Stale Rates Research:
Benefits of Frequent Transportation Bids

WHITE PAPER

IOWA STATE UNIVERSITY
COLLEGE OF BUSINESS

C.H. ROBINSON

TMC MANAGED TMS®
In brief
Transportation managers frequently debate the effectiveness of procurement events. To answer the question, recent research from Iowa State University examines how carriers adjust and honor contract rates between events. Ultimately, a freight transportation procurement strategy based on a predictable schedule and process can deliver substantial cost savings and network efficiencies. Regular procurement events lower costs and promote strategic relationships with service providers.

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How often should shippers put their freight out to bid? It may seem like a straightforward question, but the value that transportation managers attach to procurement events—and, by extension, how often they carry out these events—is the subject of considerable debate in the industry.

The arguments boil down to two basic philosophies: that procurement events are an effective tool for controlling transportation costs and should be performed regularly, or that frequent rebids represent an excessive cost and are unnecessary.

To evaluate these arguments, shippers must first understand how carriers adjust and honor contract rates between procurement events. This is the main focus of the Iowa State research. The findings provide what we believe to be the most important quantitative evidence to date that a freight transportation procurement strategy based on regular procurement events can deliver substantial cost savings and network efficiencies.

Managing market uncertainties
It is indisputable that freight rates fluctuate in response to changing market conditions and trading partners’ shifting cost structures.

Truckload markets swing from tight to loose as the economic winds change direction. The viability of lanes change as both carriers and shippers experience tugs on their demand models. Carriers win and lose customers, and their ability to position capacity is altered with each reshuffle of their customer base. Shippers suddenly become active in new lanes or reduce their volumes in existing ones because of a strategic course shift or the demands of new customer demographics.
The net result of perturbations like these is that carrier commitments change. As a consequence, more and more routing guide substitution occurs (i.e., shippers go deeper into their routing guides) and rates increase as costlier carriers are used. That state continues until a shipper re-aligns their routing guide, either through a one-off carrier negotiation or a procurement event.

The challenge for shippers is how to ensure that they are getting the best rates possible in this extremely dynamic market environment.

Some transportation managers argue that rates need to be reset regularly by rebidding their freight in frequent (annual) procurement events. Service providers make offers for the company's freight business in a lane or set of lanes during these exercises. In addition to updating contract rates, a fresh round of bids offers an opportunity to realign respective networks, which have almost certainly drifted out of alignment since the last adjustment.

The advantages of annual procurement events are discussed in a Council of Supply Chain Management Professionals (CSCMP) Explores report in 2011.¹ The report suggests that waiting, for example, two years to revisit carrier contracts is too long. Consider a situation where Carrier A is contracted at a below-market rate to ship a company's freight from Boston to Atlanta. The carrier loses customers in Atlanta and all of a sudden does not want to serve that city. But there are eight other service providers that do a lot of business in Atlanta and would welcome the business. Unfortunately, the shipper may not be able to take advantage of this alternative capacity because their two-year agreement with Carrier A still has a long way to run.

In addition, it can be argued that the nature of the freight market favors frequent rebids. Capacity supply and demand are subject to various unpredictable changes, requiring companies to make regular rate adjustments. Also keep in mind that the overarching trend over the long term is that rates nudge upwards. Correcting for this gradual movement is another reason for establishing a system for recurrent contract updates.

However, there is a cost associated with regular procurement events, and some shippers doubt that they will capture an ROI through lower rates and/or synchronized networks. These enterprises only stage freight bidding contests occasionally, or not at all.

Some managers point out that they can time the market and force carriers to hold below-market rates. Another argument is that rates are adjusted on an ongoing basis as part of the freight management process, so there is no need to stage regular procurement events.

Deciding which viewpoint has the most merit would be easier if shippers had a better understanding of how carriers adjust and honor contract rates between procurement events. Of particular interest is how quickly freight rates become outdated or stale over time, and the reasons for this decay.

