spend greater than 500 MM. The shipper held an annual procurement event with standing, biweekly "mini bids."

To earn a "state-of-the-art" score across the Technology, Process, and People categories, Interviewee 42 demonstrated "having," "using," and "sharing," in the following ways:

Technology – "Do You Have It?"

1. Data used in a procurement event is a combination of historical information, forecast, and network optimization details.
2. S&OP output is utilized monthly to translate updated business needs to the truckload level.
3. Consistency metrics are captured and reported on each lane. For example, a lane may ship 52 loads annually, but all loads are shipped in a period of four weeks.

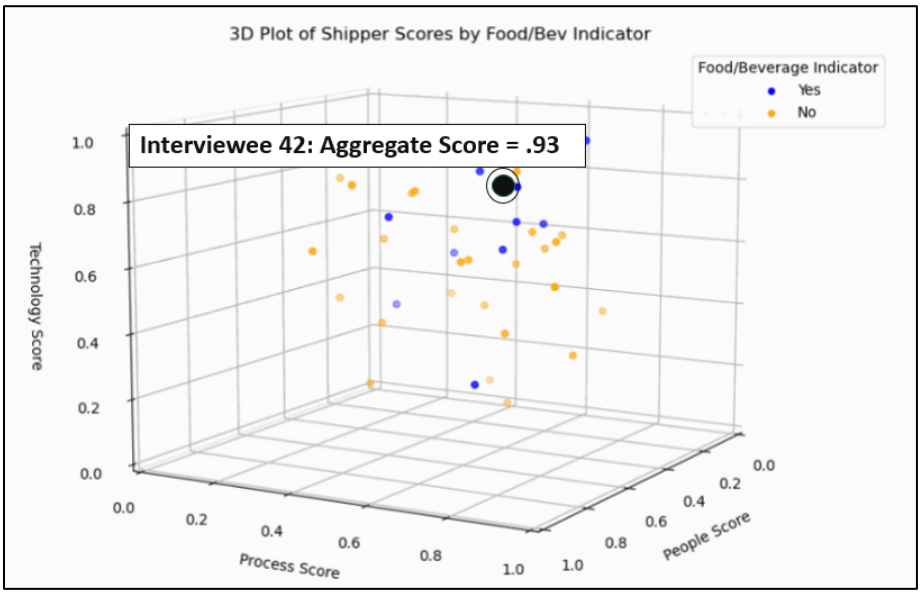
Process – "Do You Use It?"

1. Consistency metrics are used to separate volume from the annual procurement event. Instead, the inconsistent (surge/seasonal) volume is bid out in seasonal, mini events.
2. A low-volume strategy is in place, so any lane in the procurement event with <52 loads/year or ships <1 load/week is excluded from the annual procurement event.
3. When asked about its use of segmentation analysis, the shipper stated, "Segmentation only works if you hold the lanes to different expectations." The differentiated need across its network was not only understood but there was also an understanding of how that influenced carrier performance expectations.

People – "Do You Share It?"

1. Facility dwell time data and actual shipping details from the previous 12 months are provided to the carriers in a procurement event.
2. In a procurement event, carriers are provided with target rate information from a comparable carrier group. For example, a regional asset-based carrier would only receive rate information based on other regional, asset-based carriers.
3. Carriers are provided with regular performance scorecard updates with complete visibility of the performance of other carriers in the shipper's network. For example, Carrier A can see Carrier B's on-time delivery at the same time it reviews its metrics. Volume and pricing information is not disclosed, however.

Figure 5: 3D Plot of Shipper Aggregate Scores – "State-of-the-Art" Example




### 4.5 How Segmentation Analysis Bridges the Gap

While this research establishes "state-of-the-practice" and highlights what could be "state-of-the-art" in truckload procurement, it also identifies segmentation analysis's role in both. Using this research's distinction between "state-of-the-practice" and "state-of-the-art" as shippers with an aggregate score of .80 or higher, hypothesis one cannot be rejected (see Section 1.4 for hypothesis outline). Shippers in the "state-of-the-art" group were more likely to segment their network based on differentiated characteristics. Segmentation occurs informally as well as formally in shipper organizations. Informally, shippers utilize "tribal" or tacit knowledge of hard-to-serve facilities, priority of customers, or unique service requirements. Formally, shippers codify lanes via ABC analysis and create distinct procurement events for specific freight/lane characteristics.

Out of the 23 shippers that stated they practiced segmentation analysis on their networks, 43% of them segmented by customer. It appeared that shippers often allowed customer segmentation to drive the overall segmentation of their networks. For example, a customer that was a high priority for a shipper resulted in a higher priority segmentation of the lanes that serviced said customer. A "state-of-the-art" practice in the case of lane segmentation by customers also resulted in a matching service segmentation. For example, lanes servicing customer A may have 95% OTD requirements compared to lanes servicing lower priority customer B which have 80% OTD requirements. Interviewee 42 captures the sentiment of this

practice when he says, “Not every lane is built the same, and the KPIs should reflect that.” Several other shippers shared that segmentation of their networks allowed their procurement organizations to become more efficient and save time on procuring truckload capacity. With pre-defined strategies, formal or informal, in place to address specific freight/lane characteristics, shippers can more quickly procure capacity within their networks. This allows them to spend their time and resources on other strategic initiatives.

### 4.6 Food & Beverage Industry Comparison

Because Company A operates in the Food and Beverage space, the analysis included a focus on the comparison of procurement practices between the Food & Beverage industry and shippers of all other industries.

