TA Dedicated

SUPPLY CHAIN ENGINEERING

Efficiencies and Optimizations for Fleet Operators

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Supply chain management is undergoing an existential transformation today.

There are new challenges. Often rapid-fire, increasingly cataclysmic, they range from superstorms and triple digit tariffs to geopolitical crises and unrelenting competition.

In the midst of it all, there are also new opportunities to run leaner, vastly better supply chains with greater speed and flexibility than ever before --- all made possible through responsive, dynamic supply chain engineering.

SUPPLY CHAIN ENGINEERING WAS **MADE FOR THIS**

Supply chain engineering (SCE) is the pivot point that enables your company to reveal the new opportunities out there – and excel amidst challenges.

With SCE, you can uncover **economies, efficiencies, tremendous utilization, service, resilience and sustainability benefits.** SCE isn't new. It's existed for as long as supply chains. The difference is that now you can apply it much more easily and consistently.

It's all on account of technology. Cloud computing, big data, analytics, artificial intelligence (AI), and machine learning (ML) are the tools that have unlocked faster, more powerful SCE today.

Like all tools, it's how you use them that counts. In this white paper, TA Dedicated's industrial engineers and supply chain experts share insights for shippers who want to realize the full power of SCE.

CASE STUDY

DRIVER UTILIZATION FOR **HEAVY EQUIPMENT MANUFACTURER**

99% ON-TIME ACHIEVED ALONGSIDE DYNAMIC COST OPTIMIZATIONS

CHALLENGE: TA Dedicated's customer is a major auto parts distributor with uncompromising on-time (OT) requirements. The distributor was challenged to deliver parts to meet dealerships' pressing timelines and challenging delivery windows. The customer's complex routing challenges also made it difficult to control costs.

SCE Solution: SCE is an integral and ongoing component of TA Dedicated's service to this customer. A dedicated engineer is assigned to the customer for the mammoth task of reviewing every route of the distributor's network every month. Data for freight delivered and forecasted is processed, solutions are optimized and adjustments made.

"We analyze their routing every single month to look for ways to optimize their forecasted deliveries for the next month.'" Miller explains. The optimizations range from identifying routes that can be consolidated to deploying driver teams for some long hauls. The perpetual challenge is finding solutions that save without sacrificing service.

RESULTS: TA Dedicated achieved 99% OT while performing dynamic cost optimizations for the customer. TA Dedicated also engineers an assortment of sustainability optimizations for the customer. TA Dedicated has introduced BETs and vehicles that use alternative fuels to support the customer's sustainability goals, all while maintaining near-perfect OT.

THE NEW ERA OF SUPPLY CHAIN ENGINEERING

Supply chain management used to be something predictable; executed based on consistent plans from historical performance. That is not so anymore.

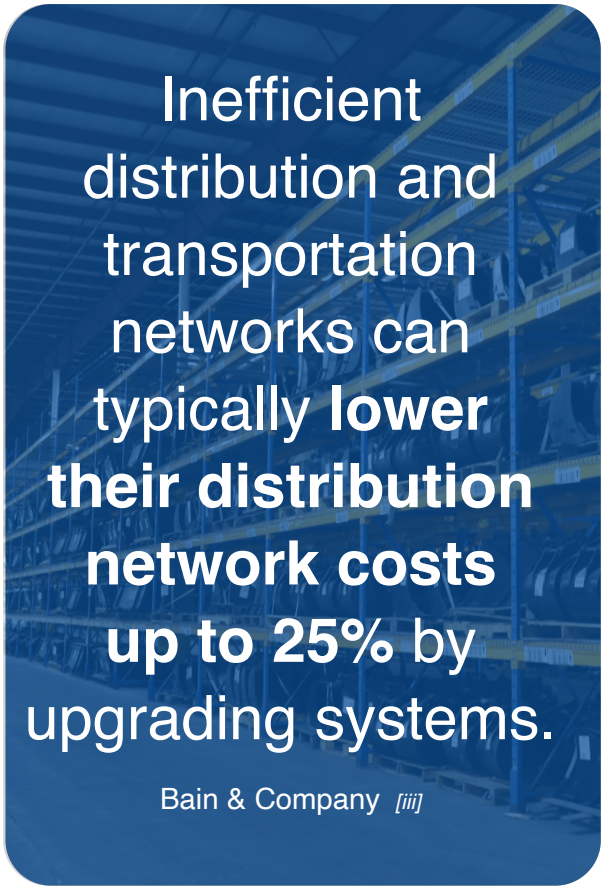
Shippers today need SCE to defend themselves from breaks in the supply chain. Gartner's 2024 survey of CPOs indicated that their number one worry is supply chain disruptions.*[i]*

