

The Crunch On Refrigerated Capacity:

How To Increase Flexibility Across Your Supply Chain

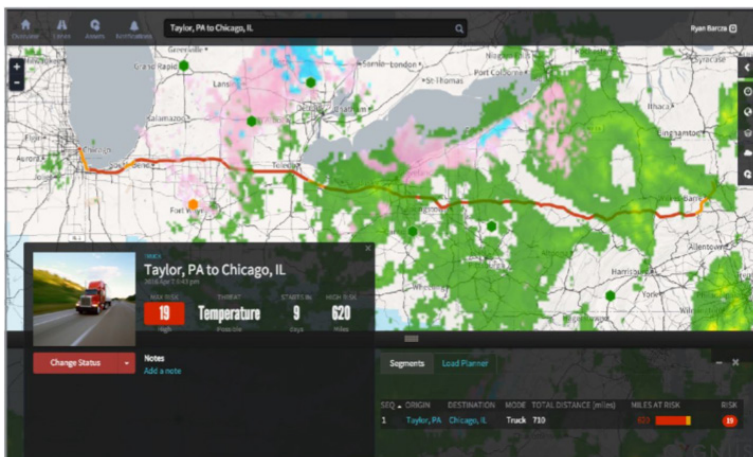
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The Crunch on Refrigerated Capacity: How to Increase Flexibility in your Supply Chain

The supply chain logistics industry is no stranger to change, but few segments have been forced to adapt to evolving market conditions quite as regularly as food and beverage shippers, carriers, and distributors. From inception to consumption, the journey of food and beverage is fraught with complex decision making and requires a symphony-like level of coordination while facing near constant environmental uncertainty.

The logistics required to deliver temperature-sensitive commodities are increasingly challenging, even for the seasoned professional. Customer service is more important than ever and the ability to meet timing and quality requirements is critical to the success of any supplier. Behind the scenes, shippers, manufacturers, growers and retailers, traverse a labyrinth of food safety regulations, complicated distribution networks, and increasingly unpredictable weather across shipping lanes. Lost or spoiled loads can be extremely costly in today's supply chain.



Ongoing challenges to deliver under transportation budgets and ensure product integrity are commonplace in the daily agenda of supply chain leaders. Navigation of those murky waters requires strategically balancing equipment cost and availability across one's transportation network to ship with confidence. Quantifying cargo temperature risk versus costly equipment can be especially difficult with limited refrigerated capacity, which sends rates soaring. However, increasingly more sophisticated technology, transportation network analysis, and lower-cost cargo protection equipment can begin to empower supply chain professionals

with the insights needed to increase shipment risk visibility and reduce transportation costs. Incorporating data science and predictive analysis into transportation decision processes, combined with a passive thermal protection program, can reduce reliance on refrigerated equipment and give organizations the tools they need to reduce costs while still exceeding customer expectations.

How does data science relate to transportation spend?

All too often, transportation and logistics suffer greatly due to poorly managed supply and demand risks which can lead to excessive freight costs, damaged cargo, broken promises to customers, and in the end, lost sales! These pains and missed opportunities can be avoided when data is refined and made relevant to a shipping network and, more importantly, to the individuals whose responsibility it is to manage that transportation. There's a wealth of weather data available, but rarely is it contextualized down to the shipment level and incorporated into transportation planning workflows to be made useful. In the world of cold chain supply, weather rules the road, air, and ocean, and with data science capabilities now at an all-time high, this information can now become the key to unlocking dynamic decision support on a network-sized scale for the first time. Transforming decision workflows into data-rich models can quantify and contextualize weather risk to shipments based on cargo-specific tolerances. This enables transportation planners to not only highlight prior overspending on expensive refrigerated equipment, but to discover where and when cost saving equipment such as passive thermal protection can be utilized on upcoming shipments still in the planning phase.

What exactly is passive thermal protection?