In general, firms in the Food & Beverage industry scored higher in aggregate than all other industries. Specifically, Food & Beverage firms outperformed in both the Technology and People categories by over 12%. The difference in performance in the Process vertical was not significant enough to draw insights from. Based on the interviews with shippers in the Food & Beverage space, their higher performance may be due to greater regulatory and service requirements of their customers. As opposed to the Retail or Consumer Goods industries, the Food & Beverage industry faces stricter regulations regarding consumers’ health and safety. For this reason, the more stringent requirements have likely demanded more sophisticated truckload procurement practices as it relates to the Technology, Process, and People categories.

Specifically, firms operating in the Food & Beverage industry have better data availability (Technology) and share more information (People) with their carriers. Of the Food & Beverage firms interviewed, 44% reported sharing detailed degrees of information with carriers during a procurement event (compared to 39% overall). Additionally, 71% stated they were proactively communicating contracted volume changes in their networks to the awarded carrier compared to 38% overall. Shippers in this space were also more likely to utilize S&OP output to influence their procurement strategy as well as regularly provide updated or rolling forecasts to carriers. Considering the elevated People and Technology scores of these shippers, it is unsurprising that they demonstrate higher levels of data accessibility and shared visibility in their procurement behaviors. While it may be intuitive considering the nature of the goods transported, it is still worth noting that players in this space reported procuring refrigerated trucks at a much higher rate (40%) than firms outside of Food & Beverage (<10%).

# 5. DISCUSSION

This section discusses the validity and feasibility of implementation of the claims outlined above on truckload procurement practices for shippers. The following recommendations provide potential next steps for shippers to migrate from "state-of-the-practice" to "state-of-the-art" in their truckload procurement practices. Lastly, the section will outline the limitations of this research as well as opportunities for future research in this focus area.

## 5.1 Recommendations

The key takeaway from this research is that the distinction between "state-of-the-practice" and "state-of-the-art" behaviors in truckload procurement is subtle. This means that even small changes in the Technology, Process, and People categories can have a significant impact on a procurement organization's effectiveness.

### 5.1.1 Technology – Have It

Small changes that shippers can make to "have" technologically "state-of-the-art" practices include:

1. Monitor and report on ghost lanes within the network.
2. Regularly utilize S&OP output to update forecasted freight needs within the network.
3. Engage in a more methodical and thorough analysis of historical data used to generate procurement events. For example, capture consistency and dwell time data.

### 5.1.2 Process – Use It

Small changes that shippers can make to design "state-of-the-art" processes that "use" that technology include:

1. Use lane data to identify distinct lane characteristics across the network.
2. Develop a distinct procurement strategy to account for differentiated needs across the network. For example, seasonal procurement events for seasonal volume.
3. Align differentiated service expectations for the differentiated needs across the network. For example, a last-mile lane to a customer requires 98% OTD compared to a first-mile lane from a vendor requiring 90% OTD.

### 5.1.3 People – Share It

Small changes that shippers can make to facilitate "state-of-the-art" "sharing" among people include:

1. Share between-round RFP feedback with carriers that goes beyond the basic "stoplight" approach.
2. Share all available lane information with carriers in an RFP, going beyond the minimum requirements needed to service and bid on a lane.
3. Proactively communicate changes in contracted volume with carriers, offering concessions or replacement volume where applicable.

## 5.2 Limitations

In this research, the primary limitations were sample bias and subjectivity in interpretation. Sample bias is a concern due to the demographics of survey and interview participants, especially because the survey and interviews produced the bulk of the primary data analyzed. Because the survey and interview participants were identified through DAT and MIT-affiliated networks, it is possible that this skewed the results in three ways.

First, shippers that regularly engage with academia and prioritize analytics are likely more aware of the latest innovations in procurement practices. For this reason, they may be more likely to implement those innovative practices and exhibit "state-of-the-art" behaviors compared to shippers who do not affiliate themselves with DAT or MIT. Therefore, the research findings could be inflated and misleading when generalizing the results to all shippers.

Second, 85% of survey participants and 79% of interview participants were from firms with greater than 50MM in annual truckload spend. Firms with a spend of less than 50MM are underrepresented in the survey data, and the presence of "mom-and-pop" operations (<500k in annual spend) is non-existent in the research.

Third, 40% of all participants were from three industries: Food & Beverage, Retail, and Industrial. Since industry type has a significant impact on product characteristics and, therefore, on lane characteristics, truckload procurement practices will vary widely among industries. For this reason, the research findings may not be as generalizable across various industries and instead may be more representative of Food and Beverage, Retail, and Industrial procurement strategies.

The final limitation is the subjectivity in the interpretation of the results. While the interview evaluation adhered to a scoring framework, each interview score is reflective of my understanding of a shipper's procurement behaviors. The framework quantified procurement capabilities at a binary, per-shipper level; however, the selection of capabilities for use in that framework is subjective. Moreover, the scoring framework assumes each capability is of equal value to the procurement organization. This is not always the case, as the importance of each category varies greatly among shippers.

### 5.3 Future Research

While this research was able to review a large number of shipper behaviors and practices in truckload procurement, it is important both to consider the carrier perspective as well as continue further analysis of lane segmentation features.

This research only briefly presents the carrier perspective on shippers' procurement practices, so this could be an area of focus for future research. Recreating this research on the carrier's role in truckload procurement would offer a holistic representation of the unique dynamics between these two parties, providing a more complete and thorough benchmarking of "state-of-the-practice" versus "state-of-the-art" behaviors.

To better pressure-test the findings of this research, longitudinal data that ties procurement event strategy and transactional reality throughout the year should be an area for future research. One hypothesis is that more information shared during a bid will result in fewer tender rejections and mid-cycle rate adjustments. This hypothesis specifically targets the contract failure instance of misalignment between strategic and execution phases (see Section 2.4). Data that would be needed to test this hypothesis includes, but is not limited to, transactional data on contracted lanes, details on in-cycle rate requests on contracted lanes, and tender acceptance data on those same contracted lanes.