The primary goal of the Iowa State University research project is to explore the longevity of contract rates by analyzing U.S. domestic truckload shipments. The study team investigated whether the rate agreements gradually erode following procurement event dates.

The methodology

The study looked at rate information on contract truckload shipments hauled 250 miles or more and tendered during the years 2008 to 2010. In all, the data covered about 700,000 records. Every move was processed by the same transportation management system (TMS) to ensure an apples-to-apples comparison in the analysis. This was made possible by using data from TMC’s Managed TMS® service.

A standard econometric model was created to estimate the relationship between the contract rate and the rate age, as well as other control variables that explain rate variance. Here is a list of some of the variables used in the study, including the critically important rate age variable.

- Rate age (the number of days since the last procurement event)
- Rate age-squared (captures non-linear relationships)\(^2\)
- ID for customers with annual procurement events
- Depth of tender (number of times the load was rejected by carriers before it was accepted)
- Length of haul (miles)
- Lane demand (the total demand, or volume of goods moved, in a given lane over a given time period for TMC customers)
- Tonnage (monthly truck tonnage data purchased from the American Trucking Association)
- Customer (variables that capture customer-specific characteristics on rates)
- Economic controls (variables that control macro-economic trends in markets)
- A large data set of 150 origin and 150 destination groups

The actual date of procurement events must be known. TMC recorded procurement dates for many of the customer data sets, and in a number of cases the dates were obvious, given the number of rate changes that were clustered around these times. In other cases, the date of procurement event was estimated by counting the number of rate changes that occurred in a given week for each shipper. A histogram of the results identified a small number of dates (weeks) in which a large number of rate changes occurred; they were used as procurement event dates. (An Iowa State University paper will be forthcoming in an academic journal that will include a more in-depth description of the methodology, including specifications for the regression model.)

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\(^2\) The researchers found that the relationship was non-linear. The model was adjusted to take account of the non-linear relationship. This is the list of all the variables used during the analysis. Some variables were not used in the final model. For further technical details see the Iowa State University paper.
The findings—advantages of regular procurement

The study findings provide strong evidence that frequent rebidding exercises are beneficial. Additionally, the research opens the door for further work on how shippers can find the optimum frequency for these events.

Cost savings affirmed

The view that regular procurement events can lower freight rates is vindicated by the research findings. Shippers in the study that annually rebid their freight achieve a rate reduction of $25.17 per load compared to those that seldom or never use this buying method. The average rate for an individual load in the data is roughly $907.00, so this rate decrease represents a 2.78% saving in transportation costs.

In addition, shippers can expect to capture lower rates by virtue of a procurement event—regardless of how frequent these events are. Rate age has a strong, non-linear effect on lane rates. When these values are graphed, the curve is initially positive until it reaches around 328 days at a value of $15.27, at which point it turns negative. In other words, after a procurement event is performed, the initial savings of $15.27 diminishes over time, and at 328 days, it disappears completely. After 328 days, savings start to reappear gradually. This result indicates that $15.27 is the maximum rate reduction a customer can expect to realize via a procurement event, irrespective of event frequency.

These two savings add up to $40.44 per load. Again, if the average load price is $907.00, shippers that consistently repeat procurement events can expect to lower their freight costs by 4.46% at the time of route guide implementation, a sizeable gain (Figure 1).
How do rates change?
As explained in the previous section, following a procurement event, rates decay until the effect levels off at around 328 days. But why do contract rates lack staying power after a rebid?

One reason is bidders’ remorse; the tendency for lower-cost carriers to start rejecting loads after winning the business because they find better margins elsewhere. As this happens, the shipper is forced to go deeper into the route guide for capacity, and usually pays a premium for using deep-tier service providers.