SCE today features powerful tools for developing contingency plans for supply chain disruptions and enabling agile actions to avoid or minimize their impact. The ability to model and simulate supply chain changes is becoming more common. No shipper wants to be the only one in the market who can't deliver when snow closes the I-80 or the Panama Canal runs dry. That's the disruption angle.

There's also the optimization angle. With today's SCE software, the real-time infusion of data and other technological advances, the opportunities to optimize routes, modes, loads and more come in the moment. There is huge potential to realize cost savings, improve efficiency and more.

The risk of tremendous disruption and potential for unprecedented optimization define the transportation environment every shipper is competing in today. The pressure's on. Transportation costs greatly impact bottom line profitability and are constantly scrutinized. Technology leaders CTSI•Global estimate that transportation and logistics costs make up 9-14% of total sales in companies.*[ii]*

An optimized supply chain imparts a significant competitive advantage, and advanced SCE is the key to unlock that advantage and juice up performance.



Committing to SCE has become a matter of competitive survival. A 2025 Gartner survey found that 95% of companies plan to increase investment in supply chain analytics – a fundamental aspect of SCE – over the next two years.*[iv]*

The bottom line is that shippers need to do it – or they need to partner with experts who can do it for them. What exactly is the "it" we're talking about? A helpful definition of supply chain engineering is in order.

CASE STUDY

SUPPLY CHAIN DESIGN THAT MAXIMIZES EVERY SQUARE FOOT OF A BUSY YARD

CUSTOM SIMULATOR
ACHIEVES 5 KPI PRIORITIES

CHALLENGE: TA Dedicated's customer is an industrial manufacturer that makes the high-demand generators powering the data centers behind the AI boom. TA Dedicated manages the manufacturer's dedicated shuttle fleet, running generators on double drop trailers from the factory to the manufacturer's busy yard. The operation was hampered by complexity. When customers came to pick up their products, forklift operators sometimes had to move multiple generators in order to reach the right one in the yard. Bottlenecks resulted and on top of that, yard space was poorly utilized. In order to stay ahead of growing demand for generators, the manufacturer needed to solve their capacity and efficiency challenges.

SCE SOLUTION: TA Dedicated engineered a custom simulator to analyze utilization, determine maximum capacity, and devise a layout for optimal efficiency. That included creating Python code to test outcomes based on different parameters ranging from forklift routes and generator positions to truck lanes, safety requirements and volume influxes. The results were fed into CAD software which created a 2D blueprint for an optimized layout of the yard. That was then overlayed to Google Maps to determine exactly where driver lanes and storage spaces should be located.

RESULTS: Where before they had disarray, now the manufacturer has a way to optimize yard operations and manage five KPIs that are essential for controlling costs and ensuring capacity as they scale to meet future demand. They are:

- Optimizing the flow of generators from plant to yard
- Optimizing forklift utilization and forklift driver productivity, especially for inbound/receiving
- Maximizing capacity for storing generators
- Minimizing forklift moves required to reach desired unit for outbound fulfillment
- Optimizing throughput in the yard

WHAT IS SUPPLY CHAIN ENGINEERING?

Supply chain engineering is the step-by-step process for evaluating, planning and realigning networks to better manage demand, manage disruption and position shippers for future growth.

1 IT STARTS WITH DATA

At its core, SCE is data. It begins by establishing a baseline profile of customer operations in relation to specific near- and long-term strategic objectives and risks. This is done by collecting and structuring internal shipment and order data, along with situational data on delivery facilities, traffic or weather constraints by route, industry or market trends, regulatory requirements and so on. These provide critical visibility into shipment patterns, order-management processes and network configuration.