## 6. CONCLUSION

### 6.1 "State-of-the-Practice" vs. "State-of-the-Art"

Detailed discussions with shippers illustrated the impact that small changes in behavior could have across the three categories evaluated: Technology, Process, and People.

In the Technology category, shippers exemplified "state-of-the-art" practices if they could demonstrate "having" data availability and accessibility. For example, "state-of-the-

practice" in most cases meant updating a shipper's forecasted freight needs only in the instance of a procurement event. Considering procurement events are held mostly annually, freight needs were only updated annually in these cases. "State-of-the-art" in this instance meant having the data available and accessible to update a shipper's forecasted freight needs more regularly, emphasizing the subtlety between "state-of-the-practice" and "state-of-the-art."

In the Process category, shippers embodied "state-of-the-art" practices if they could demonstrate "using" their data with discipline and understanding of differentiated needs across their networks. For example, "state-of-the-practice" in most instances meant treating the procurement of all lanes in a shipper's network largely the same. Since lane requirements and characteristics vary greatly within a network, it was a sign of "state-of-the-art" behavior if a shipper recognized this and was able to implement processes to address the differentiated needs. An example of this was separating highly seasonal volume from the consistent volume in the network and creating separate, smaller procurement events to address the difference in lane characteristics. Again, this example demonstrates the nuanced distinction that exists between "state-of-the-practice" and "state-of-the-art" procurement practices.

In the People category, shippers represented "state-of-the-art" if they could demonstrate a willingness to collaborate and "share" information with their carriers. For instance, "state-of-the-practice" in most cases meant sharing only essential information with carriers throughout a shipper's procurement process. If a shipper understood the value of shared visibility with its carriers, then the shipper tended to share detailed information beyond the basic details essential for service. This practice represented "state-of-the-art" in this category, again highlighting the small gap between "state-of-the-practice" in shipper procurement behaviors.

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## Appendix A: Survey Data

Appendix A1: Survey Questions and Response Rates

| Questions | Response Rate |
|---|---|
| This survey is focused on truckload transportation procurement in North America. Do you have experience in or knowledge of this topic? | 100% |
| Which departments are involved in transportation procurement in your firm? Select all that apply. - Selected Choice | 95% |
| Which departments are involved in transportation procurement in your firm? Select all that apply. - Other, please specify: - Text | 7% |
| Are the following functions in-house, outsourced, or both? - Transportation Procurement | 87% |
| Are the following functions in-house, outsourced, or both? - Transportation Planning | 87% |
| Are the following functions in-house, outsourced, or both? - Transportation Execution | 87% |
| Are the following functions in-house, outsourced, or both? - Carrier Management | 87% |
| Are the following functions in-house, outsourced, or both? - Freight Payment | 87% |
| How would you describe the frequency of your procurement process? Select all that apply. - Selected Choice | 85% |
| How would you describe the frequency of your procurement process? Select all that apply. - Other - Text | 10% |
| Do you pre-award any volumes to incumbent carriers prior to an RFP or annual procurement event? | 83% |
| What is the typical length of contracts resulting from a procurement event? - Selected Choice | 83% |
| What is the typical length of contracts resulting from a procurement event? - Other, please specify: - Text | 6% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity in the last 12 months? Total points should add to 100. - Private / Dedicated Fleet | 66% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity in the last 12 months? Total points should add to 100. - Traditional TL Contracts | 66% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity in the last 12 months? Total points should add to 100. - Index Based Contracts | 66% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity in the last 12 months? Total points should add to 100. - Dynamic Pricing (API) Relationship | 66% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity in the last 12 months? Total points should add to 100. - Open Spot Market | 66% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity in the last 12 months? Total points should add to 100. - Other, Please Specify: | 66% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity in the last 12 months? Total points should add to 100. - Other, Please Specify: - Text | 2% |

| | |
|---|---|
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity during the pandemic? Total points should add to 100. - Private / Dedicated Fleet | 66% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity during the pandemic? Total points should add to 100. - Traditional TL Contracts | 66% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity during the pandemic? Total points should add to 100. - Index Based Contracts | 66% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity during the pandemic? Total points should add to 100. - Dynamic Pricing (API) Relationship | 66% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity during the pandemic? Total points should add to 100. - Open Spot Market | 66% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity during the pandemic? Total points should add to 100. - Other, Please Specify: | 66% |
| What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity during the pandemic? Total points should add to 100. - Other, Please Specify: - Text | 2% |
| What is the approximate percentage of your for-hire truckload transportation shipments that move under these different types of providers? Total points should add to 100. - Asset Based Carriers | 66% |
| What is the approximate percentage of your for-hire truckload transportation shipments that move under these different types of providers? Total points should add to 100. - Non-Asset Based Brokers | 66% |
| What is the approximate percentage of your for-hire truckload transportation shipments that move under these different types of providers? Total points should add to 100. - Hybrid | 66% |
| What is the approximate percentage of your for-hire truckload transportation shipments that move under these different types of providers? Total points should add to 100. - Other | 66% |
| What is the approximate percentage of your truckload transportation shipments that move by equipment type? Total points should add to 100. - Dry Van | 65% |
| What is the approximate percentage of your truckload transportation shipments that move by equipment type? Total points should add to 100. - Temperature Controlled | 65% |
| What is the approximate percentage of your truckload transportation shipments that move by equipment type? Total points should add to 100. - Intermodal (TOFC/COFC) | 65% |
| What is the approximate percentage of your truckload transportation shipments that move by equipment type? Total points should add to 100. - Flatbed | 65% |
| What is the approximate percentage of your truckload transportation shipments that move by equipment type? Total points should add to 100. - Tank | 65% |
| What is the approximate percentage of your truckload transportation shipments that move by equipment type? Total points should add to 100. - Other, please specify: | 65% |
| What is the approximate percentage of your truckload transportation shipments that move by equipment type? Total points should add to 100. - Other, please specify: - Text | 3% |
| What is the approximate percentage of your truckload lanes that are defined at the following levels during a procurement event? Total points should add to 100. - 5 digit zip to 5 digit zip | 62% |

