DAT iQ
Analytics

The Methods Behind the Metrics

A Closer Look at How DAT iQ Elevates Rate Data Into Answers

Turn analytics into action

Few things affect a brokerage's bottom line more than pricing decisions. Margins are the name of the game, and without accurate freight rate data, you can't play the game at all, whether you're a large brokerage or just getting started in the industry.

Profitable decision-making requires more than data alone.

Anyone can collect data. What sets an analytics partner apart is their ability to elevate that data into actionable information, so that you get reliable answers based on calculations you can trust.

Whether you're bidding on RFPs, quoting customers, forecasting future business, or negotiating with carriers, DAT iQ helps you arrive at a rate that's right for that moment. In this white paper, we'll dive into the various rate calculations found in DAT iQ products that empower your business to make confident decisions that drive results.

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The bird's eye view

Before we get started, let's look at a couple of the rate insights available in DAT iQ.

Market Averages

Historic lane prices

What is it?

A weighted average rate based on historical lane-level data from the industry's largest database of nearly $1 trillion in transactions. These are averages for specific origin/destination pairs.

Questions it answers:

- "What are the long- and short-term seasonal impacts on this lane?"

- "Am I getting a fair rate on this lane?"

Forecasts
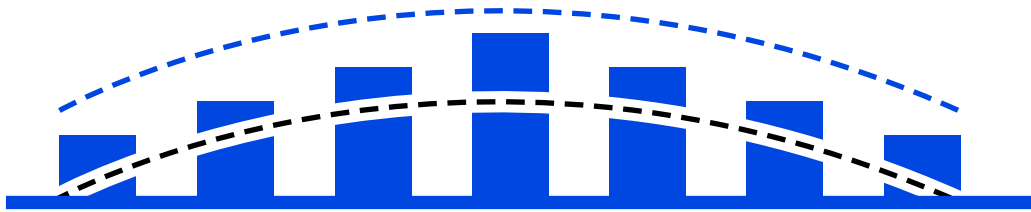
Rate predictions for specific time frames

What is it?

Machine-learning AI models forecast future rates based on historical data and short-term market effects.

Questions it answers:

- "How should I bid on the lanes in this RFP?"

- "Can I get a better rate if I move this load later this week?"

- "When should I expect costs to rise on this lane?"

Behind the numbers: Market averages

**The DAT iQ rates database is massive, with businesses of every size contributing data via freight invoice.**

Since 2009, DAT iQ has collected data on nearly $1 trillion in freight transactions from thousands of contributors. It's the only database of its kind in the world – other analytics partners have to fill gaps in their databases with proxy data.

When you search a lane and see a market average rate from DAT iQ, we don't just take a pile of invoices, add them up, and then divide by the number of shipments. While it's true that that'll give you an "average" for costs on a lane, it doesn't account for a whole host of factors that could cost you a ton of money if you lean on that metric.

DAT iQ rate data is uploaded automatically every day, directly from the TMS's of data contributors. With this system, contributors can't pick and choose which rates to submit. We also don't include bids or quotes – only the agreed-upon rates for loads actually moved.

Contributors participate so that they can combine their internal data with DAT iQ, plus it allows them to benchmark their pricing against the broader market. Our systems check for errors and outliers while organizing that data by spot vs. contract, equipment type, lane, and many other factors to give you the best view of the transportation landscape.

When researching dry van, reefer, or flatbed lanes in DAT iQ RateView there are several numbers to consider.
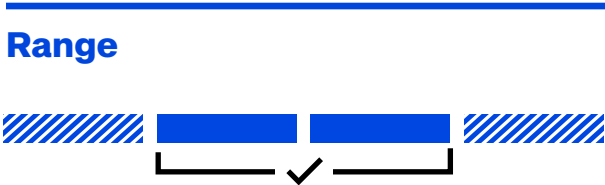
Range

The invoices we receive for every lane are divided into four quartiles based on the rate per mile. The highest rates on a lane are in the top quartile, while the lowest are in the bottom quartile. The range of rates shown in RateView is based on the middle two quartiles, meaning that outliers are not skewing the data.