Temperature-controlled trailers are expensive and capacity is limited compared to dry equipment. Surprisingly, products transported in refrigerated trailers do not always require the refrigeration buyers are paying for. Commonly referred to as thermal blankets or cargo quilts, passive thermal protection has been used for many years to cover and protect temperature-sensitive commodities during transit. These "blankets" create a barrier between the payload and the ambient conditions inside the trailer, which minimizes the amount of temperature variance during a given shipment. Various forms of passive thermal protection are used according to the sensitivity of the cargo, transit times, climate conditions, and other variables.



Most commodities are strong candidates for passive thermal protection. For shippers concerned about product spoilage during the winter or summer seasons, and otherwise ship dry year-round, thermal blankets provide the protection needed to prevent cargo damage caused by weather extremes. These blankets are increasingly being utilized as an alternative to costly temperature controlled equipment for many food and beverage shippers and logistics providers. Blanket use reduces overall transportation spend and adds flexibility, allowing the shipper to choose the specific protection needed for individual shipments.

Don't let the cross-border capacity crunch force your hand to OTR.



Shippers moving sensitive commodities during frigid Canadian winters or through the scorching heat of Mexico, often rely on temperature-controlled capacity. Securing that capacity across border is a costly supply chain challenge. Due to the lack of year-round demand, the railroads are only investing minimally into heated and insulated containers because it is only needed three to four months out of the year. As one major brewery was well aware, there is no guarantee that heated capacity will be available when they need it the most, and delayed imported beer shipments to retailers can cause major supply chain disruptions. This particular brewery was moving product from the Midwest into Western Canada through lanes that can be easily secured by over-the-road temperature-controlled capacity, but not without a large premium. Hesitant to consider passive thermal protection due to past weather extremes and historical outlook (perception thermal blankets “don’t work”), they needed to see proven results before moving forward.

A new opportunity to explore these alternatives finally became viable through the confluence of new technologies. Multiple real

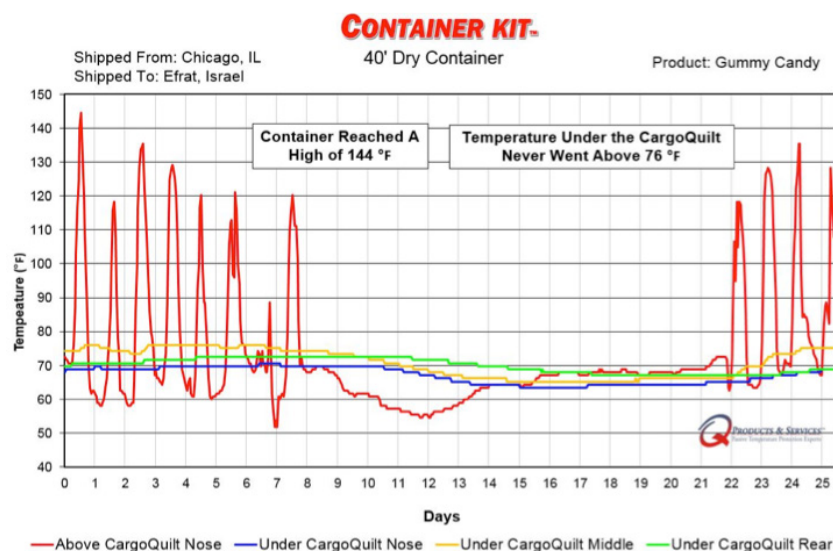
world temperature studies during the middle of winter season revealed the spoilage risk was dramatically lower than expected and highlighted the specific shipments that were viable for passive thermal protection. Improvements to passive thermal capabilities also resulted in a customized container lining application for the brewery, which finally gave them confidence to proceed on live shipments. Two winters later, this brewery has moved thousands of pallets of beer into Canada from the U.S. without a single bottle or can freezing. More importantly, this ‘capacity play’ prevented supply chain disruptions and allowed them to tighten controls over their transportation budget.

Longer transits still require temperature-controlled containers, right?

As food and beverage exports continue to rise, so does the demand for temperature-controlled equipment for vessel transport. Unfortunately for shippers, the premiums associated with refrigerated capacity only grow larger when shipping on water. Additionally, transit times in excess of 45 days create higher risk for temperature excursions as well. These budgetary and quality challenges have created more interest in alternative solutions in recent years.