| | |
|---|---|
| What is the approximate percentage of your truckload lanes that are defined at the following levels during a procurement event? Total points should add to 100. - 3 digit zip to 3 digit zip | 62% |
| What is the approximate percentage of your truckload lanes that are defined at the following levels during a procurement event? Total points should add to 100. - City State to City State | 62% |
| What is the approximate percentage of your truckload lanes that are defined at the following levels during a procurement event? Total points should add to 100. - State to State | 62% |
| What is the approximate percentage of your truckload lanes that are defined at the following levels during a procurement event? Total points should add to 100. - Mixed (e.g., 5DZ to 3DZ, 3DZ to State, etc.) | 62% |
| What is the approximate percentage of your truckload lanes that are defined at the following levels during a procurement event? Total points should add to 100. - Other, please specify: | 62% |
| What is the approximate percentage of your truckload lanes that are defined at the following levels during a procurement event? Total points should add to 100. - Other, please specify: - Text | 5% |
| In your procurement events, which features do you use to segment the lanes within your network? Select all that apply. - Selected Choice | 62% |
| In your procurement events, which features do you use to segment the lanes within your network? Select all that apply. - Other, please specify: - Text | 4% |
| How much annual volume does a lane need to have to be included in an annual RFP? - # of Loads Annually | 60% |
| What is your target or expected primary carrier tender acceptance rate? | 60% |
| What is your target or expected On-Time Delivery (OTD) performance for your carriers? | 59% |
| What is your company's primary industry? - Selected Choice | 58% |
| What is your company's primary industry? - Other, please specify: - Text | 6% |
| What is your firm's annual spend on truckload transportation? | 58% |
| Name and contact information - First name | 45% |
| Name and contact information - Last name | 45% |
| Name and contact information - Email address | 45% |
| Name and contact information - Phone number (U.S.) | 34% |
| Name and contact information - Title of Current Role | 43% |
| Would you be willing to talk in more detail about your transportation operations directly with the research team? | 45% |

Appendix A2: Survey Response Summary by Question

| Question ID | Question | Total # of Responses | Majority or Average Response |
|---|---|---|---|
| 1 | This survey is focused on truckload transportation procurement in North America. Do you have experience in or knowledge of this topic? [Multiple Choice] | 396 | 299 = Yes; Analysis is limited to these responses. |
| 2 | Which departments are involved in transportation procurement in your firm? Select all that apply. [Selected Choice] | 284 | Top responses in descending order of popularity: Logistics, Supply Chain, Procurement. |
| 2a | Other, please specify: [Text] | 22 | The top 'Other' response was the inclusion of a separate, standalone Transportation function. |
| 3 | Are the following functions in-house, outsourced, or both? [Transportation Procurement] | 259 | 78% in-house. |
| 3a | [Transportation Planning] | 259 | 76% in-house. |
| 3b | [Transportation Execution] | 259 | 58% in-house. 24% purely out-source |
| 3c | [Carrier Management] | 259 | 74% in-house. |
| 3d | [Freight Payment] | 259 | 56% in-house. 22% outsource, 22% utilize a mix. |
| 4 | How would you describe the frequency of your procurement process? Select all that apply. [Selected Choice] | 254 | The most popular response was the use of an 'Annual' event in combination with 'Mini bids as needed.' |
| 4a | Other [Text] | 29 | The top 'Other' response was a 6-month bid cycle. |
| 5 | Do you pre-award any volumes to incumbent carriers prior to an RFP or annual procurement event? [Multiple Choice] | 249 | Responses were split evenly between 'Yes' and 'No.' Larger firms tended to pre-award more, however. |
| 6 | What is the typical length of contracts resulting from a procurement event? [Selected Choice] | 248 | The most popular response was 1-year contracts (48% of all responses). The second most popular response at 21% was <1-year contracts. |

| | | | |
|---|---|---|---|
| 6a | Other, please specify: [Text] | 18 | The top 'Other' response was the comment of a 6-month contract. |
| 7 | What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity **in the last 12 months**? Total points should add to 100. [Private / Dedicated Fleet] | 196 | 14.7%. |
| 7a | [Traditional TL Contracts] | 196 | 62.3%. |
| 7b | [Index Based Contracts] | 196 | 1.64%. |
| 7c | [Dynamic Pricing (API) Relationship] | 196 | 5%. |
| 7d | [Open Spot Market] | 196 | 15.5%. |
| 7e | [Other, Please Specify] | 196 | <1%. |
| 7f | Other, Please Specify: [Text] | 6 | The responses mentioned customer and vendor backhaul agreements. |
| 8 | What was the approximate percentage of your truckload transportation shipments that moved under these different types of capacity **during the pandemic**? Total points should add to 100. [Private / Dedicated Fleet] | 196 | 14.5%. |
| 8a | [Traditional TL Contracts] | 196 | 52%. |
| 8b | [Index Based Contracts] | 196 | 2%. |
| 8c | [Dynamic Pricing (API) Relationship] | 196 | 3.7%. |
| 8d | [Open Spot Market] | 196 | 25.2%. |
| 8e | [Other, Please Specify] | 196 | 2.3%. |
| 8f | Other, Please Specify: [Text] | 6 | The responses mentioned customer and vendor backhaul agreements or 3PL engagement. |
| 9 | What is the approximate percentage of your for-hire truckload transportation shipments that move under these different types of providers? Total points should add to 100. [Asset Based Carriers] | 196 | 59%. |
| 9a | [Non-Asset Based Brokers] | 196 | 29%. |
| 9b | [Hybrid] | 196 | 9.8%. |
| 9c | [Other] | 196 | 2%. |