2 ANALYSIS

Analysis starts with the shipper and a specific set of objectives, whether it's claims reduction, cost savings, improved utilization or something else. Datapoints are used to create models that allow engineers to analyze how well solutions achieve objectives when you change the variables.

3 OPTIMIZATION AND EXECUTION

The speed of SCE today streamlines the process and reduces the time lag between analysis and optimization and execution. The ability to perform SCE quickly and accurately enables shippers to easily manage new KPIs, optimize at the micro level, measure results and then do it all over again.

WHY SUPPLY CHAIN ENGINEERING?

KEEP UP WITH DEMANDING PERFORMANCE STANDARDS

SCE processes must meet the uncompromising delivery standards buyers are used to today. 74% of consumers expect delivery within two days, according CapitalOne Shopping Research. [v] A program that collects data, measures results and guides effective action is a given because there is so much to gain. Companies who do smart supply chain engineering experience benefits including:

BENEFITS OF SUPPLY CHAIN ENGINEERING

- COST SAVINGS
- IMPROVED EFFICIENCY
- FLEXIBILITY FROM FAST ANALYSIS
- RESPONSIVENESS TO CHANGING CONDITIONS
- EMISSIONS REDUCTION
- SERVICE QUALITY

> **Many smaller shippers still analyze data using Excel sheets. It works for some optimizations, but it takes ten-times longer than SCE software and it's prone to mistakes and inaccuracies,**
>
> Shawn Miller
> Director of Supply Chain Engineering
> TA Dedicated

COMPETE IN OUR TECHNOLOGY-ENABLED WORLD

Technology enables supply chain engineering to explore more options than ever before. AI is analyzing huge amounts of data to instantly identify patterns and devise solutions. Shippers can optimize routes, loads, equipment utilization, service, sustainability – literally everything. And they can do it constantly. With supply chain engineering technology, companies operate on a higher plane.

STAY AHEAD OF MARKET SWINGS AND DISRUPTIONS

Supply chains are increasingly affected by complex factors outside of a shipper's direct control. Freight rates can change from day-to-day and week-to-week. Events on the other side of the world reverberate locally because of interconnected global supply chains.

Anticipating changes and making necessary adjustments isn't seen as going over and above anymore. It's now a critical function of regular supply chain engineering. Modeling, simulation, and predictive analytics are the SCE tools widely being used to support short- and long-term business continuity.

CASE STUDY

COST-SAVING UTILIZATION INSIGHTS FOR A HEAVY EQUIPMENT MANUFACTURER

$500K DRIVER COST AVOIDANCE
THROUGH OVERTIME VS. HIRE STRATEGY

CHALLENGE: Flatbed hauling is demanding work. Varied and remote delivery locations, delays from specialized loading and unloading equipment, and additional safety precautions often require drivers to work overtime. TA Dedicated's customer wondered if it would be more cost-effective to hire additional drivers than it is to pay overtime.

SCE Solution: Supply chain engineering is made for finding the answers to complex questions fast. TA Dedicated's team was able to crunch the numbers with the aid of advanced SCE software and proven experience in flatbed and heavy-equipment hauling.

The results determined decisively that paying overtime was dramatically more cost effective than hiring additional drivers. There are many costs outside of payroll that contribute to the overall cost of hiring, training, insuring and retaining full-time drivers. Compared to the average cost of 120 overtime hours per week for all drivers, hiring additional drivers would have been much more expensive.

RESULTS: The exercise revealed that the economic impact of hiring would be an additional $500,000 a year in payroll and hiring costs.

OPTIONS FOR SHIPPERS TO UPGRADE SCE

Advanced SCE must be the focus of any transportation program today. It doesn't matter whether you run a private fleet, outsource to carriers and 3PLs, contract with a dedicated fleet provider, or have a model that mixes some or all of these. Fast and accurate SCE functionality has to be there. Here are the important considerations and options for shippers depending on the transportation model they use:

OPTION 1: OPERATORS OF PRIVATE FLEETS have the option of performing SCE in-house through their own software and engineering team. The challenges of a DIY approach can be substantial:

OPTION 2: SHIPPERS WHO PARTNER WITH 3PLS OR CARRIERS aim to shift some of the responsibility for SCE from themselves, seeking more advanced solutions. Some 3PL or carrier partners may be able to provide workaround solutions. For example, some TMSs have SCE modules offering limited functionality and Excel sheet analysis is also an option. Neither of these workarounds can compare to the performance of a bonafide SCE software and skilled engineering team.