We do this because you need a realistic look at the current market. A hazmat load moved by team drivers would push the average upward, since rates for those shipments are well above most freight moved on that lane. This paints an inaccurate view of market conditions. But if you're moving a load that requires those types of extra considerations, then you know your costs are going to be at or above the top of the range shown in DAT iQ RateView.

Time frame

Every DAT iQ calculation reacts to changes that are happening here and now, but you can choose different time frames for different use cases. For example, DAT iQ RateView can calculate the average rate as recent as the past three days or up to the past year.

Most DAT One load board subscriptions show an average rate calculated based on the three most recent months, which gives you a long-term view of pricing dynamics on that lane. This can be handy if you're quoting longer-term business, but for more transactional business, you'll need data calculated based on a tighter time frame.

Note: RateView will not include market averages for a time frame if there isn't enough contribution data. Instead, it will default to the tightest timeframe that meets the criteria.

Geography

3-Digit Zip — **Mkt.** — X-Mkt — Region

Some freight pricing tools from other analytics providers use point-radius calculations for origins and destinations. For example, if you're searching for rate data in Chicago, they might search within a 100-mile radius. It makes sense on paper, but this isn't an accurate view of the market.

DAT iQ uses proprietary Key Market Areas for origins and destinations based on zip codes as well as the population, industry, and economics of a region.

Comparing rates based on the 3-digit zip and the expanded market – or even the region – gives you better insight into the demand in an area and a more accurate representation of the market.

Note: RateView will not include market averages at the 3-digit zip level if there isn't enough contribution data. Instead, it will default to the tightest geography that meets the criteria.

## Contributions (reports vs. companies)

DAT iQ RateView requires at least eight reports from a minimum of three companies to show a market average. This means that no company can set prices or manipulate the data, plus it guarantees that there's enough data included in the calculation to give you an accurate answer.

And we're fully transparent about this – you can see the exact number of reports and contributors included in every market average calculated by DAT iQ.

Spot vs. contract

DAT iQ RateView shows both the average rate brokers pay to carriers to move a load on a lane (spot) and the average price shippers pay transportation providers to service that lane (contract). Analyzing the gap between these rates can inform your pricing decisions and reveal insights into market demand.

Behind the numbers: Rate forecasts
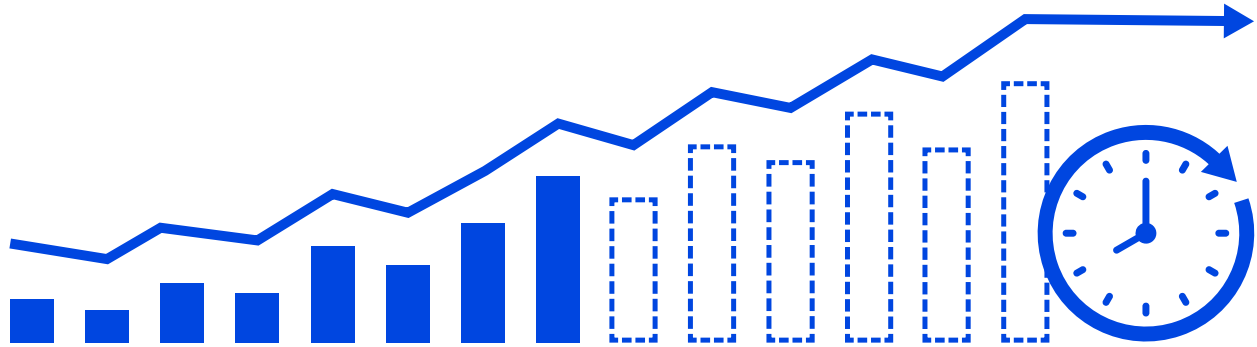
When planning and budgeting, you can't base decisions entirely on the market you're in – you have to account for the market you're going to be in.

This is where accurate forecasting separates you from the competition. DAT iQ has been on the cutting edge of freight rate forecasting, developing an AI-assisted model in 2018 that helps you respond to RFPs in a fraction of the time with more confident bids. It also allows you manage day-to-day operations more efficiently and profitably, giving you the ability to pinpoint the exact days when to schedule a pickup for maximum profitability.

4 keys to an accurate forecasting model

The accuracy of a freight rate forecast can make or break an RFP bid, or it can throw your quotes off to the point of unprofitability. To protect your margins, your forecasting model should meet these four minimum requirements.