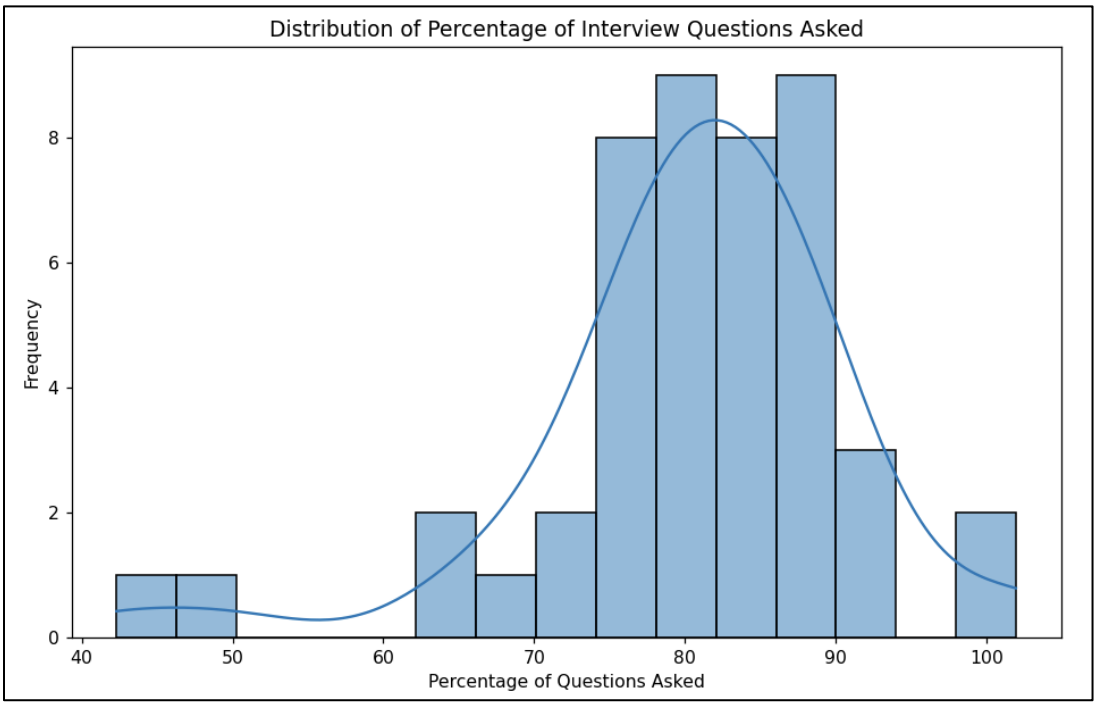
| | | | |
|---|---|---|---|
| 10 | What is the approximate percentage of your truckload transportation shipments that move by equipment type? Total points should add to 100. [Dry Van] | 196 | The average was 60%. |
| 10a | [Temperature Controlled] | 196 | The average was 15.5%. |
| 10b | [Intermodal (TOFC/COFC)] | 196 | The average was 11.7%. |
| 10c | [Flatbed] | 196 | The average was 8.5%. |
| 10d | [Tank] | 196 | The average was 3.2%. |
| 10e | [Other, please specify] | 196 | The average was <1%. |
| 10f | Other, please specify: [Text] | 10 | The responses mentioned specialized equipment like dump trucks and Conestoga. |
| 11 | What is the approximate percentage of your truckload lanes that are defined at the following levels during a procurement event? Total points should add to 100. [5-digit zip to 5-digit zip] | 196 | The average was 46%. |
| 11a | [3-digit zip to 3-digit zip] | 196 | The average was 14%. |
| 11b | [City State to City State] | 196 | The average was 20%. |
| 11c | [State to State] | 196 | The average was 7.5%. |
| 11d | [Mixed (e.g., 5DZ to 3DZ, 3DZ to State, etc.)] | 196 | The average was 6.5%. |
| 11e | [Other, please specify] | 196 | The average was 5.5%. |
| 11f | Other, please specify: [Text] | 14 | The responses mentioned defining at the zone level, address level, or country level in the case of CAN/USA. |
| 12 | In your procurement events, which features do you use to segment the lanes within your network? Select all that apply. [Selected Choice] | 185 | The top response was segmentation by 'Annual Volume.' This was followed by 'Service Needs'. A minority of responses mentioned 'Type of good being transported,' but neither this nor were variability/frequency metrics relied on significantly. |
| 12a | Other, please specify: [Text] | 13 | The top 'Other' response was segmentation by Customer. |

| | | | |
|---|---|---|---|
| 13 | How much annual volume does a lane need to have to be included in an annual RFP? [# of Loads Annually] | 178 | The top responses in descending order of popularity were 52 loads/year, 50 loads/year, 24 loads/year, and 12 loads/year. |
| 14 | What is your target or expected primary carrier tender acceptance rate? [Multiple Choice] | 178 | The most popular response was a target between 95-100%. |
| 15 | What is your target or expected On-Time Delivery (OTD) performance for your carriers? [Multiple Choice] | 178 | The most popular response was a target between 95-100%. |
| 16 | What is your company's primary industry? [Selected Choice] | 172 | The top industries in descending order of popularity were Food & Beverage, Industrial, Consumer Goods, and Retail. |
| 16a | Other, please specify: [Text] | 19 | The responses mentioned several governmental organizations, industrial firms, commodities, and automotive suppliers. |
| 17 | What is your firm's annual spend on truckload transportation? [Multiple Choice] | 172 | 74% of firms who responded stated their annual spend was greater than 50 MM. |
| 23* | Would you be willing to talk in more detail about your transportation operations directly with the research team? [Multiple Choice] | 135 | 67% of participants volunteered for a follow-up interview. |