OPTION 3: SUPPLY CHAIN CONSULTING FIRMS are an option for shippers who want access to top of the line SCE software and expertise. The consultant path helps shippers avoid the capital outlay and continue their investment in in-house capabilities. This solution does not create a continuous solution though. Outside consultants create a plan for shippers to execute. Two potential problems with this arrangement are that continuous optimization and "skin in the game" are often lacking, according to Miller.

OPTION 4: DEDICATED FLEET PROVIDERS offering dedicated SCE as part of their contract provide distinct advantages to shippers. A dedicated fleet provider like TA Dedicated will provide top-tier SCE software and the expertise of a team of industrial engineers on an ongoing basis. Like an in-house engineering team, a dedicated team provides continuity that supports continuous optimization. Unlike an in-house team, a dedicated solution also brings the benefit of an outside-in view gained across many different fleets and operations.

One way or another, shippers must beef up in-house capabilities or engage an outsourced solution. Deciding which depends on a SCE program's ability to master the major facets of a comprehensively and continuously engineered supply chain.

CASE STUDY

IMPROVING UTILIZATION FOR A GLOBAL CPG COMPANY

REDUCED COST PER POUND FROM $0.30 TO $0.10

CHALLENGE: An international consumer package goods importer and exporter struggled with high cost per pound (CPP) performance. Their network of mostly local and regional carriers was plagued by poor utilization. Shipping empty space on many loads led to their average CPP of 30 cents.

SCE SOLUTION: TA Dedicated assigned a dedicated engineer to the customer to optimize the CPG customer's routing and improve utilization. Data was provided by the customer for driver schedules, resource allocations and routing. A major challenge was that the routes changed daily. The engineered solution had to take this variability into account.

TA Dedicated's solution right-sized the truck and trailer count. "Depending on where we're delivering to and how full we can get these trailers, we made recommendations on the number of straight trucks versus the number of tractor trailers to deploy," Miller says.

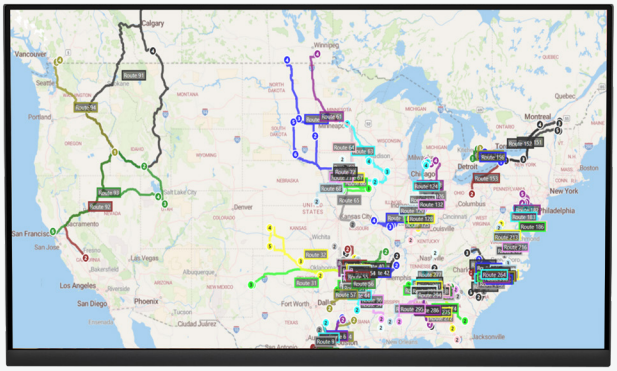
That was only one component of the solution. The other component was to optimize dispatch times for drivers in the morning to better coordinate inbound and outbound deliveries, create multi-stop deliveries and enable multiple runs. In doing so, TA Dedicated optimized the number of drivers they needed and maximized their utilization.

RESULTS: These and other optimizations reduced CPP from 30 cents to 10 cents. A huge victory on the customer's most important KPI.

DEEP SUPPLY CHAIN ENGINEERING **APPLICATIONS**

Supply chain engineering takes on many forms and functions. Here is a glimpse into the major ones any shipper should utilize:

NETWORK DESIGN



Sourcing policies and where to locate plants, distribution centers and fulfillment centers are the work of network design. Proximity to markets, suppliers and transportation corridors as well as real estate prices, labor availability, and weather patterns are key variables in decisions. Network design analyzes variables in different combinations to ascertain their impact on a variety of priorities and objectives led by cost, service, and utilization.