For example, a major exporter of food grade finished product learned that passive thermal protection created more flexibility in their operations. Finding dry capacity is very easy and cost effective—often resulting in savings of thousands of dollars compared to refrigerated equipment—but they were concerned about retaining product quality for shipment durations lasting 45 days. Similar to the beverage company shipping into Canada, this exporter needed results to quantify a process change. What they learned is that the high-risk points are the transit times inland. Because the majority of the door-to-door transit is on water – where temperatures are moderate and stable – the window of protection they needed was only 6-7 days on either side. Data shown in the temperature graph below highlights the risk points and proves the protection capabilities of this particular passive thermal solution. After several years of a passive thermal protection solution on this lane, they have expanded to other export lanes, including inbound materials to their production sites that normally would require temperature-controlled transportation. With tested, validated, and quantifiable results, this exporter discovered economical options are now viable for ensuring product integrity, even on overseas containers.



Help me avoid the pain of seasonal mode conversions, please!



When thinking about refrigerated equipment, shelf stable commodities probably are not the first thought that comes to mind. Yet, as many food and beverage shippers know all too well, it is a fairly common practice to rely on expensive temperature-controlled transportation to maintain product quality during the warmer and colder seasons. Often times, the chosen mode is OTR refrigerated. While the result meets the objective, it also presents challenges. For example, this

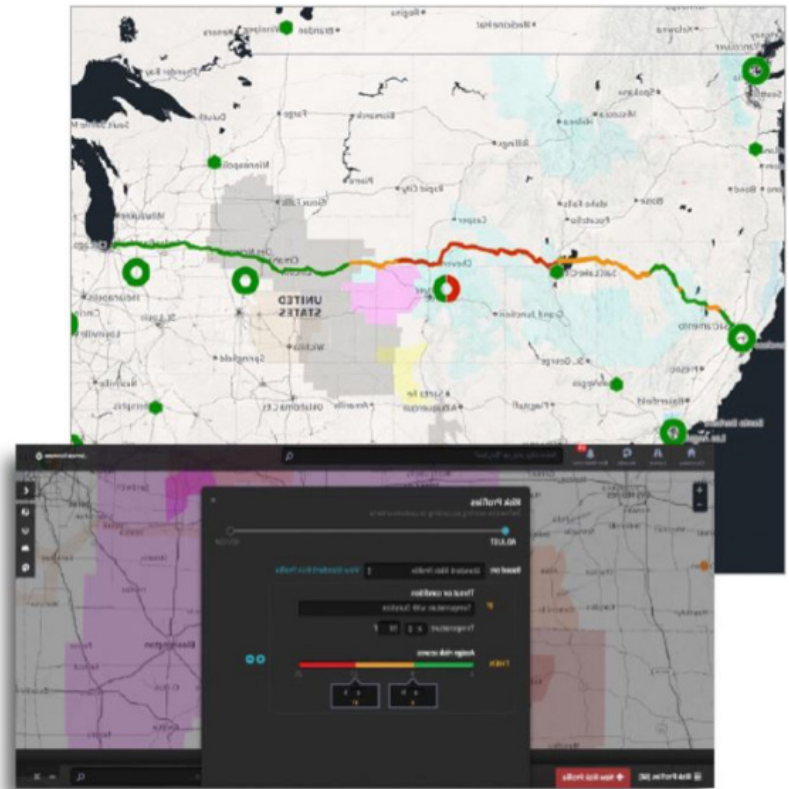
practice requires a mode conversion, something not ideal for shippers or carriers. Shippers end up paying a premium because refrigerated equipment simply costs more and capacity is fairly limited compared to dry equipment. For the refrigerated carriers, short-term capacity is difficult to plan for, and often results in network disruptions. So, is it really worth it? If mode conversions are avoided, what are the risks to product quality?