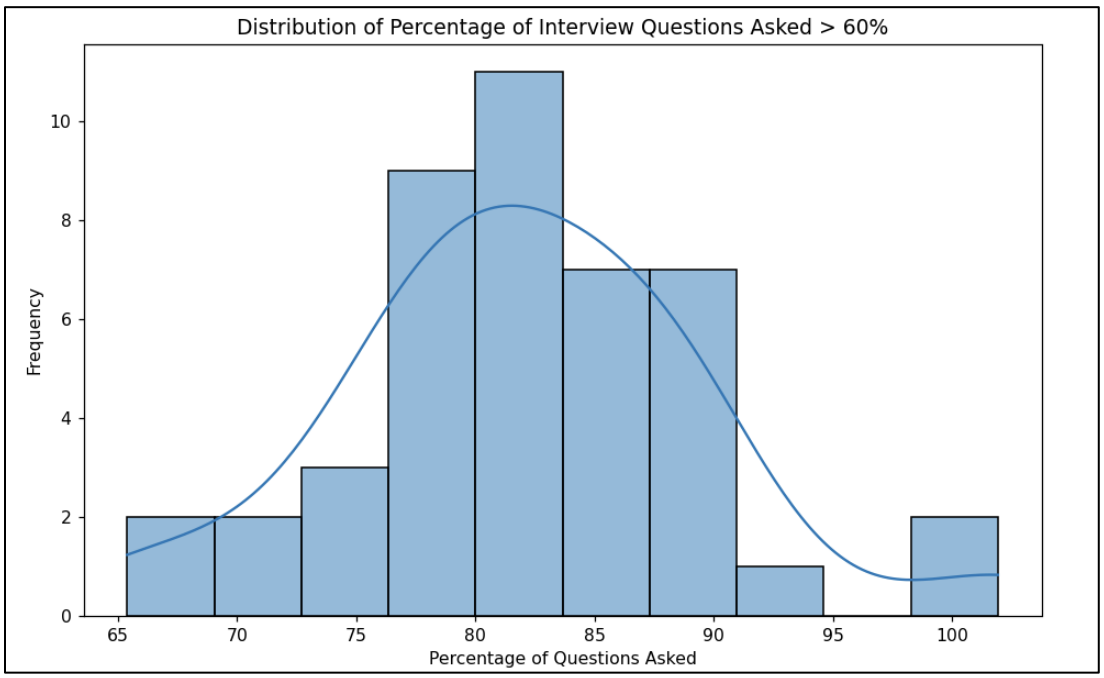
**Questions 18-22 asked for participant names, titles, and participant contact information.*

## Appendix B: Semi-Structured Interview Data

Appendix B1: Interview Question Distribution




Appendix B2: Interview Question Distribution > 60%



Appendix B3: Interview Questions

| Question | Question Category |
|---|---|
| Do you hold an annual procurement event? | Descriptive |
| Do you describe your provider type strategy as decreasing broker usage or identify as asset-biased? | Descriptive |
| Do you hold monthly procurement events? | Descriptive |
| Do you hold bi-yearly (6-month) procurement events? | Descriptive |
| Do you hold quarterly procurement events? | Descriptive |
| Do you hold continuous procurement events? | Descriptive |
| Do you hold "mini bids?" (Ad Hoc or Standing) | Descriptive |
| Does the shipper proactively share post-bid feedback? | People |
| Do you share at least origin, destination, and annual expected volume of a lane in the procurement event? (The minimum requirements to service a lane.) | People |
| Do you provide feedback to carriers at all during an RFP? | People |
| If you do provide feedback during an RFP, is it only directional? ("Stoplight" Approach) | People |
| Do you only share feedback to a carrier after an RFP if requested by the carrier first? | People |
| Do you engage in proactive (standing/regular meetings) relationship reviews with your carriers? | People |
| Do you have formal carrier performance expectations outlined? (KPIs) | People |
| Do you have a formal corrective action plan outlined for carriers who miss KPIs? | People |
| Do you have strategic goals to working with different provider types (brokers vs. asset-based)? | People |
| Do you share historical shipping data in a procurement event? | People |
| Do you share information beyond minimum requirements or historical data in a procurement event? | People |
| Do you provide beyond directional feedback during or after an RFP? | People |
| Do you proactively communciate award or volume changes to carriers? (Rather than waiting for the carrier to reach out on excesss/missing volume first.) | People |
| Do you informally segment or tier your carrier partners? | People |
| Do you formally segment or tier your carrier partners? | People |
| Do you offer specialized benefits to your strategic carrier partners? (Load boards, for example). | People |
| If you offer a load board internally, is it a formal process? (Rather than manually calling or email incumbents.) | People |
| Is transportation procurement managed in-house? | Process |
| Is transportation execution managed in-house? | Process |
| Is carrier management managed in-house? | Process |
| Do you pre-award volume to carriers before a procurement event? | Process |
| Do you utilize characteristics aside from total volume to segment or define your network? | Process |
| Does this segmentation influence procurement strategy at all? (Frequency, size, etc.) | Process |
| Is transportation procurement informed of internal network changes? | Process |
| Is transportation procurement consulted with internal network changes? | Process |