This effect is known as route guide bleed or substitution, and there are a number of underlying causes. Both the carrier’s and shipper’s businesses are dynamic, and lane volumes are constantly changing. The shipper gains and loses customers, volumes, and/or SKUs. Similarly, the carrier adds and loses clients and lane volumes. These constant tugs on the service provider’s network influence their ability to support the conditions specified in the initial freight contract, even if they fully intended to comply when the agreement was signed.

As rate age approaches 328 days, the curve begins to flatten (see Figure 2). This is partly because trading partners often make ad hoc adjustments to rates in response to market shifts and changes in the configuration of their freight networks. Some below-market rates tend to be more resilient, but these are often associated with local niche carriers. In general, impromptu tweaks eventually moderate the upward movement of rates. The researchers also found that this behavior of tweaking rates occurred for all shippers in the data set. In other words, the work associated with contract adjustments is unavoidable because rate negotiations are ongoing, even where no procurement events take place.

![Figure 2 Rate Creep](image_url)
Why the decline in rates after 328 days? There are a number of possible reasons, and this is an area that merits further investigation. For example, shippers might continue to secure more competitive rates. You can see in Figure 3 that the adjustment age in days stays between 175 to 240 days, even when it’s been more than 300 days since the last procurement event. This indicates that shippers are soliciting and accepting new rates between procurement events.

Another possibility is that as rates age, they fall below the market, which has moved upward; some carriers decide not to negotiate an adjustment to compensate for this disparity. There are various reasons why a carrier might extend lane pricing that is below market. Perhaps the service provider wants to preserve a favored relationship they perceive as fair or one that offers cost advantages. Or, maybe the business balances a lane that is overfunded in the opposite direction.

It is notable that only 15.7% of the loads move on rates that are over 400 days. The breakdown underscores that there are relatively few opportunities for shippers to capture more mature, below-market rates, such as the ones described above.

**FIGURE 3 DISTRIBUTION OF RATE AGES**

- 49.9% of the loads are in the 200-299 days age range.
- 20.0% are in the 300-399 days age range.
- 14.4% are in the 400-499 days age range.
- 5.0% are in the 500-599 days age range.
- 4.0% are in the 600-699 days age range.
- 3.0% are in the 700-799 days age range.
- 1.6% are in the 800-899 days age range.
- 1.3% are in the 900+ days age range.

Percent of total loads and adjustment age in days.
In addition to these rate curve-specific observations, the research findings suggest that infrequent procurers of freight transportation who rely on informal, ad hoc adjustments are not as effective as frequent procurers in keeping their rates aligned with market movements.

A statistical analysis of average rate age (i.e., the number of days that has elapsed between the last execution of a procurement event and the time a load is tendered) and adjustment age (i.e., the time that has elapsed since the last rate adjustment) indicates that the informal process lags the more formal procurement strategy. The average time from the last rate adjustment for frequent procurers is 138.1 days, compared to 183.3 days for infrequent procurers (highlighted in Table 1). The latter shippers can suffer more routing guide bleed in the additional 45 or so days that they take to make contract adjustments.

<table>
<thead>
<tr>
<th>Variable (average)</th>
<th>INFREQUENT PROCUREMENT EVENTS</th>
<th>FREQUENT PROCUREMENT EVENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count: 241,344</td>
<td>Count: 477,152</td>
</tr>
<tr>
<td>Cost</td>
<td>Mean 481.4</td>
<td>Mean 509.6</td>
</tr>
<tr>
<td>Miles</td>
<td>593.0</td>
<td>645.1</td>
</tr>
<tr>
<td>Rate age (days)</td>
<td>377.9</td>
<td>181.5</td>
</tr>
<tr>
<td>Days since rate update</td>
<td>158.3</td>
<td>78.0</td>
</tr>
<tr>
<td>Adjustment age (days)</td>
<td>183.3</td>
<td>138.1</td>
</tr>
<tr>
<td>Tender depth</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Lane demand</td>
<td>17.4</td>
<td>28.4</td>
</tr>
<tr>
<td>Lead time</td>
<td>2.1</td>
<td>3.1</td>
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**Table 1: Descriptive Statistics for Procurement Groups**

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Other observations
The study results also reaffirm some familiar rate-related characteristics of the truckload market. These are summarized below.