A viable solution, yet again, is passive thermal protection. For one Chicago-based provider, a key customer has benefited from using dry intermodal as their primary source of equipment / mode selection for the vast majority of the year (even during the peak of the summer and winter seasons) and utilized temperature control only when they needed it most. Sure, a higher premium comes with securing capacity on the refrigerated spot market, however the need is so infrequent that savings throughout the year vastly outweigh the spot premiums. For their transportation providers, it allows them to service customers who need their equipment year round (i.e. produce growers, frozen food manufacturers, etc.) and eliminates the pitfalls of short-term capacity. As a result, they realize more consistent utilization from their assets.

Making it work for you.

At this point you may be asking yourself how all this applies to your transportation network. No discussion was provided around your specific product temperature requirements, loads per week, full truckload vs. LTL, multiple modes of transportation, long lists of shipping lanes, etc. And you are correct; no two supply chains are alike. The common link however, is that all these variables are measurable and quantifiable. Data science enables organizations to gather insights and visualize their shipping networks like never before. Historical and predictive weather models can calculate specific risks for each individual and unique shipment, providing transportation planners with the ability to make more dynamic decisions around modes, shipment timing, and equipment selection in data-rich, intelligent ways.

Ensuring product integrity and knowing when refrigerated equipment is needed (and when it is not) does not have to be an activity shrouded in mystery and feel like dark magic any longer. For example risk platforms customized for your organization can reveal operational insights such as, “Across your shipping lane from Chicago to LA, you can avoid a reefer on 99 of your upcoming 100 shipments. Additionally, ship these 7 shipments 2 days earlier to avoid higher temperature risk and ship these other 5 shipments 1 day later.” Risk can literally be seen along a route highlighted with stretches of lanes with **high**, **medium** and **low** concern based on shipment-specific timing, max/min temperature thresholds and duration of exposure to forecasted conditions (see image above). Not only can this technology create uniform understanding across transportation and quality teams, but can be fully integrated into your TMS, internal planning systems, and reporting software including ERP applications. As the system is continually trained on the conditions that yield issues or avoidable excess spending, the predictive model continuously improves through a learning loop, increasing the effectiveness and performance of your supply chain as it evolves.



The power of knowledge and confidence in your supply chain.

As the sophistication of information technology grows exponentially, problems can now be solved that were previously thought to be impossible. Providing your supply chain with the visibility to reduce transportation costs by incorporating data science and predictive analysis into your transportation program can help organizations identify when and where to implement real-world, cost-saving solutions like passive thermal protection. Food safety regulations, complex distribution networks, and unpredictable weather all add to the complexity of your supply chain, but when you have the knowledge and confidence to manage your network using real-world data analysis, these challenges become opportunities. The power of supply chain analytics and passive thermal protection cannot be understated, even when implemented into your unique transportation environment.

About Q Products & Services

Q Products & Services provides passive temperature protection products to the food, beverage, pharma and chemical industries. Made with patented insulating systems and technologies, Q Products & Services solutions are famous for their durability and optimum thermal performance. Q Technical Services also offers live temperature testing and analysis conducted by a specialized team of engineers to ensure product performance credibility. An established industry leader for over 20 years, Q Products & Services continually develops new and innovative cost-saving solutions for transporting temperature sensitive commodities, including wireless temperature monitoring and cargo security technologies. All products are manufactured inside state of the art facilities located in the south suburbs of Chicago, IL.

For additional information, please visit www.qsales.com or call us at 708-331-0094.

About Riskpulse

Headquartered in Austin, TX, Riskpulse is a prescriptive supply chain risk analytics company that helps its clients and their partners increase the predictability and stability of their financial and physical operations globally. Members of the supply chain depend on Riskpulse probabilistic forecasts and advisory services to understand weather's impact on supply and demand in order to guide their operational planning. Many of the largest food shippers, consumer packaged goods manufacturers, automakers, and retailers trust the Riskpulse Score (RpS™) and the Riskpulse suite of cloud-based software applications to standardize their quantification of risk.

Contact us at sales@riskpulse.com or call 800-645-8480 to learn more.