NETWORK OPTIMIZATION

This is the ability to continuously analyze results and compare them to baseline expectations for designs and optimizations. Network optimization provides regular opportunities to refine processes. Miller cites continuous improvement as the greatest advantage of a dedicated supply chain engineering group. “Network optimization creates a circle of identifying what we thought was going to happen, what did happen based off new information, and what will happen when we make adjustments to lanes, driver schedules, and a wide range of other actions,” Miller explains.

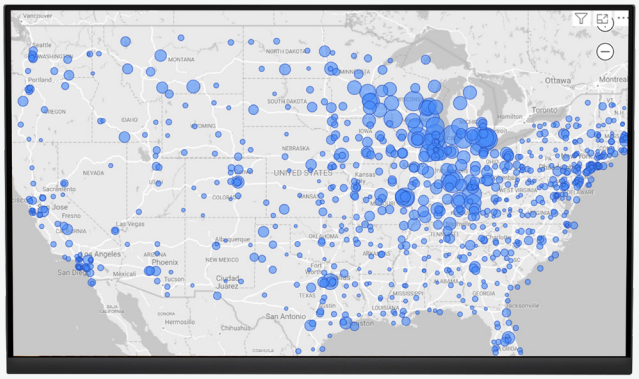
MODAL SHIFTS

Can LTL shipments be consolidated? Would a drop trailer program be cost effective? The ability to quickly ascertain impacts of mode changes leads to opportunities to: **streamline service, create efficiencies, and reduce transportation costs.** SCE today needs the flexibility to make modal shifts as opportunities arise in the short- and long-term.

ROUTING

The opportunities for achieving routing efficiencies and economies are as endless than the American highway system. Fuel is the biggest costs in trucking, and the ability to shave miles off routes or avoid traffic in real-time can bring shippers tremendous savings. In SCE, routing is determined holistically. SCE considers what shipping lanes to take and when to travel, or it determines what’s possible given a driver’s available hours of service (HOS) or with team drivers.

COST MODELING



SCE is used to collect internal and external data for an endless array of KPIs. The data is used to create sophisticated models enabling shippers to quickly get the answer to “If we do this, what will it do to costs?” You could use a model to find out whether adding another truck and driver to the fleet would be cheaper than paying existing drivers overtime. Or you could use a model to determine how much additional capacity will you additional capacity will you need to secure for peak season based on past years’ volumes and current economic factors. Modeling has been supercharged by AI and ML, enabling it to be used to analyze and compare costs more granularly and frequently.

CARBON MODELING

There are many ways supply chains can be engineered to reduce or eliminate emissions. A key focus of SCE is creating computer models that answer questions like how much carbon could be cut with battery electric trucks (BETs) or the use of LNG- or biofuel-powered trucks. Modeling also focuses on carbon emissions that can be reduced through routing enhancements or improved driving habits.

DIGITAL TWINS

At the cutting edge of supply chain engineering today lies the creation of digital twins. These are virtual replicas of systems that enable companies to simulate, analyze and optimize their operations in real-time. Digital twins are always-on models that companies can look to for answers to a host of what-if questions. This allows companies to test moves like adding a plant. It also enables them to analyze outcomes of external events and possible responses. Large companies are currently leading the way with 70% of C-level technology leaders at large enterprises say they are exploring and investing in digital twins.*[vi]*

AUTOMATION

Taking advantage of opportunities to switch to a faster, shorter or safer route requires a real-time change that is ripe for automation. That means SCE that can analyze, optimize and execute certain actions. Meeting customer demands today requires a dynamic supply chain that can perform with superhuman efficiency. Shippers need SCE that provides functionality like executing automated alerts to customers informing them of ETAs or alterations to a driver’s scheduled stops to reflect their HOS.

SUSTAINABILITY: BONUS **BENEFITS OF SMART ENGINEERING**

Nowhere are the benefits of supply chain engineering seen more directly and immediately in a company's bottom line or return on investment than fuel cost reduction, which is also at the core of broader supply chain sustainability. A recent sustainability whitepaper from TA Dedicated observes that trucks in the U.S. are typically 57% full.*[vii]* Optimized routes and utilization lead to significant savings in fuel consumption and related emissions.

Companies planning for long-term growth additionally will have to factor sustainability into their decision-making as a strategic business objective. Advanced SCE aids by providing formalized processes for measuring and verifying current emissions and progress over time in reducing them.