• Rates are apt to increase with the number of tender rejections (i.e., the depth of tender increases). Figure 4 graphs the relationship between tender depth and lane rate costs.
• The longer the time period between a freight tender and actual shipment date, the less expensive the rate. This finding is consistent with past research carried out by the MIT Center for Transportation & Logistics with data supplied by C.H. Robinson Worldwide’s TMC division.3
• A freight rate is more likely to be influenced by the destination of the load than its origin.

![Figure 4: Lane Rate Increase by Tender Depth](image)

Key takeaways
One of the foundations of an efficient transportation procurement strategy is performing regular—and preferably annual—procurement events. Such an approach lowers costs and promotes strategic relationships with service providers.

However, a proper evaluation of the pros and cons of frequent procurement events requires quantitative verification, as well as deep domain expertise. For that reason, this freight market study by Iowa State University was commissioned.

Cost savings affirmed
The analysis shows that procurement events can reduce freight rates. Moreover, if these events are carried out frequently, the potential savings are even greater.

3 Increase Lead Time, Decrease Costs, white paper by C. H. Robinson Worldwide Inc.
Certainty reduces variability
The view that revisiting freight contracts regularly helps shippers maintain alignment with carriers is supported by the Iowa State research findings. The researchers concluded that shippers with regular procurement programs tend to adjust their rates more often than infrequent procurers. Furthermore, predictable procurement cycles build patience in the carrier community. This predictability gives service providers a better sense for how long they are expected to hold contract rates that may or may not be attractive. A more arbitrary cycle tends to make rate setting more erratic, which is less conducive to strategic planning.

Realism pays
The research underlines the importance of building and maintaining a robust route guide and being realistic about rates. An effective route guide helps shippers manage the ebb and flow of freight rate movements. A pragmatic approach to the pricing of transportation avoids the pitfall of setting impractical cost goals and trying to game the market by anticipating down cycles.

Change is constant
The study found that following a procurement event, effective lane costs tend to increase in response to depth of tender and load acceptance issues for a period of roughly 328 days, and then moderate. One of the takeaways here is that shippers need to keep an eye on freight rate movements and the alignment of their networks in the dynamic truckload market. Be aware that the last rebid has a finite shelf life, and that a systematic procurement strategy helps to keep shippers abreast of these changes.

Impromptu procurement more labored
Even more compelling, the research highlights the misconception that an irregular procurement strategy based on ad hoc rate adjustments requires less work than a systematic approach. The data show that rates change even when procurement events are not carried out. This means that new contracts still have to be negotiated in the absence of regular procurement events. Indeed, the work can actually be more burdensome for sporadic procurers. Not only is the rate setting environment less certain and more vulnerable to routing guide disruptions, sporadic procurers also leave cost benefits on the table.

Opens the door to further benefits
Further research could add even more weight to the argument in favor of regular procurement events. The analysis shows that it is possible to calculate the optimal frequency for these events by comparing the fixed costs to the daily rise in rates. The sweet spot is where the total cost of transportation and procurement is at a minimum.

The findings of the Iowa State study so reinforce the case for frequent procurement events that the freight community would do well to take a fresh look at the traditional arguments against this practice. Meanwhile, shippers should reappraise their procurement strategies in light of the new research.
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C.H. Robinson helps companies simplify their global supply chains. Skilled logistics employees apply a deep knowledge of market conditions and proven processes to solve transportation problems. Integrated technology gathers data from all parts of the supply chain and provides full visibility to orders and costs. From local truck transportation to global supply chain management systems, from produce sourcing to payment services, and from consulting based on practical experience to outsourcing. C.H. Robinson supplies a competitive advantage to companies of all sizes.

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For more information, please visit www.mytmc.com

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