1

A huge archive of historical data

The deeper the archive, the better. Ideally the database includes multiple business cycles recorded over a period of many years with no gaps.

2

Many sources of data

To avoid bias, you need as many sources of data as possible, integrated in a consistent way that keeps individual companies or segments from influencing the predictions.

3

Supply & demand metrics for individual lanes

Since regions and markets respond differently to seasonal and economic influences, the model needs to learn from data that directly represents truckload supply vs demand.

4

Applied algorithms

Along with disruptions like weather events, transportation pricing has a strong day-of-week bias that creates variability over time. The forecasting model needs to analyze and learn from these events.

DAT iQ has the only rate forecast model that fulfills all four requirements for accurate predictions.

Without a deep well of data, forecasting falls apart immediately. For example, some models try to compensate for the absence of true supply-and-demand metrics by using secondary data like tender acceptance and rejections as a way to proxy truckload capacity. They then adjust their predictions based on that data's relationship with the current rate trend.

That methodology predicts rates with an accuracy in the range of plus-or-minus 17 cents per mile. If the actual rate per mile lands between $1.50 and $2, excluding fuel, then a 34-cent range does not provide useful guidance, regardless of the timeframe.

The DAT iQ team set out to create a forecast model that would produce more actionable results. For one, we don't have to create a proxy for supply and demand. We can measure it directly using the DAT One network, North America's largest truckload marketplace. The DAT iQ team also had the benefit of the most historically complete rates database in the market. With more than 15 years of historical records, the RateView database includes $1 trillion in invoices collected.

That covers three of the four requirements. For the algorithm, the DAT iQ team built a proprietary model to account for a variety of trucking-specific factors, including day-of-week biases that are often overlooked by other models. Truckload rates are strongly affected by not just the day of the week (Monday rates tend to be higher than Tuesday), but also where the date falls on the calendar (end of month, end of quarter, etc.), holidays, and seasonal factors such as produce harvests.

Note: DAT iQ rate forecasts do not include fuel costs. These predictions are for linehaul rates only. Diesel prices are driven by an entirely separate set of factors from all corners of the globe.

Types of DAT iQ rate forecasts

With access to both long- and short-term forecasts, logistics professionals can both plan and execute with confidence. This allows you to offer the kind of transparency that builds trust and makes negotiations easier with your shipper customers.

35-day forecasts

Think of these like weather reports. By assessing freight movements and current market factors, we can show you where the market average rate should move for each day in the week to come. So if your shipper customer has a flexible delivery window, you can choose a specific date when costs are more in your favor.

This also helps you provide instant, accurate quotes for your shipper customers. Just open at the calendar view and add your margin to the forecast.

52-week forecasts

Longer-term contracts can be a challenge for transportation and logistics service providers. A high bid will not be accepted by the shipper, and a low bid on even one lane can lead to significant financial losses over time. A common practice is to forecast the coming year's transportation pricing or budget by applying a uniform, percentage-based increase – or a cut – across the board.

This straight-line method can make it difficult to optimize those transportation dollars. When shippers ask for bids on a large number of lanes, and each has its distinctive market conditions, seasonal trends, and other influences that drive rates.

DAT iQ rate forecasts provide transparency for all parties, allowing for long-term bids that account for seasonality and emerging trends throughout the year. Pricing analysts can also compare spot and contract trends. Gaps between the two tell shippers and 3PLs when they risk losing access to capacity in cases when high spot rates will pull carriers away from contract shipments.

How do we measure accuracy?

Of course, a forecasting model is only useful if it's accurate. In pricing, there's a "zone of indifference," which is the range of price points where the buyer will not change a purchase decision. A similar concept applies to forecasts.

Predictions don't need to be perfect. You probably wouldn't lose faith in a meteorologist if they're off by a couple of degrees or if a rainstorm starts an hour earlier than predicted. But you still need to be able to plan for tomorrow. In order to do that, the predictive model has to produce accurate, reliable results in a consistent pattern that supports real-world solutions, allowing businesses to improve profitability and mitigate business risk.

DAT iQ analysts constantly measure and backtest the accuracy of our AI models. Given the mountains of data that are collected in order to calculate the real-world market averages you see in DAT iQ RateView, we're able to compare past forecasts to what ended up being the market average for that time frame.