| | |
|---|---|
| Is there a distinction made between service contract and rate contract? (Are contracts evergreen with rate addendums?) | Process |
| Is truckload procurement separate from indirect procurement? | Process |
| Does truckload procurement report through supply chain? | Process |
| Do you have a low volume procurement strategy? | Process |
| Do you have a surge or seasonal volume procurement strategy? | Process |
| Do you utilize a TMS? | Technology |
| Do you use EDI functionality for full truckload tender transmission? | Technology |
| Do you apply cleaning or secondary analysis to the data used in the procurement event? | Technology |
| Do you use only historical data in your procurement events? | Technology |
| Do you engage other departments in collecting and analyzing procurement event data? | Technology |
| Do you utilize track-and-trace technology? | Technology |
| Do you measure and report on ghost lanes? | Technology |
| Are tenders automatically sent to carriers? (Not a manual routing guide or excel process.) | Technology |
| Do you use API functionality for full-truckload tender transmission? | Technology |
| Do you track tenders awarded against actual tenders? | Technology |
| Do you provide updated, rolling freight forecasts to your carriers? | Technology |
| Is S&OP output regularly used to influence procurement events? | Technology |
| Do you utilize a transportation procurement tool? (Rather than using just excel.) | Technology |
| Do you measure unplanned lanes? | Technology |
| Do you measure unplanned lanes on a regular reporting schedule? | Technology |

Appendix B4: Category Score Per Question Contribution

| Category | Average Contribution Per Question |
|---|---|
| **People** | 0.08 |
| **Process** | 0.10 |
| **Technology** | 0.09 |

Appendix B5: Category and Aggregate Score Summary Statistics

| | count | mean | std | min | 25% | 50% | 75% | max | CV |
|---|---|---|---|---|---|---|---|---|---|
| **People** | 44.0 | 0.70 | 0.18 | 0.29 | 0.57 | 0.74 | 0.82 | 1.00 | 25.75 |
| **Technology** | 44.0 | 0.69 | 0.24 | 0.14 | 0.47 | 0.70 | 0.90 | 1.00 | 34.61 |
| **Process** | 44.0 | 0.68 | 0.19 | 0.27 | 0.55 | 0.71 | 0.82 | 1.00 | 27.58 |
| **Aggregate Score** | 44.0 | 0.68 | 0.15 | 0.36 | 0.57 | 0.71 | 0.80 | 0.94 | 22.36 |

Appendix B6: Additional Interview Findings by Category

| Question Category | Key Insights | Relevant Quotes | Interviewee ID |
|---|---|---|---|
| People | Only 15% of shippers reported sharing feedback with a carrier proactively after a procurement event. This means that in most cases, carriers reach out to request feedback first. | "Time is money. If we have to spend time explaining to someone why we aren't giving them freight, then it's time away from something else." | ID_35 |
| People | Shippers frequently provided between-round feedback to carriers during an RFP, but it was usually limited to directional feedback like a "stoplight" or ranking approach. | "I'm not from the school of providing garbage bs rate targets because it doesn't mean anything to carriers." | ID_42 |
| People | 75% of shippers identified as asset-biased or working towards reducing their reliance on non-asset carriers. | "I don't like brokers because they have no skin in the game." | ID_30 |
| People | The majority of shippers share only an average annual number of loads in a procurement event for a lane. It was considered "state-of-the-art" to share even a monthly breakdown or, better yet, detailed shipment actuals from the previous 12 months. | "Out carriers don't care about getting in the weeds with monthly figures."<br><br>"I don't think we would want to give them weekly historicals, because there's no guarantee it will happen again." | ID_26; ID_27 |
| People | Nearly all (88%) of shippers tracked and communicated KPIs to their carriers. These KPIs were most commonly On-Time Delivery and Tender Acceptance, both with targets between 95%-100%. | "Tender acceptance is the best leading indicator of an issue."<br><br>"Our data is not good enough to hold carriers accountable." | ID_30; ID_25 |
| People | When carriers missed their KPI targets, only 57% of shippers had a formal corrective action plan in place. Largely, shippers handled these instances informally and on a case-by-case basis. The course of action varied on the carrier partnership. | "Our corrective action plan is how much freight we award them."<br><br>"Are you making me mad? This is my criteria for carrier management." | ID_32; ID_38 |
| People | Most shippers only share basic or bare minimum requirements with carriers in a procurement event. However, 39% of shippers provide additional information like facility dwell time, volume consistency, customer name, average transit time, etc. | "If you don't provide this information, you are essentially transferring all risk to the carrier."<br><br>"What we know about our network, [the carriers] should know the same. I give name of customer, especially with grocery." | ID_28; ID_41 |