Pressure on supply chains across sectors from consumers, investors and regulators to source sustainably, reduce materials waste and lower carbon emissions, remains strong. A 2025 report by MIT researchers finds that 85% of companies surveyed say they are continuing supply chain sustainability programs at the same level as in recent years or are increasing those efforts.*[viii]*

Truck fleets are a rich target for companies trying to meet carbon-reduction goals. Greenhouse gas (GHG) emissions from transportation account for about 28% of total U.S. GHG, making transportation the largest contributor of U.S. GHG emissions, according to the EPA.*[ix]*

Integrating sustainability into supply chain operations isn't easy. Measurement requires cooperation from unaffiliated suppliers, vendors and partners, and end-to-end data must be verifiable, reported and certified by credible neutral parties. SCE provides answers by aiding with data structuring, advanced analysis, optimization and reporting.

The success of sustainability programs depends on the ability to demonstrate results for compliance, obtaining subsequent investment, meeting sustainability requirements on RFPs, and achieving continuous improvement.

Demonstrating results isn't always straightforward, though. For example, CNG, BET, hydrogen, and biodiesel are all options shippers are thinking about introducing. A persistent challenge is that freight (weight haulage), range, refueling or recharging costs, maintenance requirements, and emissions are all different and not easily compared to diesel truck standards.

Careful analysis to create a true 'apples to apples' comparison is difficult but do-able through SCE.

ACHIEVE A **COMPETITIVE ADVANTAGE** THROUGH SCE TECHNOLOGY

Supply chain management used to be simpler. You could stay the course with a strategy for years. Technology has changed that.

The main SCE functions of collecting data, performing analysis, optimizing, and executing are the same now as they were in the past. The difference is that thanks to technology, these functions are performed faster, more often, and with more detail. These are the key technological aspects of supply chain engineering to keep in mind today.

SPECIALIZED EXPERTISE REQUIRED

Optimizing transportation networks requires sophisticated SCE programs backed by experienced industrial engineers to achieve their full potential. An industrial engineer needs to have the methods and the means to maximize utilizations and output. “Just having the right data and the right technology isn’t enough. It takes technical expertise and business experience to develop and successfully translate optimizations to operations and other groups,” Miller says.

ADVANCED SCE SOFTWARE

To do the job of SCE, private fleets or outsourced providers leverage sophisticated supply chain engineering platforms or proprietary software. Even enterprise-ready platforms require a heavy lift. “The software is intricate and formatting how things are laid out is complex. You have to understand how each piece talks to the other pieces,” Miller explains. For this reason, there’s a high learning curve and training on systems is extensive.

SIGNIFICANT INVESTMENT

The cost of SCE software ranges from five to six figures per year depending on the capabilities required, number of users and whether the solution is custom built. There are often annual fees and fees for updates that are ongoing. The cost for hiring and training staff is also considerable. As a result, creating and maintaining an advanced supply chain engineering capability in-house is beyond the means of most small to mid-sized shippers – and many large shippers.

TA DEDICATED: THE ADVANTAGE OF **TECHNOLOGY & INTEGRATION**

10 ADVANTAGES OF A TECHNOLOGY-ENABLED DEDICATED FLEET PROVIDER

The reality is that the advantages of advanced SCE are largely out of reach for many shippers. The investment in technology and talent is prohibitive. That makes outsourced options the essential equalizer for small- to mid-sized shippers.

Shippers can look to consultants or 3PL providers for technology assistance, but integration between outside providers and operations are disjointed by default.

Of the available outsourcing options, a technology-enabled dedicated fleet provider like TA Dedicated provides single-source integration to realize the full benefits of seamless SCE.

01 **CONTINUOUS IMPROVEMENT** is perhaps the greatest by-product of having a dedicated fleet provider like TA Dedicated that provides SCE. The continuity of an assigned team of industrial engineers enables unceasing optimization. Integration with truckload services facilitates agile execution with no gaps.