We calculate accuracy based on the percent error of past predictions vs current rates, giving us a measurement of median absolute error (MAE).

The ability to measure these predictions against the true market is the difference between editing your own writing and getting someone else to do it – even if you're honest with yourself, other folks (in this case, the actual freight marketplace) will catch your mistakes much better.

This also allows data scientists to pinpoint gaps in the forecasting model's accuracy, analyzing the information needed to sharpen predictions on a given lane or forecasting interval.

95%+ ACCURACY

across 7M+ daily predictions
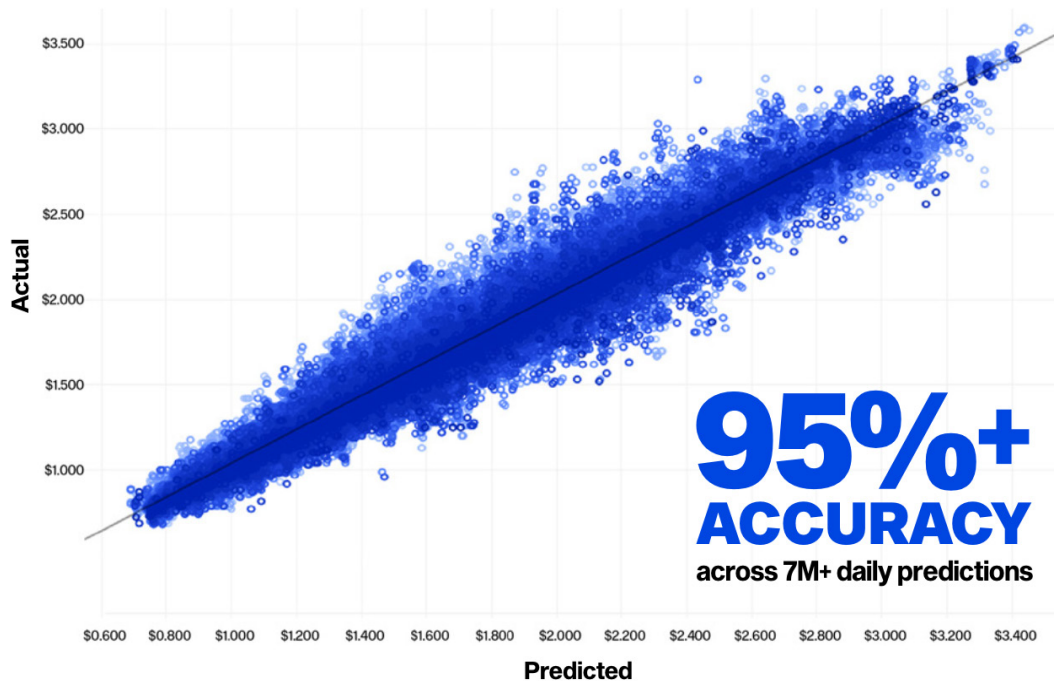
How accurate are we?

The trucking spot market can be a notoriously volatile place. Disruptions like major weather events can change prices drastically. Our predictive AI models are built assuming that these events are going to happen, so they adjust daily to events on the ground.

While that means that sudden, unexpected events can throw the forecasts off in the very short term, the predictive model is still more than 95% accurate across more than 7 million daily predictions.

Forecasts in action

How you put the DAT iQ forecast data to use depends on your own business strategies and goals. In some instances, you might sacrifice margin in order to win new business from a desired customer.

For DAT iQ users who contribute their own internal data, they're able to continuously compare where their own buy rates compare to the market as a whole. For instance, if you found that you're able to secure capacity on a lane consistently at 5% below the market average reported in DAT iQ RateView, then you might be able to subtract 5% from the RateView forecasts on that lane when quoting a customer or bidding on an RFP.

Put DAT iQ analytics into action

Speed is more important than ever in logistics, and analytics are the key to success for transportation intermediaries. You don't have to build all those capabilities in-house, though.

With more than 40 years in the industry, DAT has the expertise needed to elevate transportation data into actionable insights. With a trusted analytics partner, you can empower your teams, plan with confidence, and take your business to the next level.

Learn more about our transportation analytics services: **www.DAT.com/iQ**

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