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|---|---|---|---|
| People | In general, shippers felt that the carriers noticed when volume was not tendering as communicated first. Once this happened, only then would the shipper complete a root cause analysis. In "state-of-the-art" cases, the shipper would offer replacement volume to the carrier to maintain the relationship. | "We don't commit volumes to carriers, so carriers will reach out first."<br><br>"If ghost freight happens with a preferred carrier, we will offer them something else." | ID_37; ID_14 |
| People | Shippers nearly always had an informal understanding of how many carriers covered the majority (80% of their freight). Frequently, it followed the 80/20 rule in which 20% of its carrier network covered 80% of its freight. | "Our top 15 carriers now move 80% of our volume." | ID_30 |
| People | Shippers frequently looked for ways to award their strategic carriers preferentially. One of the ways to do this was through an internal load board offering. | "Our intention is to build a long-term partnership with a focus on service." | ID_34 |
| People | Shippers repeatedly expressed frustration about carriers requesting rate adjustments after receiving contracted volume. One shipper kept a central database of how often a carrier requested a mid-cycle rate adjustment, artificially inflating the next year's bid submission accordingly. | "If we did not directly cause hardship and a carrier is asking for price updates-- I'll drop a carrier."<br><br>"We never want to re-price after we award- especially with moving equipment."<br><br>"We look at how carriers sustain in rate commitments as well…did they come back and ask for an increase." | ID_17; ID_1; ID_42 |
| People | Shippers were generally only willing to meet their strategic carriers regularly. Most shippers opted to send out scorecards repeatedly instead. | "Finding a relationship and maintaining a relationship are two different things." | ID_35 |
| Process | Transportation functions (procurement, planning, and carrier management) are mostly operated in-house, with transportation execution the most likely to be outsourced to a 3rd party provider. | "[Our people] were spending 90% of their brains on tactical execution and not on strategy - that's why we outsourced." | ID_23 |
| Process | Annual volume and service needs drove most of the network segmentation within a shipper's procurement strategy. Few shippers had the discipline within their organization to identify shared lane characteristics and procure capacity accordingly. | "We want to include seasonality."<br><br>"Let's carve out everything we think is seasonal."<br><br>"Our goal is to segment better on customer." | ID_40; ID_16; ID_26 |

| | | | |
|---|---|---|---|
| Process | Most procurement organizations were, at minimum, informed of network changes within their firm. It was "state-of-the-art" if a truckload procurement organization was consulted prior to a network change to understand the impact on transportation costs. Only 63% of shippers reported being consulted for input on internal changes. | "I have standing meetings with network design, sometimes I'm told things I shouldn't be. They ask for my feedback, but they never listen to me." | ID_20 |
| Process | Pre-awarding volume was more common among larger shippers. Often, the pre-awarded volume was still sent to the procurement event to ensure the incumbent carrier's rates were still competitive to the market. | "Usually, I'll pre-award in more normalized conditions."<br><br>"It has to be enough of a cost-bucket for you to care. That 2 weeks of pre-negotiation and awarding takes away time from the RFP." | ID_18; ID_43 |
| Process | 80% of shippers recognized that there was value in implementing a low-volume strategy for lanes within their network. “State-of-the-art” shippers not only had a low-volume strategy for a minimum total # of loads, but they also had a minimum total # of weeks that a lane shipped volume (consistency metrics.) | "If we exclude low-volume from an RFP, then we don't see it in the budget. That’s why I include it but then do not contract it."<br><br>"We continue to struggle with and review strategy on low volume lanes." | ID_19; ID_39 |
| Process | Only 37% of shippers separated the seasonal volume in their network, mentioning that asset-based carriers were frequently unable to handle the surges in volume. | "Forecast-based seasonal RFP takes inconsistent freight from the annual bid and allows us to be flexible in both market and business conditions."<br><br>"When it comes to asset-based carriers, they just can't handle the spikes." | ID_16; ID_18 |
| Process | While 80% of shippers maintain contract lengths equal to the lengths of their procurement cycles, the remaining shippers use a form of evergreen contracts with rate and accessorial amendments to be updated on an agreed-upon schedule. | "We aim for price stability, we want to lock rates in."<br><br>"Now that I've established my strategic partners, the evergreen concept is interesting to me because I don't want a lot of churn." | ID_43; ID_12 |
| Technology | Most shippers utilized a TMS rather than following a manual process in a spreadsheet. E2Open, Manhattan, and BlueYonder were some of the most common systems. | "The best TMS is a TMS designed to be a TMS."<br><br>"When we load a routing guide, we need a rate." | ID_35; ID_8 |
| Technology | Only 33% of shippers use API for FTL transmission to carriers, but most stated using API in warehousing or fulfillment. EDI transmission is still the standard | "API is for transactional relationships." | ID_28 |

| | | | |
|---|---|---|---|
| | method being used for truckload tender transmission. | | |
| Technology | Only 37% of shippers track ghost freight whereas 71% of shippers track unplanned freight. Shippers appeared more concerned about freight going to the spot market without a contract, and there was typically a standing report to monitor when this happened more than once on a lane. | "It'd be nice to track ghost - we're probably lying to our carriers."<br><br>"Do shippers do [ghost freight] to get better rates or is it just a facet of the business?"<br><br>"We are sensitive to ghost freight because we don't want to waste people's time." | ID_30; ID_13; ID_23 |
| Technology | Nearly all data used to generate a procurement event is actual data from the previous year. Only 28% of shippers felt confident in their forecast data to incorporate it into their truckload procurement strategy. | "We don't have a good mechanism for incorporating forecast information into our RFP."<br><br>"I just don't trust S&OP enough to use regularly." | ID_28; ID_30 |
| Technology | 66% of shippers use track and trace technology. Some of the most popular responses were FourKites and Project44. | "We recently removed our [track and trace]. We know the load is going to be late - so what? We can't do anything about it."<br><br>"Track and trace makes no difference to me - we use EDI still." | ID_27; ID_39 |
| Technology | Most shippers did not monitor situations where actual tenders did not match expected/awarded tenders regularly. Only 38% of shippers tracked this and proactively worked with carriers to adjust their awards or offer replacement volume when contracted volume never materialized. | "I'm a bad business partner because I'm not using this committed capacity right now - what are they not getting?" | ID_11 |