02 Dedicated **ROUNDTRIP FLEXIBILITY AND CONTROL**, outside the chaotic carrier bid and selection process. Backhauls present an unrealized opportunity for shippers with deadhead mileage representing 16.3% of all trucking, per ATRI.*[x]*

03 **NO UPFRONT COSTS** for technology adoption, fleet and equipment upgrades, drivers, research and testing of fleet innovations, or onboarding.

04 **FLEXIBLE FLEET CAPACITY** from multiple sources that scales up or down to align with optimizations.

05 Fleets easily integrated with existing TMS and other operating platforms to optimize performance and resilience. **REMOVING GAPS BETWEEN OPERATIONS AND ENGINEERING** enables companies to quickly capitalize on opportunities and anticipate disruptions.

06 **CONTROL OF DRIVER CAPACITY** enables greater opportunities to optimize routing, utilization, service and costs. Meeting spikes doesn't always mean more drivers and equipment. Sometimes having drivers work overtime is more beneficial.

07 A holistic understanding of when and by how much to **PULL SUPPLY CHAIN LEVERS** is a key advantage of engineering expertise. At TA Dedicated engineers and pricing teams work together to find the optimal balance between rate, service and other priorities.

08 By offering greater insights to customers into cost and other impacts of potential scenarios customers can make **BETTER INFORMED DECISIONS** in the moment and over the long term. Forecasting also benefits through enhanced accuracy.

09 Disruption planning is enhanced by **SCENARIO ANALYSIS** for anticipating potential changes such as seasonal port congestion or volume spikes. This facilitates responsiveness, often enabling capacity to be supplemented by additional logistics divisions.

10 **FORECASTING** advantages are increased by the ability to look at micro timeframes such as week-by-week or day-by-day based on when windows hit historically.

ESSENTIAL PARTNERSHIPS

Third parties like dedicated fleet providers or consulting firms who provide supply chain engineering play a crucial role in filling talent and technology gaps. Shippers can piggyback off a provider's software subscription and leverage their engineering talent, thus avoiding CAPEX requirements and hiring costs. Ongoing updates and training can also be outsourced.

THE ROLE OF TMS

Advanced TMS feeds the SCE machine with data and essential functionalities. For SCE, you need a TMS that delivers the visibility for a robust understanding of end-to-end supply chain processes. Strong compatibility with existing TMS is a key consideration when shopping for SCE software or considering SCE partners.

INTEGRATION WITH OPERATIONS

There needs to be a strong connection to operations that facilitates seamless data input and execution. Strong connections between SCE software, data and assets supports speed, agility and efficiency in the supply chain. That's the advantage of in-house SCE as well as a dedicated fleet provider that provides SCE.

EVERY SUPPLY CHAIN IS A **UNIQUE ENGINEERING OPPORTUNITY**

SCE can take many forms and reveal many benefits. They depend largely on a company's size, industry, and stage of development.

The one commonality is the primary role of SCE in every shipper's future. Arrange a meeting with the SCE experts from TA Dedicated to discuss what your future supply chain could look like.

EXPERT CONTRIBUTOR

SHAWN MILLER

DIRECTOR OF SUPPLY CHAIN ENGINEERING

Shawn Miller is a seasoned supply chain engineering leader with more than a decade of experience advancing network optimization, transportation analytics, and strategic design across some of the logistics industry's most recognized organizations. He currently serves as Director of Supply Chain Engineering at TA Dedicated, where he leads the Solutions Engineering Group responsible for network design analysis, pricing strategy, and data-driven modeling that supports high-performance transportation solutions.

Prior to joining TA Dedicated, Shawn held progressive roles at Walmart within Transportation Strategy & Optimization. His contributions delivered substantial operational impact, including $240 million in network cost reductions, a 400% projected expansion of team-driver operations, and more than $200 million in potential annual savings through enhanced driver-type modeling and cross-functional collaboration.

Shawn began his career at J.B. Hunt, where he spent over nine years in engineering, pricing, and logistics design roles. His work included predictive modeling, new fleet development, and close partnership with executive leadership to align engineering solutions with financial and operational goals.

Shawn holds a Bachelor of Science in Industrial Engineering with a minor in Sales Engineering from Iowa State University. During his studies, he served as President and Treasurer of the Sales Engineering Club and held leadership positions in Tau Kappa Epsilon.

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